CITY OF ENCINITAS
ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

INTRODUCTION

The City of Encinitas Engineering Department has authored this Engineering Design Manual to assist the professional design community and the general public by consolidating information concerning the City's engineering standards and submittal requirements for various plans and permits administered by the Engineering Department. The manual is intended to be used as a guideline for design, plan preparation, and permit processing, and it includes the following chapters:

Chapter 1: Map/ Parcel Map Preparation and Processing Requirements
Chapter 2: Permits and Processing
Chapter 3: Grading Plan Preparation and Submittal Requirements
Chapter 4: Sewer Design Requirements
Chapter 5: Water Design Requirements
Chapter 6: Drainage Design Requirements

Chapter 1 covers all City requirements pertaining to maps and City map review. Chapter 2, Permits and Processing, describes all permits issued by the City Engineering Department and outlines requirements specific to each. Chapter 3, Grading Plan Preparation and Submittal Requirements, covers in depth the standards for grading plans, but it can also be used as a general guide for the preparation of improvement plans; for instance, the standard notes required for improvement plan title sheets are presented here. Specific requirements for improvement plans relating to sewer, water, drainage design, and street design are discussed in Chapters 4, 5, 6, and 8, respectively. Permanent storm water pollution control BMPs required for most grading and improvement projects are discussed in Chapter 7.

The Engineering Design Manual contains appendices specific to the material presented in each of the chapters. These appendices are designed to be modified and updated as City requirements change from time to time. If in doubt, please contact the City Engineering Department or reference the posting of the Engineering Design Manual on the City website to ensure that a current version is being used.

Should you have any questions, please contact the Engineering Department at (760) 633-2770.

ACKNOWLEDGEMENTS

Significant efforts by City of Encinitas staff, San Dieguito Water District staff, and the project consultant helped to develop this manual. Geopacifica Geotechnical Consultants was the project consultant. Stephanie Kellar managed the project for the City and authored the manual in collaboration with contributors Masih Maher, Duane Thompson, and Peter Cota-Robles. A number of advisors provided valuable review comments and recommendations; their time and input is greatly appreciated.

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DEPARTMENT NAME CHANGE

On July 21, 2014 the Engineering and Public Works Departments were combined into one Department: Public Works. All duties, responsibilities and powers previously assigned to the Engineering Director are now the responsibility of the Public Works Director. Any reference to Director of Engineering shall mean Director of Public Works. Director of Public Works serves as Public Works Director or City Engineer and any reference in the Engineering Design Manual shall be the same.

REVISIONS

Below are the revisions made to the Engineering Design Manual, beginning with the most recent changes.

Date	Section	Revision
12/6/2023	App 2.4, and App 2.5	Updated App 2.4 per City Council Reso #2023-121. Updated App 2.5 per City Council Reso #2019-095
8/22/2023	App 4.9 and App 4.10	Updated Encinitas/Cardiff Sanitary Division Applications
6/29/2023	App 1.3, App 1.4, and App 2.13	Updated Land Development Engineering Fee Sheet, Flood Control Fees, Traffic Mitigation Fees, Attachment A, and Flood Control and Traffic Mitigation Fee form
7/29/2022	App. 4.9 & App. 1.4	Updated Encinitas/Cardiff Sanitary Division Applications
6/28/2022	App 1.3 and App 2.13	Updated Land Development Engineering Fee Sheet, Flood Control Fees, Traffic Mitigation Fees, Attachment A, and Flood Control and Traffic Mitigation Fee form
2/14/2022	App. 4.9 & App. 4.10	Updated Planning Fee sheet and Encinitas/Cardiff Sanitary Division Applications
10/4/2021	App. 1.3	Updated Land Development Engineering Division Schedule of Fees
6/29/2021	App 2.13	Updated Flood Control Fees, Traffic Mitigation Fees, Attachment A, and Flood Control and Traffic Mitigation Fee form
11/12/2020	App 1.13B	Added point 1052 to Survey Control Network

11/4/2020	App 4.9 & 4.10	Updated account number and Wastewater Discharge Processing Fee
6/22/2020	App 2.13	Updated Flood Control Fees, Traffic Mitigation Fees, Attachment A, and Flood Control and Traffic Mitigation Fee form
6/19/2019	App 2.13	Updated Flood Control Fees, Traffic Mitigation Fees, Attachment A, and Flood Control and Traffic Mitigation Fee form
06/10/2019	App. 2.13	Updated header from Public Works Department to City of Encinitas Appendix 2.13
01/01/2019	App. 1.4 & 2.8	Updated Planning Department Schedule of Fees Appendix 1.4 (P 1-5 & 1-6) dated 1.1.18; Added text to Appendix 2.8 “Haul Route Permit Application” (P 2-21) & added P 2-21A with EMC 23.24.410 conditions
07/16/2018	Chapter 7	Replaced Chapter 7, “Encinitas Stormwater Manual” with Chapter 7, “BMP Design Manual, Effective 2/16/16”; inserted Table of Contents for Chapter 7, “BMP Design Manual” after Appendix 6 Table of Contents
06/26/2018	App. 2.13	P 2-30 BPTM & BPRT fees updated to $2,483.48 & Rural Residential Adder updated to $496.70; P 2-32 & 2-33 fees updated
02/15/2018	App. 4.9 & 4.10	Revised accounts for Sewer Lateral Construction & Wastewater Discharge Permit Capacity Fees (P 4-42 & 4-43)
01/19/2018	App. 2.24	Reformatted After-Hours Inspection Request Form (P 2-55)
01/01/2018	App. 1.3	Updated Engineering Division Schedule of Fees (P 1-3 & 1-4) dated 1.1.18
10/05/2017	App. 2.13	P 2-30 BPTM Rural Residential fee updated to $480.83

06/28/2017	App. 2.13	P 2-30 BPTM & BPRT fees updated to $2,404.14; P 2-32 & 2-33 fees updated
06/28/2017	App. 1.7 (c)	Replaced P 1-24 w/All Purpose Acknowledgement Form; P 1-25 changed to “This Page Intentionally Left Blank”
03/23/2017	App. 2.10(b)	Created Appendix 2.10(b); Revised Chapter 2 Appendix Table of Contents
03/23/2017	App. 2.10(a)	Appendix 2.10 renamed 2.10(a)
03/21/2017	App. 4.9	Reformatted
03/21/2017	App. 4.10	Reformatted
02/01/2017	App. 2.10	Added requirement to list benefit of proposed public ROW vacation
6/23/2016	App. 2.13	Updated Traffic Mitigation Fees
6/23/2016	App. 2.13	Updated Flood Control and Traffic Mitigation Fee Form
05/3/2016	App. 2.35	Clarified as-built processing
04/26/2016	App 1.3	Corrected construction change fees
3/17/2016	App. 4.10	Added Building Permit Number
3/17/2016	App. 4.9	Added Building Permit Number
3/17/2016	App. 3.1	Modified County recording fees
3/17/2016	App. 3.13(a)	Updated SWPPP preparation overview

3/10/2016	App. 3.2	Revise Sample Grading Title Sheet
3/10/2016	App. 3.11	Revise Sample Improvement Title Sheet
03/10/2016	App. 2.35	Create New Appendix 2.35, As-Built Processing and Requirements
3/08/2016	App. 2.18	Add Stormwater Intake Form (SWQMP) to checklist
3/08/2016	App. 2.17	Add Stormwater Intake Form (SWQMP) to checklist
03/08/2016	App. 2.10	Modify fee information and mailing label requirements
03/07/2016	App. 2.28	Delete and replace with new Appendix 2.35
03/07/2016	App. 2.30	Delete and replace with new Appendix 2.35
02/08/2016	App. 2.3	Modify Right-of-Way Construction Standard Notes
2/08/2016	App. 4.10	Modify format
2/08/2016	App. 4.9	Modify format
12/28/2015	App. 4.9	Create New Appendix 4.9, Encinitas Sanitary Division Application
12/28/2015	App. 4.10	Create New Appendix 4.10, Cardiff Sanitation District Application
12/23/2015	App. 3.18	Modify fee information and general updates to Simplified Grading Requirements
12/22/2015	App. 1.4	Update of Planning Department fees

12/22/2015	App. 2.9	Update of fee information and reformatting of Street Name Change Application
12/22/2015	App. 2.2(a)	Update fee information and reformat Newsstand Permit Application
12/21/2015	App. 2.2(b)	Update fee information and reformat Sidewalk Café Permit Application
12/9/2015	App. 1.3	Update of Engineering fees and addition of newly established fees
12/7/2015	App. 2.32	Added requirement for USA-made sewer manhole lids
7/13/2015	App. 1.2	Remove email address information from Engineering Development Application
6/29/2015	App. 1.2	Add email address information to Engineering Development Application
6/18/2015	App. 2.13	Update Traffic Mitigation Fees
6/18/2015	App. 2.13	Update Flood Control and Traffic Mitigation Fee Form
2/18/2015	App. 1.10	Update All-Purpose Notary Acknowledgement with new 2015 language
3/6/2014	App. 2.5	Update Trenching Moratorium for current year
9/19/2013	App. 2.2(b)	Update Municipal Code Reference
8/26/2013	App.2.13	Update Traffic Mitigation Fees
8/26/2013	App. 2.13	Update Flood Control and Traffic Mitigation Fee Form
7/10/2013	App. 2.4	Update Standard Trench Repair Detail (Petromat not allowed)

7/10/2013	App. 2.3	Revise Note 28
7/10/2013	App. 2 TOC	Add reference to EDM Appendix 1.2 at top of Appendix 2
5/2/2013	App. 1.3	Modified codes for building permit plancheck fees
3/22/2013	App. 3.2	Changed City Engineer to Glenn Pruim on Grading Title Sheet
3/8/2013	App. 2.9	Modified procedure for renaming streets, Item #5
3/8/2013	App. 7.D	Modifications to “HOA”, “Agent”, and “Agent for Commercial” sample agreements
1/23/2013	App 1.21	Revised Attachment B to Encroachment Covenant
1/22/2013	App. 4.1	Added clarification regarding ‘C’ (Commercial) and ‘W’ (Warehouse) designations in the table
1/15/2013	App. 4.4	Update to CSD/ESD Sewer Fees
1/3/2013	App. 2.22	Update requirements for dedication and public improvement
1/3/2013	Ch. 3.402.5	Change of requirements for contaminated material as per Council direction
2/23/2012	App. 2.2(b)	Modified to meet new sidewalk dining policy

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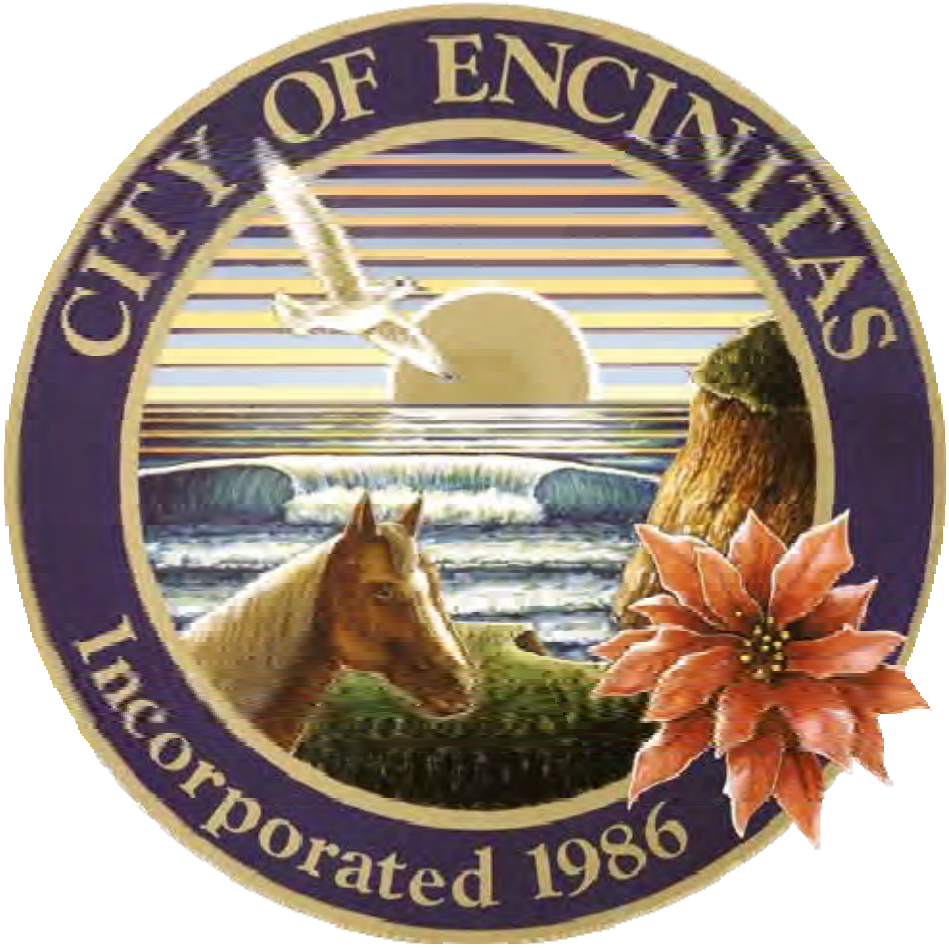

CHAPTER 1: MAP AND PARCEL MAP PROCESSING AND PREPARATION REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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RESOLUTION 2009-39

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING CHAPTER 1 OF THE ENGINEERING DESIGN MANUAL

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the first six chapters of the Engineering Design Manual have been made available for review by members of the public and the professional community in public workshops and on the City of Encinitas web page; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF CHAPTER 1 OF THE ENGINEERING DESIGN MANUAL

Chapter 1 of the Engineering Design Manual, Attachment 1 to this resolution, is hereby adopted by the City Council and is to be a comprehensive guide to the policies and processes for processing applications for subdivision maps and parcel maps.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of Chapter 1 of the Engineering Design Manual will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the Design Manual will not directly result in development; any development permit processed as a result of the policies and processes contained within the Engineering Design Manual may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

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CHAPTER 1

MAP AND PARCEL MAP PREPARATION AND PROCESSING REQUIREMENTS

1.100 GENERAL INFORMATION FOR CITY REVIEW OF MAPS.

The purpose of this chapter is to assist the engineer/ surveyor in processing a Final Subdivision Map or Parcel Map (hereinafter called "map" as per the definition in Section 1.101 below) through the City of Encinitas Engineering Department.

1.101 *DEFINITIONS AND ABBREVIATIONS.*

Certain words and phrases used in this manual are defined as set forth below. All definitions provided in the Subdivision Map Act and the City of Encinitas Municipal Code shall also be applicable to this manual and said definitions are hereby incorporated by this reference as though fully set forth herein.

A. City: shall mean the City of Encinitas and the staff and consultants performing City business.

B. City Engineer: means the City Engineer of the City of Encinitas or his/ her designee.

C. CSD: is used as an abbreviation for "Cardiff Sanitation District", one of the two sewer districts administered by the City of Encinitas.

D. Development: shall mean land improvement, construction involving land, buildings, or infrastructure, and/or the uses thereof subject to discretionary or ministerial action by the appropriate body of the City of Encinitas (see Municipal Code Chapter 24.01).

E. Developer: shall mean any person, firm, corporation, partnership, or association who proposes a development (see Subdivision Map Act 66418.1). In this chapter, "developer" and "subdivider" are used interchangeably.

F. Engineer/ Surveyor: shall mean a qualified registered engineer with a license number of 33965 or lower and/or a surveyor, licensed by the State of California, responsible for the design required for the development of land. Also referred to herein as "engineer of work".

G. ESD: is used as an abbreviation for "Encinitas Sanitary District", one of the two sewer districts administered by the City of Encinitas.

H. IOD: is used as an abbreviation for "Irrevocable Offer of Dedication".

I. LWD: is used as an abbreviation for "Leucadia Wastewater District". Three sewer districts service the City of Encinitas: Cardiff Sanitation District, Encinitas Sanitary District, and Leucadia Wastewater District. Both Cardiff Sanitation and Encinitas Sanitary have been dissolved into and are now administered by the City of Encinitas, but LWD is a separate and independent agency.

J. Map: shall be used to mean both Parcel Map and Final Map when the requirements for Parcel Maps and Final Maps are identical. The terms "Parcel Map" and "Final Map" will be used when the requirements for Parcel Maps differ from those for Final Maps.

K. Map Reviewer: or "City reviewer" shall mean the City of Encinitas staff and/or its consultants responsible for reviewing the map for compliance with applicable statutes, codes, City regulations, and this chapter.

L. Municipal Code: shall mean the current City of Encinitas Municipal Code and any and all amendments thereto in effect at the time the map and/or plans are approved.

M. OMWD: is used as an abbreviation for "Olivenhain Municipal Water District", one of the two water districts servicing the City of Encinitas. OMWD is a separate and independent agency from the City of Encinitas.

N. ROW: is used as an abbreviation for "right-of-way".

O. SDWD: is used as an abbreviation for "San Dieguito Water District", one of the two water districts servicing the City of Encinitas.

1.102 *APPLICABLE STATUTES AND REQUIREMENTS.*

Maps shall conform to all of the following:

A. Subdivision Map Act.

B. Professional Land Surveyor's Act.

C. City of Encinitas Municipal Code.

D. Requirements specified in the Conditions of Approval.

E. Requirements and guidelines for preparation of the map as specified in this manual.

F. Staff policies.

G. Generally accepted professional engineering and land surveying principles.

1.103 *MAP SUBMITTAL.*

The City shall review and approve the map prior to recordation. The initial submittal to the City for map review shall include the items and fees discussed below.

1.103.1 Submittal Requirement List. The Final Map/ Parcel Map Initial Submittal Requirement List (see Appendix 1.1) and Engineering Development Application (See Appendix 1.2) shall be filled out and accompany the map when the map review package is initially submitted to the Engineering Department for examination. All applicable items on the Final Map/ Parcel Map Initial Submittal Requirement List must accompany the map in the quantities specified on the list. Submittals without the required quantities of each item may not be accepted by the Engineering Department for submittal. An incomplete submittal will be returned by the

map reviewer to the engineer/surveyor without benefit of a review.

1.103.2 Fees. Payment of applicable mapcheck fees shall be made upon first submittal, and additional fees may be required upon subsequent submittals consistent with the City schedule of fees. The schedule of fees is available at the Engineering Department front counter at City Hall, on the City website, and is included in Appendix 1.3 of this manual. The Planning and Building Department assesses map review fees as well; the Planning and Building Department fee schedule is included in Appendix 1.4. The fee schedules are subject to change.

Mapcheck fees paid are specific to the submittal they accompany and are not refundable. Additional mapcheck fees as outlined in the then-current fee schedule may be required if more than six months lapses between consecutive submittals to the Engineering Department.

1.104 *MAP EXAMINATION.*

Once the initial map review submittal has been made, the Engineering Department will check the submittal package and work with the engineer/ surveyor to resolve review comments. When the map review comments have been resolved, the City reviewer will ensure that the map is technically correct, seek final approval of the map, and finally transmit the map for recordation. The map examination phase is discussed below; Sections 1.105 and 1.106 discuss the determination of technical correctness and map approval/ recordation, respectively.

1.104.1 Map Examination Overview. The Engineering Department will check the map for compliance with the conditions of approval and conformance with City codes, requirements, and statutes listed in Section 1.102 above. The map review does not relieve the engineer/ surveyor of the ultimate responsibility for the accuracy and adequacy of the proposed map. The engineer/ surveyor and the subdivider are responsible for reading the conditions of approval and

complying with all items, including monitoring all expiration dates.

The Final Map/ Parcel Map Review List given in Appendix 1.6 summarizes a number of items that will be checked by the City reviewer. To ensure the adequacy of the initial submittal, the engineer/ surveyor shall complete and submit a copy of this list with the first submittal. In addition, the City map reviewer will check the map for compliance with the requirements discussed in this chapter.

When the reviewer has finished the map examination, the map package, including a copy of the map, drawings, and accompanying documents will be returned to the engineer/ surveyor for corrections. Necessary corrections and missing items will be noted in red. Any missing items or corrections which may have been inadvertently overlooked by the map reviewer on the first and/ or subsequent examinations are still the engineer's/ surveyor's responsibility and must be complied with prior to the map being considered for approval.

The Engineering Department coordinates the submittal and checking of all materials related to maps on behalf of the other City departments. The package returned to the engineer/surveyor will include available comments from other City departments. The engineer is responsible for communicating directly with other departments, agencies, and outside districts reviewing the map as well as for resolving all map review issues to ensure satisfaction with all departments and districts.

1.104.2 Map Review Resubmittals. After all of the corrections have been made to the map and accompanying documents by the engineer/ surveyor, the entire package including all previous check prints, reference maps, and the requested number of revised maps, drawings, and other documents shall be submitted to the Engineering Department for re-examination; see Section 1.103 of this manual regarding requirements for submittal completeness. This submittal process is repeated until all requests for correction have been made to the satisfaction of the City Engineer.

1.104.3 Map Review Turnaround Time. The map review turnaround time and number of map reviews required depend upon a number of factors, including City workload, the extent of map review comments, the complexity of the project, the adequacy and completeness of the map review submittal, and the responsiveness of the engineer/ surveyor and developer. Maps are reviewed in the order received; resubmittals do not receive priority over initial submittals in the map review queue. Most submittals will require at least two map reviews before the map is deemed ready for approval.

1.104.4 Release of Map Review Package. Map review items are released to the engineer/ surveyor or authorized representative. If the engineer/ surveyor wishes to allow another individual to process the map review on his or her behalf, a letter of permission to release materials to that person shall be submitted to the City. Recorded maps are public record, and copies may be obtained from City files, San Diego County survey records, and the San Diego County Recorder. Mylar originals of public record maps on file with the City may be released only to licensed, bonded blueprint companies.

1.105 *DETERMINATION OF TECHNICAL CORRECTNESS.*

The map reviewer must determine that the map is technically correct before it can be considered for final approval, which shall be preceded by "timely filing" as referenced by the Subdivision Map Act plus the additional items discussed below. The determination of technical correctness may be made only when all map corrections have been made to the satisfaction of the City Engineer, the map is found to be substantially correct, and all of the following off-map items have been satisfactorily addressed:

A. All conditions of approval have been satisfied.

B. A Subdivision Guarantee in the case of a Final Map or a Parcel Map Guarantee in the case of a Parcel Map has been submitted to the Engineering Department, ensuring that the parties listed therein are the only parties having

any record title interest in the land being subdivided and that all record easements are included on the map or otherwise addressed. The guarantee should be obtained after the map reviewer has determined that the boundary and survey procedure are substantially correct. The guarantee must be fully consistent with the title sheet of the map, and the guarantee must include a legal description that matches the one given on the map. The guarantee may be a maximum of thirty days old at the time the map is transmitted for recordation.

C. All required covenants and/or proposed off-map easements have been recorded with the County Recorder, conformed copies have been submitted to the City Engineer, and the recording information has been entered on the title sheet and/or map sheets, as applicable. Other than the exceptions noted below, these documents are prepared by the Engineering Department. Covenants and off-map easements normally include one or more of the following:

1. Covenant Regarding Real Property Itemizing the Conditions of Approval. Prepared by the Planning Department, this document includes the conditions of approval of the tentative map or tentative parcel map and any associated discretionary permits.

2. Covenant Regarding Public Improvements Required as a Condition of Development. Pursuant to the Subdivision Map Act and the City of Encinitas Municipal Code Chapter 24.16, the owner will be required to install certain subdivision improvements. These improvements may be either public or private and shall be constructed prior to recording the map or deferred by entering into formal agreements with the City regarding such improvements. In the case of deferment of the construction of public improvements, this document will be required.

3. Covenant Regarding Private Improvements Required as a Condition of Development. See the description in Item 2 above. In the case of deferment of the construction of private improvements, this document will be required.

4. Covenant Regarding Future Park, Flood, and Traffic Control Fees. A covenant shall be recorded ensuring the future payment of these fees in accordance with City of Encinitas Municipal Code Chapters 24.30 through 24.32 and with City policies.

5. Hold City Harmless for Drainage Covenant. In cases in which pre-development cross-lot drainage patterns will be maintained without the installation of a storm drain system and the grant of applicable public and/or private drainage easements, this covenant is required.

6. Maintenance Agreement for Private Street and Drainage Facilities. When private street and/ or drainage facilities are proposed, an agreement stipulating the private maintenance of the facilities into perpetuity will be required.

7. Maintenance Agreement for Private Storm Water Pollution Control Facilities. When private storm water pollution control facilities are proposed, an agreement stipulating the private maintenance of the facilities into perpetuity and specifying the minimum maintenance schedule will be required.

8. Open Space Easement. In cases in which an open space area is required to be reserved, the Planning and Building Department will prepare this easement document.

9. Emergency Vehicular Access Easement. In cases in which an access easement for emergency vehicles is required, such as when access to the proposed development is via a private road, the Fire Department will prepare this easement document.

10. Height Restriction Covenant. When it is necessary to restrict the height of future buildings on a lot or parcel, the Planning and Building Department may require a height restriction deed to be recorded against the property. The Planning and Building Department will prepare this document.

11. Clear Space Covenant. When the City requires a clear space area to be maintained, such as when the construction of certain structures or landscaping within a particular area would unacceptably restrict vehicular sight visibility, this covenant will be required.

D. Approved and signed inter-office memos from all City Departments, San Dieguito Water District, San Diego County Department of Environmental Health, Leucadia Wastewater District, and Olivenhain Municipal Water District, as applicable, have been submitted to the Engineering Department. The developer or engineer/ surveyor is required to process the memos for signatures with each department and/or district and to return them to the Engineering Department with the map review package. The signed memos shall be retained by the engineer/ surveyor or developer and submitted at the time the mylar original of the map is requested by the City. The formats for each of the typical memos and instructions for obtaining the memo signatures are given in Appendix 1.5.

E. In compliance with Section 66492 of the State Subdivision Map Act, all state, county, municipal, and local taxes, bonds, special assessments collected as taxes, or security to assure the payment of taxes shall be settled or paid prior to the filing of the map for recordation. To facilitate the processing of such tax clearances, the current process released by the County Treasurer–Tax Collector of San Diego County shall be followed. A valid tax certificate shall be submitted to the Engineering Department for routing to the title company at the time map recordation is requested.

F. The following, when required, have been posted with or paid to the Engineering Department:

1. Security to ensure performance, labor, and materials for any associated grading, erosion control, and/ or improvements. Forms of surety acceptable to the City are given in a list included as Appendix 1.7 (A) and are discussed in Section 2.505 of this manual.

2. Security to ensure deferred monumentation, as required by the engineer/ surveyor and/or the City Engineer.

3. All other special deposits and/ or payments required by the Conditions of Approval.

4. Any deficit balances and all other required City fees, deposits, assessments, and charges.

G. A digital file of the map in a format consistent with the City's requirements for digital submittals has been submitted. See Appendix 1.8 for digital submittal requirements.

H. Any associated grading and/or improvements have been designed to the satisfaction of the City Engineer, and grading/ improvement drawings have been approved and are ready for permit issuance.

I. Any applicable public utility letters and/or joint use agreements have been submitted to and approved by the City Engineer.

J. Street names on the map have been approved by the City. A list of potential street names for any proposed streets shall be submitted to the Engineering Department, and once approval for one of the names has been granted by the City, the approved street names are to be shown on the map.

K. If any portion of title interest in the subject property is held by an entity such a corporation or limited liability company, evidence of the designated signatory's authority to sign the map on behalf of the entity has been submitted and approved by the City Engineer. Such evidence is not required when title interest is held solely by an individual or individuals.

L. If applicable, a letter of instruction regarding the allocation of any existing sewer credits amongst the proposed lots has been approved by the City Engineer.

1.106 *MAP APPROVAL AND RECORDATION.*

At such time as the City map reviewer has completed the map examination and has found the map to be technically correct, s/he will transmit to the engineer/ surveyor a request for the mylar original map to be printed and processed for final approval. All necessary acknowledgments and signatures, other than City signatures, must be obtained on the title sheet before the map is submitted to the Engineering Department. The final processing of the map will depend on whether it will be approved at the staff level, by Planning Commission, or by City Council. As described below, maps are approved by the same body approving the tentative map, except in the case in which a map approved by a lower body is appealed to the City Council.

1.106.1 Staff Level Approval. Most Tentative Parcel Maps are approved at the staff level and therefore the final Parcel Map will be approved at the staff level. The mylar original map and two print sets of the map shall be submitted to the Engineering Department. The map reviewer will obtain on the mylar original map the signatures of the City Treasurer, the Planning and Building Director, and the City Engineer. A mandatory appeal period of ten calendar days must be observed following the map approval. At the conclusion of the appeal period, if no appeal has been filed, the map reviewer will transmit the mylar original map with the original tax certificate to the title company for recordation.

1.106.2 Planning Commission Approval. If a Tentative Parcel Map was approved by the Planning Commission, then the final Parcel Map must be submitted for Planning Commission approval prior to recordation. Final Maps require Planning Commission and/or City Council approval. The map will be scheduled for the Planning Commission agenda approximately six weeks before the date of the meeting. The map reviewer will request from the engineer/ surveyor a minimum of ten copies of the map to be transmitted with the staff report to the Planning Commission. After the Planning Commission approval of the map, the City map reviewer will obtain on the mylar original map the signatures of the City Treasurer, the Planning and Building Director as Secretary of

the Planning Commission, and the City Engineer. The map may not be sent to record until after the conclusion of the mandatory appeal period of ten calendar days for appeals to the City Council. Following the end of the ten-day appeal period, if no appeal has been filed, the map reviewer will contact the title company listed on the Subdivision or Parcel Map Guarantee and transmit to that company the original tax certificate and the mylar original map for recordation.

1.106.3 City Council Approval. In the case in which the Tentative Map or Tentative Parcel Map was approved by the City Council, the Final Map or Parcel Map must be referred to the City Council for approval. After City Council approval of the map, the City map reviewer will obtain on the mylar original map the signatures of the City Treasurer, City Clerk on behalf of the City Council, and City Engineer. There is no appeal period for maps approved by the City Council. The map reviewer will then contact the title company listed on the Subdivision or Parcel Map guarantee and transmit to that company the original tax certificate and the mylar original map for recordation.

As discussed in Section 1.106, a Parcel Map or Final Map approved at the staff or Planning Commission level may be appealed to the City Council during the ten-day appeal period.

1.200 GENERAL MAP REQUIREMENTS.

The following items are among those that will be checked during the map examination. Requirements pertaining specifically to the Title, Procedure of Survey, and Map sheets are discussed in Sections 1.300, 1.400, and 1.500 of this manual, respectively.

1.201 *LEGIBILITY.*

The map shall be legibly drawn, printed on paper during the map review process, and then printed on polyester base film at the time the mylar original map is requested by the City. Lettering shall be no smaller than 0.10 inch. The ink used shall be black, opaque, and permanent in nature. Ink used on polyester base film shall be coated with a suitable substance to assure permanent legibility. Ammonia or electrostatic types of processes are not permitted. No shading or crosshatching will be permitted on map sheets. Sticky-backs are not acceptable. Backside printing is not allowed. All sheets shall be in conformance with the requirements of the San Diego County Recorder's Office.

1.202 *SHEET SIZE.*

The size of each sheet shall be 18 x 26 inches. A one-inch margin line shall be drawn completely around each sheet. The margin shall be left blank except for certain information as directed below. The map shall be printed in a landscape format.

1.203 *ITEMS TO APPEAR IN MARGIN.*

The area outside of the one-inch margin line shall be left blank except for the California Coordinates, the Assessor Parcel Number (APN), associated grading and/or improvement plan numbers, and the engineer's job number.

1.204 *MAP NUMBER.*

The words *"Map No. _____"* or *"Parcel Map No. _____"* shall be shown in ½ inch high heavy lettering in the upper right-hand corner of the map title sheet and shall be placed within the one-inch space between the trim line

and the margin line. There shall be a minimum 3½ inch space to the right of the words *"Map No. _____"* or *"Parcel Map No. _____"* as shown in Appendix 1.9.

1.205 *TENTATIVE MAP/ TENTATIVE PARCEL MAP NUMBER.*

The words *"City of Encinitas"* followed by either *"Tentative Map No. _____"* or *"Tentative Parcel Map No. _____"*, as appropriate, shall be shown on the title sheet in bold lettering, centered at the very top of the sheet below the margin line as shown in Appendix 1.9. If desired, the subdivision title may be added immediately below the TM/ TPM number.

1.206 *SHEET NUMBERING.*

The sheet number and total number of sheets shall be printed on the map as shown in Appendix 1.9.

1.207 *SCALE AND NORTH ARROW.*

The map scale shall be selected in order to allow clarity while minimizing details and tabled data. The scale and north arrow shall be shown on all sheets and on details. A graphic scale is required. When a detail has no scale, indicate *"Not to Scale"*.

1.208 *JOB NUMBER DESIGNATION.*

If the firm's job number and/or logo will be printed on the map, it shall be located outside the heavy border in the lower left corner.

1.209 *GRADING AND IMPROVEMENT PLAN NUMBERS.*

When the map is associated with grading or improvement plans, the plan numbers shall be shown in the margin area at the bottom of the map, as shown in Appendix 1.9.

1.300 REQUIREMENTS FOR THE MAP TITLE SHEET.

The title sheet is the first sheet and consists of the TM/ TPM number, the map title, and a legal description of the property being subdivided along with all certificates and statements as required by the Subdivision Map Act and the City of Encinitas Municipal Code. A second sheet may be necessary to handle overflow. An example title sheet with the proper location of all certificates and statements is included in Appendix 1.9 and on the City website.

The title sheet or sheets shall comply with the requirements concerning size, material, map title, sheet numbering, etcetera, as specified in Section 1.200 of this manual and shown in Appendix 1.9.

1.301 *TITLE INTEREST SIGNATURES AND SUBDIVISION GUARANTEE.*

All signatures and acknowledgments shall be signed in black permanent ink. The City may not accept unclear or smeared signatures and signatures which are not made in black ink. Statements may be stamped or reproduced, but all signatures and notary acknowledgements must be ink originals and may not be reproduced. Refer to Subdivision Map Act Sections 66430 and 66436.

The subdivider must provide evidence that all the parties having any record title interest in the property are appropriately represented on the map title sheet. This information is provided by the title company in the forms of the preliminary title report and the subdivision or parcel map guarantee, which may be issued a maximum of thirty days prior to transmittal of the map for recordation. The owners, trustees, beneficiaries, and easement holders shown on the guarantee must match exactly in name, number, and type with the owners, trustees, beneficiaries, and easement holders shown on the map title sheet. Consistent with Subdivision Map Act 66445(3)e, the signatures of the trustees/ beneficiaries may be omitted on Parcel Maps for which no dedications or offers of dedication are required. Any changes that occur after the first issue of the guarantee must be reflected in subsequent amended guarantees or

letters from the title company. The guarantee shall be referenced on the title sheet beneath the property legal description in a way similar to the following:

"(SUBDIVISION GUARANTEE)(PARCEL MAP GUARANTEE) ISSUED BY [Title Company Name] AS ORDER NO. _____ ON [Date]."

All corporation signatures shall be executed by two authorized officers of the corporation, unless a copy of the resolution passed by its board of directors authorizing a designated officer to sign on behalf of the corporation is furnished to the Engineering Department. (See Corporations Code Section 313). Signature statements for partnerships, joint ventures, and limited liability companies (LLC's) are often more complex; examples are given in Appendix 1.12. A recorded copy of all partnership agreements and/or joint venture agreements together with the Articles of Incorporation are to be provided at the time of first submittal to the Engineering Department so that all title interest can be accounted for correctly.

1.302 *NOTARY ACKNOWLEDGEMENT CERTIFICATES.*

All signatures on maps and separate documents shall be acknowledged by the proper notary certificate; an example is included as Appendix 1.10. Check with the San Diego County Recorder's Office for out-of-state notary requirements.

Notary public acknowledgments on final maps shall be all-purpose acknowledgments, signed in black permanent ink with the name printed below the signature. The principal office location must be stated and the commission expiration date must be shown. All acknowledgments for trustees, beneficiaries, and mortgagees shall contain the words "as trustee", "as beneficiary", or "as Mortgagee" at the end of the acknowledgment.

Refer to the sample title sheet included in Appendix 1.9 for the location of these certificates.

1.303 *OWNER STATEMENT AND DEDICATION STATEMENTS.*

Examples of the owner and dedication statements are presented below. For situations not covered by the examples, a proposed dedication statement shall be submitted to the Engineering Department for approval. Please refer to Subdivision Map Act Section 66439.

All easements are offered for dedication as shown on the map and are accepted as dedicated on the map or alternately are rejected as offered for dedication on the map. The language of the acceptance certificate mirrors the language in the dedication statement; examples of acceptance certificates are included in Section 1.304.

1.303.1 Owner Statement and Beneficiary/ Trustee Language.

Every owner's statement begins with the following:

"WE HEREBY IRREVOCABLY STATE THAT WE ARE THE OWNERS OF OR ARE INTERESTED IN THE LAND SUBDIVIDED BY THIS (PARCEL) MAP AND WE CONSENT TO THE PREPARATION AND RECORDATION OF THIS (PARCEL) MAP."

This basic statement may be followed by additional language addressing specific dedications being made on the map, as shown in the examples in the following sections.

When dedications are offered on a Parcel Map and a trustee/ beneficiary holds interest in the property, the following statement shall be added beneath the owner's certificate and shall be executed by the trustee/ beneficiary. The certificate shall be included on Final Maps whenever a trustee/ beneficiary holds title interest, regardless of whether a dedication is being offered. The beneficiary/ trustee language reads as follows:

"_____, (A CALIFORNIA CORPORATION), AS (TRUSTEE) (BENEFICIARY) UNDER THAT CERTAIN DEED OF TRUST RECORDED [Date] AS DOC. NO. _____."

1.303.2 Public Street Dedications.

If public street dedications are being offered, language to that effect will be added to the

basic owner's statement. The dedication of additional width adjacent to an existing public right-of-way shall be granted in the same form as the existing right-of-way; that is, where right-of-way is held by the Public or the City in fee, additional adjacent right-of-way shall also be granted in fee, and where the right-of way is held as an easement, additional adjacent right-of-way shall be granted as an easement. When multiple dedications are being offered, the dedication statement shall list the dedication of full width streets first, followed by portions of streets being dedicated, and finally the portions of lots being reserved for future streets. The City Council Resolution 2009-52 for terms and conditions for the dedication of public street right-of-way is included as Appendix 1.26 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS RUMPLE STREET, THE PORTION OF NICHOLAS LANE, THE PORTION OF THE UNNAMED ALLEY, AND THE PORTION OF LOTS 142 AND 145 RESERVED FOR FUTURE STREET, FOR USE AS STREETS, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-52, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE... ALL AS SHOWN HEREON."

In the case in which street improvements are required, the dedication to the City will be subject to the construction of the improvements:

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS, SUBJECT TO ACCEPTANCE OF THE IMPROVEMENTS BY THE CITY OF ENCINITAS, THE PORTION OF RUMPLE STREET AS SHOWN HEREON FOR USE AS A PUBLIC STREET, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-52, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

In the case in which an offer of dedication will be made but will be rejected by the City, the owner's dedication statement will include language similar to the following:

"WE HEREBY IRREVOCABLY OFFER FOR DEDICATION TO THE CITY OF ENCINITAS THE PORTION OF NICHOLAS LANE AS SHOWN HEREON FOR USE AS A PUBLIC STREET,

SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-52, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.3 Private Street Easement and Public Easement for Private Street. Streets remaining private without any offer of dedication will not be mentioned in the owner's dedication statement, with the exception noted in the paragraph below. Access via a private street requires an easement over one lot or parcel for the benefit of another and shall be reserved or granted at time of sale of the lot or parcel, concurrent with the transfer of title, and shall be reserved on the map. See Section 1.503 below.

At the discretion of the City Engineer, a Public Easement for Private Street will be required. The Public Easement for Private Street provides for such purposes as installation, access, and maintenance of public sewer, water, and storm drain facilities as well as emergency vehicular access. The Public Easement for Private Street shall be included in the owner's dedication statement with the language given below. The City Council Resolution 2009-53 for terms and conditions for the dedication of a public easement for private street is included as Appendix 1.27 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS A PUBLIC EASEMENT FOR PRIVATE STREET OVER, UNDER, AND ACROSS ALL PRIVATE STREET EASEMENTS GRANTED OR RESERVED HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-53, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.4 Relinquishment of Access Rights to Public Street. Access rights are only relinquished in and to public streets and streets offered for dedication. See Section 1.303.5 for access restriction to private streets.

A. Relinquishment of Access to Existing Public Street. The following language is added to the owner's statement:

"....AND RELINQUISH AND WAIVE ALL ACCESS RIGHTS FROM (LOTS_____)(PARCELS _____) IN AND TO MOSSY RANCH ROAD ... AS SHOWN HEREON."

B. Portion of Lot or Parcel Reserved For Future Street and Future Access Rights Waived. The following language is added to the owner's statement:

"....AND RELINQUISH AND WAIVE ALL ACCESS RIGHTS FROM (LOTS_____)(PARCELS_____) IN AND TO THE PORTIONS OF (LOTS_____)(PARCELS_____) RESERVED FOR FUTURE STREET ... ALL AS SHOWN HEREON."

C. Access Openings. When access rights will be relinquished except for at access openings along portions of the frontage, the following language is added to the owner's statement:

"..... AND RELINQUISH AND WAIVE THE ACCESS RIGHTS FROM (LOT_____)(PARCEL____) IN AND TO STEPHANIE STREET EXCEPT AT ACCESS OPENING NO. 1 ... ALL AS SHOWN HEREON."

1.303.5 Access Restriction to Private Street. When access to a private street will be relinquished and waived, wording to that effect shall be included on the map sheet. No statement on the title sheet is required.

1.303.6 Public Drainage, Flowage, and Sewer Easements. Drainage easements are dedicated to the City of Encinitas if the proposed drainage facilities are constructed to public standards and if the City accepts maintenance of the drainage facilities. Similarly, public sewer easements within the City sewer districts (Cardiff Sanitation and Encinitas Sanitary, now under the authority of the City) are dedicated to the City if the sewer facilities are constructed to public standards and will be publicly maintained. Flowage easements are dedicated in order to prevent modification or obstruction of natural drainage ways or areas of inundation that could impact adjacent properties.

An access easement to maintain drainage/ sewer facilities will be required as necessary to ensure legal access to the public drainage/ sewer easement. For example, where travel from the public right-of-way over a private street is required to access the drainage/ sewer easement, an access easement over the private street will be required. The access easement shall be a minimum of 15 feet wide and shall be improved to allow physical access, at the discretion of the City Engineer.

The following certificates shall be used for dedication of drainage and sewer easements, drainage and sewer easements with access easements as needed to maintain the facilities, and flowage easements, respectively.

A. Dedication of Drainage/ Sewer Easement. The City Council Resolutions 2009-58 and 2009-54 for terms and conditions for the dedication of a public drainage and public sewer easements are included as Appendices 1.28 and 1.29 of this manual, respectively.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS THE (DRAINAGE) (SEWER) EASEMENTS AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION (2009-58)(2009-54), WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

B. Dedication of Access Easement and Drainage/ Sewer Facilities. The City Council Resolution 2009-55 for terms and conditions for the dedication of a drainage or sewer access easement is included as Appendix 1.30 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS THE (DRAINAGE) (SEWER) EASEMENT AND THE ACCESS EASEMENT TO MAINTAIN (DRAINAGE) (SEWER) FACILITIES AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTIONS (2009-58)(2009-54) AND 2009-55, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

C. Dedication of Flowage Easement. The City Council Resolution 2009-56 for terms and conditions for the dedication of a flowage easement is included as Appendix 1.31 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS A PERPETUAL EASEMENT AND RIGHT-OF-WAY FOR THE FLOWAGE OF WATERS OVER, UNDER, UPON, AND ACROSS THE FLOWAGE EASEMENT AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-56, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE. WE RETAIN THE DUTY TO MAINTAIN SAID EASEMENT. WE RESERVE TO OURSELVES AND OUR SUCCESSORS AND ASSIGNS THE RIGHT TO USE SUBJECT LAND AT ANY TIME, IN ANY MANNER AND FOR ANY PURPOSE NOT INCONSISTENT WITH THE FULL USE AND ENJOYMENT OF THE EASEMENT BY THE CITY OF ENCINITAS AND ITS SUCCESSORS AND ASSIGNS."

1.303.7 Easements to Outside Sewer and Water Agencies (LWD, OMWD, SDWD) . Easements to agencies such as Leucadia Wastewater District (LWD) and Olivenhain Municipal Water District (OMWD) are granted by separate document prior to the map recording. Easements to San Dieguito Water District (SDWD) may be made on the map.

A. Leucadia Wastewater and Olivenhain Municipal Water Districts. The City of Encinitas cannot accept an easement on behalf of LWD or OMWD, so grant of easement to these agencies shall be by separate document. The engineer/ surveyor must contact LWD and OMWD directly to ensure the grant of easement meets the district's requirements. A conformed copy of the recorded easement shall be submitted to the City Engineer and the recording information added to the map prior to consideration of the map for recordation.

B. San Dieguito Water District. The following general language shall be used for an on-map grant of easement to San Dieguito Water District. The grant language is subject to approval by SDWD.

"WE HEREBY GRANT TO THE SAN DIEGUITO WATER DISTRICT, AN IRRIGATION DISTRICT OF THE STATE OF CALIFORNIA, AND ITS SUCCESSORS AND ASSIGNS, A PERMANENT EASEMENT FOR WATER PIPELINES, OTHER DISTRICT FACILITIES, AND FOR ALL ACCESS PURPOSES OVER, UNDER, AND ACROSS ALL PRIVATE STREETS, AND A WATER EASEMENT AS SHOWN ON THIS (PARCEL) MAP, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN THE CERTIFICATE GRANTING EASEMENTS WITHIN PRIVATE STREETS TO THE SAN DIEGUITO WATER DISTRICT ON CITY OF ENCINITAS TENTATIVE MAP NO. 94-199, MAP NO. 13226, RECORDED AUGUST 9, 1995, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.8 Easements to Telephone, Cable TV, and Gas/ Electric Companies. Telephone, cable TV, or gas and electric easements are most often granted by separate document after the map records. Contact the agency directly for the easement grant deed language.

1.303.9 Private Access, Private Utility, and Private Drainage Easements. A private easement across one lot or parcel for the benefit of another lot or parcel may not be granted until time of sale or transfer of title, but it shall be reserved on the map. Because the private access, utility, or drainage easement is not offered for dedication to the City, the statement for the reservation of the easement will be made on the map sheet and not on the title sheet.

1.303.10 Clear Space Easement. A clear space easement is required when the line of sight needed for the required sight distance as determined by the Engineering Department falls outside the right-of-way. This easement enables any obstruction caused by landscaping or construction of objects within the clear space easement to be removed. This easement may result from a requirement in the conditions of approval or through review of the design of the required improvements. A clear space easement granted on the map shall be shown

on the map sheet and monumented as per standard DS-16, attached as Appendix 1.14. The following language shall be added to the owner's statement on the title sheet. The City Council Resolution 2009-57 for terms and conditions for the dedication of a clear space easement is included as Appendix 1.32 of this manual.

"WE HEREBY GRANT TO THE CITY OF ENCINITAS A PERPETUAL EASEMENT OVER, UPON, AND ACROSS THE PORTIONS OF LAND DELINEATED ON THIS (PARCEL) MAP AND DESIGNATED HEREON AS A CLEAR SPACE EASEMENT FOR PURPOSES OF MAINTAINING PROPER VEHICULAR SIGHT DISTANCE, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-57, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.11 Open Space Easement. The purpose of an open space easement may be to preserve a portion of the property in a natural condition, to maintain it for its natural and scenic beauty, or to otherwise restrict its use or development. However, no authorization for public access, express or implied, is made. The language in the open space grant will reflect the intent of the easement and the conditions of the grant. The grant of open space easement will be made by separate document. The Planning and Building Department will prepare this document during map review, and it must record prior to consideration of the map for recordation. Because the grant is made by separate document, no grant language for the open space easement is included in the owner's dedication statement, but the easement and document recording information shall be shown on the map prior to consideration of the map for recordation.

1.303.12 Noise Protection Easement. A noise protection easement may be required, for example, along heavily traveled roads where traffic noise may impact the quality of life on adjacent lots or dwelling units. It may require approval by the Planning and Building Department of a grading and/or site plan prior to grading or construction within the easement. The grant of the noise protection easement will be made by

separate document. The Planning and Building Department will prepare this document during map review, and it must record prior to consideration of the map for recordation. Because the grant is made by separate document, no grant language for the noise protection easement is included in the owner's dedication statement, but the easement and document recording information shall be shown on the map prior to consideration of the map for recordation.

1.303.13 Slope and Drainage Easement. Slopes and drainage facilities may be included as an integral part of the construction of ultimate public improvements. The ultimate slope and drainage facilities necessary for the future construction of public improvements must be assured by irrevocable offer of dedication on the map or a separate document. Language to be added to the owner's certificate is given below. City Council Resolution 2009-59 for the terms and conditions of the dedication of a slope and drainage easement is included as Appendix 1.33 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS A SLOPE EASEMENT AND DRAINAGE EASEMENT, ALL AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-59, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.14 Recreational Trail Easement. When dedication of an easement for pedestrian and/or equestrian trail purposes is required, the wording given below should be used. City Council Resolution 2009-60 for the terms and conditions for the dedication of a recreational trail easement is given in Appendix 1.34 of this manual.

"WE HEREBY DEDICATE TO THE CITY OF ENCINITAS AN EASEMENT FOR RECREATIONAL TRAIL PURPOSES, (TOGETHER WITH ACCESS RIGHTS FOR TRAIL MAINTENANCE), ALL AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-60, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE."

1.303.15 Miscellaneous Easements. Language for several miscellaneous dedications is given below:

"... AND AN EASEMENT FOR PUBLIC VEHICULAR PARKING OVER (A PORTION OF) (ALL OF) (LOT ___ OR PARCEL ___) AS SHOWN HEREON ...."

The Council Resolution referenced below for the terms and conditions for the dedication of a general utility, drainage, and pedestrian access easement is included in Appendix 1.35. Appendix 1.36 gives the City Council Resolution 2009-62 for the terms and conditions for the dedication of a pedestrian access easement, and terms and conditions of Resolution 2009-63 for dedication of a general utility easement is given in Appendix 1.37.

"... AND AN EASEMENT FOR GENERAL UTILITY, DRAINAGE, AND PEDESTRIAN ACCESS AS SHOWN HEREON, SUBJECT TO ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-61, WHICH TERMS AND CONDITIONS ARE HEREBY INCORPORATED BY REFERENCE ..."

"...AND AN EASEMENT FOR EMERGENCY VEHICULAR ACCESS AS SHOWN HEREON..."

1.304 *CITY ACCEPTANCE CERTIFICATE.*

The acceptance certificate reflects the offers of dedication made in the owner's dedication certificate. The City either accepts or rejects those items offered for dedication to the public or the City of Encinitas. Note that every item offered to the public or to the City of Encinitas is either accepted or rejected in the Acceptance Certificate; nothing is omitted. Refer to Subdivision Map Act Section 66477.1.

1.304.1 City Engineer's General Acceptance Certificate. The City Engineer signs on behalf of the City Council for acceptance or rejection of dedications or offers of dedication for easements to the City of Encinitas or to the Public shown on

maps or granted by separate instrument. The general acceptance certificate reads as follows:

"I, [Name], THE DIRECTOR OF ENGINEERING SERVICES OF THE CITY OF ENCINITAS, BY AUTHORITY CONVEYED BY RESOLUTION NO. 94-107 ADOPTED BY THE CITY COUNCIL OF THE CITY OF ENCINITAS ON NOVEMBER 9, 1994, HAVE ACCEPTED ON BEHALF OF THE CITY OF ENCINITAS (SUBJECT TO ACCEPTANCE OF THE IMPROVEMENTS BY THE CITY) [List streets and easements], ALL AS DEDICATED HEREON AND INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION _____, TOGETHER WITH [List rights; for example, access rights relinquished as shown on the map] AND HAVE REJECTED ON BEHALF OF THE CITY OF ENCINITAS [List those portions not accepted as offered for dedication on the map], ALL AS OFFERED FOR DEDICATION HEREON.

NOTE: SECTION 66477.2 OF THE GOVERNMENT CODE OF THE STATE OF CALIFORNIA PROVIDES THAT A REJECTED OFFER SHALL REMAIN OPEN AND SUBJECT TO FUTURE ACCEPTANCE BY THE CITY OF ENCINITAS."

BY _____ _____
[Insert Name] DATE
DIRECTOR OF ENGINEERING SERVICES

The acceptance certificate is modified as necessary to include acceptance or rejection of all dedications or offers of dedication made on the map.

1.304.2 Public Street Dedications. All streets or portions of streets being dedicated or offered for dedication should be included in the certificate, and each should be accepted or rejected, as appropriate. For example, the certificate might read:

"I, [Name], THE DIRECTOR OF ENGINEERING SERVICES OF THE CITY OF ENCINITAS, ACCORDING TO AUTHORITY CONVEYED BY RESOLUTION NO. 94-107 ADOPTED BY THE CITY COUNCIL OF THE CITY OF ENCINITAS NOVEMBER 9, 1994, HAVE ACCEPTED, ON BEHALF OF THE CITY OF

ENCINITAS, SUBJECT TO ACCEPTANCE OF IMPROVEMENTS BY THE CITY, STEPHANIE STREET, THE PORTION OF NICHOLAS ROAD, THE PORTION OF MOSSY RANCH ROAD, AND THE PORTION OF THE UNNAMED ALLEY, ALL AS DEDICATED HEREON, INCLUDING TERMS AND CONDITIONS SET FORTH IN CITY COUNCIL RESOLUTION 2009-52 AND HAVE REJECTED ON BEHALF OF THE CITY OF ENCINITAS THE PORTIONS OF LOTS 142 AND 145 RESERVED FOR FUTURE STREET AS OFFERED FOR DEDICATION HEREON.

NOTE: SECTION 66477.2 OF THE GOVERNMENT CODE OF THE STATE OF CALIFORNIA PROVIDES THAT A REJECTED OFFER SHALL REMAIN OPEN AND SUBJECT TO FUTURE ACCEPTANCE BY THE CITY OF ENCINITAS."

BY:_____ _____
DIRECTOR OF ENGINEERING SERVICES DATE
[Insert Name]

The City Council Resolution 2009-52 for the terms and conditions for the dedication of an easement for public street is included as Appendix 1.26 of this manual. For the dedication of roads that will be accepted for public use but will not be publicly maintained, the following language should be used:

"BACHELOR BOULEVARD IS ACCEPTED AS DEDICATED TO THE CITY OF ENCINITAS SOLELY FOR THE PURPOSE OF DESIGNATING THE ROAD FOR PUBLIC USE. THE CITY OF ENCINITAS BY THIS ACTION IS NOT ACCEPTING THE ROAD INTO THE CITY OF ENCINITAS MAINTAINED SYSTEM, AND THE CITY OF ENCINITAS WILL NOT BE RESPONSIBLE FOR MAINTENANCE."

1.304.3 Private Street Easements and Public Easement for Private Street. Refer to Section 1.303.3 of this manual. Note that a private street is not dedicated to the City and therefore will not be accepted or rejected by the City, but must be shown as "Proposed Private Street and Utility Easement" on map sheets.

At the discretion of the City Engineer, a Public Easement for

Private Street may be required over private street easements granted or reserved on the map. A Public Easement for Private Street will be accepted by the City Engineer with the language given below. City Council Resolution 2009-53 with the terms and conditions for the dedication of a public easement for private street is included in Appendix 1.27 of this manual.

"...AND HAVE ACCEPTED ON BEHALF OF THE CITY THE PUBLIC EASEMENT FOR PRIVATE STREET AS SHOWN HEREON, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-53."

1.304.4 Relinquishment of Access Rights to Public Street. The relinquishment of access will be accepted by the City Engineer in the acceptance certificate with the following language:

"... AND HAVE ACCEPTED THE RELINQUISHMENT AND WAIVER OF ACCESS RIGHTS FROM THE PORTIONS OF (LOTS)(PARCELS) ___ RESERVED FOR FUTURE STREET IN AND TO SEQUOIA STREET EXCEPT AT ACCESS OPENING NO. 1 AS SHOWN HEREON..."

1.304.5 Access Restriction to Private Street. The relinquishment and waiver of access to a private street is not accepted or rejected by the City and therefore is not included in the acceptance certificate.

1.304.6 Public Drainage, Flowage, and City Sewer Easements. Drainage, flowage, and sewer easements within the Cardiff Sanitation and Encinitas Sanitary sewer districts will be accepted or rejected by the City Engineer in the acceptance certificate. City Council Resolutions 2009-58, 2009-56, and 2009-54 for the terms and conditions for the dedication of public drainage, flowage, and city sewer easements, respectively, are included as Appendices 1.28, 1.31, and 1.29 of this manual, respectively.

"... AND HAVE (ACCEPTED)(REJECTED) ON BEHALF OF THE CITY OF ENCINITAS THE (DRAINAGE)(FLOWAGE)

EASEMENT AND THE EASEMENT FOR ACCESS TO MAINTAIN DRAINAGE FACILITIES, ALL AS SHOWN HEREON, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION (2009-58)(2009-56)."

"...AND HAVE (ACCEPTED)(REJECTED) ON BEHALF OF THE CITY OF ENCINITAS THE SEWER EASEMENT AND THE EASEMENT FOR ACCESS TO MAINTAIN SEWER FACILITIES, ALL AS SHOWN HEREON, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-54."

1.304.7 Private Access, Private Utility, and Private Drainage Easements. Private easements are not dedicated to the City and therefore will not be included in the acceptance certificate, but must be referenced on the map. See Section 1.503.

1.304.8 Easements to Outside Sewer and Water Districts (LWD, OMWD, SDWD).

A. Leucadia Wastewater and Olivenhain Municipal Water Districts. Easements to Olivenhain Municipal Water District and Leucadia Wastewater District are not granted to the City and therefore will not be included in the acceptance certificate, but should be referenced on the map. The easement will be granted with a separate document; the document shall be recorded and the recording information entered on the map prior to consideration of the map for approval.

B. San Dieguito Water District. Grants of easements to SDWD will be accepted by SDWD, not by the City Engineer. If an easement to SDWD is being granted, the following certificate should be included on the title sheet in addition to the City Engineer's acceptance statement:

"THE SAN DIEGUITO WATER DISTRICT HEREBY ACCEPTS THE GRANT OF EASEMENTS DESCRIBED HEREIN, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN THE CERTIFICATE GRANTING EASEMENTS WITHIN PRIVATE STREETS GRANTED TO THE SAN DIEGUITO

WATER DISTRICT ON CITY OF ENCINITAS TENTATIVE MAP NO. 94-199, MAP NO. 13226, RECORDED AUGUST 9, 1995. THE SAN DIEGUITO WATER DISTRICT CONSENTS TO THE RECORDATION OF THIS MAP AND HAS AUTHORIZED ITS DISTRICT MANAGER TO SIGN THE CERTIFICATE PURSUANT TO BOARD RESOLUTION NO. R 83-29, ADOPTED AUGUST 22, 1983.

BY: _____ DATED: _____
[Insert Name]
FOR DISTRICT MANAGER
SAN DIEGUITO WATER DISTRICT

C. Vacation of Existing Easement by San Dieguito Water District. If necessary to vacate a SDWD easement on a map, the easement to be vacated shall not be shown on the map sheet but the vacation shall be noted on the title sheet and certified in conformance with Subdivision Map Act 66434(g). Language similar to the following shall be added before the final sentence in the certificate for acceptance/ rejection of offers of dedication to the San Dieguito Water District:

"THE SAN DIEGUITO WATER DISTRICT HAS VACATED, PURSUANT TO SECTION 66434(g) OF THE SUBDIVISION MAP ACT, THE EASEMENT TO THE SAN DIEGUITO WATER DISTRICT FOR A WATER EASEMENT PER DOC NO. _____ RECORDED _____ AND ANY PORTION OF THE WATER EASEMENT AS PER DOC. NO. ____ RECORDED ____ WITHIN THE BOUNDARY OF THIS (PARCEL) MAP."

1.304.9 Easements to Telephone, Cable TV, and Gas/ Electric Companies. These easements are not granted to the City and therefore are not included in the acceptance certificate.

1.304.10 Clear Space Easement. The language given below is added to the City Engineer's acceptance statement. City Council Resolution 2009-57 for the terms and conditions for the dedication of a clear space easement is included as Appendix 1.32 of this manual.

" ... AND HAVE ACCEPTED ON BEHALF OF THE CITY OF

ENCINITAS THE CLEAR SPACE EASEMENT AS GRANTED HEREON, INCLUDING TERMS AND CONDITIONS SET FORTH IN CITY COUNCIL RESOLUTION 2009-57."

1.304.11 Open Space Easement. Open space easements will most often be granted as per separate document and therefore will not be included in the acceptance certificate.

1.304.12 Noise Protection Easement. Noise protection easements will most often be granted as per separate document and will therefore not be included in the acceptance certificate.

1.304.13 Slope and Drainage Easement. The language below is added to the City Engineer's acceptance statement. City Council Resolution 2009-59 for the terms and conditions for the dedication of a slope and drainage easement is included in Appendix 1.33 of this manual.

"... AND HAVE REJECTED ON BEHALF OF THE CITY OF ENCINITAS THE PORTION OF (LOT ___, PARCEL __) AS OFFERED FOR DEDICATION AS FUTURE STREET TOGETHER WITH THE SLOPE AND DRAINAGE EASEMENT, ALL AS SHOWN HEREON, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTIONS 2009-52 AND 2009-59."

1.304.14 Recreational Trail Easement. The language below is added to the City Engineer's acceptance statement. City Council Resolution 2009-60 for the terms and conditions for the dedication of a recreational trail easement is given in Appendix 1.34 of this manual.

"... AND HAVE (REJECTED) (ACCEPTED) ON BEHALF OF THE CITY OF ENCINITAS THE EASEMENT FOR RECREATIONAL TRAIL PURPOSES (TOGETHER WITH THE ACCESS RIGHTS FOR TRAIL MAINTENANCE, ALL) AS (IRREVOCABLY OFFERED FOR DEDICATION) (DEDICATED) HEREON, INCLUDING ALL TERMS AND CONDITIONS CONTAINED IN CITY COUNCIL RESOLUTION 2009-60."

1.304.15 Miscellaneous Easements. Several examples of additions to the City Engineer's acceptance statement are given below.

"..... AND HAVE ACCEPTED ON BEHALF OF THE CITY OF ENCINITAS AN EASEMENT FOR PUBLIC VEHICULAR PARKING OVER (ALL, A PORTION OF) OF (LOT __, PARCEL ___) AND AN EASEMENT FOR PUBLIC PATHWAY AND BEACH ACCESS PURPOSES OVER (ALL, A PORTION OF) (LOT ___, PARCEL ___) ALL AS DEDICATED HEREON."

"...AND HAVE ACCEPTED ON BEHALF OF THE CITY OF ENCINITAS AN EASEMENT FOR GENERAL UTILITY, PUBLIC DRAINAGE, AND PUBLIC PEDESTRIAN ACCESS AS DEDICATED HEREON, INCLUDING TERMS AND CONDITIONS SET FORTH IN CITY COUNCIL RESOLUTION 2009-61."

"...AND HAVE ACCEPTED ON BEHALF OF THE CITY OF ENCINITAS AN EASEMENT FOR EMERGENCY VEHICULAR ACCESS AS DEDICATED HEREON."

1.305 *STATEMENTS BY A UTILITY COMPANY.*

Refer to the Subdivision or Parcel Map Guarantee for those parties required to sign the map. In the case in which a public street is being dedicated to the City of Encinitas and the street easement will overlay existing utility easements or blanket easement rights granted previously to a utility agency, the utility agency shall sign the map consenting to the offer of dedication over the area of its existing easement and shall subordinate its rights to those of the City if required to do so by the City Engineer. If the City Engineer determines that the City requires senior rights to the easement, then a subordination agreement shall be executed by the prior easement holder.

1.305.1 Statement for Utility Easement Acquired Prior to TM/ TPM Approval Date. If a utility company easement exists prior to the approval of the tentative map or parcel map, the City Engineer may require that the utility company consent to an offer of dedication over the area of its existing easement. A statement similar to the one below or a Joint Use Agreement is to be used. See Appendix 1.11 for a sample Joint Use Agreement.

"THE UNDERSIGNED, [Name of Utility Company], HEREBY STATES THAT IT IS INTERESTED IN THE LAND SUBDIVIDED BY THIS (PARCEL) MAP BY VIRTUE OF AN EASEMENT RECORDED [Date] AS PER DOCUMENT NUMBER _____ OF OFFICIAL RECORDS OF SAN DIEGO COUNTY AND CONSENTS TO THE RECORDATION OF THIS (PARCEL) MAP."

BY: _____ DATE: _____
[Insert Name], [Insert Title]
[Name of Utility Company]

1.305.2 Statement for Utility Easements Acquired After TM/TPM Approval Date. When a public street dedication is offered over an existing public utility easement that was granted after approval of the tentative map or tentative parcel map, the City Engineer may require the following language to be added to the basic subordination statement given in Section 1.305.1:

" ... AND HEREBY DEDICATES ITS INTEREST IN RAVENSBURG ROAD TO THE PUBLIC FOR USE AS A STREET AS SHOWN HEREON."

1.305.3 Subordination of Utility Easement by Separate Document. If the utility company does not wish to subordinate its rights by signing the map, the company may submit a memo to the City Engineer in compliance with Section 66436 (a)(3)(A)(i) of the Subdivision Map Act. A joint use agreement may be required to accompany the letter at the discretion of the City Engineer. See Appendix 1.11 for a sample joint use agreement and utility memos.

1.305.4 Joint Use Agreement. At the discretion of the City Engineer, an agreement for joint use with a utility agency can be used in lieu of a subordination certificate on the map. A joint use agreement may be utilized in cases in which the utility easement was acquired prior to the approval of the TM or TPM. If the public utility does not wish to sign the subordination certificate on the map and instead submits a letter as described in Section 1.305.3 a joint use agreement may be required to accompany the letter, at the discretion of

the City Engineer. See Appendix 1.11 for a sample joint use agreement.

1.305.5 Relocation of Utilities. For some developments, utilities are to be relocated as part of the improvements, and the existing utility easement will no longer be necessary. In this case, the following note should be placed on the improvement plans on the sheet(s) where the easement is shown:

"PRIOR TO ACCEPTANCE OF IMPROVEMENTS AND RELEASE OF SECURITY BY THE CITY OF ENCINITAS, [Name of Utility Company] WILL RELOCATE THEIR FACILITIES AND QUITCLAIM THE EXISTING EASEMENT."

1.306 *SIGNATURE OMISSIONS STATEMENT.*

Section 66436 of the Subdivision Map Act requires the subdivider to notify certain interested parties by certified mail. If the interested parties do not object to the filing of the map without their signatures, they shall provide a letter stating that they do not object. The name of the interested parties and the nature of their interests shall be stated on the map in the signature omissions statement.

Given below are the most commonly used signature omissions statements. Refer to Section 66436 of the Subdivision Map Act for all interested parties required to be listed on the statement.

1.306.1 General Statement. The general statement together with some example signature omissions are given below.

"THE SIGNATURES OF THE PARTIES LISTED BELOW, OWNERS OF (EASEMENTS) (RIGHTS) AS PER DOCUMENTS NOTED BELOW, HAVE BEEN OMITTED UNDER THE PROVISIONS OF SECTION 66436 SUBSECTION (a)(3)(A)(i) OF THE SUBDIVISION MAP ACT. THEIR INTEREST IS SUCH THAT IT CANNOT RIPEN INTO A FEE TITLE AND SAID SIGNATURES ARE NOT REQUIRED BY THE GOVERNING BODY.

A. LEUCADIA WASTEWATER DISTRICT, OWNER OF A SEWER EASEMENT AS PER DOCUMENT RECORDED AUGUST 9, 1971 AS DOCUMENT NO. 175602 OF OFFICIAL RECORDS OF SAN DIEGO COUNTY.

B. OLIVENHAIN MUNICIPAL WATER DISTRICT, OWNER OF A WATER EASEMENT AS PER DOCUMENT RECORDED APRIL 4, 1972 AS FILE/PAGE NO. 81491 OF OFFICIAL RECORDS OF SAN DIEGO COUNTY."

1.306.2 Signatures Impossible or Impractical to Obtain. Section 66436 of the Subdivision Map Act allows omission of signatures of interested parties when the right-of-way, easement, or reversion appears to no longer be of practical use and the signatures are impossible or impractical to obtain. A statement of the circumstances preventing the procurement of those signatures shall also be given on the map.

"THE SIGNATURE OF [Insert Name], OWNER OF (AN EASEMENT) (RIGHTS) AS DISCLOSED BY DEED RECORDED [Date] AS (FILE/PAGE)(DOCUMENT) NO. _____ OF OFFICIAL RECORDS OF SAN DIEGO COUNTY HAS BEEN OMITTED UNDER THE PROVISIONS OF SECTION 66436, SUBSECTION (a)(3)(B) OF THE SUBDIVISION MAP ACT SINCE BY REASON OF CHANGED CONDITION, LONG DISUSE, OR LACHES SAID INTEREST APPEARS TO BE NO LONGER OF PRACTICAL USE OR VALUE, AND SAID SIGNATURE IS IMPOSSIBLE OR IMPRACTICAL TO OBTAIN."

1.306.3 Gas and Mineral Rights. Signatures of parties holding an interest in gas and/ or mineral rights may be omitted and the following statement included on the title sheet of the map:

"THE SIGNATURE OF [Name], OWNER OF RIGHTS PER DEED RECORDED [Date] IN BOOK ____ PAGE ___ OF OFFICIAL RECORDS OF SAN DIEGO COUNTY HAS BEEN OMITTED UNDER THE PROVISIONS OF SECTION 66436, SUBSECTION (a)(3)(C) OF THE SUBDIVISION MAP ACT, INASMUCH AS IT CONTAINS AN INTEREST IN OR RIGHTS TO MINERALS INCLUDING BUT NOT LIMITED TO OIL, GAS, OR OTHER

HYDROCARBON SUBSTANCES."

1.306.4 Interested Parties Object to the Map Recording Without Their Signatures. If those interested parties as defined by Section 66436 of the Subdivision Map Act object to the recordation of the map without their signatures, a statement stating their respective interests and their consent to the recordation of the map shall be placed on the title sheet in the same general location as the signature omissions statement. This statement shall be signed and notarized.

"THE UNDERSIGNED, [Insert Name(s)], HEREBY STATE THAT (I, WE, IT) (AM, ARE, IS) INTERESTED IN THE LAND SUBDIVIDED BY THIS (PARCEL) MAP BY VIRTUE OF AN EASEMENT RECORDED [Date] AS FILE/PAGE NO. _____ OF OFFICIAL RECORDS OF SAN DIEGO COUNTY AND CONSENT TO THE PREPARATION AND RECORDATION OF THIS (PARCEL) MAP."

BY _____ DATE _____

1.307 *COVENANT AND EASEMENT LIST.*

A list of all covenants and easements recorded as per separate document prior to consideration of the map for recordation shall be included on the title sheet. Commonly required covenants and easements are discussed in Section 1.105. Each covenant and easement shall be listed with the document recording information and, in the case of an easement, the grantee information. Several examples are given below.

TRAFFIC, PARK, AND FLOOD CONTROL FEES ARE DOCUMENTED IN A COVENANT WITH THE CITY OF ENCINITAS RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-0112374 OF OFFICIAL RECORDS.

AN ITEMIZED LIST OF THE CONDITIONS OF APPROVAL IS DOCUMENTED IN A COVENANT WITH THE CITY OF ENCINITAS RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-8291978 OF OFFICIAL RECORDS.

A HOLD HARMLESS AGREEMENT FOR DRAINAGE ACROSS ADJACENT PROPERTIES IS DOCUMENTED IN A COVENANT WITH THE CITY OF ENCINITAS RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-0962003 OF OFFICIAL RECORDS.

FUTURE PUBLIC IMPROVEMENTS ARE DOCUMENTED IN A COVENANT WITH THE CITY OF ENCINITAS RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-7146100 OF OFFICIAL RECORDS.

A PRIVATE MAINTENANCE AGREEMENT FOR STORM WATER TREATMENT RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-1978829 OF OFFICIAL RECORDS.

A PRIVATE MAINTENANCE AND REMOVAL COVENANT WITH THE CITY OF ENCINITAS FOR FUTURE PRIVATE IMPROVEMENTS WITHIN THE PUBLIC RIGHT-OF-WAY AS PERMITTED BY ENCROACHMENT PERMIT NO. 1978-PE RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-0071461 OF OFFICIAL RECORDS.

AN EASEMENT FOR OPEN SPACE GRANTED TO THE CITY OF ENCINITAS RECORDED SEPTEMBER 6, 2003 AS FILE NO. 2003-9062003 OF OFFICIAL RECORDS.

1.308 *OWNER'S HOLD HARMLESS CERTIFICATE.*

Each property owner listed in the subdivision or parcel map guarantee shall sign the owner's hold harmless certificate.

"THE OWNER AGREES TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY OF ENCINITAS AND ITS AGENTS, OFFICERS, AND EMPLOYEES FROM ANY CLAIM, ACTION, OR PROCEEDING ARISING FROM THE APPROVAL OF THIS SUBDIVISION AGAINST THE CITY OF ENCINITAS OR ITS AGENTS, OFFICERS, OR EMPLOYEES OR AGAINST THE OWNER."

1.309 *ENGINEER / SURVEYOR STATEMENT.*

Maps shall be prepared by or under the supervision of a Licensed Surveyor or a Registered Civil Engineer with a registration number of 33965 or lower (as per Section 8731 and 8761 of Business and Profession Code) and shall be

signed, dated, and stamped by that engineer/ surveyor. The appropriate engineer/ surveyor's statement is dependent upon whether construction of improvements is required and whether the monumentation will be deferred; several examples are given below. Refer to Subdivision Map Act Section 66441.

1.309.1 Monumentation Not Deferred. If the subdivision monuments can be set before the map records because no construction is proposed or because proposed construction is not anticipated to disturb the monuments, the City will not allow the subdivision monumentation to be deferred. When all monumentation has been completed, inspected, and approved prior to map being recorded, the language below should be used.

"I, [Name], A (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER), STATE THAT THE SURVEY OF THIS SUBDIVISION WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN [Date] AND [Date] AND SAID SURVEY IS TRUE AND COMPLETE AS SHOWN; AND THAT MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED AND ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED."

_____
[Insert Name]

_____
TITLE AND NUMBER
MY (LICENSE) (REGISTRATION) EXPIRES ON [Date]

1.309.2 Monumentation Deferred and Improvements Proposed. Use the following statement when any portion of the boundary monumentation will be deferred and improvements are proposed. Monumentation security will be required at the discretion of the engineer/ surveyor and/or the City Engineer.

"I, [Name], A (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER), STATE THAT THE SURVEY OF THIS SUBDIVISION WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN [Date] AND [Date] AND SAID SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT

MONUMENTS OF THE CHARACTER INDICATED HAVE BEEN SET OR FOUND AT THE SUBDIVISION BOUNDARY CORNERS AND I WILL SET ALL OTHER MONUMENTS OF THE CHARACTER AND AT THE POSITION INDICATED BY LEGEND IN THIS MAP WITHIN 30 DAYS AFTER THE COMPLETION OF THE REQUIRED IMPROVEMENTS; AND THAT SUCH MONUMENTS ARE OR WILL BE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED. SEE LEGEND ON SHEET ___."

_____
[Insert Name]

_____
TITLE AND NUMBER
MY (LICENSE) (REGISTRATION) EXPIRES ON [Date]

1.309.3 Monumentation Deferred and No Improvements Proposed. Use the following statement when any portion of the boundary monumentation will be deferred and either no improvements are proposed or when required improvements have already been constructed, approved, and accepted. The time allotted to set the monuments will be determined by the City Engineer and should be inserted where indicated in the certificate below. Monumentation security will be required at the discretion of the engineer/ surveyor and/or the City Engineer.

"I,[Name], A (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER), STATE THAT THE SURVEY OF THIS SUBDIVISION WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN [Date] AND [Date] AND SAID SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS OF THE CHARACTER INDICATED HAVE BEEN SET OR FOUND AT THE SUBDIVISION BOUNDARY CORNERS, AND I WILL SET ALL OTHER MONUMENTS OF THE CHARACTER AND AT THE POSITION INDICATED BY LEGEND IN THIS MAP WITHIN ___ DAYS AFTER THE DATE OF MAP APPROVAL; AND THAT SUCH MONUMENTS ARE OR WILL BE

SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED. SEE LEGEND ON SHEET ___."

_____
[Insert Name]

_____
TITLE AND NUMBER
MY (LICENSE) (REGISTRATION) EXPIRES ON (DATE)

1.310 *PLANNING AND BUILDING DEPARTMENT CERTIFICATE.*

For Parcel Maps that will be approved by the Planning and Building Department at the staff level, the following certificate should be added to the map. The Engineering Department will obtain the signature for the certificate.

"I, [Name], DIRECTOR OF THE PLANNING AND BUILDING DEPARTMENT, HEREBY CERTIFY THAT THE PLANNING AND BUILDING DEPARTMENT HAS REVIEWED THIS MAP PURSUANT TO CITY OF ENCINITAS MUNICIPAL CODE AND HAS FOUND IT TO BE IN CONFORMANCE WITH TENTATIVE PARCEL MAP NO. ____."

BY: _____ DATE: _____
[Insert Name], DIRECTOR
PLANNING AND BUILDING DEPARTMENT

1.311 *PLANNING COMMISSION CERTIFICATE.*

If the Tentative Map or Tentative Parcel Map was approved by Planning Commission, the Final Map or Parcel Map will require Planning Commission approval. The following language should then be provided instead of the Planning and Building Department statement given in Section 1.310. The Engineering Department will obtain the signature for the certificate.

"I, [Name], SECRETARY OF THE PLANNING COMMISSION OF THE CITY OF ENCINITAS, STATE OF CALIFORNIA, HEREBY CERTIFY THAT THE PLANNING COMMISSION OF SAID CITY HAS REVIEWED THIS (PARCEL) MAP PURSUANT TO THE CITY OF ENCINITAS MUNICIPAL CODE AND FOUND

IT TO BE IN CONFORMANCE WITH TENTATIVE (PARCEL) MAP NO. ____.

IN WITNESS THEREOF, SAID PLANNING COMMISSION OF THE CITY OF ENCINITAS HAS CAUSED THESE PRESENTS TO BE EXECUTED BY THE SECRETARY THIS __ DAY OF _____, 20__."
BY: _____
[Insert Name]
SECRETARY, PLANNING COMMISSION

1.312 *CITY COUNCIL STATEMENT.*

If the Tentative Map or Tentative Parcel Map was approved by the City Council or if the map was appealed to City Council, the Final Map or Parcel Map will require City Council approval. The following statement should then be placed on the map. The Engineering Department will obtain the required signature.

"THE CITY COUNCIL OF THE CITY OF ENCINITAS, STATE OF CALIFORNIA, HEREBY APPROVES THIS (PARCEL) MAP AND THE SUBDIVISION SHOWN HEREON."

BY ORDER OF THE CITY COUNCIL.
SIGNED THIS ___ DAY OF _____, 20__.
BY: _____
[Insert Name]
CITY CLERK AS THE SECRETARY OF THE CITY COUNCIL

1.313 *CITY TREASURER CERTIFICATE.*

The Engineering Department will be responsible for obtaining all City signatures, including that of the City Treasurer.

"I, [Name], CITY TREASURER OF THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, HEREBY CERTIFY THAT, ACCORDING TO THE RECORDS OF THIS OFFICE, THERE ARE NO LIENS FOR UNPAID CITY TAXES, EXCEPT TAXES NOT YET PAYABLE, NOR FOR UNPAID BOND ISSUES UNDER ANY IMPROVEMENT BOND ACT OF THE STATE OF CALIFORNIA SHOWING ON THE BOOKS OF THIS OFFICE, AGAINST THE SUBDIVISION OR ANY PART

THEREOF AS SHOWN HEREON.

IN WITNESS THEREOF, I HAVE HEREUNTO SET MY HAND THIS ____ DAY OF ____, 20__."

BY: _____
[Insert Name], CITY TREASURER

1.314 *CITY ENGINEER STATEMENT.*

Engineering Department staff will obtain the signatures on these statements when the map is approved by the Engineering Department. See Subdivision Map Act Section 66442.

"I, [Name], CITY ENGINEER OF THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, HEREBY STATE THAT I HAVE EXAMINED THE (PARCEL) MAP AND FIND IT TO BE SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE (PARCEL) MAP AND ANY APPROVED ALTERATION THEREOF, AND THAT THE PROVISIONS OF THE STATE SUDIVISION MAP ACT AND TITLE 24 OF THE CITY OF ENCINITAS MUNICIPAL CODE IN EFFECT AT THE TIME OF TENTATIVE (PARCEL) MAP APPROVAL HAVE BEEN COMPLIED WITH (AND THAT I AM SATISFIED THAT THIS (PARCEL) MAP IS TECHNICALLY CORRECT)."

SIGNATURE: _____ DATED: _____
[Insert Name]
CITY ENGINEER, CITY OF ENCINITAS
(R.C.E.) (L.S.) No.: _____
EXPIRATION DATE: _____

In the event the office of City Engineer is not held by a land surveyor or an engineer with a registration number below 33965, the City Engineer will not certify that the map is technically correct; another delegate of the Engineering Department will make that certification. In that case, the separate certificate shown below is required.

"I, [Name], [Title] FOR THE CITY OF ENCINITAS, HEREBY

STATE THAT I AM SATISFIED THAT THIS (PARCEL) MAP IS TECHNICALLY CORRECT."

SIGNATURE:_____ DATED: _____
[Insert Name]
[Insert Title]
(R.C.E.) (L.S.) No: _____
EXPIRATION DATE: _____

1.315 *TAX DEPOSIT CERTIFICATE BY THE CLERK OF THE BOARD OF SUPERVISORS.*

The title company will obtain the signature on this certificate after it has received the map from the City. The certificate is required on maps that record between January 1st and September 30th of each year when future and/or supplemental taxes are required to be secured. Please refer to Subdivision Map Act Section 66493(a) and Revenue and Taxation Code Section 2192 for additional information. This certificate is waived for most parcel maps as per County Code Section 81.710.

"I, [Name], CLERK OF THE BOARD OF SUPERVISORS, HEREBY CERTIFY THAT THE PROVISIONS OF THE SUBDIVISION MAP ACT (DIVISION 2 OF TITLE 7 OF THE GOVERNMENT CODE) REGARDING (A) DEPOSITS FOR TAXES, AND (B) CERTIFICATION OF THE ABSENCE OF LIENS FOR UNPAID STATE, COUNTY, MUNICIPAL, OR LOCAL TAXES OR SPECIAL ASSESSMENTS COLLECTED AS TAXES, EXCEPT THOSE NOT YET PAYABLE, HAVE BEEN COMPLIED WITH."

BY: _____ DATE: _____
[Insert Name]
DEPUTY
CLERK OF THE BOARD OF SUPERVISORS

1.316 *COUNTY RECORDER CERTIFICATE.*

This certificate is the last to be signed. The filing of the map for recordation by the County Recorder shall automatically determine the validity of such map, and when the map is recorded, shall impart constructive notice thereof. Refer to Subdivision Map Act Section 66442.5 for additional

information. The language of the County Recorder's certificate shall read as follows:

"FILE NO._____ FILED THIS _____ DAY OF _____, 20_____, AT_____.M. IN BOOK OF MAPS AT PAGE _____, AT THE REQUEST OF _____.

BY: _____"
[Insert Name]
DEPUTY COUNTY RECORDER

1.317 *MISCELLANEOUS CERTIFICATES AND STATEMENTS.* These statements shall be added to the title sheet, as applicable.

1.317.1 Statement for Subdivision with Geological Concerns. The City Engineer may require the following note to be placed on maps when issues of geological concern exist onsite.

"BASED ON PRELIMINARY GEOLOGIC INFORMATION CONTAINED IN REPORTS BY [Firm Name] DATED [Date], GEOLOGICAL CONCERNS EXIST WITHIN THE BOUNDARY OF THIS (PARCEL) MAP WHICH MAY REQUIRE CORRECTIVE MEASURES. PRIOR TO ISSUANCE OF BUILDING OR GRADING PERMTS AND/ OR THE CONSTRUCTION OF THE PROPOSED STREET IMPROVEMENTS AND/OR FURTHER DIVISION OF THE LAND, ADDITIONAL GEOLOGIC AND/ OR SOIL ENGINEERING REPORTS WILL BE REQUIRED BY THE CITY OF ENCINITAS."

1.317.2 Major Use Permit Statement. In some cases, a major use permit affects the requirements for a residential subdivision. In these cases, a note will be added to the dedication statement, as follows:

"THIS SUBDIVISION IS FILED PURSUANT TO THE SUBDIVISION MAP ACT AND MAJOR USE PERMIT NO. ___ GRANTED BY ORDER OF THE PLANNING COMMISSION ON [Date]."

1.317.3 Condominium Statements. When a condominium subdivision is proposed, the title sheet will show one of the following statements immediately following the dedication statements and before the owner's signature(s):

A. Residential Condominium Subdivision.
"THIS SUBDIVISION IS A CONDOMINIUM PROJECT AS DEFINED IN SECTION 1351 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA, CONTAINING A MAXIMUM OF [Number] DWELLING UNITS AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT."

B. Commercial Condominium Subdivision.
"THIS SUBDIVISION IS A CONDOMINIUM PROJECT AS DEFINED IN SECTION 1351 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA, CONTAINING A MAXIMUM OF [Number] COMMERCIAL UNITS AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT."

C. Residential Condominium with a Commercial Lot or Parcel. In the example below, the residential lots are condominium lots, but the commercial lot is not a condominium lot.

"(LOTS OR PARCELS) [Lot Numbers] OF THIS SUBDIVISION ARE CONDOMINIUM (LOTS OR PARCELS) AS DEFINED IN SECTION 1351 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA, AND THIS MAP IS FILED PURSUANT TO THE SUBDIVISION MAP ACT. THERE WILL BE A MAXIMUM OF [Number] DWELLING UNITS ON LOT ____, [Number] DWELLING UNITS ON LOT ____, AND [Number] DWELLING UNITS ON LOT ____. LOT ___ OF THIS SUBDIVISION IS A COMMERCIAL LOT."

D. Condominium that is a Planned Development.
"THIS SUBDIVISION IS A CONDOMINIUM PROJECT AS DEFINED IN SECTION 1351 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA, CONTAINING A MAXIMUM OF [Number] DWELLING UNITS AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT AND MAJOR USE PERMIT NO. _____ GRANTED BY THE CITY OF ENCINITAS ON [Date]."

1.317.4 Planned Development or Lot Averaging Statement. When a Final Map is a planned development or includes the use of lot averaging provisions (see Municipal Code Section 30.16.020), the following statement should be added to the title sheet:

"THIS SUBDIVISION IS A (PLANNED) (LOT AVERAGING) DEVELOPMENT AS DEFINED IN MUNICIPAL CODE SECTION 30.16.020 CONTAINING A MAXIMUM OF [Number] DWELLING UNITS AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT USE PERMIT NO. ___ GRANTED BY ORDER OF THE [Granting Body] OF THE CITY OF ENCINITAS ON [Date]."

1.400 PROCEDURE OF SURVEY AND INDEX SHEET.

Necessary information for the procedure of survey sheet is discussed in Sections 1.400 through 1.410 of this manual. Survey and traverse information is discussed in Section 1.411 below.

The procedure of survey sheet shall generally be prepared at a minimum scale of one inch equal to 400 feet, subject to good design judgment. The scale shall be suitable for microfilming and shall be acceptable to the Office of the County Recorder.

All distances shown on the procedure of survey shall be ground distances. The sum of the parts on any line shall equal the total. All bearings shall be shown to the second and distances shall be shown to two decimal points.

Listed below are a number of items required to be shown on the procedure of survey. When necessary, additional information not covered in this manual will be required in order to ensure a clear and complete map.
The procedure of survey shall show:

A. The general layout of the subdivision, discussed further in Section 1.401 below.

B. Location relative to surrounding subdivisions, parcel maps, and record of survey maps. See Section 1.402 of this manual.

C. Section lines and City boundaries. Section lines are discussed further in Section 1.403.

D. Legend, an example of which is given in Section 1.404 of this manual.

E. Standard notes as presented in Section 1.405.

F. Scale and north arrow. See Section 1.406 below.

G. Lot/ parcel numbering, discussed further in Section 1.407 below.

H. Basis of bearings, discussed below in Section 1.408 of this manual.

I. The convergence angle and the combined scale factor, discussed in Section 1.409 below.

J. Found, set, and deferred monumentation, described in Section 1.410 of this manual.

K. Streets, highways, roads, legal access to the subdivision, and major easements outside the boundary of the subdivision. However, existing easements or the dedication of new easements within the boundary of the proposed subdivision shall not be shown on the procedure of survey.

L. A vicinity map showing the geographic location of the subdivision. The approximate distance to main intersections shall be noted. Any major streets and the distance to the nearest cross street shall also be shown.

M. Sheet index map, if the subdivision is shown on three or more map sheets.

The sections below elaborate upon the requirements in items A-J above.

1.401 *GENERAL LAYOUT OF THE SUBDIVISION.*

The boundary of the map shall be shown on the procedure of survey sheet as a heavy solid black line. The boundary shall not be drawn through any open monument symbols. Solid lines will be used for interior lot lines. Lots should not be dimensioned on the procedure of survey sheet unless it is not possible to show a lot in its entirety on one map sheet. Any area within the subdivision but not included as a part of the subdivision shall be marked “Not a Part of this Subdivision”.

1.402 *LOCATION RELATIVE TO ADJOINING SUBDIVISIONS.*

Adjoining or nearby recorded subdivision lots or parcels, records of survey, and other maps and records shall be shown by light, broken lines, except that existing public street sidelines shall be shown as light solid lines. The

adjacent subdivision names and map numbers shall be shown in phantom letters. Any adjoining deed or record of survey lines shown should be properly identified. References to adjoining ownership by recorded deed may be required.

1.403 *SECTION LINES AND CITY BOUNDARIES.*

Section lines and City boundaries shall be shown on the procedure of survey sheet. When the legal description of the area being surveyed makes it necessary to subdivide U.S. Government sections, the "*Manual of Instructions for the Survey of the Public Lands of the United States*" shall be followed for subdividing the section and as a basis for checking the map. In sectionalized land, reference to government notes and lengths shall be provided if applicable; i.e., if original monuments are found, if corners are established by topographic evidence, or if the corner is lost and re-established.

1.404 *LEGEND.*

The legend is to be part of the procedure of survey sheet and defines the symbols and abbreviations used on the map. The legend should also note any special conditions affecting the procedure of survey map, and it should include explanatory notes concerning interior lot/ parcel monumentation in lieu of symbols.

The legend shall include a symbol for all monuments being found, set, or deferred on the exterior boundary of the subdivision. The minimum symbol size should be 0.10 inch. Open symbols shall be used for set monuments and solid symbols for found monuments. The symbols shown in the San Diego Area Regional Standard Drawing M-13 may be used. An example legend is presented below.

LEGEND:

A found monument as described hereon.

A 2" iron pipe with disc stamped _____ was shown as deferred on (Parcel) Map _____. Not set prior to recording of this map.

A 2" x 24" iron pipe with disc stamped ___. See deferred monumentation statement on sheet No. 1.

Set 2" x 24" iron pipe and disc marked _____.

Set street survey monument marked _____ as per San Diego Area Regional Standard Drawing M-10 and M-13. See deferred monumentation statement on sheet No. 1.

Set clear space marker marked _____.

Fd. ------ *Found.*
Rad. —— *A radial bearing.*
I.P. ——— *An iron pipe.*
/ / / / / / / *Access rights relinquished and waived as shown hereon.*
XXXXXX *City of Encinitas Boundary.*
( ) *Per deed recorded _____ as _____.*
(( )) Indicates record data per Parcel Map No. ___

1.405 *STANDARD NOTES.*

Standard notes for the procedure of survey sheet is given below and shall be included as appropriate.

NOTES:

A. UNLESS OTHERWISE SHOWN ON THIS (PARCEL) MAP, A [Describe Monument] WITH DISC MARKED (RCE ___) (LS ___) WILL BE SET AT ALL REAR (PARCEL)(LOT) CORNERS, ALL FRONT (PARCEL)(LOT) CORNERS, AND ALL POINTS OF CURVE ALONG THE SIDELINES OF DEDICATED STREETS. SEE DEFERRED MONUMENTATION STATEMENT ON SHEET NO. 1.
- or-

UNLESS OTHERWISE SHOWN ON THIS (PARCEL) MAP, ALL REAR (PARCEL)(LOT) CORNERS, FRONT (PARCEL)(LOT) CORNERS, AND POINTS OF CURVE ALONG THE SIDELINES OF DEDICATED STREETS WILL BE MARKED WITH LEAD PLUG AND METAL DISC

STAMPED (RCE ___) (LS ___) AND SET IN SIDEWALK OR CURB ON A [Offset Distance] FOOT OFFSET FROM THE PROPERTY LINE ON THE (PROLONGATION OF THE (PARCEL)(LOT) LINES) (RADIAL TO POINT OF CURVE). WHERE (PARCEL) (LOT) LINES ARE NOT AT RIGHT ANGLES OR RADIAL, THE OFFSET DISTANCE IS SHOWN ON THE (PARCEL) MAP FROM (PARCEL) (LOT) CORNER TO OFFSET MONUMENT. SEE DEFERRED MONUMENTATION STATEMENT ON SHEET NO. 1.

B. THE BEGINNING AND ENDING (PARCEL) (LOT) NUMBERS ARE ____ AND ____, RESPECTIVELY.

C. THE TOTAL NUMBER OF LOTS IS _____.
RESIDENTIAL LOTS __ (LOTS __ THROUGH __)
PRIVATE STREET LOTS __ (LOTS __ THROUGH __)
OPEN SPACE LOTS __ (LOTS __ THROUGH __)

D. THE TOTAL GROSS AREA IS ___.__ ACRES.

E. THIS SUBDIVISION HAS A MINIMUM OF 100 SQUARE FEET OF SOLAR ACCESS FOR EACH EXISTING AND/OR PROPOSED (DWELLING) (COMMERCIAL) (INDUSTRIAL) UNIT AS REQUIRED BY THE STATE MAP ACT 66475.3.

F. A SOILS REPORT TITLED [Name as it Appears on Report] COVERING THE AREA WITHIN THIS SUBDIVISION WAS MADE ON [Date], UNDER PROJECT NO._____ BY [Name], RCE____, OF [Company Name]. A COPY OF SAID REPORT IS ON FILE IN THE ENGINEERING DEPARTMENT OF THE CITY OF ENCINITAS.

1.406 *SCALE AND NORTH ARROW.*

A numeric scale and a graphic scale, a minimum of 4 inches in length, shall be shown on the procedure of survey sheet and each map sheet. The scales shall be consistent with one another.

A north arrow shall appear on each sheet. The north arrow shall be oriented toward the top or left of each sheet.

1.407 *LOT/ PARCEL/ UNIT NUMBERING AND AREAS.*

Lots and parcels and the lot/ parcel numbers are to be shown on the procedure of survey sheet together with streets and street names. Lots/ parcels must be numbered consecutively starting from the number one. Any subsequent units of an earlier subdivision shall begin with the next number from the previous map with no omissions or duplications. Each lot/ parcel shall be shown in its entirety on one sheet, except that large lots/ parcels such as open space lots may be shown on two or more sheets. Gross and net areas shall be shown to two decimal places for each lot/ parcel. All areas shown on the map must agree with the traverse tape to within 1/100 (one one-hundredth) of a square foot.

1.408 *BASIS OF BEARINGS.*

Use the California Coordinate System (CCS 83) for the basis of bearings and express all measured and calculated bearing values in terms of that system. The California Coordinate Index (CCS 83) of the map shall be determined from the U.S.G.S. quad sheets available in the Survey Records Office of San Diego County. For location, see the sample title sheet in Appendix 1.9.

Where known California Coordinates are located within the procedure of survey, those coordinates shall be referenced on the map. The reference shall include the coordinate datum, North American Datum NAD 83. The 1991.35 epoch shall be used unless modified in writing by the City Engineer. Referencing only the North American Datum NAD 27 is not acceptable. The coordinates shall comply with the order of the Public Resource Code Section 8813-8815.

Ties to two City-approved first order monuments referencing NAD 83 are required for establishing the boundary of the map. The City survey network is shown on ROS 18416, ROS 19379, and ROS 20188; the records of survey and monument description sheets for ROS 18416 are available from the Engineering front counter at the City, on the City website, and included as Appendix 1.13 of this manual.

The basis of bearings shall be given in a statement similar to that appearing below:

"THE BASIS OF BEARINGS FOR THIS SURVEY IS BASED UPON THE CALIFORNIA COORDINATE SYSTEM NAD83, ZONE 6. GRID BEARING BETWEEN THE CITY OF ENCINITAS HORIZONTAL CONTROL POINTS ENC-1024 AND ENC-1005 AS SHOWN ON ROS 18416 IS N04º33'49"E. THE GEODETIC BEARING BETWEEN POINTS 1024 AND 1005 IS N03º59'32"E ."

1.409 *MAPPING/ CONVERGENCE ANGLE AND COMBINED SCALE FACTOR.*

The angle of divergence of grid north from geodetic north (theta or mapping angle) shall be included on the procedure of survey sheet. The statement might read as follows:

"THE CONVERGENCE ANGLE AT ENC-1024 IS 00º34'24" ."

The combined scale factor shall be given in a statement similar to that below. If the combined scale factor was not obtained from a City record document, the engineer/ surveyor shall provide to the City during map review a copy of the source document.

"ALL DISTANCES AS SHOWN HEREON ARE GROUND DISTANCES. THE COMBINED SCALE FACTOR AT POINT NO. ____ IS _____. GRID DISTANCE = GROUND DISTANCE x COMBINED SCALE FACTOR."

1.410 *MONUMENTATION.*

Show bearings and distance ties to all existing record monuments, and show the monument descriptions as found and used to establish the map boundary. All monuments to be set or deferred shall also be shown (See Municipal Code Section 24.01.150). Discussed below are the minimum requirements for found monument identification, no-record monuments, set monument identification, monument location, monument ties, monument deferral, and clear space markers.

1.410.1 Found Monument Identification. Monuments found as per the field survey shall be compared with record maps in the

area and any discrepancies shall be noted. All record maps for a given monument shall be indicated when possible; only the first and last records showing the monument are required to be referenced if the record maps are too numerous for all to be identified. The identification of found monuments shall include the size, type of monument, and engineer/ surveyor number according to the record map.

Found insufficient monuments (for example P.K. nails) accepted for survey control shall be replaced with an approved monument and tagged. The map shall show clearly the stakes, monuments, or other evidence found and used as ties to determine the boundaries of the subdivision.

In some cases, it may be necessary to preserve a monument that is in poor condition; if so, the map should clearly state what exactly was removed and what replaced it. At the discretion of the City Engineer, a "witness" or offset monument may be set with the appropriate tags. The location of the witness or offset monument in relation to the found monument shall be shown on the map.

1.410.2 No-Record Monuments. No-record monuments are those not identified on any public record document. Label no-record monuments as to type, size, disc, and engineer/ surveyor number, if any. After analyzing the location of the monument, the engineer/surveyor should state whether the monument is accepted or rejected. If the monument is rejected, ties to the correct location should be shown. Monument acceptance should cite the most basic control; i.e., current deed calls to a corner of an older deed or aliquot part of a section. Such monuments should be labeled as follows:

"FOUND [Type of Monument]. NO RECORD. MONUMENT NOT ACCEPTED."

Or, in the case of a no record monument that will be accepted, the monument should instead be labeled as:

"FOUND [Type of Monument]. ACCEPTED AS [Description] AND TAGGED (LS ___) (RCE___)".

In the case of found no-record monuments bearing LS or RCE identification, the field notes or survey plat should be obtained whenever possible from the engineer/surveyor of work and submitted with the map for monument verification. If notes cannot be obtained, a letter to the City Engineer explaining the circumstances shall be submitted to the Engineering Department.

Found no-record monuments not bearing LS or RCE identification are not acceptable unless the monument position can be proven from other record monuments and measurements. If accepted, the engineer/ surveyor shall replace the monument with a 2" x 24" Iron Pipe, San Diego Regional Standards M-10 and M-13, or other as approved by the City Engineer, or shall set a new brass, copper, or plastic tag on the monument.

If the monument is replaced, it shall be shown on the map as:

"FOUND [Type of Monument]. NO RECORD. ACCEPTED AS [Description]. RESET WITH [Type of Monument] TAGGED (LS ___) (RCE ___)."

If a new tag is set, the monument shall be shown as:

"FOUND [Type of Monument]. NO RECORD; ACCEPTED AS [Description]. SET (BRASS) (COPPER) (PLASTIC) TAG MARKED (LS ___) (RCE___)."

1.410.3 Set Monument Identification. In making the survey for the subdivision, the engineer/ surveyor shall set sufficient pipe, pin, or lead and disc permanent monuments so that the survey or any part thereof may be readily retraced. The monuments shall be visibly marked with the registration number of the engineer/ surveyor as per Section 8772 of the Land Surveyors Act. The LS or RCE number shall be attached as a plastic cap to all ½ inch steel pin monuments set. Other monuments shall be marked with a copper or brass tag bearing the LS or RCE number. The size and type of monuments set shall be fully described on the map.

Street centerline monuments shall be marked according to

San Diego Area Regional Standard Drawings M-10 and M-13. The final "As Built" improvement plans shall be consistent with the map or amended map with regards to the location of centerline monuments.

1.410.4 Monument Location. Monuments set or found shall be sufficient in number and located so as not to be readily disturbed and to assure the perpetuation or re-establishment of any point or line of the survey. Found monuments complying with Municipal Code Section 24.01.150 may be used in lieu of setting new monuments; the description of said monument and record data shall be shown on the map.

The exterior boundary of the subdivision shall be monumented with permanent monuments set at each corner. A 2" x 24" iron pipe monument is required for monumenting the exterior subdivision boundary. If setting a 2" x 24" iron pipe is not feasible, an alternate approved by the City Engineer shall be set. Monuments shall also be set at intermediate points along the subdivision boundary at points of intervisibility between boundary monuments and not more than 1000 feet apart. The beginning and ending of all curves along the boundary shall also be monumented. Iron pipe monuments shall be driven flush or deeper into the ground.

All interior lot/ parcel corners, including the beginning and ending of all property line curves or the points of intersection of curve tangents, shall be monumented with permanent monuments. A 3/4 inch galvanized iron pipe not less than 18" inches in length and tagged with the engineer's/ surveyor's registration number shall be driven flush or deeper into the ground. Any other type of monument shall receive the prior approval of the City Engineer. Offset monuments shall be placed along the extension of the common property line.

Street centerline monuments shall be placed at the intersections of street centerlines and at the beginning and end of curves on centerlines or at points of intersection of curve tangents. Monuments shall be as per San Diego Regional Standard Drawing M-10 unless otherwise approved

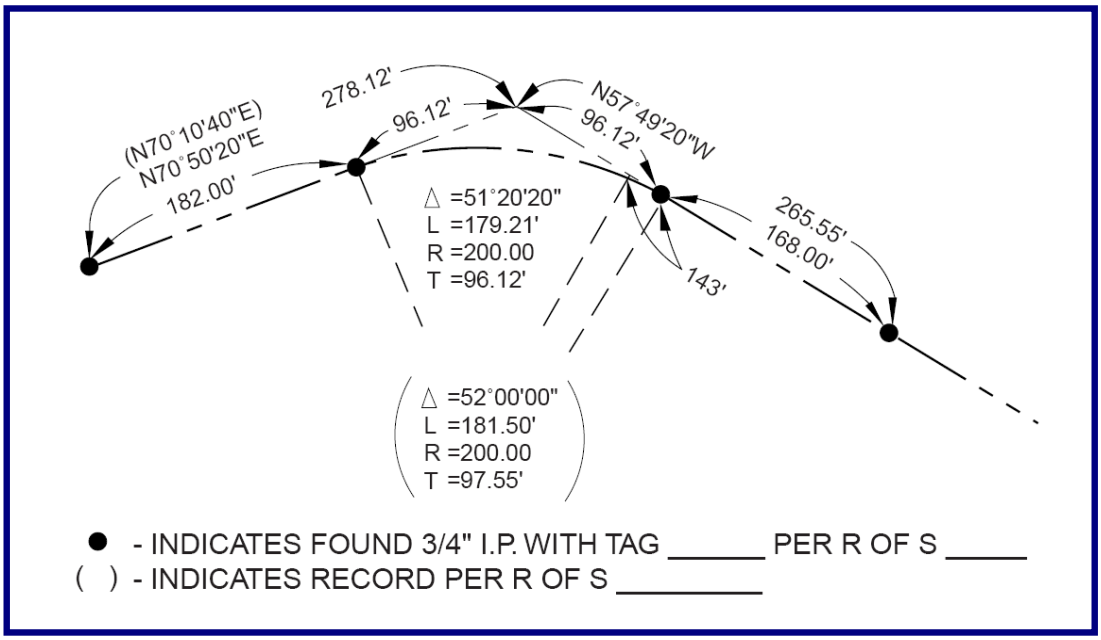
by the City Engineer and shall be marked as per Standard Drawing M-13. The character, type, and positions of all monuments shall be noted on the map. Where a point falls in the location of an existing manhole, it shall be evidenced by 4 punch marks on the manhole rim, and an offset M-10 shall be placed.

1.410.5 Monument Ties. All monuments found or set shall be tied to the survey by bearing and distance. If differences exist in bearing and/or distance between any record tie and the measured tie to a found monument, the record bearing and distance shall be shown in parentheses; for example, (S89º51'20"E 139.75' as per R. of S. 9006). All record maps for a given monument shall be indicated whenever possible; only the first and last records showing the monument are required to be referenced if the record maps are too numerous for all to be identified.

If the monument is used for direction only, it should be labeled, *"Used for Line Only",* and the bearing and approximate or record distance to the monument shall be clearly shown.

If a monument is rejected and shown out of position, the bearing and distance of the rejected monument from the surveyed position shall be clearly shown.

If field measurements of roadway alignment disagree with record data, new centerline curve data should be calculated from angular field measurements using found street centerline or right-of-way monuments for the tangent alignment and using the record radius. The position of the new beginning and ending of curve will be determined by the calculated semi-tangent distance measured from the point of intersection location as found or calculated. This procedure will prevent having non-tangent curves for lots adjacent to existing road right-of-way. An alternate procedure may be approved at the discretion of the City Engineer. The following example illustrates the procedure described above:



In cases where record monuments are found within the road right-of-way and no street centerline monuments exist, the right-of-way monuments are to be used for establishing the centerline and tangent alignment. The curve data can then be computed.

1.410.6 Monument Deferral. Encinitas Municipal Code Section 24.01.150 requires all monuments to be set prior to the approval of the map unless the setting thereof is deferred in accordance with Section 66496 of the Subdivision Map Act.

1.410.7 Clear Space Markers. Markers shall be set in connection with the grant of a clear space easement for sight visibility. The engineer's/ surveyor's registration number shall be stamped on the disc. If improvement plans require a clear space easement and the map does not show setting markers, a record of survey must be filed to show the setting of the markers. See San Diego County Design Standard DS-16, included as Appendix 1.14 of this manual.

1.411 *SURVEY AND TRAVERSE INFORMATION.*

Surveys for the preparation of the map shall be made in accordance with standard practices and principles for land

surveying and the requirements of the City of Encinitas. The date of the survey shall be no more than one year before the date of map recordation.

Traverses must be run to determine the correct procedure, basis of bearings ties, boundary of subdivision, lots, streets, and easements. Traverse sheets and work sheets shall be provided to the City by the engineer/ surveyor. Traverse data shall be the same as that appearing on the map. Traverses shall be submitted in a form that facilitates checking and shall clearly denote the manner in which the area was traversed. The computer traverse calculations shall include:

A. The map boundary with area, gross and net.

B. All lots within the map with area, gross and net.

C. All boundary ties to NAD (North American Datum) coordinates.

D. Streets and centerlines.

E. All easements.

F. Closure on all traverses. All traverses shall be adjusted for exact closure, then rounded off to the nearest second on bearing and the nearest .01 foot on distance. The minimum traverse closure of the boundaries of the subdivision shall meet requirements as prepared by the Federal Geometric Control Committee and published by the United States Department of Commerce.

1.500 MAP SHEETS.

The map sheets shall comply with the general information given in Section 1.200 of this manual. The sections below elaborate upon additional requirements including general requirements for the map sheets and the way that various easements and offers of dedication are required to be portrayed.

1.501 *GENERAL MAP SHEET REQUIREMENTS.*

General requirements for the map sheets are discussed below. Specific requirements pertaining to irrevocable offers of dedication, public and private streets, and a variety of easements are discussed in Sections 1.502 through 1.512.

1.501.1 Scale. The scale of the map sheets must be such that there is sufficient area to show the relationship of the parts to each other without the use of tables. The scale is subject to good design judgment, and the same scale must be used throughout all map sheets except for details and the procedure of survey sheet.

1.501.2 Details. When lines and figures crowd the map, a detail shall be drawn at a scale appropriate to clearly show all dimensions, names, and other information. If more than one detail is used, details should be labeled as "*Detail A*" and so on.

1.501.3 Dimensions. The requirements for the depiction of bearings and distances along property lines and street sidelines are given below. On lines broken into segments, the total length and delta for curves, the total distance for centerlines and sidelines of streets, and the total distance on lots and boundary lines are to be shown. In all cases, the sum of the parts on any line must equal the total shown on the map. No dimension on the map shall be shown to less than 0.01 (one one-hundredth) of a foot.

A. Property Line. The bearing and length of each property line shall be shown in full; indicating that a given bearing or length repeats will not suffice. The bearing and total distance along each sideline and on the centerline of every street shall be fully shown. Arrows shall be used to clearly show the limits of each bearing and distance.

B. Street Curves. The length, radius, and total central angle of each curve on the sidelines and centerline of each street shall be indicated. The bearing of each radial line shall be shown to each lot corner on each curve, unless the lot line is radial. The central angle and length of each segment within each lot shall be shown. The central angle and radius shall be placed neat the curve with arrows indicating the appropriate curve segment.

1.501.4 Remainder Lot or Parcel. Refer to Subdivision Map Act Section 66434(e). The following note is to be shown on the same sheet as the remainder lot. It should be placed inside the lot if there is sufficient room or as close to it as possible if there is not. Certificates of Compliance are discussed further in Section 1.900 of this manual.

"PRIOR TO SALE AND/ OR TRANSFER OF TITLE OF THE REMAINDER (LOT) (PARCEL), A CERTIFICATE OF COMPLIANCE SHALL BE APPROVED BY THE PLANNING AND BUILDING DEPARTMENT AND RECORDED WITH THE SAN DIEGO COUNTY RECORDER."

1.501.5 Street Names. The name of every street along or within the boundary of the map shall be shown in bold lettering on each sheet portraying the street. A designation such as "Street A" is not sufficient. Existing streets outside the subdivision boundary but adjacent thereto shall be shown with their current name. Alleys shall be designated on the map as "*Unnamed Alley*".

Any proposed street name requires Engineering Department approval prior to consideration of the map for recordation. The engineer/ surveyor will be required to provide to the City

a list of three potential names for each proposed street prior to consideration of the map for approval and recordation. Prior to submitting the list, the engineer/ surveyor shall research existing street maps such as the Thomas Brothers Guide in order to determine that names similar to those being requested are not already in use. The City will approve the first name choice if possible. If not, the City will evaluate the second and then the third alternative name to determine if either one is acceptable. The City will either inform the engineer/ surveyor of the approved name or request additional potential names if those on the original list cannot be approved.

1.502 *MAP SHEET REQUIREMENTS FOR PUBLIC STREETS AND IOD'S.*

Issues related to public street naming, the depiction of public streets on the map sheets, street dedication, and street vacation are discussed in Sections 1.502.1 through 1.502.4, and various situations related to Irrevocable Offers of Dedication (IOD's) are covered in Section 1.502.5 below.

1.502.1 Depiction of Public Street Width and Centerline. Each public street, highway, and/ or alley shall be depicted with the centerline and the width on either side of centerline shown. The existing right-of-way widths must be shown at two points to show the right-of-way as either constant or diverging. The width of any proposed offer of dedication shall also be shown. Street centerline shall be indicated by broken lines separated by a short dash, e.g., — – *CL* – —. However, if the street centerline is also the map boundary, it shall instead be shown as a heavy solid line. Where streets intersect at angles other than 90° and/or the limits of each street would otherwise be uncertain, a light dashed line shall be shown across the intersection and labeled *"Limits of [Street Name]"*.

1.502.2 Street Dedicated and Accepted. Streets or portions of streets being dedicated shall be shown on the map with the width, bearing, and ties to lot corners or the boundary. When streets are being dedicated, it may be necessary for the utility company to subordinate their interest unless the

City of Encinitas has prior rights over the streets being dedicated. See Section 1.305 above. Streets dedicated on the map should be labeled as follows:

"(PORTION OF) MARC RANCH ROAD DEDICATED AND ACCEPTED HEREON."

For streets offered for dedication and rejected, see Section 1.502.5 below.

1.502.3 Existing Public Road Easements. When the existing right-of-way will be widened by a proposed dedication, the area previously granted as public right-of-way shall be denoted by light dashed lines where it does not coincide with the new right-of way line. The existing easement shall be labeled as follows:

"EXISTING EASEMENT GRANTED TO THE PUBLIC FOR PUBLIC STREET AND UTILITY PURPOSES AS PER DOCUMENT RECORDED [Date] AS DOC. NO.____."

1.502.4 Street Vacation. The City Council is the sole authority to vacate or abandon City streets, as described in Section 15.16.025 of the Municipal Code. The vacation application may be submitted prior to submittal of the Tentative Map or Tentative Parcel Map to the City. Alternately, the Subdivision Map Act allows applicants to request a right-of-way vacation through the subdivision process (Government Code Section 66434(g)). When a vacation request is a part of a subdivision, the subdivision is referred to the City Council for action with a recommendation from the lower body, either staff or Planning Commission. The vacation will be complete at the time the certified copy of the Resolution of Vacation or the map records with the County Recorder. The Planning Department should be contacted for the vacation processing procedure at the tentative map or tentative parcel map stage. Appendix outlines the City policy and processing procedure for street vacations.

A vacated street is to be shown on the first map after it is vacated. All previously vacated streets within the boundary of the subdivision or adjacent to the subdivision boundary

shall be denoted by light, dashed lines. The vacation data shall be lettered in or near the street and worded as:

"THOMPSON AVENUE VACATED ON [Date] ACCORDING TO CITY COUNCIL RESOLUTION OF VACATION NO. ____ RECORDED IN THE OFFICE OF THE SAN DIEGO COUNTY RECORDER ON [Date] AS DOC. NO. ____."

1.502.5 Irrevocable Offers of Dedication for Street Rights-of-Way. If the City Engineer determines that a street right-of-way is needed or will be needed in the future, an Irrevocable Offer of Dedication (IOD) will be required. An Irrevocable Offer of Dedication rejected by the City Engineer may be accepted by the City at some future date. The IOD may be made on the map or by a separate document, at the discretion of the City Engineer.

A. IOD Made on Map. A street which is offered for dedication but not accepted as a public street will be privately maintained and shall be separated from any adjoining public street by a solid line. If public utility easements or private access easements exist within or cross these rejected streets, they shall be shown. The private street shall be labeled as follows:

"[Width] FOOT WIDE EASEMENT FOR (PORTION OF) MCMENAMIN AVENUE OFFERED FOR DEDICATION AND REJECTED HEREON; TO BE PRIVATELY MAINTAINED IN ACCORDANCE WITH PRIVATE ROAD MAINTENANCE AGREEMENT RECORDED [Date] AS DOC NO. _____."

For streets offered for dedication and accepted, see Section 1.502.2 above.

B. IOD Made by Separate Document. The onsite reservation for future street right-of-way (R.O.W) necessary for the alignment of future road improvements may, in certain cases, be reserved by separate document. In addition to the offer of dedication of right-of-way, the document may include relinquishment of access rights, easements outside

the ROW, drainage easements, and rights to extend slopes. For an Irrevocable Offer of Dedication (IOD) reserved by a separate document, the IOD shall be indicated on the map as follows:

"[Width] FOOT EXISTING IRREVOCABLE OFFER OF DEDICATION FOR PUBLIC ROAD PURPOSES AS PER DOCUMENT RECORDED [Date] AS DOC. NO._____."

C. Acceptance of an Existing I.O.D. The City Engineer may accept a previously rejected IOD on behalf of the City Council at such time as the right-of-way is deemed necessary by the City. Language for the acceptance of a formerly rejected street, which will be accomplished by the recordation of a separate document, appears below.

"EXISTING IRREVOCABLE OFFER OF DEDICATION FOR PUBLIC ROAD PURPOSES AS PER DOCUMENT RECORDED [Date] AS DOC. NO. _____ ACCEPTED ON BEHALF OF THE PUBLIC AS PER DOC. NO. _____ RECORDED [Date] ."

1.503 *MAP SHEET REQUIREMENTS FOR PRIVATE STREETS.*

Access via a private road easement to an individual lot or to multiple lots must comply with Municipal Code Section 24.29.100 and be to the satisfaction of the City. An easement for emergency vehicular access easement or a public easement for private street as discussed in Section 1.503.6 below may be required to be granted over the private street. Similarly, sewer, water, storm drain, pedestrian, and/or general utility easements may be required. The ownership of the underlying fee title as well as the entity responsible for the maintenance of the private road easement shall be clearly identified on each map sheet portraying the private road. Requirements for the depiction of private streets and streets offered for dedication and rejected are discussed below.

1.503.1 Depiction of Private Street Width and Centerline. The private street centerline and the point of intersection of the private

street with a public road shall be shown so that the required street centerline monument can be located. A centerline that is also a lot line within a private street easement shall be shown with the same line weight as other lot lines. Private streets are to be separated from public streets with a light solid line across their intersection and should be labeled as *"Limits of Palau Place, Private Street"*. Private streets shall be labeled with their names, such as *"Palau Place, Private Street"*.

1.503.2 Existing Private Street Easements. All existing private street easements shall be delineated on the map and dimensioned with ties to lot and boundary corners. Private street easements affect net area and are therefore subtracted from the gross lot/ parcel area. Existing private street easements shall be labeled as follows:

"EXISTING [Width] PRIVATE ROAD AND UTILITY EASEMENT, AS PER (DOC. NO. ____ RECORDED [Date]) (MAP NO. _____)."

In certain cases, a private road and utility easement provides access to the subdivision from a publicly maintained road. In those cases, the private easement(s) shall be labeled with language similar to that below.

"ACCESS FROM NW PORTLAND AVENUE, WHICH IS A PUBLICLY MAINTAINED ROAD, TO AND ALONG THE BOUNDARY OF THE SUBJECT PROPERTY IS BY PRIVATE ROAD EASEMENT AS PER (DOC. NO. _____ RECORDED [Date]) (MAP NO. _____). EASEMENT WIDTH IS A MINIMUM OF [Width] FEET AND IS FOR THE BENEFIT AND USE OF THE PROPERTY BEING DIVIDED. NW PORTLAND AVENUE IS TO BE MAINTAINED AS SPECIFIED IN A PRIVATE ROAD MAINTENANCE AGREEMENT RECORDED [Date] AS DOC. NO. ____."

1.503.3 Proposed Private Streets. Streets offered for dedication and rejected are discussed in Section 1.502.5 above. A street which is to remain private with no offer of dedication may be shown in one of the ways listed below. The City-approved street name shall be shown on the map.

A. The lot lines may be extended to the centerline of the street with dashed sidelines. The private street shall be labeled with the following language:

"PROPOSED PRIVATE ROAD AND UTILITY EASEMENT; [Street Name]."

B. The lot lines may end at solid street sidelines, in which case the street will be given a lot/ parcel number as well as a street name. Label with each of the following statements:

"PRIVATE STREET" "(LOT __) (PARCEL___)" and "[Street Name]".

C. A proposed private street overlaying the same area covered by an existing public utility easement shall be labeled as follows:

"EXISTING PUBLIC [Type] EASEMENT"; "PROPOSED PRIVATE ROAD EASEMENT" and "[Street Name]".

1.503.4 Private Street Maintenance Agreements. All private road easements used to access the project as well as those private roads being created by the map must be included in a Private Street Maintenance Agreement. Additional private easements and utilities such as drainage facilities may also be included in the maintenance agreement. The agreement will be prepared by the Engineering Department during map review and must record prior to consideration of the map for recordation. In special cases, an alternate agreement approved in advance by the City Attorney may be allowed.

The following note shall be placed on each sheet where the easement is shown reflecting the recording information:

"PRIVATE ROADS (AND PRIVATE [Type] EASEMENTS) TO BE MAINTAINED IN ACCORDANCE WITH PRIVATE ROAD MAINTENANCE AGREEMENT RECORDED [Date] AS DOC. ___."

1.503.5 Granting of Private Road and Utility Easements. Additional notes may be required to document the requirement for

easements to be granted/ reserved at the time of sale or transfer of title of each lot, whichever occurs first. The following language will be required on all maps proposing private streets:

"IT IS THE SUBDIVIDER'S RESPONSIBILITY TO PROVIDE INSURABLE ACCESS AND UTILITY EASEMENTS TO ALL (LOTS) (PARCELS) CREATED BY THIS (PARCEL) MAP."

Each private road easement to be granted or reserved at time of sale or transfer of title shall be labeled as follows:

"ACCESS EASEMENT TO BE (GRANTED) (RESERVED) AT TIME OF SALE OR TRANSFER OF TITLE, WHICHEVER OCCURS FIRST."

Other typical language appears below, which should be added to the map as applicable.

A. Condominium or Planned Development Project.

"IT IS THE SUBDIVIDER'S RESPONSIBILITY TO RESERVE AN EASEMENT FOR INGRESS AND EGRESS AND UTILITY PURPOSES OVER THE PRIVATE STREETS WITHIN THE COMMON AREA OF THIS (PARCEL) MAP FOR THE OWNERS OF (LOTS) (PARCELS) IN SUBSEQUENT SUBDIVISIONS OF THIS (CONDOMINIUM) (PLANNED DEVELOPMENT)."

B. Street Offered for Dedication and Rejected. Additional language required for the offer of dedication is discussed in Section 1.502.5 of this manual.

"IT IS THE SUBDIVIDER'S RESPONSIBILITY TO GRANT AN EASEMENT FOR INGRESS AND EGRESS AND UTILITY PURPOSES OVER THE PRIVATE STREETS WITHIN THE COMMON AREA OF (LOT __) (PARCEL __) OF THIS (PARCEL) MAP AS WELL AS OVER [Street Name of Offered and Rejected Street] WITH ALL DEEDS CONVEYING TITLE INTEREST IN THIS SUBDIVISION."

C. Maintenance Agreement for Onsite and Offsite Private Maintenance.

"RAVENSBURG ROAD IS TO BE A PRIVATE ROAD AND PUBLIC UTILITY EASEMENT. SAID PRIVATE ROAD IS TO BE MAINTAINED ONSITE AND OFFSITE IN ACCORDANCE WITH PRIVATE ROAD MAINTENANCE AGREEMENT RECORDED [Date] AS DOC. NO. ____."

D. Underlying Fee Ownership.

"UNDERLYING FEE OWNERSHIP TO THE PROPOSED ROADS WILL BE VESTED IN THE ADJACENT LOTS AS SHOWN ON THE (PARCEL) MAP. ALL (LOT) (PARCEL) OWNERS WILL BE GRANTED A NON-EXCLUSIVE [Type of Easement] EASEMENT OVER SAID ROADS."

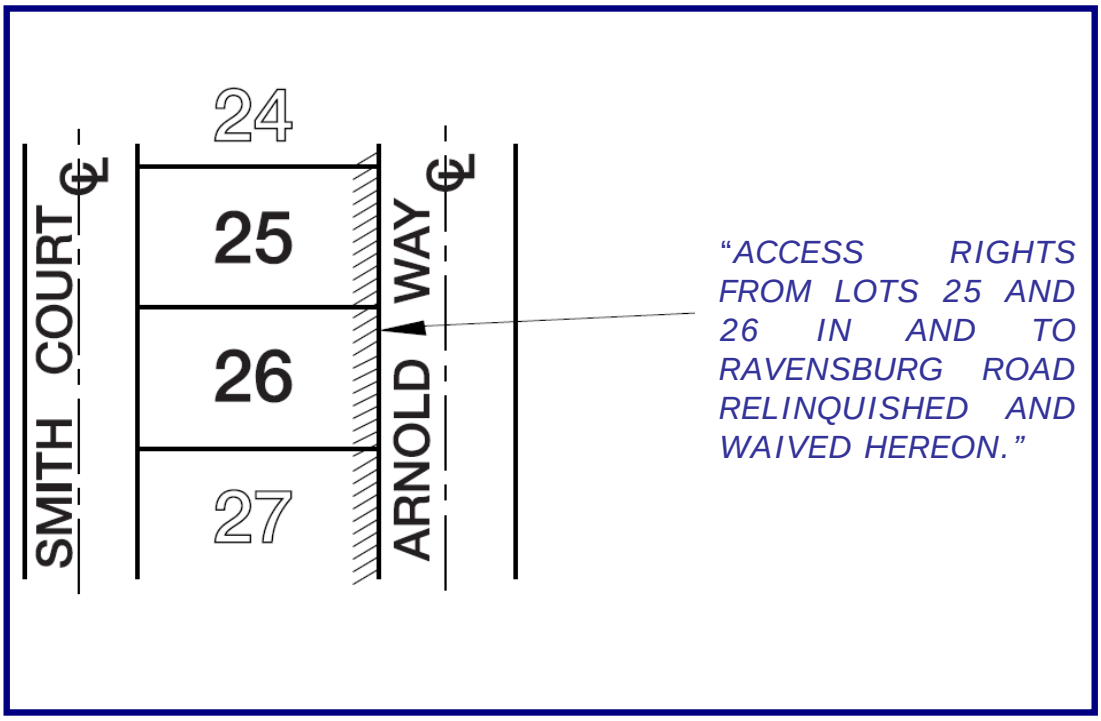
1.503.6 Public Easement for Private Street. At the discretion of the City Engineer, a Public Easement for Private Street will be required. The Public Easement for Private Street provides for such purposes as installation, access, and maintenance of public sewer, water, and storm drain facilities as well as emergency vehicular access. The Public Easement for Private Street shall be delineated on the map and dimensioned with ties to lot and boundary corners, and it shall be labeled as follows:

"PUBLIC EASEMENT FOR PRIVATE STREET OFFERED AND ACCEPTED HEREON."

1.504 *MAP SHEET REQUIREMENTS FOR RELINQUISHMENT OF ACCESS RIGHTS TO A PUBLIC STREET.*

1.504.1 Relinquishment of Access to Existing Public Street. When access rights are to be relinquished from a lot to an existing public street, the right-of-way line along the portion of the lot where access is being relinquished shall be shown with the proper symbol and language similar to that below shall be placed on the map.

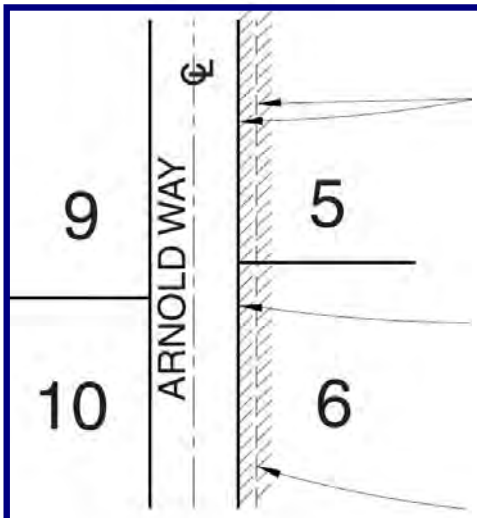
Example:



1.504.2 Portion of Lot or Parcel Reserved for Future Street and Future Access Rights Waived. If a strip of land is to be reserved for future street widening, the strip of land being reserved shall be delineated on the map. Access relinquishment will be from the lot concerned to the reserved portion of that lot and also from the reserved portion of the lot to the existing street, as shown in the example below.

Offers of dedication for *"Portion of Lot ____ Reserved for Future Street"* will be rejected by the City; the offer of relinquishment in and to the portion of the lot reserved for future street will be rejected as well. An example is presented below. Language similar to that given below shall be added to the map sheet, as appropriate.

Example:



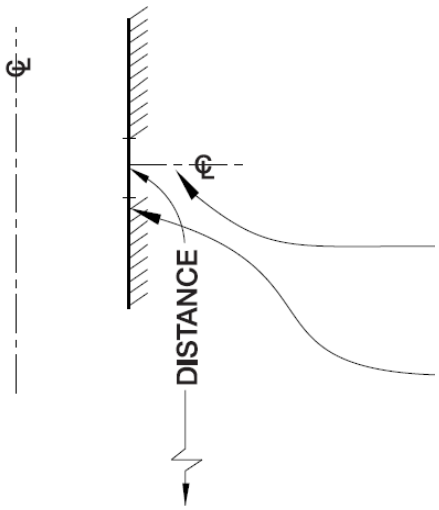
"PORTION OF LOTS 5 AND 6 RESERVED FOR FUTURE STREET OFFERED AND REJECTED HEREON.

ACCESS RIGHTS FROM PORTION OF LOTS 5 AND 6 RESERVED FOR FUTURE STREET IN AND TO STEPHANIE LANE RELINQUISHED AND WAIVED AND ACCEPTED HEREON.

ACCESS RIGHTS FROM LOTS 5 AND 6 IN AND TO THE PORTION OF LOTS 5 AND 6 RESERVED FOR FUTURE STREET RELINQUISHED AND WAIVED AND REJECTED HEREON."

1.504.3 Access Openings. Access openings are used to allow for an approved driveway location when access rights beyond that approved location will be relinquished or waived. The opening width and tie to a lot corner must be shown so that the location of the access opening can readily be determined, as shown in the example below.

Example:



"CENTERLINE OF [Width] WIDE ACCESS OPENING NO. 1."

"ACCESS RIGHTS FROM LOT 1 IN AND TO BACHELOR BOULEVARD RELINQUISHED AND WAIVED AND ACCEPTED HEREON EXCEPT AT ACCESS OPENING NO. 1."

1.505 *MAP SHEET REQUIREMENTS FOR ACCESS RESTRICTION TO PRIVATE STREET.*

When access to a private street will be relinquished and waived, the following wording should be used on the map sheet:

"VEHICULAR ACCESS FROM (LOTS___) (PARCELS___) TO PAROS PLACE, A PRIVATE STREET, RELINQUISHED AND WAIVED HEREON."

1.506 *MAP SHEET REQUIREMENTS FOR PUBLIC DRAINAGE, FLOWAGE, AND CITY SEWER EASEMENTS.*

The paragraphs below describe the treatment of public drainage and flowage easements. Also discussed below are sewer easements within Cardiff Sanitation District (CSD) or Encinitas Sanitary District (ESD) sewer easements, which have been dissolved and are now administered by the City. See Section 1.303.6 for title sheet wording for these easements. Sewer easements inside the Leucadia Wastewater District are discussed in Section 1.507 below.

Some of the easements discussed below may remain private by way of either not being offered for dedication or being offered and rejected. Such private easements shall be labeled *"PROPOSED PRIVATE [Type] EASEMENT"* and included in the private road maintenance agreement. These private easements are discussed further in Section 1.503 below.

1.506.1 Public Drainage Easements and CSD/ ESD Sewer Easements.

All existing drainage and sewer easements shown in the subdivision or parcel map guarantee or vesting deeds shall be delineated on the map with bearings, distances, widths, and ties to all lot corners and boundary corners, when such information is shown in the record documents. The location, dimensions, and line bearings of a proposed drainage or sewer easement shall be in agreement with the improvement plans, and the easement shall be tied to the lot lines and/or subdivision monumentation. The side lines of drainage easements shall be shown on the map as short, light, broken lines. Where the easement is parallel to and along a lot line or boundary line, the lot line or boundary line

shall be a solid line of the correct line weight. If the lot line is the centerline of the easement, it shall be a solid line and the easement on either side of the centerline shall be called out or shown clearly with the width given.

A. Dedication of Public Drainage or CSD/ ESD Sewer Easement. Drainage easements and sewer easements within the former Cardiff Sanitary or Encinitas Sanitation districts dedicated on the map shall be designated on the map sheet as follows:

"(DRAINAGE) (SEWER) EASEMENT DEDICATED TO THE CITY OF ENCINITAS AND ACCEPTED HEREON."

For drainage and sewer easements offered for dedication and rejected, see Section 1.506.2 below.

B. Proposed Offsite Public Drainage or CSD/ ESD Sewer Easement. When a drainage easement or CSD/ ESD sewer easement must be acquired outside the boundary of the subdivision, a portion of the easement sufficient to clearly establish its location and relationship to the subdivision shall be delineated, dimensioned, and labeled on the map. The offsite easement shall be granted by separate document, and shall be shown on the map sheet with language similar to the following:

"EXISTING PUBLIC (DRAINAGE)(SEWER) EASEMENT GRANTED AS PER DOC. NO. __ RECORDED [Date]."

C. Existing Public Drainage or CSD/ ESD Sewer Easement. An existing drainage or CSD/ ESD sewer easement shall be labeled on the map sheet in the following way:

"EXISTING (DRAINAGE)(SEWER) EASEMENT GRANTED AS PER (DOC. NO. _____, RECORDED [Date]) (MAP NO. _____)."

D. Drainage Easement with Portion of Right-of-Way Offered for Dedication and Rejected. If a portion of the right-of-way has been previously or is currently being dedicated and an additional portion of the right-of-way has been or is being offered and rejected, the drainage easement as necessary for the ultimate road width will be

offered for dedication to the City of Encinitas and rejected. Language similar to that appearing below shall be used, as appropriate:

"DRAINAGE EASEMENT DEDICATED TO THE CITY OF ENCINITAS AND ACCEPTED HEREON."

"EXISTING DRAINAGE EASEMENT AS PER DOC. NO. _____ RECORDED [Date]."

"DRAINAGE EASEMENT IRREVOCABLY OFFERED FOR DEDICATION TO THE CITY OF ENCINITAS AND REJECTED HEREON."

A drainage or CSD/ ESD sewer easement that is dedicated and rejected will remain private and is discussed further in Section 1.506.2 below.

1.506.2 Dedication of Public Access Easement. In certain cases, a street and drainage/ sewer easement will be offered for dedication and only the drainage/ sewer easement will be accepted, or access to public drainage or sewer facilities will require travel over an existing private road easement. In these situations, an access easement for the maintenance of the public storm drain or sewer facilities will be dedicated and accepted on the map. In other cases, a drainage/ sewer easement is offered for dedication on the map and rejected, and the City will need access to the proposed facilities to ensure the ability to assume public maintenance at a future date. In this situation, an access easement will be offered for dedication and rejected on the map. The access easement shall be labeled on the map sheets as follows:

"ACCESS EASEMENT TO MAINTAIN (DRAINAGE)(SEWER) FACILITIES (DEDICATED) (IRREVOCABLY OFFERED FOR DEDICATION) TO THE CITY OF ENCINITAS AND (ACCEPTED) (REJECTED) HEREON."

1.506.3 Dedication of Flowage Easement. Any portion of land within the subdivision boundary subject to inundation by 100-year flood shall be delineated on the map. A flowage easement may be required over that area, at the discretion of the City

Engineer. The area subject to inundation shall be labeled on the map as follows:

"APPROXIMATE AREA SUBJECT TO INUNDATION BY 100 YEAR FLOOD."

If a flowage easement is required, it shall be shown on the map sheet and labeled as follows:

"FLOWAGE EASEMENT OVER (ALL) (A PORTION) OF (LOT___) (PARCEL ____) IS (DEDICATED) (IRREVOCABLY OFFERED FOR DEDICATION) TO THE CITY OF ENCINITAS AND (ACCEPTED) (REJECTED) HEREON."

1.507 *MAP SHEET REQUIREMENTS FOR EASEMENTS TO LWD, OMWD, AND SDWD.*

Discussed below are sewer easements granted to Leucadia Wastewater District and water easements granted to San Dieguito Water and Olivenhain Municipal Water districts. All existing utility easements shown in the subdivision or parcel map guarantee or vesting deeds shall be delineated on the map with bearings, distances, widths, and ties to all boundary corners, when such information is shown in the record documents and is plotable. The location, dimensions, and line bearings of a proposed sewer or water easement shall be in agreement with the improvement plans, and the easement shall be tied to the lot lines and/or subdivision monumentation. The side lines of easements shall be shown on the map as short, light, broken lines.

1.507.1 Leucadia Wastewater and Olivenhain Municipal Water Districts. Easements to Leucadia Wastewater and Olivenhain Municipal Water districts must be made by separate document and referenced on the map. Language similar to the following shall be placed on the map sheets:

"EXISTING [Type] EASEMENT GRANTED TO [Grantee] AS PER (DOC. NO. ___ RECORDED [Date])(MAP NO. ___) (PARCEL MAP NO. ___)."

1.507.2 San Dieguito Water District. Easements to San Dieguito Water District will be made on the map and accepted or

rejected by SDWD. See Section 1.303.7 for title sheet wording.

A. Proposed SDWD Easement. An easement proposed to be granted to SDWD shall be labeled as follows:

"PROPOSED PUBLIC WATER EASEMENT (GRANTED) (OFFERED) TO SDWD AND (ACCEPTED) (REJECTED) HEREON."

B. Existing SDWD Easement. An existing water easement shall be labeled as follows.

"EXISTING PUBLIC WATER EASEMENT GRANTED TO SDWD AS PER (DOC. NO. __ RECORDED [Date]) (MAP NO. __) (PARCEL MAP NO. __)."

1.508 *MAP SHEET REQUIREMENTS FOR EASEMENTS TO TELEPHONE, CABLE TV, AND GAS/ ELECTRIC COMPANIES.*

Telephone, cable TV, and gas/ electric easements are most often granted by separate document after the map records. Contact the utility company directly for the easement grant deed language. All existing public utility easements shown in the subdivision or parcel map guarantee or vesting deeds shall be delineated on the map with bearings, distances, widths, and ties to all lot and boundary corners, when such information is shown in the record documents. Such easements shall be labeled as follows:

"EXISTING [Width] EASEMENT FOR [Specify Purpose] GRANTED TO [Grantee] AS PER (DOC. NO. __ RECORDED [Date]) (MAP NO. _) (PARCEL MAP NO. __)."

1.509 *MAP SHEET REQUIREMENTS FOR PRIVATE ACCESS, PRIVATE UTILITY, AND PRIVATE DRAINAGE EASEMENTS.*

All existing public or private road, utility, and drainage easements shown in the subdivision or parcel map guarantee or vesting deeds shall be delineated on the map with bearings, distances, widths, and ties to all lot corners and boundary corners, when such information is shown in

the record documents. The location, dimensions, and line bearings of proposed private easements shall be tied to the lot lines and/or subdivision monumentation. The side lines of easements shall be shown on the map as short, light, broken lines.

1.509.1 Private Easements to be Granted or Reserved at Time of Sale or Transfer of Title. Private access, utility, and drainage easements most often need to be granted or reserved at the time of sale or transfer of title. It is the developer's responsibility to see that the easements are successfully granted when the property is sold or the title transfers. Such easements shall be labeled on the map sheets as follows:

"PRIVATE [Specify Easement Type] EASEMENT TO BE (GRANTED)(RESERVED) AT TIME OF SALE OR TRANSFER OF TITLE, WHICHEVER OCCURS FIRST."

1.509.2 Drainage and CSD/ESD Sewer Easement Offered for Dedication and Rejected. If the drainage easement is offered for dedication and is rejected, the drainage facilities will remain privately maintained until such time as the City accepts the irrevocable offer of dedication. A note similar to the following shall be indicated on the plans:

"(DRAINAGE) (SEWER) EASEMENT IRREVOCABLY OFFERED FOR DEDICATION TO THE CITY OF ENCINITAS AND REJECTED HEREON, TO BE MAINTAINED AS PRIVATE DRAINAGE FACILITY."

1.510 ***MAP SHEET REQUIREMENTS FOR CLEAR SPACE EASEMENTS.*** When the City determines that a sight distance problem exists, a clear space easement may be required at the discretion of the City Engineer. Such easement shall be monumented in accordance with the requirements of Section 1.410.7 and shall be shown on the map sheet with bearings, dimensions, and ties to lot corners or the boundary. See Section 1.303.10 for title sheet wording. The clear space easement shall be labeled as indicated in the applicable statement below:

A. Acceptance of Clear Space Easement. A clear space easement that is dedicated and accepted shall be labeled as follows on the map sheets:

"CLEAR SPACE EASEMENT GRANTED TO THE CITY OF ENCINITAS AND ACCEPTED HEREON."

B. Rejection of Clear Space Easement. If an offer of dedication for the road is being made and rejected, the clear space easement will be rejected as well. It should then be labeled as:

"CLEAR SPACE EASEMENT OFFERED FOR DEDICATION AND REJECTED HEREON; TO BE MAINTAINED AS PRIVATE CLEAR SPACE EASEMENT."

1.511 ***MAP SHEET REQUIREMENTS FOR OPEN SPACE EASEMENTS.***

A proposed open space easement will be granted as per separate document. The document will be prepared by the Planning Department during the map review process. The open space easement shall be delineated on the map with bearings, distances, and ties to lot corners and the boundary. The recording information shall be shown on the map sheet with the following language:

"OPEN SPACE EASEMENT OVER (LOT/ PARCEL __)(PORTION OF LOT/ PARCEL(S) ___) GRANTED TO THE CITY OF ENCINITAS AS PER DOC NO. ____ RECORDED [Date]."

1.512 *MAP SHEET REQUIREMENTS FOR NOISE PROTECTION EASEMENTS.*

The Planning and Building Department may require a noise protection easement to place conditions or restrictions on the development of a property. If so, the Planning and Building Department will prepare this document during map review, and it must record prior to consideration of the map for recordation. A noise protection easement is to be dimensioned and labeled on the map sheets as follows:

"NOISE PROTECTION EASEMENT GRANTED TO THE CITY OF ENCINITAS AS PER (DOC. NO. ___ RECORDED [Date])."

1.513 *MAP SHEET REQUIREMENTS FOR SLOPE/ DRAINAGE EASEMENTS.*

When street improvements will not be constructed to ultimate City of Encinitas standards or when the easement will not be graded to ultimate City of Encinitas standards, the drainage and slope easements are to be plotted and labeled on the map sheets. They will be offered for dedication and rejected. See Section 1.303.13 for title sheet wording. The following language shall be added to the map sheet, as appropriate:

"DRAINAGE EASEMENT IRREVOCABLY OFFERED FOR DEDICATION AND REJECTED HEREON."

"SLOPE EASEMENT WITH THE RIGHT TO MAINTAIN SLOPES IRREVOCABLY OFFERED FOR DEDICATION AND REJECTED HEREON."

If the subject property does not include the underlying fee ownership of an adjacent roadway, the subdivider may be required to offer a slope easement only. The following note shall be placed on the map sheet:

"THE RIGHT TO EXTEND AND MAINTAIN DRAINAGE FACILITIES AND EXCAVATION/ EMBANKMENT SLOPES BEYOND THE LIMITS OF THE EXISTING RIGHT-OF-WAY (DEDICATED) (IRREVOCABLY OFFERED FOR DEDICATION) AND (ACCEPTED) (REJECTED) HEREON"

1.514 *MAP SHEET REQUIREMENTS FOR RECREATIONAL TRAIL EASEMENTS.*

A proposed easement for recreational trail shall be shown with bearings, dimensions, and ties to lot corners or the boundary. If the easement will be accepted, it shall be labeled on the map sheets as follows:

"EASEMENT FOR PUBLIC RECREATIONAL TRAIL PURPOSES (TOGETHER WITH ACCESS RIGHTS FOR TRAIL MAINTENANCE), DEDICATED AND ACCEPTED HEREON."

An easement for recreational trail that is offered on the map and rejected shall be labeled with language similar to the following:

"EASEMENT FOR PUBLIC RECREATIONAL TRAIL PURPOSES (TOGETHER WITH ACCESS RIGHTS FOR TRAIL MAINTENANCE) IRREVOCABLY OFFERED FOR DEDICATION AND REJECTED HEREON; TO BE PRIVATELY MAINTAINED."

1.515 *MAP SHEET REQUIREMENTS FOR MISCELLANEOUS EASEMENTS.*

Requirements for the depiction on the map sheets of several miscellaneous easements are shown below.

A. Blanket Easement. A blanket easement is an easement without a specific location set forth in the deed and must be accounted for with a note on all map sheets and on the Procedure of Survey Sheet.

"EXISTING [Specify Type] EASEMENT GRANTED TO [Grantee] AS PER DOC. NO. ____ RECORDED [Date] HAS NO SPECIFIC LOCATION SET FORTH IN THE DEED AND CANNOT BE PLOTTED ON (PARCEL) MAP."

B. General Utility, Drainage, and Pedestrian Easement.

"GENERAL UTILITY, DRAINAGE, AND PEDESTRIAN EASEMENT (DEDICATED) (IRREVOCABLY OFFERED FOR DEDICATION) TO THE CITY OF ENCINITAS AND (ACCEPTED) (REJECTED) HEREON."

C. Emergency Vehicular Access Easement.

"EMERGENCY VEHICULAR ACCESS EASEMENT (DEDICATED) (IRREVOCABLY OFFERED FOR DEDICATION) TO THE CITY OF ENCINITAS AND (ACCEPTED) (REJECTED) HEREON."

1.600 CHANGES TO RECORDED MAPS.

After a map records, the original cannot be changed. However, the map may be amended by a certificate of correction or an amending map to correct an error or omission on the original map, to show the proper location and character of a monument that was originally shown in error or has been modified from the original location and/or character, or to indicate monuments set by a licensed party other than the original engineer/ surveyor. Refer to Subdivision Map Act Section 66469 for additional information. Certificates of correction and amended maps are discussed in turn below.

1.601 *CERTIFICATE OF CORRECTION.*

The certificate of correction is used to make minor changes per Section 66469 or 66472.1 of the Subdivision Map Act. The Certificate of Correction will be processed with the Engineering Department. A simple sketch may be included as part of the certificate of correction to illustrate the corrections made.

See Appendix 1.16 for sample certificate of correction for map error and Appendix 1.15 for a sample certificate of correction for map modification. The sample certificate can be modified for use with final maps, parcel maps and record of survey maps. The certificate will be signed by the City Engineer. If the City Engineer is a land surveyor or an engineer with a license number below 33965, a delegate of the City Engineer will sign instead.

1.602 *AMENDED MAPS.*

The Engineering Department should be contacted when determining whether a Record of Survey, Certificate of Correction, or an Amended Map is the appropriate mechanism for a modification to an existing map. Refer to Sections 66469 through 66472.1 of the Subdivision Map Act as well as Section 24.54.160 of the Municipal Code, which discuss conditions authorizing the filing of an amended map.

Amended maps are unique in that no division of land is proposed with the map and are therefore not subject to the

tentative map process. Re-dedication of easements, the City Treasurer's certificate, and the tax certificate will not be required on the amended map.

1.602.1 Requirements for the Title Sheet of an Amended Map. Listed below are the standard title sheet certificates modified for use with an amended map. The title sheet of the original map must be completely redone.

A. Amended Map Title. The title of the amended subdivision will be as follows:

"AMENDED (PARCEL) MAP OF CITY OF ENCINITAS (PARCEL) MAP NO. ____."

B. Preamble for Amended Map. The preamble will be shown as follows:

"BEING AN AMENDED (PARCEL) MAP OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO. _____, (PARCEL) MAP NO. _____ FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON [Date]. SAID AMENDED PORTIONS AFFECT (LOT(S)__) (PARCEL(S) ____) INCLUSIVE OF SAID (PARCEL) MAP."

C. Subdivision Guarantee for Amended Map. A new subdivision or parcel map guarantee will be required for the amended map. The document information for the subdivision or parcel map guarantee shall be included on the title sheet with language similar to the following:

"SUBDIVISION GUARANTEE PREPARED BY [Title Company] AS ORDER NO. ____DATED [Date]."

D. Owner's Statement for the Amended Map. The owner's statement shall include the following language:

"WE HEREBY STATE THAT WE ARE THE OWNERS OF OR ARE INTERESTED IN THE LANDS DELINEATED AND EMBRACED WITHIN THE AMENDED PORTIONS OF THIS AMENDED MAP OF TENTATIVE (PARCEL) MAP NO. ___, THE ORIGINAL (PARCEL) MAP NO. ___ HAVING BEEN FILED ON [Date] AS FILE NO.____ IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, CALIFORNIA. AS SUCH OWNERS OR INTERESTED PARTIES BEING AFFECTED BY CORRECTIONS/ MODIFICATIONS TO THE ORIGINAL (PARCEL) MAP, WE HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS AMENDED (PARCEL) MAP.

WE HEREBY ACKNOWLEDGE THE DEDICATION OF [List All Dedications on the Original Map] AND THE IRREVOCABLE OFFER OF DEDICATION OF [List All Offers of Dedication Rejected on the Original Map] AS ACCOMPLISHED ON THE (PARCEL) MAP OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO. ____ FILED AS (PARCEL) MAP NO. ____ , ALL AS SHOWN HEREON WITHIN THE AMENDED PORTIONS OF THIS SUBDIVISION."

E. Title Interest Signatures for Amended Map. Provide the names and signatures of all the owners and all other interested parties (for example, trustees or beneficiaries) having an interest in the property affected by said correction or addition, except those signatures being omitted in accordance with Section 1.602.1(F) below. The name of each party shall appear as it does in the subdivision or parcel map guarantee. Notarization of the signatures will be required. See Appendix 1.10 of this manual for a sample all-purpose acknowledgement. Refer to Section 1.301 of this manual for greater detail on the requirements for title interest signatures.

F. Signature Omission Statement for Amended Map. The names and interest of each holder of an easement or rights with an omitted signature shall be listed; refer to Section 1.306 of this manual for a further

explanation of the signature omission statement.

G. Engineer's/ Surveyor's Statement for Amended Map:

"I, [Name], A (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER) OF THE STATE OF CALIFORNIA, HEREBY STATE THAT CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO. _____, ORIGINALLY FILED AS (PARCEL) MAP NO. _____ IS IN ERROR IN THAT THE (COURSES) (DISTANCES) (DESCRIPTION OF REAL PROPERTY) (LOCATION OF MONUMENTS) (ACREAGE) ARE (IN ERROR) (WERE OMITTED) AND ARE CORRECTED IN ACCORDANCE WITH SECTION 66469 OF THE SUBDIVISION MAP ACT. (SEE TABLE OF AMENDMENTS ON SHEET ___).

I FURTHER STATE THAT THIS AMENDED MAP WAS PREPARED BY OR UNDER THE DIRECTION AND CONTROL OF THE UNDERSIGNED (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER).

BY: _____ DATE: _____
[Name] , [Registration Number]
MY REGISTRATION EXPIRES [Date]."

H. City Engineer's Statement for Amended Map. The City Engineer's statement is modified from the standard format as given below. In the event that the office of City Engineer is not held by a land surveyor or engineer with a registration number below 33965, a delegate of the City Engineer will sign instead, and the certificate should be modified accordingly.

"I, [Name], CITY ENGINEER OF THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, STATE THAT I HAVE EXAMINED THIS AMENDED MAP AND HAVE FOUND THAT THE ONLY CHANGES SHOWN HEREON ARE CHANGES PROVIDED

FOR BY SECTION 66469 OF THE SUBDIVISION MAP ACT.

BY: _____ DATE: _____
[Name], [Registration Number]
CITY ENGINEER
MY REGISTRATION EXPIRES [Date]."

I. Recorder's Certificate for Amended Map. Upon recordation of the amended map, the original map is deemed to have been conclusively corrected. The certificate for the County Recorder shall read as follows:

"I, [Name], COUNTY RECORDER OF THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, HEREBY CERTIFY THAT I HAVE ACCEPTED FOR RECORDATION THIS AMENDED MAP OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO.___, (PARCEL) MAP NO. ___, FILED AS FILE NO. _____ AT THE REQUEST OF _____ THIS ___ DAY OF _____, 20__, AT __.M.

BY: _____
[Name]
DEPUTY COUNTY RECORDER

FEE: $_____ ."

1.602.2 Map Sheets for the Amended Map. The proposed amended map may not include changes on all sheets, but those sheets not affected by the changes must still be included in the amended map.

A. Sheets Not Affected by the Proposed Change. Each sheet will contain an amendment note. The sheets not affected by any changes will be labeled as follows:

"AMENDMENT NOTE: THERE ARE NO AMENDMENTS TO THIS SHEET."

B. Sheets Affected by the Proposed Change. Each change proposed on the sheet shall be indicated by a

delta in numerical sequence; the first change being delta 1 and so on. The delta number will appear both by the change where it occurs on the map sheet and also in the amendment note as indicated below. Those sheets affected by the proposed change will be labeled with language similar to the following:

"AMENDMENT NOTE: THE AMENDMENT(S) ON THIS SHEET (IS)(ARE) INDICATED BY: 1 2 3 4 ."

C. Other Required Changes to the Map Sheets. Certain other changes as described below will be made to the map sheets as well. These changes are necessitated by the filing of the amended map, not by errors or omissions made on the original map. Some examples are listed below.

1. The following statement might occur on the original map:

   "PORTION OF NICHOLAS DRIVE DEDICATED AND ACCEPTED HEREON."

   The above statement is changed on the amended map to read:

   "PORTION OF NICHOLAS DRIVE DEDICATED AND ACCEPTED ON MAP NO. _____".

2. The following statement might occur on the original map:

   "OPEN SPACE EASEMENT OVER ALL OF LOT 21 GRANTED AND ACCEPTED HEREON."

   The above statement is changed on the amended map to read:

   "OPEN SPACE EASEMENT OVER ALL OF LOT 21 GRANTED AND ACCEPTED ON MAP NO. _____."

3. The following statement might occur on the original map:

   "ACCESS RIGHTS FROM LOTS 1 THROUGH 18 IN AND TO NICHOLAS DRIVE RELINQUISHED AND WAIVED AND ACCEPTED HEREON."

   The above statement is changed on the amended map to read:

   "ACCESS RIGHTS FROM LOTS 1 THROUGH 18 IN AND TO NICHOLAS DRIVE RELINQUISHED AND ACCEPTED ON MAP NO._____."

1.602.3 Table of Amendments for the Amended Map. At the discretion of the City Engineer, the engineer/ surveyor may submit an amended map which describes the minor changes being made in a tabular form. The table of amendments shows the change number in sequence, the sheet number affected, the data on the original map which is in error, and the new data shown on the amended map. A sample table of amendments is shown below.

TABLE OF AMENDMENTS

Change No.	Sheet No.	Data Per Map 09006	Changed To
1	6	N 49° 00' 00" W 87.67'	N 48° 20' 20" W 89.69'
2	7	Lot 184 1.060 Acres	Lot 184 1.030 Acres
3	7	(Added)	△ = 42° 30' 00" R = 300' L = 222.53'
4	9	Existing easement granted to the public per Doc. No. 2003-962003 recorded Sept. 6, 2003.	Existing drainage easement granted to the public per Doc. No. 2003-962003 recorded Sept. 6, 2003.

1.603 *REVERSION TO ACREAGE.*

Property previously subdivided by a final or parcel map may be reverted to acreage pursuant to the provisions of Sections 66499.11 through 66499.201 of the Subdivision Map Act.

1.603.1 Procedure for Preparing a Map for Reversion to Acreage. The procedure for preparing a map for reversion to acreage is the same as that for any other subdivision map. A tentative map showing a one lot subdivision will be filed with the City. The Planning Department should be contacted with questions about the process.

1.603.2 Title Sheet of Map for Reversion to Acreage. Characteristics of the reversion to acreage title sheet are discussed below.

A. Reversion to Acreage Map Title. The title of the map will be as follows:

"MAP OF REVERSION TO ACREAGE OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO. ___, (PARCEL) MAP NO. ___."

B. Reversion to Acreage Preamble. The preamble will be shown as indicated below:

"BEING A MAP OF REVERSION TO ACREAGE OF (LOTS____) (PARCELS ___) OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP NO. _____ IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA ACCORDING TO (PARCEL) MAP NO. _____ FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY AS FILE NO. ____ ON [Date]."

If the portion of the original map being reverted results in the need for a new metes and bounds legal description of the boundary, the following language shall also be added to the preamble:

"FOR LEGAL DESCRIPTION OF THE BOUNDARY OF THIS REVERSION TO ACREAGE MAP, SEE (CITY OF

ENCINITAS MAP NO. ___) (CERTIFIED TITLE COMPANY DESCRIPTION ON FILE IN THE OFFICE OF THE CITY OF ENCINITAS ENGINEERING DEPARTMENT)."

C. Subdivision Guarantee for the Reversion to Acreage. A new subdivision guarantee will be required for the reversion to acreage.

"(SUBDIVISION GUARANTEE)(PARCEL MAP GUARANTEE) ISSUED BY [Title Company Name] AS ORDER NO. _____ ON [Date]."

D. Owner's Statement for Reversion to Acreage. Notarization of the owners' signatures will be required. See Appendix 1.10 of this manual for a sample all-purpose acknowledgement. The owner's statement will be worded as follows:

"WE HEREBY STATE THAT WE ARE THE OWNERS OF, OR ARE INTERESTED IN, THE LAND SHOWN WITHIN THE BOUNDARY OF THIS MAP OF REVERSION TO ACREAGE AND WE CONSENT TO THE PREPARATION AND RECORDATION OF THIS MAP."

E. Title Interest Signatures for Reversion to Acreage. Provide the names and signatures of all the owners and all other interested parties such as trustees or beneficiaries. Notarization of the signatures will be required. Appendix 1.10 of this manual for a sample all-purpose notary acknowledgement.

F. Signature Omission Statement for Reversion to Acreage. A list of the easement holders who do not object to the filing of the map without their signatures and whose signatures are therefore omitted shall be provided. The easement holders shall agree with those listed in the subdivision guarantee. Section 1.306 of this manual provides the wording of the statement as well as a more detailed discussion of

signature omissions.

G. City Treasurer's Statement for Reversion to Acreage. The statement will be shown as on any other subdivision map. The statement is discussed in Section 1.313 of this manual.

H. Engineer's/ Surveyor's Statement for Reversion to Acreage. The statement by the engineer/ surveyor of work will be worded as follows:

"I, [Name], A (PROFESSIONAL LAND SURVEYOR) (REGISTERED CIVIL ENGINEER) STATE THAT THIS REVERSION TO ACREAGE MAP WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN [Date] AND [Date] AND SAID MAP IS TRUE AND COMPLETE AS SHOWN AND THAT MONUMENTS OF THE CHARACTER INDICATED HAVE BEEN (FOUND)(SET) ON ONE EXTERIOR BOUNDARY LINE AS REQUIRED.

BY: _____ DATE: _____

(Name), (P.L.S. No. ____)(R.C.E ___)
MY (LICENSE) (REGISTRATION) EXPIRES [Date]."

I. City Engineer's Statement for Reversion to Acreage. In the event the City Engineer is not a land surveyor or an engineer with a license number below 33965, a delegate of the City Engineer will sign instead, and the certificate should be modified accordingly.

"I, [Name], CITY ENGINEER OF THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, STATE THAT I HAVE EXAMINED THIS REVERSION TO ACREAGE MAP OF CITY OF ENCINITAS TENTATIVE (PARCEL) MAP ____ , (PARCEL) MAP ___.
BY: _____ DATE: _____
[Name], (P.L.S. No. ____)(R.C.E ___)
CITY ENGINEER
MY (License) (Registration) EXPIRES [Date]."

J. Tax Deposit Certificate by the Clerk of the Board of Supervisors. There is no requirement for a tax bond; therefore, the tax deposit certificate by the Clerk of the Board of Supervisors will not be required.

K. Street Vacation Proposed. A street vacation proposed with a reversion to acreage must be approved by the City Council. Refer to Section 1.502.4 and Appendix 2.10 of this manual for a further discussion on the vacation of public right-of-way.

1.603.3 Procedure of Survey for Reversion to Acreage. The procedure of survey sheet will conform to Section 1.400 of this manual.

1.603.4 Map Sheet for Reversion to Acreage. The Map Sheet shall comply with the requirements discussed in Section 1.500 of this manual. Since one lot is generally created, the subdivision will be labeled "Lot 1".

A. Easements and Easement Vacations for Reversion to Acreage. If any streets or easements are to remain, the map must indicate such. The easements not being vacated shall be shown and labeled as follows:

"EXISTING [Type] EASEMENT TO REMAIN."

If any streets or easements are being vacated, they shall be noted on the map sheet in conformance with the requirements given in Section 1.502.4 of this manual. The only easements that will be abandoned by the filing of a reversion to acreage map are those public easements that were dedicated to the City of Encinitas or public on the map being reverted. Any easements being vacated shall be depicted with dashed lines and labeled with language similar to the following:

"[Type] EASEMENT DEDICATED ON (PARCEL) MAP NO. ___ VACATED HEREON."

"PORTION OF [Street Name] OFFERED AND REJECTED

ON MAP NO. ____ TERMINATED HEREON".

1.700 PARCEL MAP WAIVERS.

1.701 *PARCEL MAP WAIVER GENERAL INFORMATION.*

A parcel map waiver may, at the discretion of the Director of the Planning and Building Department, be applied to those projects in which lot consolidation will result in the creation of one single lot and to condominium conversions when no new units or lots are being created (Ordinance 92-39). The parcel map waiver process relieves the applicant of the requirement to file and receive approval of a tentative and final parcel map and to record a final parcel map; the lots are created by deed, and a certificate of compliance is issued. The parcel map waiver process is an administrative process and under normal circumstances requires no public hearing.

1.702 *PARCEL MAP WAIVER PROCESS.*

The engineer/ surveyor will prepare a parcel map waiver plat for review and approval by the Planning and Building Department and the Engineering Department. If the parcel map waiver is approved, the applicant shall have a site survey done and shall have a record of survey prepared and recorded conforming to the lots and lot lines approved in the parcel map waiver application. The applicant shall also have prepared and recorded new deeds of property ownership to conform to the lots approved. The applicant will provide the Planning and Building Department with copies of the recorded record of survey and the recorded deeds of ownership together with the traverse closure calculations for each of the new lots. Upon confirmation that these instruments are in substantial conformance with the parcel map waiver application as approved, the Director of Planning and Building shall prepare and record a certificate of compliance for each of the new lots. Recordation of the certificates of compliance completes the parcel map waiver process for an approved application.

1.800 CONDOMINIUM SUBDIVISIONS AND CONVERSIONS.

1.801 *CONDOMINIUM SUBDIVISIONS.*

A condominium project containing five or more units is a major condominium subdivision; one containing four or fewer units is a minor condominium subdivision. Condominium subdivisions may be a one lot subdivisions or may contain several lots. Condominiums may be residential, commercial, or industrial units. The Planning and Building Department should be contacted for answers to questions regarding condominium subdivisions.

1.802 *CONDOMINIUM CONVERSIONS.*

Chapter 24.40 of the Municipal Code contains procedures for condominium conversion of residential minor airspace subdivisions, those airspace subdivisions of four or fewer units. Section 24.60.050 of the Municipal Code allows for condominiums to be approved via the parcel map waiver process. A certificate of compliance will be issued following satisfactory completion of the parcel map waiver process described in Section 1.700 above.

1.802.1 Condominium Conversion/ Parcel Map Waiver Processing.

The Planning and Building Department should be contacted for information on condominium conversions. The project will follow the parcel map waiver process discussed in Section 1.700 of this manual. When the project is in compliance with the conditions of approval to the satisfaction of the Planning and Building Department, the Director of Planning and Building will prepare and record one certificate of compliance, indicating the total number of condominium units. The document in Appendix 1.17 includes Planning and Building Department information of the procedures and requirements of the condominium conversion/ parcel map waiver.

1.900 CERTIFICATES OF COMPLIANCE.

1.901 ***GENERAL INFORMATION FOR CERTIFICATES OF COMPLIANCE.*** The Planning and Building Department should be contacted for information on certificates of compliance. When no parcel map is required because the project will be processed as a parcel map waiver as discussed in Section 1.700 above, all the conditions specified in the conditions of approval must still be complied with prior to issuance of the certificate of compliance. It is the responsibility of the developer to provide evidence that all items have been satisfied or complied with as per the conditions of approval. If improvements are required as a condition of approval for the project, they must be completed and approved prior to the issuance of a certificate of compliance as per Section 66426(a) of the Subdivision Map Act. Certificates of Compliance are issued by the Planning and Building Department. Information on processing is included in Appendix 1.20.

1.902 ***INFORMATION TO BE INCLUDED ON THE CERTIFICATE OF COMPLIANCE.***

Items which must, by title practice and state or local ordinance, be shown on the title sheet and/or map sheets are to be included with the recorded certificate of compliance on separate sheets. These items may include the condominium statement, solar statement, legal description, 180 day notice, and a statement consenting to the project executed by all record owners of the property and all record owners of a security interest in the property, i.e., trustee under deed of trust or the owner of the beneficial interest (but not both).

1.902.1 Owner's Statement. Owners and trustees can sign on one page with the following statement as a heading:

"WE HEREBY STATE THAT WE ARE THE OWNERS OF, OR ARE INTERESTED IN, THE LAND/ INTEREST SUBDIVIDED BY THIS CERTIFICATE OF COMPLIANCE AND WE CONSENT TO THE PREPARATION AND RECORDATION OF THIS CERTIFICATE OF COMPLIANCE."

1.902.2 Subdivision Guarantee. The subdivision guarantee and vesting deed shall be submitted at the time processing is requested.

APPENDIX CHAPTER 1:
MAP AND PARCEL MAP PROCESSING AND PREPARATION REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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FINAL MAP/ FINAL PARCEL MAP
INITIAL SUBMITTAL REQUIREMENT LIST

A first submittal for Final Map or Final Parcel Map processing must contain the following items:

- ☐ Blueline prints of the Final Map or Final Parcel Map
  - 6 copies if project is in Olivenhain Municipal Water District (OMWD) or Leucadia Wastewater District (LWD).
  - 7 copies if in the San Dieguito Water District (SDWD).
- ☐ Approved Tentative Final Map (TM) or Approved Tentative Parcel Map (TPM).
  - 2 copies
- ☐ Resolution of Approval or Notice of Decision, with project conditions.
  - 2 copies
- ☐ Traverse Calculations, including NAD83 ties and easement closures.
  - 2 copies
- ☐ Preliminary Title Report, less than 3 months old.
  - 2 copies
- ☐ Copies of all documents listed in the Preliminary Title Report, including Vesting Deed.
  - 2 copies
- ☐ Reference Maps.
  - 1 copy
- ☐ Corporate/Partnership papers, as appropriate.
  - 2 copies
- ☐ Instructions for the distribution of any existing sewer EDU's amongst the newly created parcels.
  - 2 copies
- ☐ Legal Description/Plat/Cost Estimate, as needed to prepare any easements/covenants.
  - 2 copies
- ☐ Deferred Monumentation Letter, if applicable
  - 2 copies
- ☐ Access Letter, if applicable.
  - 2 copies
- ☐ Covenants/Conditions/Restrictions, private, if applicable.
  - 2 copies
- ☐ Submittal Fee/Deposit.
- ☐ Completed and signed Engineering Development Application.

If submitted together with a Grading Plan and/or Improvement Plan, the items can serve for both submittals.

APPLICATION NO._______

ENGINEERING DEVELOPMENT APPLICATION

JOB SITE ADDRESS

_____

ASSESSOR PARCEL NUMBER

_____

CIVIL ENGINEER INFORMATION

_____
NAME

_____
STREET ADDRESS

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE REGISTRATION NO.

_____
EMAIL

PROPERTY OWNER INFORMATION

_____
NAME

_____
STREET ADDRESS (MAILING)

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE

_____
EMAIL

SOILS ENGINEER INFORMATION

_____
NAME

_____
STREET ADDRESS

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE REGISTRATION NO.

_____
EMAIL

CONTRACTOR INFORMATION

_____
NAME

_____
STREET ADDRESS (MAILING)

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE STATE LIC. # & TYPE

_____
EMAIL

DESCRIPTION OF WORK TO BE DONE

_____

_____

_____ CASE NO. _____-_____

_____
SIGNATURE DATE

_____
PRINT NAME

_____
TELEPHONE

_____
EMAIL

PLANNING DEPARTMENT REVIEW

OK FOR SUBMITTAL TO PLAN/MAP CHECK FOR: PLANNING CASE NO. _____

☐ GRADING PLAN ☐ FINAL MAP ☐ PARCEL MAP

_____
PLANNER

_____
DATE

LAND DEVELOPMENT ENGINEERING DIVISION SCHEDULE OF FEES

Grading Plan/Permit

Grading Plan Check		$ 2,020.00/ Sheet
NPDES Plan Check		$ 226.00/ Sheet
Erosion Control Plan Check		$ 257.00/ Sheet
Landscape and Irrigation - Plan Check: Public		$ 470.00
Landscape and Irrigation - Plan Check: Private		$ 226.00
Structural Review	*Outside Consultant Review*	Direct reimbursement of costs
Structural Review	*New Sheet*	$ 404.00/ Sheet
Simplified Grading		$ 3,214.00
Construction Change - Minor		$ 297.00/ Sheet
Construction Change - Major		$ 632.00/ Sheet
Construction Change - New Sheet		$ 2,020.00/ Sheet
Inspection	*Approved Cost Estimate ≤ $100,000*	6.7% of ACE
Inspection	*Approved Cost Estimate > $100,000*	$ 6,767 plus 4% of ACE over $100,000
NPDES Inspection	*Approved Cost Estimate ≤ $100,000*	1.2% of ACE
NPDES Inspection	*Approved Cost Estimate > $100,000*	$ 1,353 plus 0.8% of ACE over $100,000

Public Improvement Plan/Permit

Public Improvement Plan Check		$ 2,662.00/ Sheet
Simplified Public Improvement Permit		$ 3,178.00
Construction Change - Minor		$ 297.00
Construction Change - Major		$ 632.00
Construction Change - New Sheet		$ 2,662.00/ Sheet
Inspection	*Approved Cost Estimate ≤ $100,000*	6.7% of ACE
Inspection	*Approved Cost Estimate > $100,000*	$ 6,767 plus 4% of ACE over $100,000
NPDES Inspection	*Approved Cost Estimate ≤ $100,000*	1.2% of ACE
NPDES Inspection	*Approved Cost Estimate > $100,000*	$ 1,353 plus 0.8% of ACE over $100,000

Traffic

Traffic Control – Per Location/Intersection/Segment/1000lf	$ 338.00
Traffic Control – Minor	$ 80.00
Transportation Permit	No Fee
Haul Route Permit	$ 40.00

Building Permit Plan Check

Residential	*0-500 SF*	$ 257.00
Residential	*500-2,000 SF*	$ 454.00
Residential	*2,000-5,000 SF*	$ 676.00
Residential	*> 5,000 SF*	$ 917.00
Commercial	*0-500 SF*	$ 275.00
Commercial	*500-2,000 SF*	$ 454.00
Commercial	*2,000-10,000 SF*	$ 825.00
Commercial	*> 10,000 SF*	$ 1,122.00
Commercial Remodel, Tenant Improvement		$ 406.00
Pool/Spa		$ 338.00
Demo Building Permit		$ 112.00

Misc. Building Permit		$ 40.00

Map and Parcel Map Processing

Final Map Processing	*Major Subdivision Map*	$ 2,850.00/ Sheet
Final Parcel Map Processing	*Minor Subdivision Map*	$ 2,850.00/ Sheet
Certificate of Correction		$ 194.00
GIS Map Fee	*Update of GIS Database*	$ 554.00

Stormwater and Flood Control

Storm Water Control Simulation Model Review	*Minor*	$ 1,551.00
Storm Water Control Simulation Model Review	*Major*	$ 2,865.00
FEMA Conditional Letter of Map Revision		$ 1,828.00
FEMA Letter of Map Revision		$ 620.00
FEMA Letter of Map Revision/Elevation Certificate		$ 620.00

Utility and Right-of-Way Construction

Utility Construction Permit	*Trenching < 200 LF*	$ 379.00
Inspection Fee for Utility Permit	*Trenching ≥ 200 LF; ACE < $100,000*	6.7% of ACE
Inspection Fee for Utility Permit	*Approved Cost Estimate > $100,000*	$ 6,767 plus 4% of ACE over $100,000
Right-of-Way Construction - Minor	*Associated with a Single Family Dwelling*	$ 446.00
Right-of-Way Construction - Major	*Not associated with a Single Family Dwelling; or more than one trench; and/or ACE > $10,000*	$ 1,112.00
Inspection Fee for Major R/W Permit	*Trenching ≥ 200 LF*	6.7% of ACE
Sewer Lateral Construction Permit		$ 595.00

Various Encroachment Permits

Beach Encroachment	$ 1,966.00
Beach Encroachment – Additional Lifeguard Time	$ 202.00/ Day
Beach Encroachment Security Deposit	$ 6,767.00
Permanent Encroachment Permit	$ 502.00
Permanent Encroachment Permit with Construction	$ 676.00
Temporary Encroachment Permit	$ 241.00
Newsrack Operations Permit	$ 72.00
Sidewalk Café	$ 388.00
Sidewalk Café Renewal	$ 124.00
Sidewalk Café Renewal with Violation	$ 230.00
Sidewalk Vending Permit – New	$ 171.00
Sidewalk Vending Permit – Renewal	$ 64.00

Miscellaneous

Wastewater Discharge Permit Processing Fee	$ 62.00
Sewer Reimbursement District – Establishment Fee	$ 4,075.00
Street Name Change Application	$ 4,514.00
Street Vacation Application	$ 4,567.00
Tree Removal Permit/ Urban Forest Management Permit	$ 742.00
Miscellaneous Engineering Approval	$ 38.00
Generic Survey Review	$ 197.00
After Hours Inspection	$ 676.00/ Day
Hardscape/ Drainage Permit	$ 446.00
Covenant Release (Engineering)	$ 79.00

PLANNING DEPARTMENT
SCHEDULE OF FEES

APPLICATION FEES			
	APPLICATION		**FEE**
PLANNING APPLICATIONS	1	Affordable Housing Administration & Monitoring	$ 2,385.00
	2	Affordable Unit Policy	$ 1,089.00
	3	Agricultural Permit	$ 275.00
	2	Amendment Authorization by Council*	$ 726.00
	4	Appeals	$ 330.00
	5	Boundary Adjustment / Cert. of Compliance	$ 1,144.00
	6	Building Plan Copying	$ 66.00
	7	Certificate of Compliance	$ 737.00
	8	Climate Action Plan – Compliance Review	$ 995.00
	9	Coastal Development Permit	$ 1,760.00
	10	Coastal Development Permit – Blufftop	$ 8,445.00
	11	Conceptual Review - Admin./Planning Comm	$ 1,320.00
	12	Covenant Release	$ 455.00
	13	Design Review – Right-of-Way Admin Level**	$ 935.00
	14	Design Review - Admin Level	$ 1,402.00
	15	Design Review - Plan Comm (<2500 sq ft)	$ 3,025.00
	16	Design Review - Plan Comm (2501-10k sq ft)	$ 3,960.00
	17	Design Review - Plan Comm (10,001-19,999 sq ft)	$ 5,280.00
	18	Design Review - Plan Comm (20K-50k sq ft)	$ 17,485.00
	19	Design Review - Plan Comm >50K sq ft	$ 19,795.00
	20	Design Review Modifications - Admin	$ 968.00
	21	Design Review Modifications - Plan Comm	$ 2,607.00
	22	Major Use Permit	$ 6,600.00
	23	Major Use Permit Modifications	$ 3,476.00
	24	Minor Use Permit	$ 2,321.00
	25	Minor Use Permit Modifications	$ 1,738.00
	26	Misc. Service Requests	$ 154.00
	27	Plan Comm or City Council Interpretation	$ 1,100.00
	28	Resolution Amendments	$ 1,452.00
	29	Resubmittal Fee	1/2 original fee
	30	SB330 Preliminary Application – Housing Crisis Act of 2019	$ 2,565.00
	31	Sign Program	$ 935.00
	32	Sign Review	$ 462.00
	33	Sign/Banner Permit	$ 104.00
	34	Substantial Conformance Review	$ 368.00
	35	Substantial Conformance Review - Complex	$ 2,250.00
	36	Tent Parcel Map Appl or Mod (2-4 lots)	$ 5,010.00
	37	Parcel Map Waiver (condo conversion, etc.)	$ 1,980.00

	38	Tentative Subdivision Map***	$ 14,300.00
	39	Tentative Map Modification	$ 11,121.00
	40	Time Extensions	$ 1,116.00
	41	Variance - Administrative	$ 1,738.00
	42	Variance - Planning Commission	$ 4,191.00
	43	Variance - Planning Commission/sfd	$ 2,051.00
PLAN CHECKS	44	Minor Plan Check	$ 77.00
	45	Commercial Plan Check	$ 1,100.00
	46	Single Family Plan Check	$ 440.00
	47	Duplex Plan Check	$ 770.00
	48	Multi-Family (3-10 units) Plan Check	$ 1,100.00
	49	Multi-Family (11+ units) Plan Check	$ 1,320.00
	50	General Plan Update Fee****	$ 38.00
	51	Technology Fee****	$ 40.00
ENVIRO. REVIEW	44	Environmental Review - Exemption	$ 77.00
	45	Comprehensive Initial Study (in-house)	$ 5,560.00
	46	Comprehensive Initial Study Contract Admin	$ 1,160.00
	47	EIR's Contract Admin	$ 4,933.00
	50	Wireless Review Contract Admin	$ 352.00
	51	Misc Technical Studies Contract Admin	$ 726.00

APPLICATION DEPOSITS

	APPLICATION	DEPOSIT
1	Annexation	$ 5,000.00
2	General Plan Amendment (no vote req)	$ 13,000.00
3	General Plan Amendment (vote req)	$ 20,000.00
4	Zoning Code Amendments	$ 20,000.00
5	Specific Plan	$ 30,000.00

Staff time and City costs including 50% overhead will be charged for all above deposit applications.

CONSULTANT DEPOSITS

	APPLICATION	DEPOSIT
1	Enviro. Review Consultant Deposit	TBD*****
3	Wireless Consultant Deposit	$ 3,000.00
4	Misc Tech Studies Consultant Deposit	TBD*****

* Authorization of requests/letters of intent for General Plan, Specific Plan, Zoning Code, and Local Coastal Program Amendments

** $935 fee applied per pole

*** $14,300 plus $715 per lot in excess of 5 lots

**** Applies to building permits with valuation

*****To be determined based on consultant contract

INSTRUCTIONS FOR OBTAINING MYLAR SIGNATURES

At this time, the Engineering Department is requesting from you mylars signed and approved by all departments. Plan mylars must be signed by all City Departments and any other agencies involved prior to approval by the Engineering Department. The applicant and/ or engineer is responsible for obtaining these signatures. Upon submittal to the Engineering Department, the plan mylars must bear all departmental and outside agency signatures.

Appointments must be made to obtain signatures on mylars. Applicants requesting signatures without an appointment will be required to make an appointment for a later time.

Contact information for each department is listed below:

Fire Prevention	Fire Prevention Line	760-633-2820
Parks & Recreation	Parks & Rec Line	760-633-2740
Planning	Andrew Maynard	760-633-2718
Public Works	Donna Trotter	760-633-2850
SDWD	Blair Knoll	760-633-2793

The applicant must contact outside agencies such as Leucadia Wastewater District and Olivenhain Municipal Water District directly to obtain approval signatures from those agencies.

LWD: Ph. 760.753.0155
1960 La Costa Ave., Carlsbad
Open 8am-5pm, Mon-Fri

OMWD: Ph. 760.753.6466
1966 Olivenhain Rd., Encinitas
Open 8am-5pm, Mon-Fri

After signatures of authorized representatives of the above departments are obtained, please submit mylars, two sets of prints, and all previous plancheck documents to the Engineering front counter staff for normal plancheck processing. Engineering plancheckers are not able to provide over-the-counter preliminary reviews of mylars, but please contact your planchecker prior to submittal if you have any questions about the last plancheck.

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: FIRE DEPARTMENT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE ENCINITAS FIRE DEPARTMENT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. ____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON _____.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME
FOR ENCINITAS FIRE DEPT.

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: PARKS AND RECREATION DEPARTMENT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE ENCINITAS PARKS AND RECREATION DEPARTMENT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. ____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON _____.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME

FOR ENCINITAS PARKS AND RECREATION DEPT.

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: PLANNING DEPARTMENT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE ENCINITAS PLANNING DEPARTMENT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. ____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON _____.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME
FOR ENCINITAS PLANNING DEPT.

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: PUBLIC WORKS DEPARTMENT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE ENCINITAS PUBLIC WORKS DEPARTMENT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. ____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON _____.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME

FOR ENCINITAS PUBLIC WORKS DEPT.

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: LEUCADIA WASTEWATER DISTRICT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE DIVISION OF PROPERTY SHOWN ON TENTATIVE MAP NO. _____-TM WILL NOT UNREASONABLY INTERFERE WITH THE FREE AND COMPLETE EXERCISE OF ANY EASEMENTS HELD BY THE LEUCADIA WASTEWATER DISTRICT WITHIN THE BOUNDARIES OF SAID MAP, AND THE DISTRICT DOES NOT OBJECT TO THE RECORDATION OF SAID MAP.

PLEASE ALSO BE ADVISED THAT THE LEUCADIA WASTEWATER DISTRICT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. _____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON ___.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME
FOR LEUCADIA WASTEWATER DISTRICT

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: OLIVENHAIN MUNICIPAL WATER DISTRICT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE DIVISION OF PROPERTY SHOWN ON TENTATIVE MAP NO. _____-TM WILL NOT UNREASONABLY INTERFERE WITH THE FREE AND COMPLETE EXERCISE OF ANY EASEMENTS HELD BY THE OLIVENHAIN MUNICIPAL WATER DISTRICT WITHIN THE BOUNDARIES OF SAID MAP, AND THE DISTRICT DOES NOT OBJECT TO THE RECORDATION OF SAID MAP.

PLEASE ALSO BE ADVISED THAT THE OLIVENHAIN MUNICIPAL WATER DISTRICT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. _____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON ___.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME
FOR OLIVENHAIN MUNICIPAL WATER DISTRICT

CITY OF ENCINITAS

MAP APPROVAL MEMORANDUM
TM _____

TO: DIRECTOR, ENGINEERING SERVICES DEPARTMENT

FROM: SAN DIEGUITO WATER DISTRICT

ASSESSOR'S PARCEL NUMBER: _____

PROJECT ADDRESS: _____

NAME OF SUBDIVIDER: _____

PLEASE BE ADVISED THAT THE DIVISION OF PROPERTY SHOWN ON TENTATIVE MAP NO. _____-TM WILL NOT UNREASONABLY INTERFERE WITH THE FREE AND COMPLETE EXERCISE OF ANY EASEMENTS HELD BY THE SAN DIEGUITO WATER DISTRICT WITHIN THE BOUNDARIES OF SAID MAP, AND THE DISTRICT DOES NOT OBJECT TO THE RECORDATION OF SAID MAP.

PLEASE ALSO BE ADVISED THAT THE SAN DIEGUITO WATER DISTRICT CONDITIONS OF APPROVAL FOR RECORDATION OF A FINAL MAP FOR CASE NO. _____-TM REQUIRED BY RESOLUTION NUMBER _____ HAVE BEEN SATISFIED. THIS TENTATIVE MAP EXPIRES ON ___.

THIS MEMORANDUM MUST BE PROCESSED BY THE SUBDIVIDER AND RETURNED TO THE ENGINEERING SERVICES DEPARTMENT.

_____ _____

SIGNATURE DATE

_____

PRINT NAME
FOR SAN DIEGUITO WATER DISTRICT

FINAL MAP/ FINAL PARCEL MAP REVIEW LIST

Complete	Notes		Plancheck Item
		1	Traverse sheets submitted and checked- boundary and lots
		2	Sheet size 18" x 26"; 1" margins
		3	Names of all streets - existing and future.
		4	Lot numbers consistent with tentative map.
		5	Sheet numbers (index sheet for more than 2 sheets)
		6	Procedure of Survey minimum scale 1"=400'
		7	Map sheet scale minimum 1"=40'
		8	Certification of soils report and date
		9	Easements - centerline data, width, type ownership use and record data (shown by broken line)
		10	Radius, arc length, and delta on all curves
		11	Tie points found (map references; sectionalized land corners, centerline intersections)
		12	Legend showing monuments set and found use M10, M13 standards
		13	Show found monuments outside and inside subdivision boundary

Complete	Notes		Plancheck Item
		14	Bearings, distances, and closure of boundary lines, basis of bearings
		15	Bearings, distances, and closure - lots, streets, alleys, and blocks.
		16	Each lot shown entirely on one sheet
		17	Total distances shown and equal to the sum of the parts of - lots, blocks and boundaries
		18	Basis of bearings shown on procedure of survey, use first order NAD 83 ties (Public Resource code 8813)
		19	Mapping angle, with grid divergence angle, north arrow
		20	Street centerline data on all streets, alleys and easements (delta, distances & bearings)
		21	Notation made on each sheet where area in map is subject to flood hazard, may be shown on a Non-Title sheet
		22	North arrow and graphic scale (min. 4" long)
		23	Radial lines marked for non-tangent curves
		24	Surrounding map numbers and names
		25	Check Improvement Plans for easements, etc.
		26	Lot Areas indicated.
		27	Streets and easements dedicated to public.
		28	City boundary lines clearly shown ,if applicable

Complete	Notes		Plancheck Item
		29	Title sheet:
			A. Street Dedication-offer and acceptance or rejection statements.
			B. Engineer's/Surveyor's Statement
			C. Civil Engineers to be registered before January 1, 1982
			F. Area and number of lots
			E. Brief description of land
			F. Condominium note, if applicable
			G. Subdivision guarantee order no.; less than 30 days old when recording
			H. Signature of surveyor or engineer including seal and expiration date*
			I. City Engineer's Certificate**
			J. Easement holder certificate or omission note*
			K. City Treasurer's Statement**
			L. Land owner's Certificate signed, matches title exactly*; Acknowledgements (Notary Public)*
			M. Planning Commission Chairman & Secretary**
			N. County Officers - Treasurer, Tax Collector ***

Complete	Notes		Plancheck Item
		30	Adequate access to all lots.
		31	Approved Fire Department access
		32	Clear space easement (site distance) plotted on map and monumented.
		33	Open space easements shown and approved by Planning Dept.
		34	Pedestrian, Equestrian, and trail easements; compliance with Trails Master Plan.
		35	Signature not required statement, check title report
		36	Subordination statements if required, utilities, open space, sewer.
		37	Lien Contract statement, if a Lien Contract recorded.
		38	Street names approved by Planning, Fire Department, Engineering.
		39	Street vacated on map subdivision map act 66434g
		40	Relinquishment of access rights on final map, offer and acceptance on title sheet too.
		41	Non-Title sheet.

Done	Notes		Final Map completion
		1	All items of Resolution completed.
		2	Inter-office memos received back from all departments.
		3	Grading and Improvement plans are complete.
		4	Get subdivision guarantee updated to be less than 30 days old before recording.
		5	Check final map against guarantee for any new loans, easement, ownership, etc. Make sure signature omission statement agrees with what is shown on guarantee.
		6	Bonds and security are in place for all improvements.
		7	Schedule final map for approval by Planning Commission.
		8	Once approved 10 day mandatory waiting period for appeals to City Council.
		9	During waiting period get City Treasurer, Planning Director, City Engineer to sign final map.
		10	Applicant to provide tax certificate to be sent to recorder at time of recording.
		11	When bonds are in place, all signatures are on map, new guarantee is shown, call Title Company and request map be picked up for recording. Include Title Company order number on transmittal, full address of Title Company, Title officer, Tax Certificate. Request Title Company provide a photo mylar of the recorded map for City records.

* Signatures required prior to scheduling for City Council/Planning Commission
** Signatures required after City Council/ Planning Commission approval and prior to transmittal to title company
*** Signatures obtained by title company prior to recordation

POSTING SURETY FOR DEVELOPMENT PROJECTS

Acceptable forms of surety for securing performance of a development project are listed below. The total surety posted must equal 100% of the amount of the approved engineer's cost estimate. Originals of the required documents must be submitted to the City, and the bank return address must be printed on all documents. The execution of security obligation agreements associated with the proposed work may be required.

Acceptable Forms of Security:

1. **Letter of Credit**.
   - See Engineering Design Manual Appendix 1.7 (C) for further information.
2. **Cash**.
3. **Certificate of Deposit (CD)**.
   - If entire amount of required surety will be posted in the form of a CD, the applicant should obtain two separate CD's in amounts of 25% and 75% of the engineer's cost estimate to facilitate the partial security release.
4. **Faithful Performance Bond**.
   - Permit for public improvements: bond may be used to secure 100% of the engineer's cost estimate.
   - Permit for grading or private improvements: bond may be a maximum of 80% of the engineer's cost estimate, with the balance of the surety posted in the form of cash, CD, or a letter of credit.
5. **Labor and Materials Bond**.
   - Used for deferred monumentation only, the bond may be up to 100% of the engineer's cost estimate for the monumentation.

Release of Securities:

1. **Partial Release**.
   - A one-time partial release in the amount of 75% of the posted surety can be completed following rough grade approval by the Engineering Inspector and the project soils engineer.
2. **Full Release.**
   - The final release of securities may be completed following Engineering Inspector approval and approval of the project as-built drawings.
3. **Public Improvements Warranty Period.**
   - All improvement projects require that 25% of the posted security be retained for a one-year warranty period.

CITY OF ENCINITAS
MISCELLANEOUS ASSIGNMENT OF ACCOUNT

_____, hereinafter called ASSIGNOR, whose address is _____ _____, does hereby assign and set over to the CITY OF ENCINITAS, hereinafter called ASSIGNEE, all right, title, and interest of whatever nature of the assignor in and to the insured account of assignor in the _____ _____, evidenced by an account in the amount of $_____ numbered ___ _____, which is delivered to the assignee herewith. Assignor agrees that his assignment carries with it the right in the insurance of the account by the Federal Savings and Loan Insurance Corporation and includes and gives the right to assignee to redeem, collect, and withdraw the full amount of such account at any time WITHOUT NOTICE TO ASSIGNOR.

Assignor hereby notifies _____ of this assignment.

Dated this _____ day of _____, 20___. By: _____
Assignor's Signature

RECEIPT FOR NOTICE OF ASSIGNMENT

Receipt is hereby acknowledged to assignee of written notice of the assignment to assignee of the account identified above. We have noted in our records the assignee's interest in said account as shown by the above assignment and have retained a copy of this document. We certify that we have received no notice of any lien, encumbrance, hold, claim, or obligation of the above-identified account prior to the assignment to the assignee. We agree to make payment to assignee upon request in accordance with the laws applicable to this bank.

Dated this _____ day of _____, 20___. By: _____
Signature and Title

RECEIPT FOR SECURITY

Receipt is acknowledged of the above assignment and the account identified in the above assignment.

Dated this _____ day of _____, 20___.

CITY OF ENCINITAS, Assignee.

By:_____
Assignee or Authorized Officer

NOTICE OF CANCELLATION

The above assignment is hereby canceled, and the security thereunder is hereby released.

Dated this _____ day of _____, 20_____.

_____, CITY OF ENCINITAS, Assignee.

By:_____
Assignee or Authorized Officer

INSTRUCTIONS FOR PREPARATION OF AN IRREVOCABLE STANDBY LETTER OF CREDIT

The following instructions detail the use and completion of the Irrevocable Standby Letter of Credit.

1. The Irrevocable Standby Letter of Credit ("Letter of Credit") is one of the five forms of financial deposit instruments accepted by the City to secure proposed work following Engineering Department approval of the project plans and engineering cost estimate.

2. The attached Letter of Credit format should be forwarded to the applicant's financial institution to assist in the preparation of the Letter of Credit.

3. The financial institution prepares the Letter of Credit according to the format given below and returns it to the City printed on the financial institution's letterhead.

4. The name of the financial institution is entered in the blank space in item number one.

5. Item number two, the aggregate amount, is 100% of the approved project cost estimate.

6. IMPORTANT: AUTOMATIC RENEWAL IS REQUIRED.

7. The full legal name of the financial institution and the signatures, names, and titles of the authorized officers are entered in the appropriate spaces in item number five.

8. The financial institution then has the signatures notarized in both of the appropriate places and sends the Letter of Credit to the City's Finance Manager.

9. The Letter of Credit must be accepted and signed by the City's Finance Manager and the City Engineer.

10. The applicant will be notified of the City's acceptance of the Letter of Credit by telephone or at the time of submittal.

IRREVOCABLE STANDBY LETTER OF CREDIT

To: Finance Manager
CITY OF ENCINITAS
505 South Vulcan Avenue
Encinitas, CA 92024

Re: [Financial Institution's identification number or other designation for this Credit]

1. The undersigned, _____("Financial Institution"), having a branch in the County of San Diego, hereby establishes an Irrevocable Standby Letter of Credit ("Credit") in favor of the City of Encinitas.

2. The aggregate amount drawn against this Credit shall not exceed _____ dollars ($_____).

3. This Credit shall be available by your drafts drawn at sight and accompanied by a duly signed certificate of the City Engineer of the City of Encinitas in form and of content as set forth in the attached Exhibit A or Exhibit B (a "Certificate"). The Financial Institution shall have no responsibility whatsoever for verifying or investigating the truth of any matter stated in Certificate.

4. AUTOMATIC RENEWAL REQUIRED.

   In the event the draft or drawing under this Letter of Credit is for an amount less than the amount available under this Letter of Credit, the original Letter of Credit shall be endorsed by the Financial Institution in the amount of the draft or drawing. After such endorsement for partial drawing, the Financial Institution shall forthwith return the original of this Letter of Credit to the City of Encinitas.

5. This Credit is subject to the Uniform Custom and Practice for Documentary Credits (latest version, as updated), International Chamber of Commerce latest publication. In the event this Letter of Credit shall not have been drawn upon and shall expire during any interruption of business, the Financial Institution hereby agrees specifically to permit a draft on or under this Letter of Credit for a period of thirty (30) days after the resumption of business as also defined therein.

ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this Certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of _____ } SS.

On _____ (DATE), before me, _____, Notary Public,

personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

PLACE NOTARY SEAL IN ABOVE SPACE

_____
NOTARY'S SIGNATURE

OPTIONAL INFORMATION

The information below is optional. However, it may prove valuable and could prevent fraudulent attachment of this form to an unauthorized document.

CAPACITY CLAIMED BY SIGNER (PRINCIPAL)

- ☐ INDIVIDUAL
- ☐ CORPORATE OFFICER _____ (TITLE(S))
- ☐ PARTNER(S)
- ☐ ATTORNEY-IN-FACT
- ☐ GUARDIAN/CONSERVATOR
- ☐ SUBSCRIBING WITNESS
- ☐ OTHER: _____

SIGNER (PRINCIPAL) IS REPRESENTING:
NAME OF PERSON(S) OR ENTITY(IES)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
TITLE OR TYPE OF DOCUMENT

_____
NUMBER OF PAGES

_____
DATE OF DOCUMENT

_____
OTHER

RIGHT THUMBPRINT OF SIGNER

Top of thumbprint here

"This page intentionally left blank"

Exhibit 'A'

CERTIFICATE OF THE CITY ENGINEER

TO ACCOMPANY DRAFT(S) DRAWN UNDER

_____
[Financial Institution's identification number or other designation for this Credit]

Re:_____
[Property Location or Project Description]

I, _____ [name] do hereby certify that I am the City Engineer of the City of Encinitas and do certify that:

(1) _____ [name of subdivider/grantee] has not satisfactorily complied with the terms and conditions of that certain covenant (the "Covenant") regarding real property public/private improvements required as a condition of the _____ [e.g., variance, use permit, other entitlement, or subdivision] dated _____, 20_____; and

(2) The Covenant remains outstanding and in full force and effect as of the date hereof.

Dated:_____ By: _____
City Engineer,
City of Encinitas

(Note: in cases of no recorded covenant, substitute term "Covenant" with "Permit" and reference the appropriate municipal ordinance).

Exhibit 'B'

CERTIFICATE OF THE CITY ENGINEER

TO ACCOMPANY DRAFT(S) DRAWN UNDER

_____
[Financial Institution's identification number or other designation for this Credit]

Re:_____
[Property Location or Project Description]

I, _____ [name] do hereby certify that I am the City Engineer of the City of Encinitas and do further certify that: the draft or drawing against_____
[name of financial institution] Letter of Credit No. _____
in the principal amount of $_____ dollars (U.S. $_____) is being made solely due to the fact the Letter of Credit shall expire within 90 days or less, and has been renewed or replaced by _____ [name of subdivider/grantee]. The original Letter of Credit together with all other required documentation, are herewith enclosed and said Letter of Credit is to be cancelled upon receipt and payment drawn for the full amount available under said Letter of Credit.

Dated:_____ By: _____
City Engineer,
City of Encinitas

DIGITAL SUBMITTAL GUIDELINES

Digital files shall be based on accurate coordinate geometry calculations and the NAD 83 State Plane Coordinate System (Zone 6) Feet. The digital file submitted shall combines all individual plan sheets for the proposed work into a **single** CAD or ArcView (GIS) formatted drawing. The drawing shall contain the following individual layers:

1. Subdivision Boundary (polylines)
2. Lot/ parcel lines (polylines)
3. Street centerlines (polylines)
4. Easements (polylines)
5. Street names (annotation)
6. Lot numbers (annotation)

Lines should be POLYLINES) (@-D) not POLYLINEZ (s-0)

No callouts, page boundaries, or map primitives of any kind are required.

Please turn off any extension outside of the usual CAD software.

Accepted file formats: AutoCAD dxf, Microstation dgn, or ArcView shapefile.

Submit the digital files on a CD or DVD labeled with Tentative Map/ Parcel Map number and City of Encintas plancheck number.

SAMPLE MAP TITLE SHEET

MAP No. _____

CITY OF ENCINITAS TM XX-XXX
MAP TITLE

SHEET ___ OF ___ SHEETS

LEGAL DESCRIPTION OF PROPERTY

TITLE COMPANY SUBDIVISION GUARANTEE STATEMENT

OWNER'S STATEMENT AND DEDICATION STATEMENT

SIGNATURE OMISSION STATEMENT

COVENANTS & EASEMENTS LIST

ENGINEER'S / SURVEYORS STATEMENT

OWNER'S HOLD HARMLESS CERTIFICATE

STATEMENTS BY UTILITY COMPANIES

PLANNING & BUILDING DEPARTMENT CERTIFICATE

CITY ENGINEER'S STATEMENT

TRUSTEE SIGNATURES

MISCELLANEOUS REQUIRED CERTIFICATES & STATEMENTS, AS APPLICABLE

CITY TREASURER CERTIFICATE

CITY ACCEPTANCE CERTIFICATE

NOTARY ACKNOWLEDGEMENTS

PLANNING COMMISSION OR CITY COUNCIL STATEMENT, AS APPLICABLE

SAN DIEGUITO WATER DISTRICT ACCEPTANCE CERTIFICATE, AS APPLICABLE

TAX CERTIFICATE BY CLERK OF BOARD OF SUPERVISORS

COUNTY RECORDER'S CERTIFICATE

ENGINEER/SURVEYOR
COMPANY NAME
AND CONTACT INFO

GRADING/IMPROVEMENT PLAN NUMBER: XXXXX-G/I
CALIFORNIA COORDINATE INDEX 318-1683

CITY OF ENCINITAS
TM XX-XXX

APPENDIX 1.9 PAGE 1-29

CALIFORNIA ALL- PURPOSE NOTARY ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of _____)

On _____ before me, _____
(insert name and title of the officer)

personally appeared _____,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ **(Seal)**

JOINT USE AGREEMENT

City of Encinitas, hereinafter City, and _____, owner of an easement recorded _____ as _____ , hereinafter Company, desire to enter into this Agreement to provide for the rights and obligations of each of the parties in their joint use of the public street areas as indicated on this map.
City and Company agree as follows:

a. CONSTRUCTION BY CITY

In the event that the future use or alteration of said areas by City for streets or highway purposes or improvements incidental thereto shall at any time necessitate a rearrangement, relocation or reconstruction of any of Company's facilities, the work shall be performed by Company and the City shall pay the cost thereof; if acquisition of additional easements or property is required, they shall be obtained by the City in a form satisfactory to the Company, or by the Company with the written consent of the City, and City shall pay the costs thereof.

b. CONSTRUCTION BY COMPANY

In the event that the future use or alteration of said area by Company for utility purposes or improvements incidental thereto shall at any time necessitate are arrangement, relocation, or reconstruction of any City street or highway or public improvements incidental thereto, the work shall be performed by the City, or other person authorized by the City, and the Company shall pay the cost thereof; if acquisition of additional easements or property is required, they shall be obtained by the Company in a form satisfactory to the City, or by the City with the written consent of the Company, at the cost of the Company.

c. ROAD WORK

Company shall, at its own expense, comply with all permit and safety requirements of State law and City ordinance when working within City rights of way subject to this agreement.

d. COMPANY FACILITY ADJUSTMENTS

Company shall, at its own expense, perform maintenance and minor adjustment work on Company facilities necessitated by resurfacing, sealing, or similar road maintenance operations.

e. DETERMINATION OF COST

The parties shall cooperate in the rearrangement, relocation, and reconstruction of streets and highways and facilities therein. Prior to one party undertaking any work, or acquiring any easement or property, as to which the other must pay the cost, the party responsible for the cost shall be given reasonable notice of the time and extent of the proposed work, the estimated cost thereof, and a copy of the plans and specifications for the project. If the work is to be performed by private contractors pursuant to public bidding, separate quotations shall be obtained, if it is reasonably feasible to do so, for the work to be paid for by each party. If the work is to be performed by forces of a party, the amount of reimbursement from the other party shall be determined in accordance with generally accepted accounting principles and shall include a reasonable sum for overhead and administration.

f. SENIOR RIGHTS

Neither Company nor City shall claim or assert any rights against the other over or in such streets and highways, notwithstanding any interests or rights that each might otherwise have as a result of any

charter, statute, contract, conveyance, or by operation of law, unless this agreement is determined by a court of competent jurisdiction to be invalid or is otherwise terminated. Except as herein set forth, this agreement shall not, in any way, alter, modify, or terminate any of the Company's prior rights in said areas.

g. VACATION OR ABANDONMENT

City shall, in vacation or abandonment proceedings, make a determination that the public convenience and necessity require the reservation and exception of easements and rights-of-way for such Company, and such reservation and exception shall be recited in the resolution of vacation for all rights acquired by the Company.

h. COOPERATION

The parties shall cooperate in the use of streets and highways in which the Company has facilities. Neither the City nor the Company shall permanently interrupt the use or operation of such streets and highways or of the facilities of each therein. Any use of City streets and highways by either the City or the Company which temporarily interfere(s) with the use or operation of facilities therein by the other party(s) shall be made only when necessary, and such interferences shall be terminated as soon as the necessity therefore no longer exists.

i. RESPONSIBILITY OF PARTIES

During the course of any rearrangement, relocation, reconstruction, each party shall be responsible for actions and omissions. To the extent permitted by law, each shall indemnify and hold harmless the other from any and all claims, injuries, losses, and damages suffered or incurred by the other as a result of such actions or omissions.

j. SUCCESSORS AND ASSIGNS

This agreement shall be for the benefit of and be binding upon the successors and assigns of each party.

BY _____ Date _____

Printed Name of Signatory, Title

City of Encinitas

BY _____ Date _____

Printed Name of Signatory, Title
Company

MAP/ PARCEL MAP SIGNATURE STATEMENTS FOR VARIOUS FORMS OF OWNERSHIP

Those individuals, partnerships, corporations, and other owners having record title interest in the land being subdivided shall sign the map in the space immediately following the dedication statements. Public utilities such as electric power companies, communication companies, and sanitation, water, and irrigation districts, who hold existing easements that are proposed to be overlaid by newly dedicated streets are required to execute a Subordination Certificate or Joint Use Agreement. All signatures must be notarized.

Sufficient documentation must be submitted to the Engineering Department to verify the identity of signatories. Documentation may include, but is not limited to: articles of incorporation, corporate resolutions, partnership papers recorded in San Diego County, LP-1 forms, LLC-1 forms, operating agreements, joint venture papers, recorded powers of attorney, trust papers, and guardian, administrator, or executor papers.

The following information and example signature blocks are provided as a guide for various types of ownership. Consult with the Engineering Department for specific ownership configurations not discussed below.

A. CORPORATION.

Corporate signatories must be:

1. The chairman of the board, president, vice-president, secretary, assistant secretary, chief financial officer, or assistant treasurer (Corporations Code section 313); or
2. The corporate officer(s) authorized by the corporate bylaws or by resolution of the board of directors to act on behalf of the corporation; or
3. An attorney-in-fact as authorized by the corporate bylaws or by resolution of the board of directors.

Failure to affix a corporate seal does not affect the validity of any instrument executed by the corporation (Corporations Code section 207[a]). The Engineering Department will require evidence of signature authorization such as the Articles of Incorporation and a copy of a resolution of the board of directors naming those persons authorized to sign on behalf of the corporation.

Corporation Example:

S & N Corporation, a California Corporation, as Owner

By _____ By_____
I. R. Jones, President R. U. Smith, Secretary

B. GENERAL PARTNERSHIP.

All partners of a general partnership must sign unless there is specific authorization otherwise. Partnership papers recorded in San Diego County must be provided together with any authorization naming those persons who can sign if fewer than all partners.

General Partnership Example:

S & N Properties, a General Partnership, as Owner:

By_____ By_____
U. R. Smith, General Partner R. I. Jones, General Partner

C. LIMITED PARTNERSHIP

Only the general partner (or partners, if more than one) needs to sign for this type of partnership. A general partner can be an individual, another partnership, a corporation, or other form of ownership. A copy of the Certificate of Limited Partnership (Form LP-1) certified by the Secretary of State or the partnership papers, recorded in San Diego County, must be provided.

Limited Partnership Example with Individual as General Partner:

Sequoia Properties, Limited, a Limited Partnership, as Owner

By_____
C. M. Jones, General Partner

Limited Partnership Example with Corporation as General Partner:

Sequoia Properties, Limited, a Limited Partnership, as Owner

S & N Development Corporation, General Partner

By _____By_____
I. R. Jones, President R. U. Smith, Secretary

D. LIMITED LIABILITY COMPANY.

The managing member or members must sign unless there is specific authorization directing otherwise. Provide a copy of the Articles of Organization (Form LLC-1) certified by the Secretary of State and a copy of the signed operating agreement that identifies the members and/or managing member(s).

Limited Liability Company Example:

S & N Development, L.L.C., as Owner

By_____
I. M. Manager, Managing Member

E. JOINT VENTURE.

A copy of the joint venture agreement must be provided. If the joint venture involves a corporation, partnership, or limited liability company, appropriate documentation must be provided.

Joint Venture Example with Individuals as Joint Venturers:

Sequoia Properties, a Joint Venture, as Owner

By _____ By_____
I. R. Smith, Joint Venturer U. R. Jones, Joint Venturer

Joint Venture Example with Corporation and L.P. as Joint Venturers:

Sequoia Properties, a Joint Venture, as Owner

S & N Development Corporation, Joint Venturer

By _____ By _____
I. R. Jones, President R. U. Smith, Secretary

S & N Properties, Limited, a limited partnership, as joint venturer

By _____
C. M. Jones, General Partner

F. TRUST.

A copy of either the trust document or a Certification of Trust shall be provided pursuant to Probate Code Section 18100.5 in order to assess any limitations on the power of the trustee(s), the number of trustees for the trust, and the number of trustees required to sign.

Trust Example:

S & N TRUST created October 2, 1936, as Owner

BY _____
I. M. Trusty, Trustee

G. TRUSTEE/ BENEFICIARY.

Trustee/ Beneficiary Example:

Sequoia National Title Company, a California Corporation, as (Trustee)(Beneficiary) under deed of trust recorded _____ as Doc. _____.

BY _____ BY _____
I. R. Jones, President R. U. Smith, Secretary

H. ADMINISTRATOR/ EXECUTOR.

When an administrator or executor is appointed as the result of a court case or by some other action or instrument, a copy of the action or instrument must be provided to verify the signatory.

Administrator/ Executor Example:

By _____, Executor of the Estate of _____, deceased, per Superior Court case No. _____.

I. ATTORNEY-IN-FACT.

An individual executing a certificate on behalf of another must furnish a signed copy of the recorded power of attorney. Certain legal entities such as banking associations normally act as an Attorney-in-fact. Any document furnished as evidence must have correct notarized signature(s) for the legal entity which appointed the Attorney-in-Fact.

Attorney-In-Fact Example:

BY _____ BY _____
I.M. Ohwner, as Owner Lee Galeze, his Attorney-in-Fact

J. NATIONAL BANKING ASSOCIATION.

A National Banking Association is a federally chartered banking establishment. The title company will state in the Guarantee if the bank is a member of a National Banking Association. Like a corporation, two officers must sign on behalf of the association.

National Banking Association Example.

Sequoia Federal Repository, a National Banking Association, as (owner) (trustee under deed of trust recorded ____ as doc. _____).

BY _____ BY _____
(Title) (Title)

CITY OF ENCINITAS SURVEY CONTROL NETWORK AND MONUMENT DESCRIPTION SHEETS

ROS 18416

RECORD OF SURVEY NO. 18416

SHEET 1 OF 6 SHEETS

CITY OF ENCINITAS
SURVEY CONTROL

PROCEDURE OF SURVEY:

THE PURPOSE OF THIS SURVEY IS TO ESTABLISH A NETWORK OF HORIZONTAL AND VERTICAL GEODETIC CONTROL STATIONS THROUGHOUT THE CITY OF ENCINITAS TO UTILIZE FOR GIS PURPOSES AND SUBSEQUENT MAPPING SURVEYS IN THE CITY.

TO ACCOMPLISH THIS TASK A GPS SURVEY WAS CONDUCTED USING FOUR LEICA SYSTEM 500 SYSTEMS COMPRISED OF AT502 L1,L2 MICROSTRIP ANTENNAS, AND SR 530 DUAL FREQUENCY RECEIVERS UTILIZING "FAST AMBIGUITY RESOLUTION" TECHNIQUES. ALL OCCUPATIONS UTILIZED FIXED HEIGHT ANTENNA TRIPODS. MONUMENTS USED FOR THE SURVEY WERE SELECTED IN UNOBSTRUCTED LOCATIONS FOR FUTURE USE, AT ONE MILE GRIDS AND SPACED NO GREATER THAN 1 MILE UNLESS DIRECTED BY THE CITY ENGINEER. LEVELING WITH A WILD NA-2002 BAR CODE LEVEL WAS PERFORMED INLAND TO TWENTY THREE MONUMENTS FROM THE EXISTING FIRST ORDER LEVEL LINE LYING ALONG THE COASTAL RAILROAD LINE.

AN ADDITIONAL MONUMENT WAS SET AND OBSERVATIONS MADE IN JULY OF 2004 AT WHICH TIME POINT 1049 WAS ADDED TO THE OVERALL NETWORK.

THE NETWORK SURVEY WAS CONDUCTED IN TWO DISTINCT PHASES, A CONTROL TIE NETWORK AND AN OVERALL NETWORK. BOTH NETWORKS WERE PERFORMED IN COMPLIANCE WITH ACCURACY STANDARDS PER THE CALIFORNIA GEODETIC CONTROL COMMITTEE (C.G.C.C.) DOCUMENT "SPECIFICATIONS FOR GEODETIC CONTROL NETWORKS USING HIGH-PRODUCTION GPS SURVEYING TECHNIQUES" VERSION 2.0, JULY 1996 FOR BAND V (1cm), GROUP C 1'ST ORDER EQUIVALENT AS DEFINED IN THE CALIFORNIA PUBLIC RESOURCES CODE SECTION 8801(c)(10).

THE NETWORK CONTROL TIES CONSISTS OF 2 MONUMENTS ONE ON THE NORTH END AND ONE ON THE SOUTH END OF THE PROJECT AREA AND 2 "B" ORDER MONUMENTS OUTSIDE THE PROJECT AREA. ADDITIONALLY THIS NETWORK WAS TIED TO THREE CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) OUTSIDE THE PROJECT AREA. THE 2 LOCAL MONUMENTS ARE HIGH STABILITY MARKS SET AS 2.5" DISKS IN MAJOR CONCRETE STRUCTURES. THE NETWORK CONTROL TIES WERE SURVEYED ON APRIL 16, 2004 CONCURRENTLY WITH THE OVERALL NETWORK. STATION DATA LOGGING OCCUPATION TIMES TO THE EXISTING B ORDER MONUMENTS RANGED FROM 60 TO 90 MINUTES.

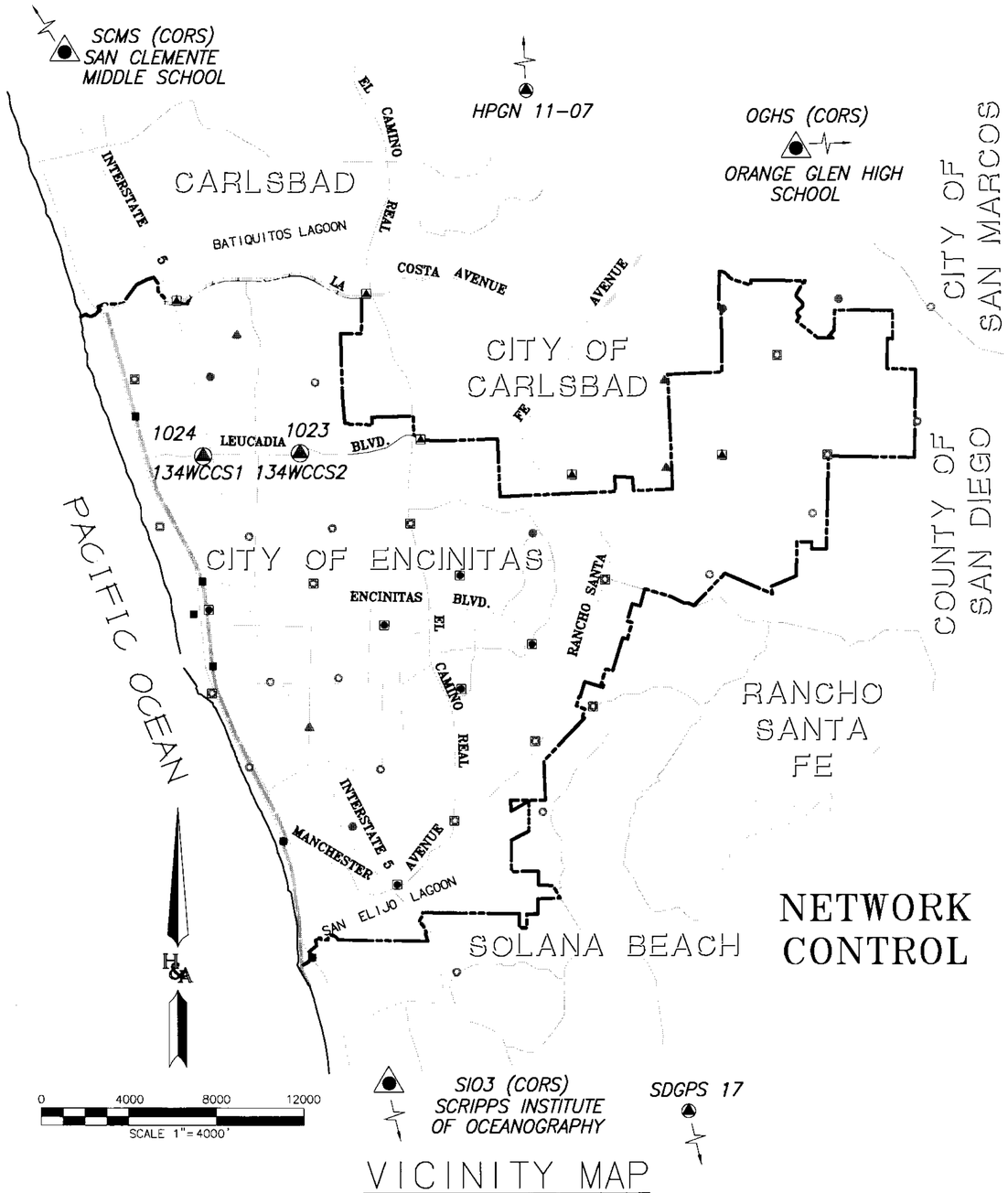
THE OVERALL NETWORK INCLUDES THE REMAINING FORTY FIVE STATIONS (52 STATIONS IN TOTAL ADJUSTMENT) AND WAS SURVEYED FROM APRIL 13, TO APRIL 16, 2004. STATION DATA LOGGING OCCUPATION TIMES RANGED FROM 30 TO 50 MINUTES.

THE OVERALL NETWORK WAS CONSTRAINED IN TWO ADJUSTMENTS ON TWO SEPARATE DATUMS. THE CCS83 ZONE 6, 1991.35 EPOCH HORIZONTAL DATUM WITH THE NGVD 29 VERTICAL DATUM TO CORRESPOND WITH EXISTING HIGH ORDER CONTROL SURVEYS, AND ALSO CONSTRAINED TO THE CCS83 ZONE 6, 2004.0 EPOCH HORIZONTAL DATUM WITH THE NAVD88 VERTICAL DATUM PER CORS STATIONS NGS DATASHEETS AS THE MOST CURRENT HIGH PRECISION GEODETIC NETWORK (HPGN) SURVEY.

THE CCS83 ZONE 6, 1991.35 EPOCH HORIZONTAL DATUM WITH THE NGVD 29 VERTICAL DATUM NETWORK ADJUSTMENT INCLUDED 3 CORS STATIONS, 1 "B" ORDER MONUMENT AND TWO FIRST ORDER MONUMENTS USED AS THE BASIS OF COORDINATES. 10 FIRST ORDER BENCHMARKS AND TWENTY ONE MONUMENTS WERE USED AS THE BASIS OF ELEVATION. THE NETWORK STATION POSITION DATA IS THE RESULT OF A CONSTRAINED BASELINE ADJUSTMENT USING "MOVE 3 VERSION 3.2.2" LEAST SQUARES ADJUSTMENT SUBROUTINE IMBEDDED IN "LEICA SKI PRO VERSION 3.0" GPS SOFTWARE. THE ADJUSTMENT WAS CONSTRAINED TO THE HORIZONTAL AND VERTICAL MONUMENTS LISTED UNDER "BASIS OF COORDINATES" AND "BASIS OF ELEVATIONS" AS NOTED AND ARE THE BASIS FOR THE CCS83 (1991.35 EPOCH), NGVD29 COORDINATES FOR THIS SURVEY.

THE CCS83 ZONE 6, 2004.0 EPOCH HORIZONTAL DATUM WITH THE NAVD 88 VERTICAL DATUM PRIMARY NETWORK ADJUSTMENT INCLUDED THREE CORS STATIONS USED AS THE BASIS OF COORDINATES. 11 FIRST ORDER BENCHMARKS WITH 21 MONUMENTS WERE USED AS THE BASIS OF ELEVATION. THE NETWORK STATION POSITION DATA IS THE RESULT OF A CONSTRAINED BASELINE ADJUSTMENT USING "MOVE 3 VERSION 3.0.2" LEAST SQUARES ADJUSTMENT SUBROUTINE IMBEDDED IN "LEICA SKI PRO VERSION 2.0" GPS SOFTWARE. THE ADJUSTMENT WAS CONSTRAINED TO THE HORIZONTAL AND VERTICAL MONUMENTS LISTED UNDER "BASIS OF COORDINATES" AND "BASIS OF ELEVATIONS" AS NOTED. THE NETWORK CONTROL TIES FOR THIS ADJUSTMENT WAS USED TO VERIFY THE VALIDITY OF THE CONSTRAINTS AND COMBINED WITH THE OVERALL NETWORK.

COMPUTATIONS PERFORMED WITH THE "LEICA " LEAST SQUARES ADJUSTMENT WERE SPECIFIED TO 2-SIGMA (95%) CONFIDENCE REGIONS. GEOID 2003 PUBLISHED BY THE NATIONAL GEODETIC SURVEY (NGS) WAS THE GEOID MODEL UTILIZED TO COMPUTE GEOID SEPARATIONS FOR THE ADJUSTMENTS. THE RESULTS OF THE NETWORK ADJUSTMENT ACCURACIES CONFORM TO FIRST ORDER AS DEFINED BY THE FEDERAL GEODETIC CONTROL COMMITTEE (F.G.C.C.) BY DOCUMENT ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", VERSION 5.0, REPRINTED WITH CORRECTIONS AUGUST 1, 1989.



VICINITY MAP

RECORD OF SURVEY

OF A GEODETIC CONTROL NETWORK OF THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

SURVEYORS STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYOR'S ACT AT THE REQUEST OF THE CITY OF ENCINITAS IN APRIL, 2004.

8-31-2004

DAVID W. AMBLER L.S. 7322
EXP. 12-31-05

LICENSED LAND SURVEYOR
DAVID W. AMBLER
L.S. 7322
Exp. 12-31-05
STATE OF CALIFORNIA

LEGEND

- INDICATES CONTINUOUSLY OPERATING REFERENCE STATION (CORS)
- INDICATES EXISTING FIRST OR "B" ORDER CONTROL MONUMENT HELD IN ADJUSTMENT (SEE BASIS OF COORDINATES)
- INDICATES EXISTING FIRST ORDER BENCHMARK UNLESS OTHERWISE NOTED (SEE BASIS OF ELEVATION)
- INDICATES MONUMENT INCLUDED IN LEVELING AS A PART OF THIS SURVEY (SEE BASIS OF ELEVATION)
- INDICATES EXISTING 1'ST ORDER MONUMENT PER CITY OF CARLSBAD CONTROL NETWORK (SEE R.O.S. 17271), UNLESS NOTED OTHERWISE.
- INDICATES A MONUMENT ESTABLISHED (SET) AS A PART OF THIS SURVEY.
- INDICATES MONUMENT USED (EXISTING) AS A PART OF THIS SURVEY

STATION NAME DESCRIPTIONS:
(MONUMENTS WITH STATION NAMES WHICH HAVE THE FOLLOWING DESIGNATION)

(CORS) – INDICATES AN EXISTING CONTINUOUSLY OPERATING REFERENCE STATION (CORS) MONUMENT IN SAN DIEGO COUNTY FROM THE SOUTHERN CALIFORNIA INTEGRATED GPS NETWORK.

HPGN – INDICATES AN EXISTING CALIFORNIA HIGH PRECISION GEODETIC NETWORK MONUMENT PER R.O.S. 14310.

CLSB – INDICATES AN EXISTING CARLSBAD NETWORK MONUMENT PER R.O.S. 17271.

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYORS ACT THIS 30th. DAY OF AUGUST, 2004.

LICENSED LAND SURVEYOR
PHILIP J. GIURBINO
L.S. 4424
Exp. 9-30-05
STATE OF CALIFORNIA

PHILIP J. GIURBINO
L.S. 4424, COUNTY SURVEYOR

RECORDER'S STATEMENT

FILE NO. 2004-843575

FILED THIS 3RD DAY OF SEPTEMBER, 2004, AT 10:31 O'CLOCK A.M. IN BOOK OF RECORD OF SURVEY MAPS AT PAGE NA AT THE REQUEST OF DAVID W. AMBLER.

GREGORY J. SMITH
COUNTY RECORDER

BY: M. HERRERA
DEPUTY

FEE $18.00

HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING – ENGINEERING – SURVEYING
10179 HUENNEKENS STREET – SAN DIEGO, CA 92121
(858) 558-4500 – FAX (858) 558-1414

R:\0460\&Map\RS Encinitas Control Sht 01.dwg [1891] Aug-30-2004 W.O.2452-1

CCI: 306-1675

CITY OF ENCINITAS
SURVEY CONTROL

ADJUSTMENT NO. 1

BASIS OF COORDINATES:
CCS83, ZONE 6, 1991.35 EPOCH PER R.O.S. 14310

THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 1991.35 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR THREE CONTROL MONUMENTS OF B-ORDER ACCURACY OR BETTER.

NO.	NAME	NORTHING	EASTING	ELLIPSOID HEIGHT	SOURCE	FGCC ORDER
OGHS	ORANGE GLEN HS	1992065.599	6319282.762	608.6	NGS DATA*	(CORS)
SIO3	SCRIPPS	1895870.270	6254483.553	115.2	NGS DATA*	(CORS)
SMCS	SAN CLEMENTE	2108031.366	6139329.633	77.1	NGS DATA*	(CORS)
1107	HPGN 11-07	1992291.232	6247272.613	196.75	R.O.S. 16810	B
1024	134WCCS1	1968854.614	6242001.192	62.73	R.O.S. 16810	FIRST
1023	134WCCS2	1968948.942	6246412.993	204.89	R.O.S. 16810	FIRST

* COMPUTED TO 1991.35 EPOCH USING HTDP.

NGVD29 ELEVATIONS PER NGS 1ST ORDER BENCHMARKS:

THE HEREIN LISTED NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR SEVEN BENCHMARKS OF FIRST ORDER ACCURACY AND 3 OF SECOND ORDER.

NO.	NAME	ORTHOMETRIC HEIGHT	SOURCE	FGCC ORDER
1001	CLSB-021	44.95	R.O.S. 17271	2ND
1003	CLSB-017	19.58	R.O.S. 17271	2ND
1042	OC-136	14.79	NGS DATA	FIRST
1107	HPGN 11-07	309.19	CALTRANS DATA	FIRST
*	CLSB-027	520.64	R.O.S. 17271	2ND
*	OC-140	77.49	NGS DATA	FIRST
*	U1307	55.01	NGS DATA	FIRST
*	N 131	77.43	NGS DATA	FIRST
*	OC-139	76.51	NGS DATA	FIRST
*	T 131	71.38	NGS DATA	FIRST

THE NGS. GEOID 99, GEOID MODEL AND AN ADDITIONAL TWENTY ONE STATIONS LEVELED TO AND HELD IN THE VERTICAL COMPONENT OF THE ADJUSTMENT WERE USED TO DERIVE NGVD29 ORTHOMETRIC HEIGHTS USING GPS MEASUREMENTS.

ADJUSTMENT NO. 2

BASIS OF COORDINATES:
CCS83, ZONE 6, 2004.0 EPOCH PER NGS DATASHEETS

THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 2004.0 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR FOUR CONTROL MONUMENTS OF B-ORDER ACCURACY OR BETTER AND TWO FIRST ORDER MONUMENTS.

* COMPUTED TO 2004.0 EPOCH USING HTDP.

NO.	NAME	NORTHING	EASTING	ELLIPSOID HEIGHT	SOURCE	FGCC ORDER
OGHS	ORANGE GLEN HS	1992066.979	6319281.696	610.3	NGS DATA*	(CORS)
SIO3	SCRIPPS	1895871.559	6254482.497	116.8	NGS DATA*	(CORS)
SMCS	SAN CLEMENTE	2108032.748	6139328.570	193.1	NGS DATA*	(CORS)

BASIS OF ELEVATION:
NAVD88 ELEVATIONS PER NGS 1ST ORDER BENCHMARKS:

THE HEREIN LISTED NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR EIGHT BENCHMARKS OF FIRST ORDER ACCURACY AND 3 OF SECOND ORDER ACCUARCY PER CITY OF CARALSBAD CONTROL NETWORK.

NO.	NAME	ORTHOMETRIC HEIGHT	SOURCE	FGCC ORDER
1001	CLSB-021	47.114	R.O.S. 17271	2ND
1003	CLSB-017	21.739	R.O.S. 17271	2ND
1042	OC-136	16.938	NGS DATA	FIRST
1043	J1415	34.665	NGS DATA	FIRST
1107	HPGN 11-07	311.358	CALTRANS DATA	FIRST
*	CLSB-027	522.803	R.O.S. 17271	2ND
*	OC-140	79.636	NGS DATA	FIRST
*	U1307	57.165	NGS DATA	FIRST
*	N 131	79.580	NGS DATA	FIRST
*	OC-139	78.658	NGS DATA	FIRST
*	T 131	73.546	NGS DATA	FIRST

* USED FOR LEVEL TIES ONLY, NOT PART OF THIS SURVEY.

THE NGS. GEOID 2003, GEOID MODEL AND AN ADDITIONAL TWENTY THREE STATIONS WERE LEVELED TO AND HELD IN THE VERTICAL COMPONENT OF THE ADJUSTMENT TO DERIVE NAVD88 ORTHOMETRIC HEIGHTS USING GPS MEASUREMENTS.

EXISTING CONTROL CHECK

Pt. No	CCS83 Zone 6, 1991.35 Epoch Northing	Easting	NGVD29 Elevation	Pt. No.	RECORD EP No.	Northing	Easting	NAVD88 Elev.	Description	Dy	Dx	Dz	Notes
1	1975959.65	6240754.97	44.95	1	1001	1975959.58	6240754.91	44.85	CLSB-021 R.O.S. 17271	-0.065	-0.056	-0.101	Hold GPS
2	1974349.91	6243508.88	311.52	2	1002	1974350.10	6243508.83		WHITE NGS Data sheet (Conventional)	0.188	-0.053		Pre HPGN
3	1976246.32	6249451.81	19.58	3	1003	1976246.26	6249451.81	19.58	CLSB-017 R.O.S. 17271	-0.055	0.003	0.000	Hold Levels
7	1969591.76	6251923.84	82.53	7	1007	1969591.69	6251923.82	82.44	CLSB-004 R.O.S. 17271	-0.063	-0.020	-0.086	GPS HGT
8	1967966.13	6256842.70	218.28	8	1008	1967966.09	6256842.68	218.20	CLSB-006 R.O.S. 17271	-0.040	-0.017	-0.076	GPS HGT
9	1968260.91	6263147.03	297.08	9	1009	1968260.83	6263147.02	297.02	CLSB-007 R.O.S. 17271	-0.086	-0.008	-0.064	GPS HGT
10	1968880.96	6265716.17	201.00	10	1010	1968880.89	6265716.19	200.96	CLSB-012 R.O.S. 17271	-0.067	0.016	-0.024	GPS HGT
23	1968949.02	6246413.01	318.26	23	1023	1968948.99	6246412.94	318.16	134WCCS2 - ROS16810&ROS17271	-0.029	-0.065	-0.107	GPS HGT
24	1968854.66	6242001.19	176.39	24	1024	1968854.61	6242001.19	176.27	134WCCS1 - ROS16810&ROS17271	-0.041	0.002	-0.118	GPS HGT
42	1951126.36	6245651.73	14.79	42	1042			14.79	BM OC-136 NGS Data sheet			0.000	Hold Levels
43	1945758.04	6246975.45	32.51	43	1043			32.51	BM J 1415 NGS Data sheet			0.000	Hold GPS
47	1956319.83	6246846.56	229.54	47	1047	1956319.83	6246846.56		HPGN-D 11-DC R.O.S. 16607	-0.001	0.000		

Not used to compute Std. Dev.

Std. Dev. Dy 0.025
Std. Dev. Dx 0.027
Std. Dev. Dz 0.047

LEVELING RESULTS

ENC DESIGNATION	MONUMENT NAME	NAVD 88 ELEVATION	NGVD 29 ELEVATION	
1003	CLSB-017**	21.739	19.58	** HELD FOR LEVELING MAIN CIRCUITS
1042	OC-136**	16.938	14.79	* HELD FOR LEVELING MINOR LOOPS
	CLSB-027**	522.803	520.64	PER R.O.S. 17271 LEVELING
	OC-140*	79.636	77.49	JUNE 1991 LEVELING PER NGS DATA SHEET
	U 1307*	57.165	55.01	PER R.O.S. 17271 LEVELING
	N 131*	79.580	77.43	JUNE 1991 LEVELING PER NGS DATA SHEET
	OC-139*	78.658	76.51	JUNE 1991 LEVELING PER NGS DATA SHEET
	T 131*	73.546	71.38	JUNE 1991 LEVELING PER NGS DATA SHEET
				JUNE 1991 LEVELING PER NGS DATA SHEET
1004	ENC-04	67.639	65.48	
1007	CLSB-004	84.683	82.53	84.607 & 82.444 PER R.O.S. 17271 (GPS DERIVED, NOT HELD)
1008	CLSB-006	220.432	218.28	220.368 & 218.204 PER R.O.S. 17271 (GPS DERIVED, NOT HELD)
1010	CLSB-012	203.160	201.00	203.140 & 200.976 PER R.O.S. 17271 (GPS DERIVED, NOT HELD)
1013	ENC-13	454.416	452.25	
1017	ENC-17	427.877	425.72	
1020	ENC-20	120.565	118.41	
1022	ENC-22	142.124	139.97	
1028	ENC-28	250.481	248.33	
1029	ENC-29	218.104	215.95	
1030	ENC-30	388.480	386.33	
1031	ENC-31	182.995	180.85	
1032	ENC-32	92.004	89.86	
1033	ENC-33	82.081	79.93	
1035	ENC-35	243.238	241.09	
1036	ENC-36	37.309	35.16	
1037	ENC-37	55.569	53.42	
1038	ENC-38	37.522	35.37	
1041	ENC-41	74.279	72.12	
1044	ENC-44	18.561	16.41	
1001	CLSB-021	47.114	44.95	EXISTING BM (NOT INCLUDED IN LEVELING) PER R.O.S. 17271 LEVELING
1043	J 1415	34.665	-----	EXISTING BM (NOT INCLUDED IN LEVELING) JUNE 1991 PER NGS DATA SHEET
1107	HPGN-11-07	311.358	309.19	EXISTING BM (NOT INCLUDED IN LEVELING) JUNE 1991 PER NGS DATA SHEET

NAVD88 CONSTRAINTS
CUMMULATIVE DISTANCE = 37017.77 +
CUMMULATIVE ERROR = 0.084
ERROR RATIO =

MEAN DIFFERENCE FROM NAVD88 TO NGVD 29 = - 2.154

NGVD29 CONSTRAINTS
CUMMULATIVE DISTANCE = 45127.56'+58170.27' = 103,297.83' =19.5 MILES
CUMMULATIVE ERROR = 0.0070' +0.0553' = 0.0623'
ERROR RATIO = 1' : 1.658,071' : 314 MILES

Not Held. NAVD 88 Elevations. GPS ties from adjacent benchmarks shows a difference of 0.33'

MAP SHEET INDEX:

SHEET 1 – NETWORK DIAGRAM, PROCEDURE & CERTIFICATES SHEET.

SHEET 2 – BASIS OF COORDINATES AND ELEVATIONS, SURVEYORS NOTES.

SHEETS 3 – DETAILED NETWORK DIAGRAM SHEETS.

SHEETS 4 – FINAL COORDINATE VALUE LISTINGS.

SHEETS 5–6 – MONUMENT DESCRIPTIONS.

SURVEYORS NOTE: CORS

THE CORS STATION COORDINATES HAVE BEEN UPDATED TO THE SPECIFIED HORIZONTAL DATUM EPOCH UTILIZING THE HORIZONTAL TIME DEPENDENT POSITIONING PROGRAM (HTDP) VERSION 2.5 PUBLISHED BY THE NGS.

THE 2004.0 COORDINATES UPDATED OVER TWO MONTHS COMPARED TO THE MINIMALLY CONSTRAINED ADJUSTMENT VALUES WAS AT MOST 0.05' NORTH, AND 0.03' EAST WHICH IS WITHIN THE ACCURACY OF THE GPS OBSERVATIONS AND WERE USED AS THE BASIS OF COORDINATES.

THE 1991.35 COORDINATE UPDATED OVER TWELVE YEARS COMPARED TO THE MINIMALLY CONSTRAINED ADJUSTMENT VALUES WAS 0.08' NORTH, AND 0.05' EAST WHICH IS WITHIN THE ACCURACY OF THE GPS OBSERVATIONS AND WAS USED AS THE BASIS OF COORDINATES.

SURVEYORS NOTE: ELEVATIONS

THE LEVELING FOR THIS SURVEY WAS PERFORMED TO ESTABLISH 3RD ORDER BENCH MARKS INLAND TO ADD AS VERTICAL CONSTRAINTS FOR THE GPS ADJUSTMENTS. THE LEVELING PROCEDURES USED DO NOT SUPPORT A HIGH ORDER OF ACCURACY ON THESE MONUMENTS EVEN THOUGH THE CLOSURES INDICATE OTHERWISE.

NAVD88 CLOSURE = 0.2208' IN 22.3 MILES. ERROR RATIO = 1:532,849
NGVD29 CLOSURE = 0.2196' IN 22.3 MILES. ERROR RATIO = 1:535,760

THE GPS DERIVED ELEVATIONS ON THE REMAINDER OF THE STATIONS IN THE NETWORK RESOLVED TO +–0.05 FEET BUT ARE STILL SUBJECT TO ERRORS IN CONTROL (3RD ORDER CONSTRAINTS), THE VERTICAL COMPONENT OF THE GPS ADJUSTMENT AND THE USE OF THE GEOID 2003 GEOID MODEL. THERFFORE NO SPECIFIC ORDER OF ACCURACY IS CLAIMED FOR THIS SURVEY'S ELEVATIONS DUE TO THE INABILITY TO DEFINE THE ABSOLUTE RELATIONSHIP TO THE DATUM.

HOWEVER, THE NETWORK IS TIED TO FIRST ORDER BENCHMARKS AND THE LEVELING CLOSURES AND GPS ADJUSTMENTS SHOW THE RELATIVE VERTICAL ACCURACY TO BE SUFFICIENT FOR MOST ENGINEERING AND GEOGRAPHIC INFORMATION SYSTEM (GIS) APPLICATIONS.

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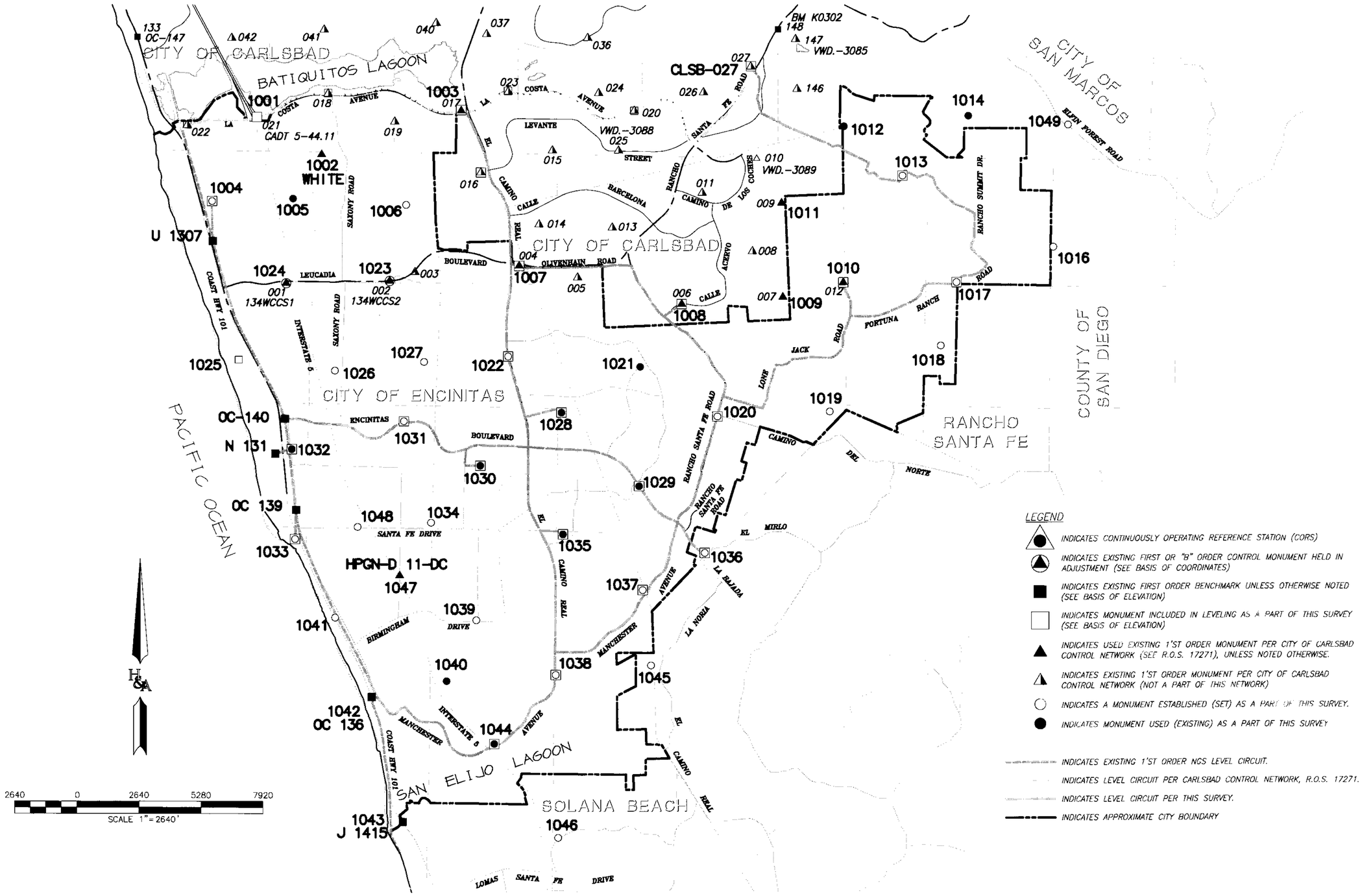
CCI: 306–1675

CITY OF ENCINITAS
SURVEY CONTROL NETWORK



LEGEND

- INDICATES CONTINUOUSLY OPERATING REFERENCE STATION (CORS)
- INDICATES EXISTING FIRST OR "B" ORDER CONTROL MONUMENT HELD IN ADJUSTMENT (SEE BASIS OF COORDINATES)
- INDICATES EXISTING FIRST ORDER BENCHMARK UNLESS OTHERWISE NOTED (SEE BASIS OF ELEVATION)
- INDICATES MONUMENT INCLUDED IN LEVELING AS A PART OF THIS SURVEY (SEE BASIS OF ELEVATION)
- INDICATES USED EXISTING 1'ST ORDER MONUMENT PER CITY OF CARLSBAD CONTROL NETWORK (SEE R.O.S. 17271), UNLESS NOTED OTHERWISE.
- INDICATES EXISTING 1'ST ORDER MONUMENT PER CITY OF CARLSBAD CONTROL NETWORK (NOT A PART OF THIS NETWORK)
- INDICATES A MONUMENT ESTABLISHED (SET) AS A PART OF THIS SURVEY.
- INDICATES MONUMENT USED (EXISTING) AS A PART OF THIS SURVEY

- INDICATES EXISTING 1'ST ORDER NGS LEVEL CIRCUIT.
- INDICATES LEVEL CIRCUIT PER CARLSBAD CONTROL NETWORK, R.O.S. 17271.
- INDICATES LEVEL CIRCUIT PER THIS SURVEY.
- INDICATES APPROXIMATE CITY BOUNDARY

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CCI: 306-1675

Pt. No.	Name	Latitude	Longitude	Ellipsoid Height	CCS 83 2004.0		NAVD88	CCS83 1991.35		NGVD29	Convergence	Combined SF	Pt. No.
					Northing	Easting	Elevation	Northing	Easting	Elevation			
1001	CLSB-021	33°5'3.96659"N	117°17'51.79963"W	-66.857	1975960.979	6240753.851	47.114	1975959.601	6240754.950	44.950	- 0 34 32.663	0.99996685	1001
1002	WHITE	33°4'48.31301"N	117°17'19.24557"W	199.831	1974351.244	6243507.768	313.681	1974349.862	6243508.871	311.526	- 0 34 14.774	0.99995442	1002
1003	CLSB-017	33°5'7.655752"N	117°16'9.622199"W	-91.668	1976247.649	6249450.690	21.739	1976246.274	6249451.783	19.580	- 0 33 36.515	0.99996796	1003
1004	ENC-04	33°4'27.96099"N	117°18'13.83224"W	-46.586	1972340.984	6238842.552	67.639	1972339.607	6238843.657	65.480	- 0 34 44.770	0.99996665	1004
1005	ENC-05	33°4'29.37186"N	117°17'33.36999"W	60.399	1972448.960	6242286.869	174.391	1972447.581	6242287.976	172.235	- 0 34 22.536	0.99996150	1005
1006	ENC-06	33°4'27.26036"N	117°16'36.71041"W	207.012	1972187.715	6247105.857	320.695	1972186.325	6247106.957	318.541	- 0 33 51.400	0.99995453	1006
1007	CLSB-004	33°4'2.055622"N	117°15'39.81066"W	-28.778	1969593.087	6251922.721	84.683	1969591.693	6251923.819	82.530	- 0 33 20.133	0.99996637	1007
1008	CLSB-006	33°3'46.62845"N	117°14'18.33077"W	107.355	1967967.457	6258841.581	220.432	1967966.069	6258842.679	218.280	- 0 32 35.358	0.99996021	1008
1009	CLSB-007	33°3'49.94583"N	117°13'27.78832"W	186.499	1968262.241	6263145.909	299.239	1968260.857	6263147.007	297.082	- 0 32 07.584	0.99995635	1009
1010	CLSB-012	33°3'56.31692"N	117°12'57.66865"W	90.629	1968882.286	6265715.053	203.160	1968880.903	6265716.150	201.000	- 0 31 51.033	0.99996079	1010
1011	CLSB-009	33°4'29.58801"N	117°13'28.97375"W	256.970	1972269.626	6263082.484	369.543	1972268.243	6263083.581	367.380	- 0 32 08.236	0.99995209	1011
1012	ENC-12	33°5'2.576987"N	117°12'58.10122"W	581.048	1975579.215	6265740.295	693.314	1975577.832	6265741.392	691.149	- 0 31 51.271	0.99993588	1012
1013	ENC-13	33°4'41.64944"N	117°12'28.564"W	342.241	1973440.977	6268233.900	454.416	1973439.595	6268234.997	452.250	- 0 31 35.039	0.99994775	1013
1014	ENC-14	33°5'7.426698"N	117°11'55.85189"W	726.578	1976020.716	6271040.951	838.481	1976019.333	6271042.049	836.316	- 0 31 17.063	0.99992882	1014
1015	Intentionally Deleted												1015
1016	ENC-16	33°4'11.81826"N	117°11'12.74445"W	437.433	1970367.455	6274657.997	549.325	1970366.072	6274659.095	547.165	- 0 30 53.375	0.99994385	1016
1017	ENC-17	33°3'56.74896"N	117°12'1.037054"W	315.676	1968881.661	6270534.698	427.877	1968880.278	6270535.796	425.720	- 0 31 19.913	0.99995001	1017
1018	ENC-18	33°3'29.86907"N	117°12'8.630961"W	197.564	1966170.936	6269863.655	309.922	1966169.552	6269864.753	307.765	- 0 31 24.086	0.99995628	1018
1019	ENC-19	33°3'1.554508"N	117°13'3.831248"W	-4.952	1963352.581	6265139.257	107.826	1963351.198	6265140.355	105.670	- 0 31 54.419	0.99996663	1019
1020	ENC-20	33°2'59.05586"N	117°13'59.91094"W	7.487	1963144.715	6260363.776	120.564	1963143.331	6260364.873	118.410	- 0 32 25.236	0.99996610	1020
1021	ENC-21	33°3'19.7696"N	117°14'38.92075"W	151.063	1965269.631	6257063.479	264.323	1965268.244	6257064.577	262.170	- 0 32 46.673	0.99995874	1021
1022	ENC-22	33°3'23.73644"N	117°15'44.84127"W	28.525	1965724.525	6251457.028	142.124	1965723.139	6251458.126	139.970	- 0 33 22.897	0.99996451	1022
1023	134WCCS2	33°3'55.16318"N	117°16'44.48988"W	206.590	1968950.353	6246411.892	320.417	1968948.942	6246412.993	318.266	- 0 33 55.675	0.99995526	1023
1024	134WCCS1	33°3'53.79573"N	117°17'36.31764"W	64.424	1968855.987	6242000.075	178.543	1968854.614	6242001.192	176.391	- 0 34 24.155	0.99996210	1024
1025	ENC-25	33°3'21.10154"N	117°17'59.57943"W	-53.753	1965571.643	6239987.266	60.601	1965570.266	6239988.375	58.449	- 0 34 36.938	0.99996850	1025
1026	ENC-26	33°3'16.96275"N	117°17'11.5028"W	61.096	1965112.418	6244074.767	175.189	1965111.036	6244075.873	173.040	- 0 34 10.519	0.99996311	1026
1027	ENC-27	33°3'21.04116"N	117°16'26.85728"W	198.734	1965487.052	6247878.517	312.567	1965485.663	6247879.619	310.417	- 0 33 45.986	0.99995642	1027
1028	ENC-28	33°3'0.093278"N	117°15'17.8912"W	136.955	1963312.846	6253727.625	250.480	1963311.462	6253728.722	248.330	- 0 33 08.088	0.99995988	1028
1029	ENC-29	33°2'29.2827"N	117°14'38.75615"W	104.698	1960167.051	6257028.838	218.103	1960165.668	6257029.935	215.950	- 0 32 46.582	0.99996217	1029
1030	ENC-30	33°2'37.32793"N	117°15'58.26832"W	274.724	1961045.386	6250268.586	388.479	1961044.005	6250269.682	386.330	- 0 33 30.276	0.99995384	1030
1031	ENC-31	33°2'55.73258"N	117°16'36.60969"W	69.048	1962937.417	6247023.326	182.995	1962936.036	6247024.425	180.850	- 0 33 51.345	0.99996323	1031
1032	ENC-32	33°2'43.38641"N	117°17'32.6524"W	-22.320	1961736.994	6242240.837	92.004	1961735.615	6242241.939	89.860	- 0 34 22.141	0.99996790	1032
1033	ENC-33	33°2'5.34315"N	117°17'30.47467"W	-32.322	1957890.328	6242387.781	82.081	1957888.951	6242388.878	79.930	- 0 34 20.945	0.99996932	1033
1034	ENC-34	33°2'12.92925"N	117°16'22.60259"W	168.735	1958599.802	6248173.084	282.723	1958598.426	6248174.178	280.574	- 0 33 43.648	0.99995951	1034
1035	ENC-35	33°2'8.555423"N	117°15'16.54178"W	129.551	1958103.085	6253792.292	243.238	1958101.705	6253793.387	241.090	- 0 33 07.346	0.99996149	1035
1036	ENC-36	33°2'1.246752"N	117°14'5.620281"W	-76.034	1957306.836	6259822.644	37.309	1957305.454	6259823.741	35.160	- 0 32 28.373	0.99997151	1036
1037	ENC-37	33°1'45.24134"N	117°14'36.52001"W	-57.971	1955714.211	6257176.769	55.569	1955712.830	6257177.865	53.420	- 0 32 45.353	0.99997106	1037
1038	ENC-38	33°1'8.905583"N	117°15'19.54898"W	-76.340	1952077.071	6253478.164	37.521	1952075.692	6253479.259	35.370	- 0 33 08.999	0.99997288	1038
1039	ENC-39	33°1'31.75092"N	117°15'59.52732"W	209.973	1954418.927	6250096.804	323.983	1954417.550	6250097.897	321.833	- 0 33 30.967	0.99995858	1039
1040	ENC-40	33°1'5.776596"N	117°16'14.1695"W	108.074	1951806.027	6248824.522	222.245	1951804.650	6248825.615	220.097	- 0 33 39.014	0.99996414	1040
1041	ENC-41	33°1'32.17311"N	117°17'10.0452"W	-40.780	1954520.693	6244093.576	73.612	1954519.319	6244094.667	71.463	- 0 34 09.718	0.99997057	1041
1042	ENC-42	33°0'58.75634"N	117°16'51.36416"W	-97.449	1951127.688	6245650.619	16.938	1951126.311	6245651.712	14.793	- 0 33 59.453	0.99997416	1042
1043	ENC-43	33°0'5.772762"N	117°16'35.19847"W	-79.827	1945759.365	6246974.337	34.664	1945757.987	6246975.431	32.509	- 0 33 50.569	0.99997476	1043
1044	ENC-44	33°0'39.41167"N	117°15'49.95019"W	-95.577	1949121.354	6250860.731	18.560	1949119.976	6250861.825	16.410	- 0 33 25.705	0.99997459	1044
1045	ENC-45	33°1'13.27032"N	117°14'32.09101"W	-88.778	1952479.481	6257523.075	24.841	1952478.100	6257524.170	22.691	- 0 32 42.920	0.99997336	1045
1046	ENC-46	32°59'59.73542"N	117°15'17.64972"W	56.220	1945084.872	6253572.495	170.313	1945083.493	6253573.589	168.162	- 0 33 07.955	0.99996842	1046
1047	CADT 11-DC	33°1'50.25583"N	117°16'37.93358"W	117.523	1956321.159	6246845.450	231.691	1956319.791	6246846.538	229.539	- 0 33 52.072	0.99996253	1047
1048	ENC-48	33°2'10.81824"N	117°16'59.21386"W	59.165	1958417.185	6245054.418	173.376	1958415.809	6245055.513	171.227	- 0 34 03.766	0.99996480	1048
1049	ENC-49	33°5'3.95231"N	117°11'5.94947"W	477.343	1975631.219	6275283.460	588.991	1975629.836	6275284.558	586.829	- 0 30 49.641	0.99994082	1049

PT. NO. 1001 **NAME** CLSB-021

STAMPING 5-44.11 1997

MONUMENT DESCRIPTION:

FD. 2.5" CADT DISK IN WEST END OF DRAINAGE BOX INLET IN THE NORTHEAST QUADRANT OF THE INTERSECTION OF LA COSTA AVENUE AND INTERSTATE HIGHWAY 5, IN THE NORTHWEST CORNER OF NORTHBOUND ON RAMP AND 47 FT. EAST OF BRIDGE

TO REACH DESCRIPTION:

MONUMENT IS IN THE NORTHEAST QUADRANT OF THE INTERSECTION OF LA COST AVENUE AND INTERSTATE HIGHWAY 5, AT THE NORTHWEST CORNER OF LA COSTA AVE. AND THE NORTHBOUND ON RAMP TO I-5, 47 FT. EASTERLY OF THE EAST END OF THE LA COSTA AVE. BRIDGE OVER I-5, 9 FT. WESTERLY OF TRAFFIC LIGHT AND 3.5 FT. FROM CURB.

PT. NO. 1002 **NAME** WHITE

STAMPING WHITE

MONUMENT DESCRIPTION:

FD. 3" USC&GS DISC IN 8"X8" CONCRETE MONUMENT 6" ABOVE GROUND STAMPED "WHITE, 1938"

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF GLOSCONY ROAD AND AMALFI DRIVE GO SOUTH ON GLASCONY ROAD 0.25 MI. TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE WEST SIDE OF THE ROAD 12.5 FEET WEST OF AC BERM AND 43 FEET WEST OF POWER POLE #P120181.

PT. NO. 1003 **NAME** CLSB-017

STAMPING CLSB-017 L.S. 6215

MONUMENT DESCRIPTION:

FD. 2.5" DISK IN NORTHEAST CORNER OF LA COSTA AVENUE BRIDGE OVER ENCINITAS CREEK. 185' WEST OF EL CAMINO REAL.

TO REACH DESCRIPTION:

MONUMENT IS IN THE NORTHEAST CORNER OF LA COSTA AVENUE BRIDGE OVER ENCINITAS CREEK, 185' WEST OF EL CAMINO REAL ON NORTH SIDEWALK OF BRIDGE, 6 FT. NORTH OF CURB AND 2.5 FT. WEST OF THE EAST END OF BRIDGE WALL.

PT. NO. 1004 **NAME** ENC-04

STAMPING ENC-04, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN DRAINAGE BOX INLET AT THE NORTHEAST CORNER OF THE CITY OF ENCINITAS LEUCADIA OAKS PARK ON THE WEST SIDE OF RAINTREE DRIVE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED 4.5 FEET WEST OF CURB ON THE WEST SIDE OF RAINTREE DRIVE IN CURVE KNUCKLE, 250 FEET NORTHERLY FROM THE INTERSECTION OF RAINTREE DRIVE AND SANFORD DRIVE.

PT. NO. 1005 **NAME** ENC-05

STAMPING RCE 29577

MONUMENT DESCRIPTION:

FD. 2" IRON PIIPE WITH TAG STAMPED "RCE 29577" AT A 20 FOOT OFFSET TO THE CENTER OF CUL-DE-SAC AT THE NORTHEAST END OF ARBOR COURT.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF OLYMPUS STREET AND ARBOR COURT, GO NORTHEASTERLY 0.1 MI. TO A BULB CUL-DE-SAC. THE MONUMENT IS LOCATED 20 FEET NORTHWESTERLY OF A 2" IRON PIPE AT THE CENTER OF CUL-DE-SAC, 27' SOUTHERLY OF A STREET LIGHT AND 19 FEET SOUTHEASTERLY OF A SEWER MANHOLE SET FLUSH IN ASPHALT.

PT. NO. 1006 **NAME** ENC-06

STAMPING ENC-06, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF CONCRETE PEDESTAL FOR UTILITY BOXES. WEST SIDE OF CITY TRAIL ENTRANCE AT THE SOUTH END OF RAINEY COURT.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED 190 FEET SOUTHERLY OF THE INTERSECTION OF RANCH ROAD AND RAINEY COURT IN THE SOUTHWEST CORNER OF A CONCRETE PEDESTAL, 15 FEET SOUTHERLY OF ROLLED CURB AND 31 FEET WESTERLY OF A STREET LIGHT.

PT. NO. 1007 **NAME** CLSB-004

STAMPING CLSB-004 L.S. 6215

MONUMENT DESCRIPTION:

FD. 2.5" DISK IN THE NORTHEAST CORNER OF A 3'X3' DRAINAGE BOX IN THE SOUTHEAST QUADRANT OF EL CAMINO REAL AND OLIVENHAIN RD. 33 FT. OFF CURB AND 310 FT. EAST OF INTERSECTION.

TO REACH DESCRIPTION:

MONUMENT IS IN THE NORTHEAST CORNER OF A 3'X3' DRAINAGE BOX IN THE SOUTHEAST QUADRANT OF EL CAMINO REAL AND OLIVENHAIN RD. 33 FT. SOUTH OF THE SOUTHERLY CURB OF OLIVENHAIN RD. AND 310 FT. EAST OF EL CAMINO REAL.

PT. NO. 1008 **NAME** CLSB-006

STAMPING CLSB-006 L.S. 6215

MONUMENT DESCRIPTION:

FD. 2.5" DISK IN SOUTH CURB OF CALLE ACERVO AT THE WEST END OF THE WEST CURB RETURN OF THE EAST DRIVEWAY OF ELEMENTARY SCHOOL. 0.1 MI. NORTHEAST OF OF RANCHO SANTA FE RD.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF RANCHO SANTA FE RD. AND CALLE ACERVO GO NORTHEASTERLY ON CALLE ACERVO 0.1 MI. TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS IN THE SOUTHERLY CURB OF CALLE ACERVO AT THE WEST END OF THE WEST CURB RETURN OF THE EASTERLY DRIVEWAY OF AN ELEMENTARY SCHOOL. 84 FT. WESTERLY OF A STREET LIGHT.

PT. NO. 1009 **NAME** CLSB-007

STAMPING CLSB-007 L.S. 6215

MONUMENT DESCRIPTION:

FD. ROD DRIVEN TO REFUSAL WITH CAP ON WEST SIDE OF PASEO ESMERADO AT ACCESS DRIVEWAY TO PROTECTED HABITAT AREA, 50' FROM CURB AND 20' FROM FENCE ON CANYON RIM.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF AVENIDA PANTERA AND PASEO ESMERADO GO SOUTH ON PASEO ESMERADO 0.3 MI. TO THE POINT ON THE NORTH SIDE AND ACROSS FROM 7980 PASEO ESMERADO, 54 FT. FORM CURB AND 21 FT. FROM HABITAT AREA FENCE AND 13 FT. EAST OF A "NO TRESPASSING" SIGN.

PT. NO. 1010 **NAME** CLSB-012

STAMPING CLSB-012 L.S 6215

MONUMENT DESCRIPTION:

FD. 2.5" DISK IN THE NORTHEAST CORNER OF VAULT IN THE SOUTHWEST QUADRANT OF LONE JACK RD. AND DOUBLE LL RANCH RD. IN SAN MARCOS.

TO REACH DESCRIPTION:

MONUMENT IS IN THE SOUTHWEST QUADRANT OF LONE JACK RD. AND DOUBLE LL RANCH RD. IN THE NORTHEAST CORNER OF VAULT. 44FT. SOUTH OF SOUTHERLY CURB OF DOUBLE LL RANCH RD., 3 FT. WEST OF WESTERLY CURB OF LONE JACK RD. AND 36 FT. WESTERLY OF POWER POLE NO. 618620.

PT. NO. 1011 **NAME** CLSB-009

STAMPING RCE 23956

MONUMENT DESCRIPTION:

FD. WELL MONUMENT IN THE CENTER OF THE SOUTHEAST END OF BULB CUL-DE-SAC OF SITIO BORDE.

TO REACH DESCRIPTION:

MONUMENT IS IN CENTER OF THE SOUTHEAST END OF BULB CUL-DE-SAC OF SITIO BORDE. 0.1 MI. SOUTHEASTERLY OF AVENIDA DIESTRO AND 47.5 FT. NORTHWESTERLY OF A STREET LIGHT.

PT. NO. 1012 NAME ENC-12

STAMPING (NONE)

MONUMENT DESCRIPTION:

FD. 4" DIAMETER CONCRETE CYLINDER UP 1 FOOT WITH 3/8" PIN UP 1 INCH IN MOUND OF ROCKS.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF RANCHO SANTA FE ROAD AND CAMINO JUNIPERO GO 0.3 MILES EASTERLY ON CAMINO JUNIPERO TO A SDG&E TRANSMISSION LINE. TURN LEFT ONTO DIRT ACCESS ROAD UNDER TRANSMISSION LINE GO SOUTHEAST ALONG DIRT ROAD 0.2 MILES TO 2'ND TRANSMISSION TOWER AND A DIRT ROAD TO THE LEFT. TURN LEFT GO NORTH UPHILL 0.1 MILES TO END OF DRIVABLE ROAD CONTINUE ON FOOT UP TRAIL 500 FEET TO THE MONUMENT. THE MONUMENT IS LOCATED 10 FEET NORTHERLY OF THE TRAIL.

PT. NO. 1013 **NAME** ENC-13

STAMPING ENC-13, L.S. 7322

MONUMENT DESCRIPTION:

SET 2" IRON PIPE WITH 2.5" BRASS DISC WITH 8" CONCRETE COLLAR UP 6", 0.6 MILES WEST OF TWIN WATER TANKS AT NORTH END OF FORTUNA SUMMIT DRIVE ALONG DIRT ROAD THAT CROSSES CANYON, 21 FEET EAST OF THE WESTERLY FORK OF DIRT ROAD AND 3 FEET WEST OF TBAR POST.

TO REACH DESCRIPTION:

FROM LONE JACK RD AND FORTUNA RANCH RD GO EAST ON FORTUNA RANCH RD 1 MI TO THE END OF PAVEMENT. CONTINUE EAST ALONG DIRT RD 700 FT TO A FORK AT CANYON DE ORO RD. TAKE LEFT FORK GO NE'LY ALONG CANYON DE ORO RD 500 FT TO THE INTERSECTION WITH RANCHO SUMMIT DR. TURN LEFT GO NORTH 0.4 MI ON RANCHO SUMMIT DR TO A LOCKED GATE AT THE SECOND RESIDENCE ALONG ROAD. CONTINUE NORTH THROUGH GATE 0.5 MILES UP HILL TO THE FENCED WATER TANKS. TURN LEFT GO WEST 0.1 MI ALONG FENCE TO CORNER. TURN RIGHT GO NW ALONG FENCE 200 FT TO SECOND DIRT RD, TURN LEFT GO WEST DOWNHILL ON DIRT RD 0.4 MILES TO A LOCKED GATE, CONTINUE ALONG DIRT ROAD 0.2 MI TO A SPLIT IN THE ROAD, TAKE LEFT FORK GO SOUTH 200 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED 150 FT NORTH OF DUAL POWER POLES ADJACENT TO AN SDG&E TRANSMISSION LINE.

PT. NO. 1014 **NAME** ENC-14

STAMPING SM LF 40. 9-19-92

MONUMENT DESCRIPTION:

FD. 2" IRON PIPE WITH 1 1/2" ALUMINUM COUNTY OF SAN DIEGO DISC STAMPED HORIZ. CONTROL SURVEY MONUMENT AT THE TOP OF SLOPE BETWEEN 2 DIRT ROADS HEADING NORTH INTO ABANDONED DUMP SITE NORTH OF THE NORTH END OF RANCHO SUMMIT DRIVE.

TO REACH DESCRIPTION:

FROM CANYON DE ORO RD AND RANCHO SUMMIT DR. GO NORTH 0.4 MI ON RANCHO SUMMIT DRIVE TO A LOCKED GATE AT THE SECOND RESIDENCE. CONTINUE NORTH 0.5 MI UP HILL TO THE FENCED WATER TANKS. TURN LEFT GO WEST 0.1 MI ALONG FENCE TO COR, TURN RIGHT GO NW, NORTH AND NE 0.2 MI ALONG FENCE AROUND TANK TO THE NORTH SIDE OF THE SOUTH TANK AND A GRAVEL ROAD TO THE LEFT. TURN LEFT GO NORTH ALONG GRAVEL RD 0.3 MI TO A LOCKED GATE TO CLOSED COUNTY DUMP SITE, GO PAST GATE 200 FT TO THE MONUMENT IN THE SPLIT OF THE DIRT ROAD. THE MONUMENT IS LOCATED AT THE TOP OF SLOPE FOR THE LOWER ROAD, 5 FEET WEST OF THE EDGE OF UPPER GRAVEL ROAD, 3 FEET EAST OF THE TOP OF SLOPE, 13 FEET NORTH OF 18"X18" CONC. PEDESTAL FOR ELECTRIC BOX AND 1 FOOT EAST OF TBAR POST.

PT. NO. 1015 **NAME**

STAMPING INTENTIONALLY DELETED

MONUMENT DESCRIPTION:

TO REACH DESCRIPTION:

PT. NO. 1016 **NAME** ENC-16

STAMPING ENC-16. L.S. 7322

MONUMENT DESCRIPTION:

SET 2" IRON PIPE WITH 2.5" CITY OF ENCINITAS BRASS DISC ON THE WEST SIDE OF CANYON DE ORO. 150 FEET NORTH OF PAINT MOUNTAIN ROAD AND 150 FEET SOUTH OF POWER LINES.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED 150 FEET NORTHERLY ALONG CANYON DE ORO FROM THE INTERSECTION WITH PAINT MOUNTAIN ROAD AND 16FEET WESTERLY OF THE WESTERLY EDGE OF PAVEMENT.

PT. NO. 1017 **NAME** ENC-17

STAMPING ENC-17, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN DROP INLET ON THE NORTH SIDE OF FORTUNA RANCH ROAD AND 50 FEET SOUTH OF ADAM'S RUN.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE NORTHWESTERLY CORNER OF A DRAINAGE BOX INLET 80 FEET SOUTHWESTERLY ALONG FORTUNA RANCH ROAD FROM THE CENTERLINE INTERSECTION WITH ADAMS RUN, 16 FEET NORTHWESTERLY OF THE CENTER OF FORTUNA RANCH ROAD AND 4.5 FEET NORTHWESTERLY OF CURB.

PT. NO. 1018 **NAME** ENC-18

STAMPING ENC-18, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN CONCRETE SLAB FOR FIRE HYDRANT, 800 FEET NORTH OF THE END OF BUMANN ROAD.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF BUMANN ROAD AND ROCKING HORSE CIRCLE. GO EASTERLY 300 FEET TO AN INTERSECTION TURN RIGHT GO SOUTH ONTO A DIRT ROAD 0.2 MILES TO THE BEGINNING OF AC PAVEMENT, A DIRT DRIVEWAY TO THE LEFT AND THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE NORTHWESTERLY CORNER OF A CONCRETE PEDESTAL FOR A FIRE HYDRANT, 8 FEET WEST OF AC BERM, 12 FEET SOUTHERLY OF THE BEGINNING OF PAVEMENT AND 65 FEET SOUTHWESTERLY OF ADDRESS SIGN ON FENCE "3465 BUMANN ROAD".

PT. NO. 1019 **NAME** ENC-19

STAMPING ENC-19, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE EAST END OF A 1'X7' HEADWALL ON THE SOUTH SIDE OF CIRCA DE TIERRA, 210 FEET WEST OF THE CUL-DE-SAC AT THE SOUTH END OF ROAD AND 9.5 FEET OFF CURB.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF VAL SERENO DRIVE AND CIRCA DE TIERRA, GO NORTHEASTERLY ON CIRCA DE TIERRA 0.4 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE EAST END OF A 1 FOOT WIDE BY 7 FEET LONG HEADWALL, 210 FEET WESTERLY OF THE CENTER OF A CUL-DE-SAC, AND 9.5 FEET SOUTH OF THE SOUTHERLY CURB.

PT. NO. 1020 **NAME** ENC-20

STAMPING ENC-20, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF CONCRETE PEDESTAL FOR FIRE HYDRANT ON THE EAST SIDE OF RANCHO SANTA FE ROAD AND 100 FEET SOUTH OF EL CAMINO DEL NORTE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE SOUTHWEST CORNER OF A CONCRETE PEDESTAL FOR A FIRE HYDRANT ON THE EAST SIDE OF RANCHO SANTA FE ROAD, 100 FEET SOUTHERLY OF THE MIDDLE OF EL CAMINO DEL NORTE, 2.5 FEET EASTERLY OF AN AC. BERM AND 63 FEET WEST OF POWER POLE NO. P164067.

PT. NO. 1021 **NAME** ENC-21

STAMPING R.C.E. 9416

MONUMENT DESCRIPTION:

FD. WELL MONUMENT WITH A 2.5" BRASS DISC STAMPED RCE9416 ON CENTERLINE OF VILLAGE PARK WAY AT A BEGINNING OF CURVE 340 FEET SOUTHWEST OF WILLOW SPRINGS DRIVE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE MIDDLE OF VILLAGE PARK WAY, 340 FEET SOUTHERLY OF THE INTERSECTION WITH WILLOW SPRINGS DRIVE, 61 FEET SOUTHWESTERLY OF A STREET LIGHT AND 53 FEET NORTHWESTERLY OF A FIRE HYDRANT.

PT. NO. 1022 **NAME** ENC-22

STAMPING ENC-22, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN TOP OF CURB NOSE IN THE MIDDLE OF EL CAMINO REAL IN THE 3'RD ISLAND APPROXIMATELY 700 FEET SOUTH OF GARDEN VIEW ROAD.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE WESTERLY CURB OF THE 3'RD MEDIAN ISLAND BEING 700 FEET SOUTHERLY FROM THE MIDDLE OF GARDEN VIEW ROAD AND 10 FEET SOUTHERLY OF CURB NOSE.

PT. NO. 1023 **NAME** 134WCCS2

STAMPING 134WCCS2

MONUMENT DESCRIPTION:

FD. 2." DISK IN MEDIAN ISLAND OF LEUCADIA BLVD. 141 FT. +- WESTERLY OF LEFT TURN ISLAND GORE NOSE AT QUAIL GARDENS DRIVE

TO REACH DESCRIPTION:

MONUMENT IS 141 FT. WESTERLY OF LEFT TURN ISLAND GORE NOSE OF LEUCADIA BLVD. AT QUAIL GARDENS DRIVE. 38 FT. SOUTHERLY OF A STREET LIGHT.

HUNSAKER & ASSOCIATES SAN DIEGO, INC.
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CCI: 306-1675

PT. NO. 1024 **NAME** 134WCCS1

STAMPING 134WCCS1

MONUMENT DESCRIPTION:

FD. 2.5" DISK IN SIDEWALK IN THE SOUTHEAST QUADRANT LEUCADIA BLVD. AND ORPHEUS AVENUE. 37' EASTERLY OF TRAFFIC SIGNAL.

TO REACH DESCRIPTION:

MONUMENT IS IN ENCINITAS AT THE SOUTHEAST QUADRANT OF THE INTERSECTION OF LEUCADIA BLVD. AND ORPHEUS ST. IN THE SOUTHERLY SIDEWALK OF LEUCADIA BLVD. 3 FT. FROM FACE OF CURB AND 37 FT. EASTERLY OF TRAFFIC SIGNAL ON THE CORNER.

PT. NO. 1025 **NAME** ENC-25

STAMPING ENC-25, L.S.7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN WELL MONUMENT IN THE MIDDLE OF THE INTERSECTION OF SOUTH EL PORTAL STREET AND LA MESA AVENUE. 100 FEET NORTH ALONG THE SOUTHEASTERLY CURB LINE OF SOUTH EL PORTAL STREET.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE MIDDLE OF THE INTERSECTION OF SOUTH EL PORTAL STREET AND LA MESA AVENUE.

PT. NO. 1026 **NAME** ENC-26

STAMPING ENC-26, L.S.7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF A DRAINAGE INLET BOX AT THE WEST SIDE OF PARKING LOT FOR OFFICE BUILDINGS ON THE SOUTH SIDE OF SAXONY PLACE, 200 FEET WEST OF SAXONY ROAD.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF SAXONY ROAD AND SAXONY PLACE, GO WEST ON SAXONY PLACE 265 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE SOUTHWEST CORNER OF A DRAINAGE BOX INLET AT THE WEST END OF THE FIRST PARKING LOT, 2 FEET WEST OF CURB AND 33 FEET SOUTH OF THE NORTHWEST CORNER OF THE PARKING LOT.

PT. NO. 1027 **NAME** ENC-27

STAMPING ENC-27, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN TOP OF CURB AT THE NORTH END OF HANDICAP RAMP ON THE NORTH SIDE OF CYPRESS HILLS DRIVE AT PASEO DE LAS VERDES.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE TOP OF THE EASTERLY CURB AT THE INTERSECTION OF PASEO DE LAS VERDES AND CYPRESS HILLS DRIVE AT THE NORTH END OF A HANDICAP RAMP AND 24' NORTHERLY OF A STREET LIGHT.

PT. NO. 1028 **NAME** ENC-28

STAMPING L.S.5663

MONUMENT DESCRIPTION:

FD. WELL MONUMENT AT CENTERLINE INTERSECTION OF TURNER AVENUE AND SHIELDS AVENUE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE CENTERLINE INTERSECTION OF TURNER AVENUE AND SHIELDS AVENUE, 5 FEET SOUTH OF A SEWER MANHOLE AND 12 FEET NORTHWESTERLY OF A WATER GATE VALVE.

PT. NO. 1029 **NAME** ENC-29

STAMPING (BLANK WITH PUNCH)

MONUMENT DESCRIPTION:

FD. WELL MONUMENT IN AC. ON CENTERLINE OF ENCINITAS BOULEVARD, 300' EAST OF INTERSECTION WITH WILLOW SPRINGS AT BEGINNING OF LEFT TURN POCKET.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE SOUTHEAST END OF THE LEFT TURN POCKET FROM NORTHBOUND ENCINITAS BOULEVARD TO WILLOW SPRINGS DRIVE WESTBOUND.

PT. NO. 1030 **NAME** ENC-30

STAMPING L.S. 3997

MONUMENT DESCRIPTION:

FD. WELL MONUMENT AT CENTER OF CUL-DE-SAC, NORTH END OF OAK CREST PARK DRIVE AT ENTRANCE TO OAK CREST MIDDLE SCHOOL.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE CENTER OF A 50 FOOT CURB RADIUS AT THE ENTRANCE TO THE OAK CREST MIDDLE SCHOOL.

PT. NO. 1031 **NAME** ENC-31

STAMPING ENC-31, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE NORTHWEST CORNER OF DRAINAGE BOX ON NORTH SIDE OF ENCINITAS BOULEVARD AND 700 FEET EAST OF WESTLAKE STREET.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF ENCINITAS BOULEVARD AND WESTLAKE STREET GO EAST 700 FEET ALONG ENCINITAS BOULEVARD TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE NORTHWEST CORNER OF A DRAINAGE BOX CURB INLET ON THE NORTH SIDE OF ENCINITAS BOULEVARD 4.5 FEET NORTH OF CURB AND 57 FEET WEST OF DRIVEWAY INTO THE SAN DIEGITO UNION HIGH SCHOOL DISTRICT OFFICES.

PT. NO. 1032 **NAME** ENC-32

STAMPING HORIZ. CTRL. ENC TC 2

MONUMENT DESCRIPTION:

FD. 2" SD. CO. ENG. DEPT. BRASS DISC SET IN TOP OF CURB EAST SIDE OF VULCAN AVENUE, 200 FEET NORTH OF E STREET.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE TOP OF EAST CURB OF VULCAN AVENUE 200 FEET NORTH OF E STREET AND 2.5 FEET NORTH OF THE DRIVEWAY INTO THE ENCINTAS CITY ADMINISTRATION OFFICES.

PT. NO. 1033 **NAME** ENC-33

STAMPING ENC-33. L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN CURB ON THE SOUTH SIDE OF THE PARKING LOT FOR THE CITY OF ENCINITAS SWAMIS PARK IN RED CURB NORTH OF RESTROOMS.

TO REACH DESCRIPTION:

FROM HE INTERSECTION OF CHESTERFIELD DRIVE AND HIGHWAY 101 GO NORTH 1.2 MILES TO THE ENTRANCE TO SWAMI'S CITY PARK, TURN LEFT INTO PARKING LOT AND THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE TOP OF CURB ON THE SOUTH SIDE OF THE PARKING LOT ADJACENT TO THE RESTROOMS, 65 FEET NORTH OF RESTROOMS AND 7 FEET WEST OF PARKING BAY.

PT. NO. 1034 **NAME** ENC-34

STAMPING ENC-34

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE WEST END OF A 1'X5' HEADWALL ON THE NORTH END OF PIPE UNDER DRIVEWAY ON THE WEST SIDE OF BONITA DRIVE, 225 FEET NORTH OF SANTA FE DRIVE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED IN THE WEST END OF THE NORTHERLY HEADWALL FOR A PIPE UNDER A DRIVEWAY ON THE WEST SIDE OF BONITA DRIVE 225 FEET NORTH OF THE MIDDLE OF SANTA FE ROAD.

PT. NO. 1035 **NAME** ENC-35

STAMPING R.C.E. 13817

MONUMENT DESCRIPTION:

FD. WELL MONUMENT AT CENTER OF CUL-DE-SAC, EAST END OF ORANGE VIEW DRIVE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE CENTER OF THE CUL-DE-SAC AT THE EAST END OF ORANGE VIEW DRIVE, 12 FEET WEST OF A SEWER MANHOLE AND 10 FEET NORTH OF A WATER GATE VALVE.

PT. NO. 1036 **NAME** ENC-36

STAMPING ENC-36, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE NORTHEAST CORNER OF DRAINAGE INLET ON THE NORTH SIDE OF RANCHO SANTA FE ROAD, 200' WEST OF THE INTERSECTION WITH LA BAJADA AND EL MIRLO.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE NORTHSIDE OF RANCHO SANTA FE ROAD, 200 FEET WEST OF THE INTERSECTION WITH LA BAJADA AND EL MIRLO, 200 FEET EASTERLY OF THE EAST END OF THE RANCHO SANTA FE ROAD BRIDGE OVER ESCONDIDO CREEK AND 4.5 FEET NORTH OF CURB.

PT. NO. 1037 **NAME** ENC-37

STAMPING ENC-37. L.S. 7322

MONUMENT DESCRIPTION:

SET 2" IRON PIPE WITH CONCRETE COLLAR AND 2.5" CITY OF ENCINITAS BRASS DISC 220 FEET NORTH OF MANCHESTER AVENUE AND 85 FEET WEST OF TRABERT RANCH ROAD.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED 220 FEET NORTH OF MANCHESTER AVENUE, 85 FEET WEST OF TRABERT RANCH ROAD, 20 FEET EAST OF A CITY MAINTAINED TRAIL AND 81 FEET WEST OF THE SOUTHERLY END OF A WOOD SPLIT RAIL FENCE.

PT. NO. 1038 **NAME** ENC-38

STAMPING ENC-38, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN NE CORNER OF DRAINAGE CURB INLET ON THE EAST SIDE OF MANCHESTER AVENUE 0.1 MILE SOUTH OF THE INTERSECTION WITH EL CAMINO REAL .

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF EL CAMINO REAL AND MANCHESTER AVENUE GO SOUTH ON MANCHESTER AVENUE 0.1 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE NORTHEAST CORNER OF A DRAINAGE CURB INLET, 4.5 FEET FROM CURB AND 66 FEET SOUTH OF AN ANCHOR POLE.

PT. NO. 1039 **NAME** ENC-39

STAMPING ENC-39, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE TOP OF CURB, NORTHWEST QUADRANT OF BIRMINGHAM DRIVE AND LAKE DRIVE IN THE MIDDLE OF RETURN.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE NORTHWEST QUADRANT OF BIRMINGHAM DRIVE AND LAKE DRIVE, 35 FEET NORTH OF THE CENTER OF BIRMINGHAM DRIVE AND 15 FEET WEST OF THE CENTER OF LAKE DRIVE.

PT. NO. 1040 **NAME** ENC-40

STAMPING ENC-40, L.S. 7322

MONUMENT DESCRIPTION:

FD. WELL MONUMENT AT THE CENTER OF CUL-DE-SAC, SOUTH END OF BULRUSH LANE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED AT THE CENTER OF A 38 FOOT CURB RADIUS CUL-DE-SAC AT THE SOUTH END OF BULRUSH LANE.

PT. NO. 1041 **NAME** ENC-41

STAMPING ENC-41. L.S. 7322

MONUMENT DESCRIPTION:

SET 2" IRON PIPE IN AC. WITH 2.5" CITY OF ENCINITAS BRASS DISC IN A TURNOUT ON THE EAST SIDE OF NORTHBOUND HIGHWAY 101, 0.5 MILES NORTH OF CHESTERFIELD AND 10 FEET WEST OF THE NORTH END OF GUARD RAIL.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF HIGHWAY 101 AND CHESTERFIELD DRIVE GO NORTH ON HIGHWAY 101 0.5 MILES TO A TURNOUT AND THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED 10 FEET WESTERLY AND OPPOSITE THE NORTH END OF A GUARD RAIL IN THE AC. PAVEMENT.

PT. NO. 1042 **NAME** ENC-42

STAMPING OC 136, 1968

MONUMENT DESCRIPTION:

FD 2.5" SD. CO. ENGINEERS DISC STAMPED "OC 136, 1968" IN EAST WING WALL OF THE NORTH END OF THE NORTHBOUND HIGHWAY 101 BRIDGE OVER SAN ELIJO LAGOON.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF CHESTERFIELD DRIVE AND HIGHWAY 101, GO SOUTH ON HIGHWAY 101 0.2 MILES TO THE BRIDGE OVER THE SAN ELIJO LAGON AND THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE EAST WING WALL OF THE NORTH END OF BRIDGE, 9 FEET EAST OF EAST CURB AND 3.8 FEET SOUTH OF NORTH CURB.

PT. NO. 1043 **NAME** ENC-43

STAMPING J 1415, 1987

MONUMENT DESCRIPTION:

FD. 3.5" NATIONAL GEODETIC SURVEY DISC IN HEADWALL, 0.2 MILES NORTH OF SOLANA VISTA DRIVE ON THE EAST SIDE OF NORTHBOUND HIGHWAY 101, 3 FEET OFF SHOULDER AND 6 FEET WEST OF CARDIFF BY THE SEA SIGN.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF SOLANA VISTA DRIVE AND HIGHWAY 101, GO NORTH ON HIGHWAY 01 0.25 MILES TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE EAST SIDE OF HIGHWAY 101, THE TOP OF THE HILL BEFORE THE BEGINNING OF A LONG CURVE TO THE RIGHT, ON THE NORTHWEST END OF A DRAINAGE PIPE HEADWALL, 3 FEET EAST OF AC. BERM AND 6 FEET WEST OF "CARDIFF BY THE SEA" SIGN.

PT. NO. 1044 **NAME** ENC-44

STAMPING SEV 104, 1974

MONUMENT DESCRIPTION:

FD. 3.5" DIAMETER CORPS OF ENGINEERS-US ARMY BRASS DISC STAMPED "SEV 104, 1974" SET IN CONCRETE STRUCTURE OF THE OLIVENHAIN PUMP STATION IN THE NORTHWEST QUADRANT OF MANCHESTER AVENUE AND THE NORTHBOUND INTERSTATE 5 OFF RAMP TO MANCHESTER AVENUE.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE NORTH SIDE OF MANCHESTER AVENUE, 65 FEET WESTERLY OF THE CENTER OF THE NORTHBOUND INTERSTATE HIGHWAY 5 FREEWAY OFF RAMP. IN THE MIDDLEOF THE SOUTHERLY EDGE OF A CONCRETE SLAB FOR AN OLIVENHAIN MUNICIPAL WATER DISTRICT PUMP STATION.

PT. NO. 1045 **NAME** ENC-45

STAMPING ENC-45. L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN WESTERLY CORNER OF CONCRETE DROP INLET, EAST SIDE OF STONEBRIDGE LANE AND 450 FEET WEST OF EL CAMINO REAL.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF STONEBRIDGE LANE AND EL CAMINO REAL, GO SOUTHWESTERLY ON STONEBRIDGE LANE 450 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE SOUTHWEST CORNER OF A DRAINAGE BOX INLET ON THE SOUTH SIDE OF STONEBRIDGE LANE, 0.5 FEET FROM CURB.

PT. NO. 1046 **NAME** ENC-46

STAMPING ENC-46, L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHWEST CORNER OF CONCRETE DROP INLET IN THE NORTHWEST QUADRANT OF THE INTERSECTION OF SANTA HELENA AND SANTA ROSITA STREETS.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED 60 FEET NORTH OF THE CENTER OF SANTA HELENA AND 20 FEET WEST OF THE CENTER OF SANTA ROSITA, 2 FEET WEST OF CURB.

PT. NO. 1047 **NAME** CADT 11-DC

STAMPING STA. 11-DC, 1993

MONUMENT DESCRIPTION:

FD. 3.5" CALIFORNIA DEPARTMENT OF TRANSPORTATION ALUMINUM DISC IN THE SIDEWALK OVER THE SOUTHEAST END OF THE NORTHEAST ABUTMENT OF THE MACKINNON AVENUE BRIDGE OVER INTERSTATE HIGHWAY 5.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE SOUTH EAST SIDE OF MACKINNON AVENUE OVER THE NORTHEAST ABUTMENT FOR THE BRIDGE OVER INTERSTATE HIGHWAY 5, IN THE CENTER OF SIDEWALK.

PT. NO. 1048 **NAME** ENC-48

STAMPING ENC-48. L.S. 7322

MONUMENT DESCRIPTION:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHWEST CORNER OF CONCRETE DROP INLET ON NORTH SIDE OF SANTA FE DRIVE WEST OF INTERSTATE HIGHWAY 5 AT THE NORTHEAST RETURN INTO SCRIPPS MEMORIAL HOSPITAL, ENCINITAS.

TO REACH DESCRIPTION:

THE MONUMENT IS LOCATED ON THE NORTH SIDE OF SANTA FE DRIVE, 175 FEET WEST OF THE INTERSTATE HIGHWAY 5 SOUTHBOUND OFF RAMP TO SANTA FE DRIVEIN THE NORTHWEST CORNER OF A DRANAGE CURB INLET, 4 FEET NORTH OF CURB.

PT. NO. 1049 **NAME** ENC-49

STAMPING ENC-49. L.S. 7322

MONUMENT DESCRIPTION:

SET 2" IRON PIPE WITH CONCRETE COLLAR AND 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHERLY RIGHT OF WAY OF ELFIN FOREST ROAD 0.1 MILES EASTERLY OF FORTUNA DEL NORTE. 29 FEET NORTH OF PAVEMENT.

TO REACH DESCRIPTION:

FROM THE INTERSECTION OF ELFIN FOREST ROAD WITH FORTUNA DEL NORTE AND FORTUNA DEL SUR. GO EASTERLY ON ELFIN FOREST ROAD 0.1 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED 29 FEET NORTHERLY OF THE EDGE OF PAVEMENT, 7 FEET SOUTHERLY OF THE CENTER OF A "SDCWA COMCBLE" VAULT NO. FB26, AND 55 FEET EASTERLY OF POWER POLE NO. 712397.

HUNSAKER & ASSOCIATES SAN DIEGO, INC.

PLANNING – ENGINEERING – SURVEYING

10179 HUENNEKENS STREET – SAN DIEGO, CA 92121

R:\0460\&Map\RS Encinitas Control Sht 06.dwg [1891] Aug-30-2004 W.O.2452-1

(858) 558-4500 – FAX (858) 558-1414

CCI: 306-1675

CITY OF ENCINITAS SURVEY CONTROL NETWORK AND MONUMENT DESCRIPTION SHEETS

ROS 18416 BENCHMARK DATA SHEETS

CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1001 **Station Name:** CLSB-021

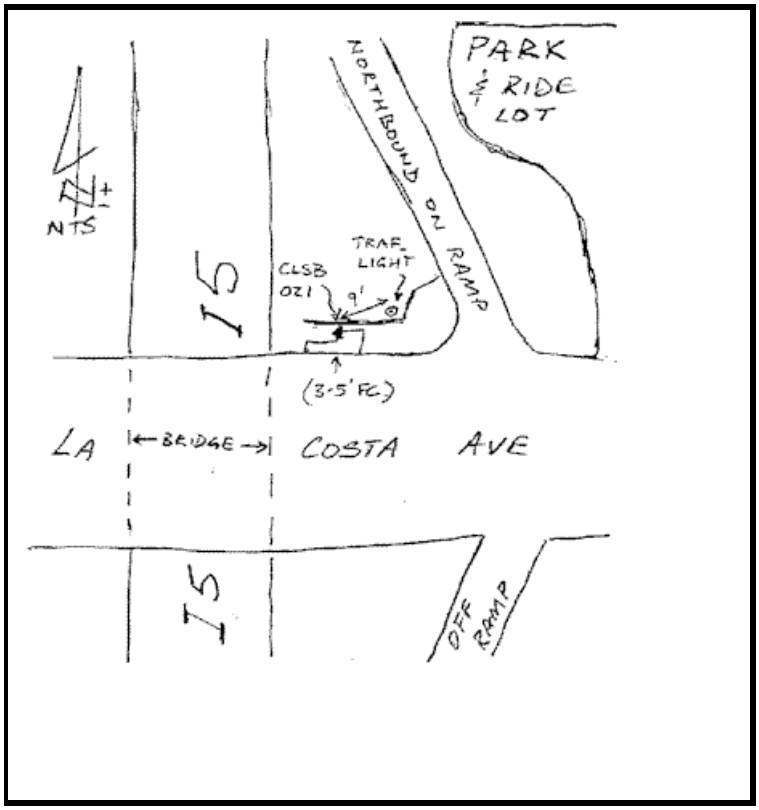
Monument Description:

FD. 2.5" CADT DISK IN WEST END OF DRAINAGE BOX INLET IN THE NORTHEAST QUADRANT OF THE INTERSECTION OF LA COSTA AVENUE AND INTERSTATE HIGHWAY 5, IN THE NORTHWEST CORNER OF NORTHBOUND ON RAMP AND 47 FT. EAST OF BRIDGE

Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	1/1/1997

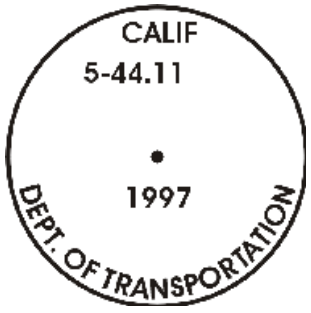
Monument "To Reach" Description:

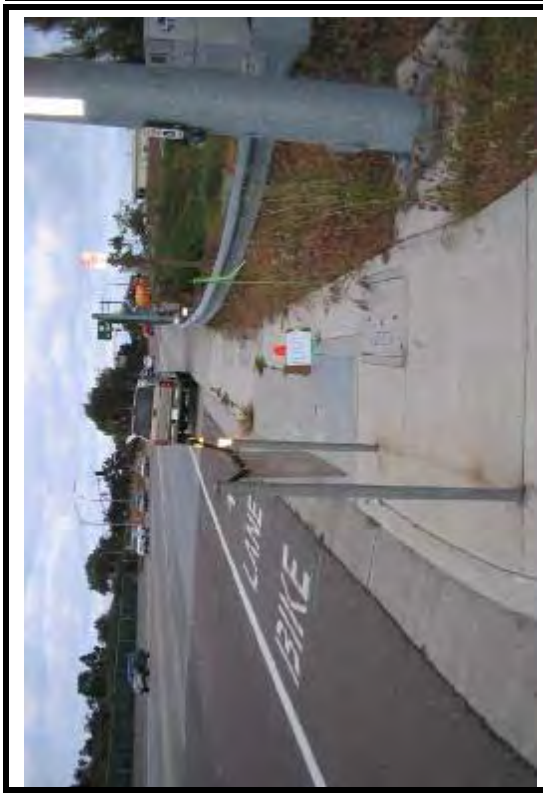
MONUMENT IS IN THE NORTHEAST QUADRANT OF THE INTERSECTION OF LA COST AVENUE AND INTERSTATE HIGHWAY 5, AT THE NORTHWEST CORNER OF LA COSTA AVE. AND THE NORTHBOUND ON RAMP TO I-5, 47 FT. EASTERLY OF THE EAST END OF THE LA COSTA AVE. BRIDGE OVER I-5, 9 FT. WESTERLY OF TRAFFIC LIGHT AND 3.5 FT. FROM CURB.



Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º5'3.953066"N
Longitude:	117º17'51.78654"W
Ellipsoid Height:	-68.577
Northing:	1975959.601
Easting:	6240754.95
NGVD29 Elevation:	44.95
NAVD88 Elevation:	47.114
Combined Scale Factor	0.99996685
Convergence:	- 0 34 32.663
Horizontal Order:	FIRST

Monument Sketch:





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10179 Huennekens St. ▪ Suite 200 ▪ San Diego, CA 92121
PH: (858) 558-4500 FX: (858) 558-1414

CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1002 **Station Name:** WHITE

Monument Description:

FD. 3" USC&GS DISC IN 8"X8" CONCRETE MONUMENT 6" ABOVE GROUND STAMPED "WHITE, 1938"

Established By:

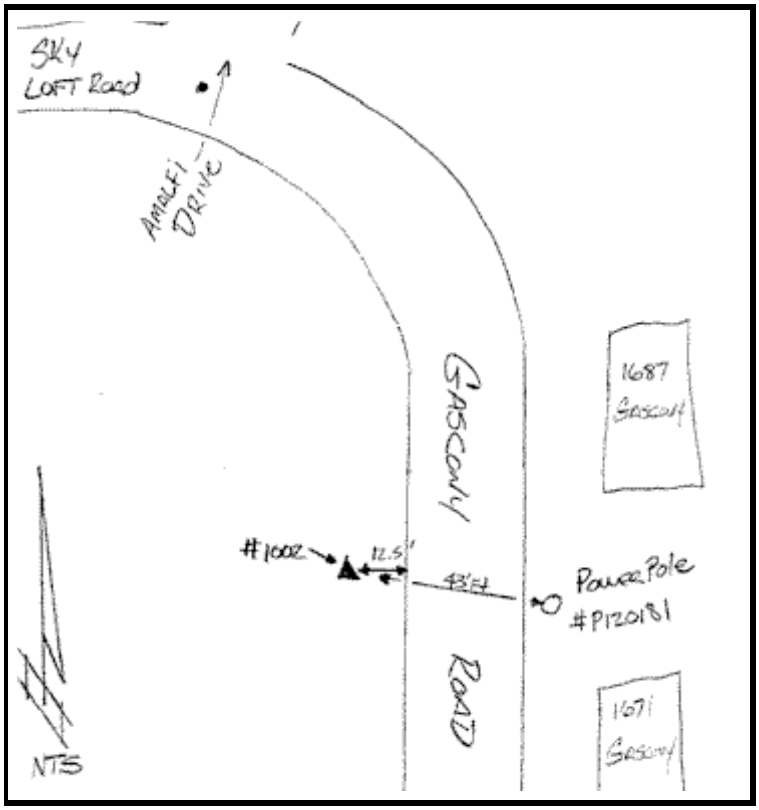
Date Established:

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'48.29945"N
Longitude:	117º17'19.23244"W
Ellipsoid Height:	198.129
Northing:	1974349.862
Easting:	6243508.871
NGVD29 Elevation:	311.526
NAVD88 Elevation:	313.681
Combined Scale Factor	0.99995442
Convergence:	- 0 34 14.774
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF GLOSCONY ROAD AND AMALFI DRIVE GO SOUTH ON GLASCONY ROAD 0.25 MI. TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE WEST SIDE OF THE ROAD 12.5 FEET WEST OF AC BERM AND 43 FEET WEST OF POWER POLE #P120181.

Monument Sketch:



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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1003 **Station Name:** CLSB-017

Monument Description:

FD. 2.5" DISK IN NORTHEAST CORNER OF LA COSTA AVENUE BRIDGE OVER ENCINITAS CREEK, 185' WEST OF EL CAMINO REAL.

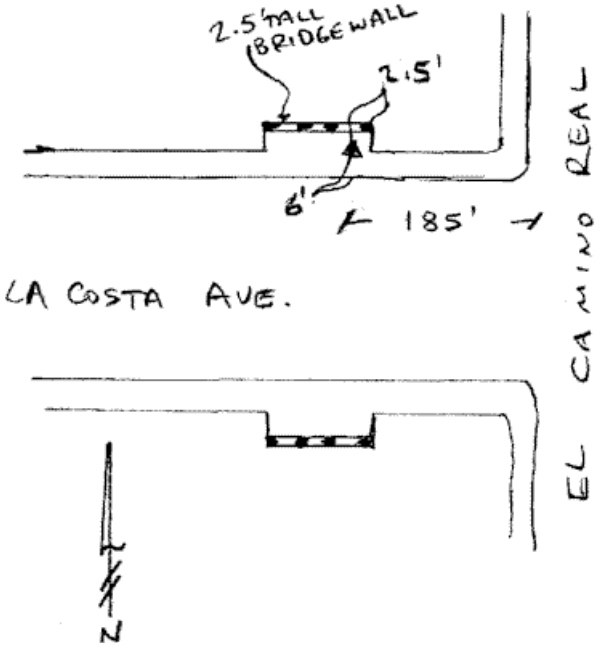
Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	5/18/2001

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º5'7.642248"N
Longitude:	117º16'9.609201"W
Ellipsoid Height:	-93.374
Northing:	1976246.274
Easting:	6249451.783
NGVD29 Elevation:	19.58
NAVD88 Elevation:	21.739
Combined Scale Factor	0.99996796
Convergence:	- 0 33 36.515
Horizontal Order:	FIRST

Monument "To Reach" Description:

MONUMENT IS IN THE NORTHEAST CORNER OF LA COSTA AVENUE BRIDGE OVER ENCINITAS CREEK, 185' WEST OF EL CAMINO REAL ON NORTH SIDEWALK OF BRIDGE, 6 FT. NORTH OF CURB AND 2.5 FT. WEST OF THE EAST END OF BRIDGE WALL.

Monument Sketch:



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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1004 **Station Name:** ENC-04

Monument Description:

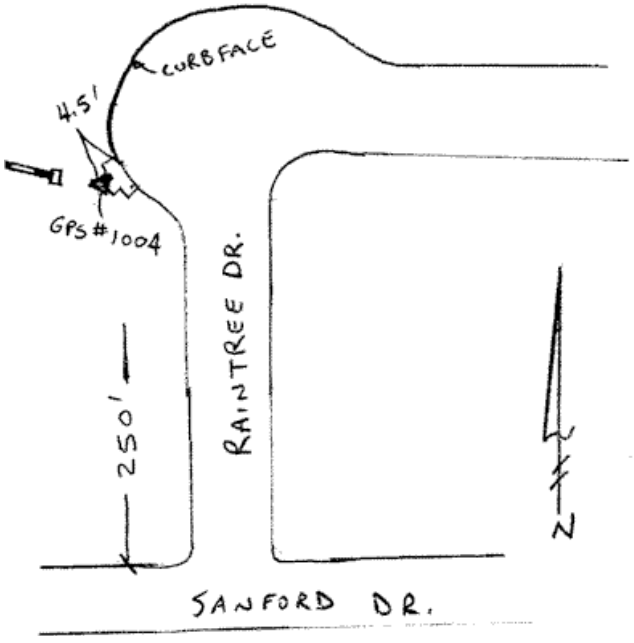
SET 2.5" CITY OF ENCINITAS BRASS DISC IN DRAINAGE BOX INLET AT THE NORTHEAST CORNER OF THE CITY OF ENCINITAS LEUCADIA OAKS PARK ON THE WEST SIDE OF RAINTREE DRIVE.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

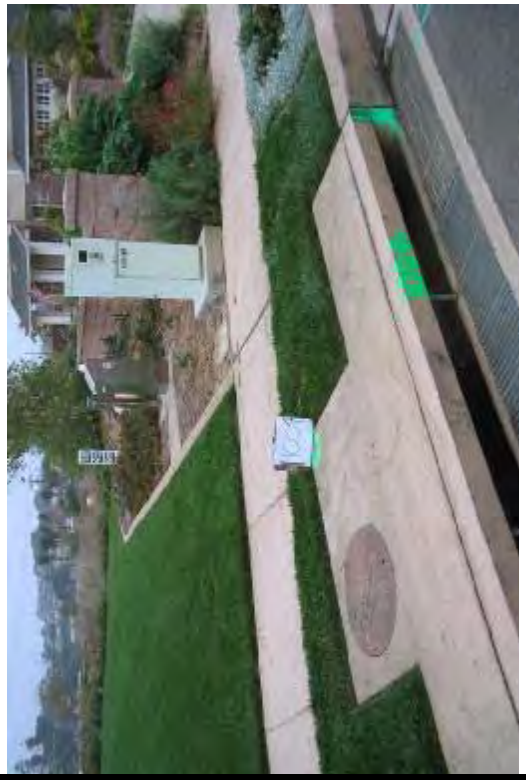
Monument "To Reach" Description:

THE MONUMENT IS LOCATED 4.5 FEET WEST OF CURB ON THE WEST SIDE OF RAINTREE DRIVE IN CURVE KNUCKLE, 250 FEET NORTHERLY FROM THE INTERSECTION OF RAINTREE DRIVE AND SANFORD DRIVE.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'27.94747"N
Longitude:	117º18'13.81909"W
Ellipsoid Height:	-48.283
Northing:	1972339.607
Easting:	6238843.657
NGVD29 Elevation:	65.48
NAVD88 Elevation:	67.639
Combined Scale Factor	0.99996665
Convergence:	- 0 34 44.770
Horizontal Order:	FIRST

Monument Sketch:



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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1005 **Station Name:** ENC-05

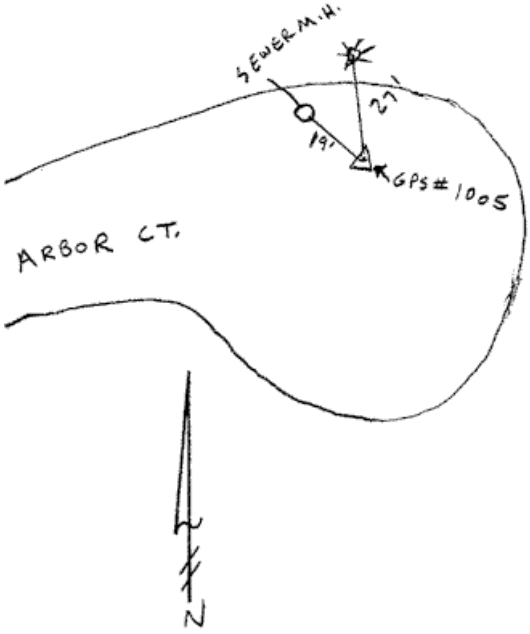
Monument Description:

FD. 2" IRON PIIPE WITH TAG STAMPED "RCE 29577" AT A 20 FOOT OFFSET TO THE CENTER OF CUL-DE-SAC AT THE NORTHEAST END OF ARBOR COURT.

Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	4/15/2004

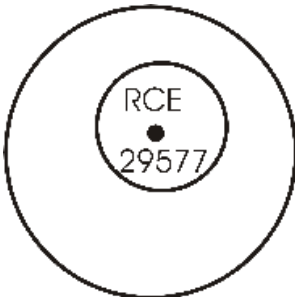
Monument "To Reach" Description:

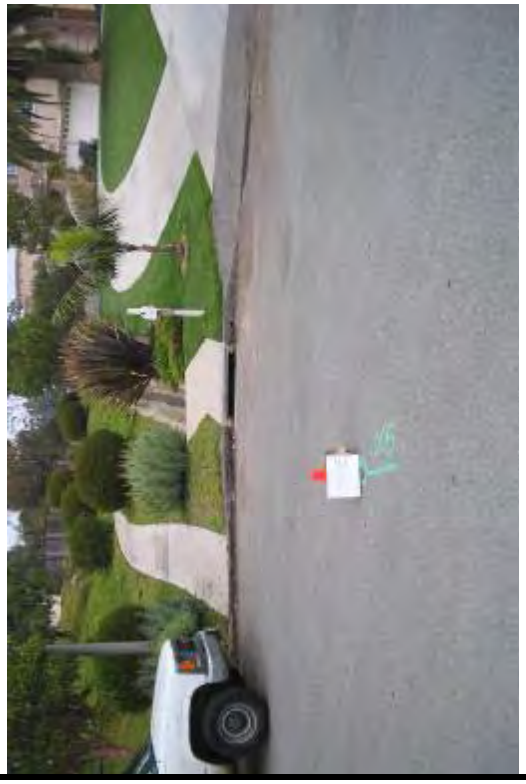
FROM THE INTERSECTION OF OLYMPUS STREET AND ARBOR COURT, GO NORTHEASTERLY 0.1 MI. TO A BULB CUL DE-SAC. THE MONUMENT IS LOCATED 20 FEET NORTHWESTERLY OF A 2" IRON PIPE AT THE CENTER OF CUL-DE-SAC, 27' SOUTHERLY OF A STREET LIGHT AND 19 FEET SOUTHEASTERLY OF A SEWER MANHOLE SET FLUSH IN ASPHALT.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'29.35833"N
Longitude:	117º17'33.35682"W
Ellipsoid Height:	58.7
Northing:	1972447.581
Easting:	6242287.976
NGVD29 Elevation:	172.235
NAVD88 Elevation:	174.391
Combined Scale Factor	0.9999615
Convergence:	- 0 34 22.536
Horizontal Order:	FIRST

Monument Sketch:





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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1006 **Station Name:** ENC-06

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF CONCRETE PEDESTAL FOR UTILITY BOXES, WEST SIDE OF CITY TRAIL ENTRANCE AT THE SOUTH END OF RAINEY COURT.

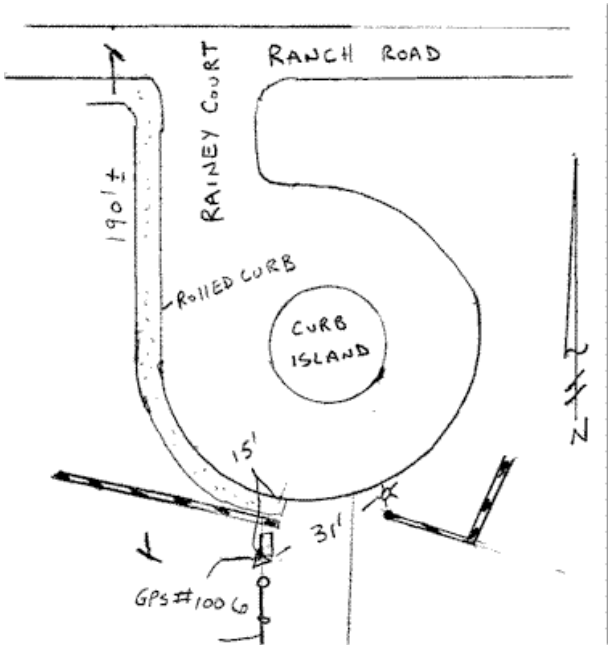
Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'27.24671"N
Longitude:	117º16'36.69734"W
Ellipsoid Height:	205.311
Northing:	1972186.325
Easting:	6247106.957
NGVD29 Elevation:	318.541
NAVD88 Elevation:	320.695
Combined Scale Factor	0.99995453
Convergence:	- 0 33 51.400
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED 190 FEET SOUTHERLY OF THE INTERSECTION OF RANCH ROAD AND RAINEY COURT IN THE SOUTHWEST CORNER OF A CONCRETE PEDESTAL, 15 FEET SOUTHERLY OF ROLLED CURB AND 31 FEET WESTERLY OF A STREET LIGHT.

Monument Sketch:



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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1007 **Station Name:** CLSB-004

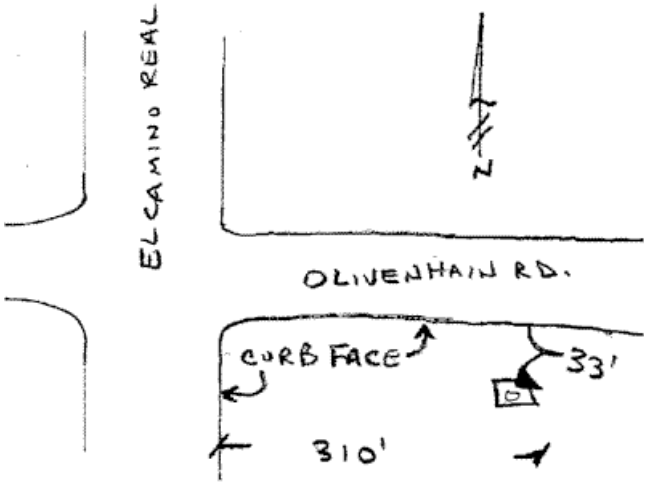
Monument Description:

FD. 2.5" DISK IN THE NORTHEAST CORNER OF A 3'X3' DRAINAGE BOX IN THE SOUTHEAST QUADRANT OF EL CAMINO REAL AND OLIVENHAIN RD. 33 FT. OFF CURB AND 310 FT. EAST OF INTERSECTION.

Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	5/18/2001

Monument "To Reach" Description:

MONUMENT IS IN THE NORTHEAST CORNER OF A 3'X3' DRAINAGE BOX IN THE SOUTHEAST QUADRANT OF EL CAMINO REAL AND OLIVENHAIN RD. 33 FT. SOUTH OF THE SOUTHERLY CURB OF OLIVENHAIN RD. AND 310 FT. EAST OF EL CAMINO REAL.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º4'2.041934"N
Longitude:	117º15'39.7976"W
Ellipsoid Height:	-30.475
Northing:	1969591.693
Easting:	6251923.819
NGVD29 Elevation:	82.53
NAVD88 Elevation:	84.683
Combined Scale Factor	0.99996637
Convergence:	- 0 33 20.133
Horizontal Order:	FIRST

Monument Sketch:

HUNSAKER & ASSOCIATES
SAN DIEGO, INC.
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10179 Huennekens St. ▪ Suite 200 ▪ San Diego, CA 92121
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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1008 **Station Name:** CLSB-006

Monument Description:

FD. 2.5" DISK IN SOUTH CURB OF CALLE ACERVO AT THE WEST END OF THE WEST CURB RETURN OF THE EAST DRIVEWAY OF ELEMENTARY SCHOOL. 0.1 MI. NORTHEAST OF OF RANCHO SANTA FE RD.

Established By: HUNSAKER & ASSOCIATES SAN

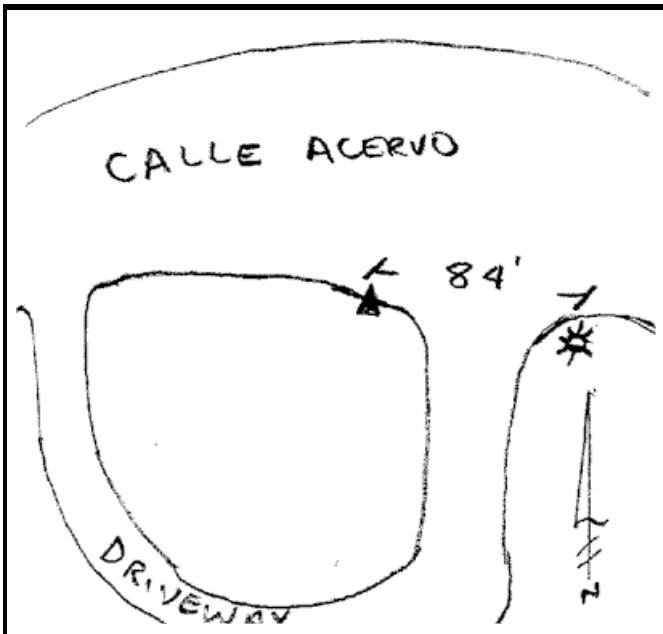
Date Established: 5/18/2001

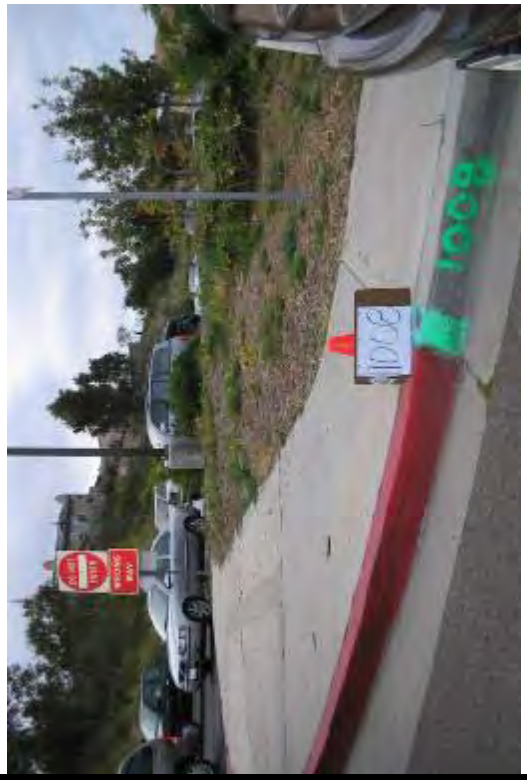
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'46.61483"N
Longitude:	117º14'18.31771"W
Ellipsoid Height:	105.656
Northing:	1967966.069
Easting:	6258842.679
NGVD29 Elevation:	218.28
NAVD88 Elevation:	220.432
Combined Scale Factor	0.99996021
Convergence:	- 0 32 35.358
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF RANCHO SANTA FE RD. AND CALLE ACERVO GO NORTHEASTERLY ON CALLE ACERVO 0.1 MI. TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS IN THE SOUTHERLY CURB OF CALLE ACERVO AT THE WEST END OF THE WEST CURB RETURN OF THE EASTERLY DRIVEWAY OF AN ELEMENTARY SCHOOL. 84 FT. WESTERLY OF A STREET LIGHT.

Monument Sketch:





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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1009 **Station Name:** CLSB-007

Monument Description:

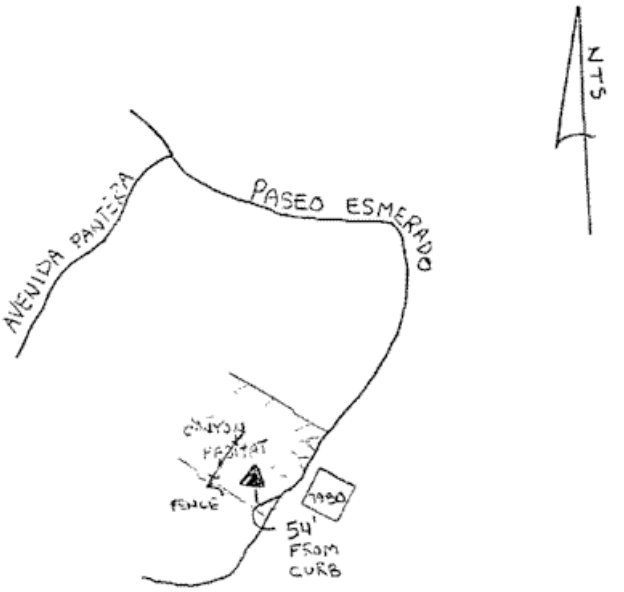
FD. ROD DRIVEN TO REFUSAL WITH CAP ON WEST SIDE OF PASEO ESMERADO AT ACCESS DRIVEWAY TO PROTECTED HABITAT AREA, 50' FROM CURB AND 20' FROM FENCE ON CANYON RIM.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 5/18/2001

Monument "To Reach" Description:

FROM THE INTERSECTION OF AVENIDA PANTERA AND PASEO ESMERADO GO SOUTH ON PASEO ESMERADO 0.3 MI. TO THE POINT ON THE NORTH SIDE AND ACROSS FROM 7980 PASEO ESMERADO. 54 FT. FORM CURB AND 21 FT. FROM HABITAT AREA FENCE AND 13 FT. EAST OF A "NO TRESPASSING" SIGN.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º3'49.93223"N
Longitude:	117º13'27.77527"W
Ellipsoid Height:	184.737
Northing:	1968260.857
Easting:	6263147.007
NGVD29 Elevation:	297.082
NAVD88 Elevation:	299.239
Combined Scale Factor	0.99995635
Convergence:	- 0 32 07.584
Horizontal Order:	FIRST

Monument Sketch:

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SURVEY CONTROL NETWORK

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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1010 **Station Name:** CLSB-012

Monument Description:

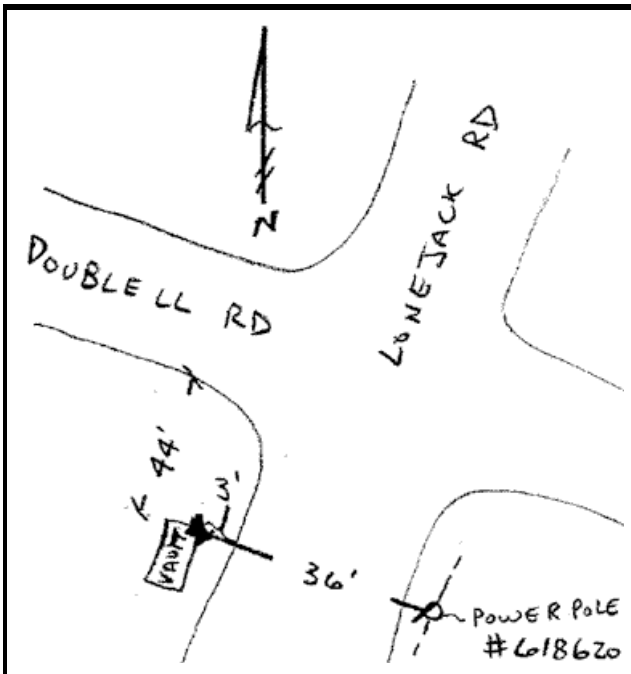
FD. 2.5" DISK IN THE NORTHEAST CORNER OF VAULT IN THE SOUTHWEST QUADRANT OF LONE JACK RD. AND DOUBLE LL RANCH RD. IN SAN MARCOS.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 5/18/2001

Monument "To Reach" Description:

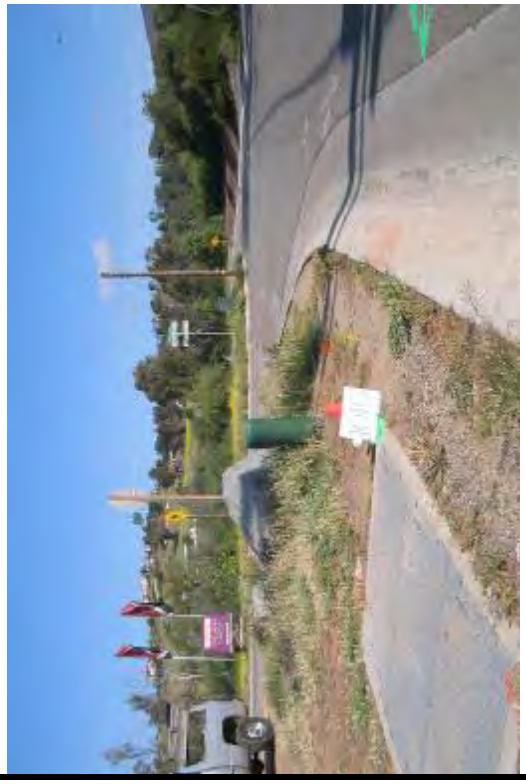
MONUMENT IS IN THE SOUTHWEST QUADRANT OF LONE JACK RD. AND DOUBLE LL RANCH RD. IN THE NORTHEAST CORNER OF VAULT. 44FT. SOUTH OF SOUTHERLY CURB OF DOUBLE LL RANCH RD. , 3 FT. WEST OF WESTERLY CURB OF LONE JACK RD. AND 36 FT. WESTERLY OF POWER POLE NO. 618620.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º3'56.30334"N
Longitude:	117º12'57.6556"W
Ellipsoid Height:	88.839
Northing:	1968880.903
Easting:	6265716.15
NGVD29 Elevation:	201
NAVD88 Elevation:	203.16
Combined Scale Factor	0.99996079
Convergence:	- 0 31 51.033
Horizontal Order:	FIRST

Monument Sketch:



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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1011 **Station Name:** CLSB-009

Monument Description:

FD. WELL MONUMENT IN THE CENTER OF THE SOUTHEAST END OF BULB CUL-DE-SAC OF SITIO BORDE.

Established By: HUNSAKER & ASSOCIATES SAN

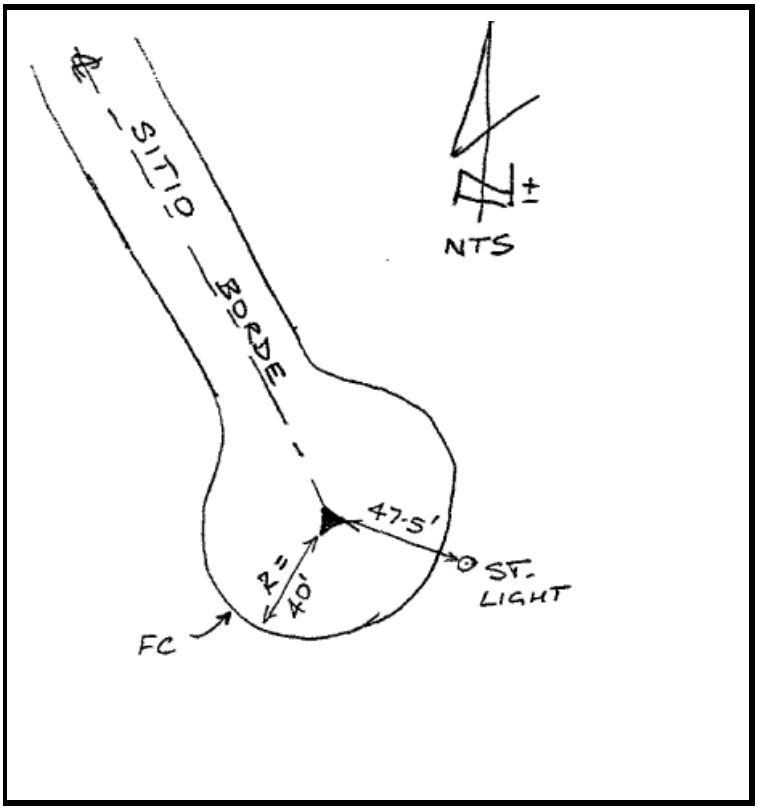
Date Established: 5/18/2001

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'29.57443"N
Longitude:	117º13'28.9607"W
Ellipsoid Height:	255.173
Northing:	1972268.243
Easting:	6263083.581
NGVD29 Elevation:	367.38
NAVD88 Elevation:	369.543
Combined Scale Factor	0.99995209
Convergence:	- 0 32 08.236
Horizontal Order:	FIRST

Monument "To Reach" Description:

MONUMENT IS IN CENTER OF THE SOUTHEAST END OF BULB CUL-DE-SAC OF SITIO BORDE, 0.1 MI. SOUTHEASTERLY OF AVENIDA DIESTRO AND 47.5 FT. NORTHWESTERLY OF A STREET LIGHT.

Monument Sketch:



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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1012 **Station Name:** ENC-12

Monument Description:

FD. 4" DIAMETER CONCRETE CYLINDER UP 1 FOOT WITH 3/8" PIN UP 1 INCH IN MOUND OF ROCKS.

Established By: HUNSAKER & ASSOCIATES SAN

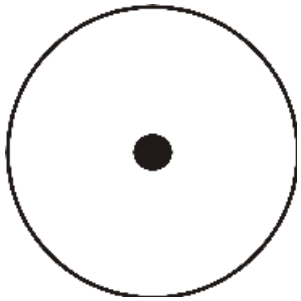
Date Established:

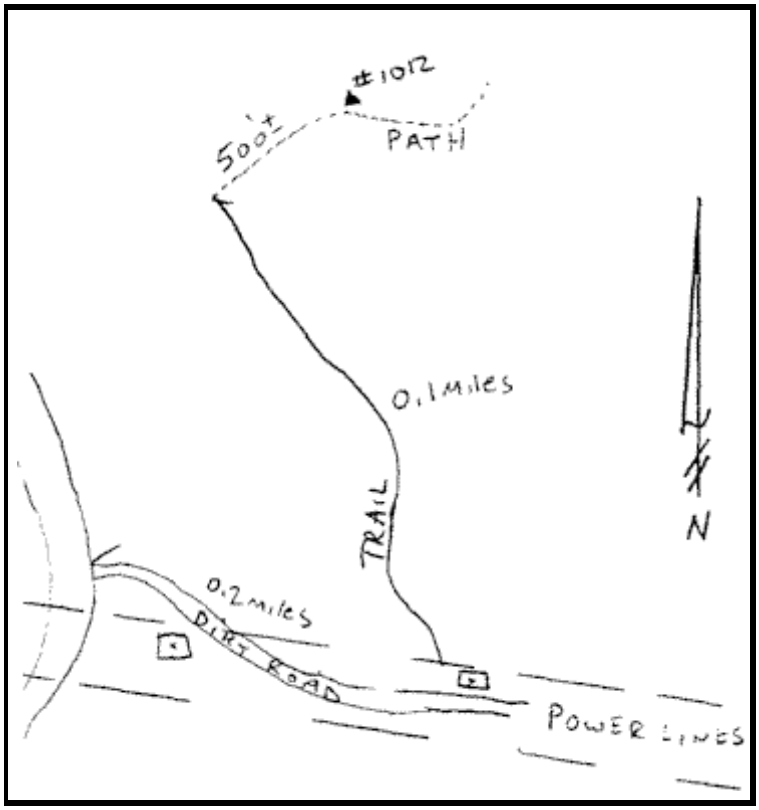
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º5'2.563409"N
Longitude:	117º12'58.08818"W
Ellipsoid Height:	579.238
Northing:	1975577.832
Easting:	6265741.392
NGVD29 Elevation:	691.149
NAVD88 Elevation:	693.314
Combined Scale Factor	0.99993588
Convergence:	- 0 31 51.271
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF RANCHO SANTA FE ROAD AND CAMINO JUNIPERO GO 0.3 MILES EASTERLY ON CAMINO JUNIPERO TO A SDG&E TRANSMISSION LINE. TURN LEFT ONTO DIRT ACCESS ROAD UNDER TRANSMISSION LINE GO SOUTHEAST ALONG DIRT ROAD 0.2 MILES TO 2'ND TRANSMISSION TOWER AND A DIRT ROAD TO THE LEFT, TURN LEFT GO NORTH UPHILL 0.1 MILES TO END OF DRIVABLE ROAD CONTINUE ON FOOT UP TRAIL 500 FEET TO THE MONUMENT. THE MONUMENT IS LOCATED 10 FEET NORTHERLY OF THE TRAIL.

Monument Sketch:





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Phone (760) 633-2770
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Point Number: 1013 **Station Name:** ENC-13

Monument Description:

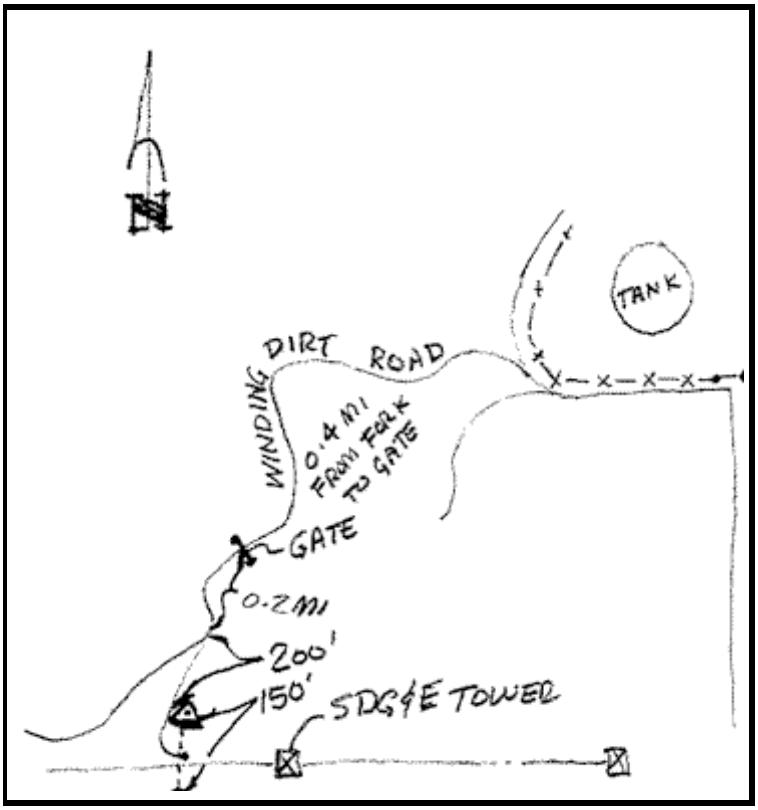
SET 2" IRON PIPE WITH 2.5" BRASS DISC WITH 8" CONCRETE COLLAR UP 6", 0.6 MILES WEST OF TWIN WATER TANKS AT NORTH END OF FORTUNA SUMMIT DRIVE ALONG DIRT ROAD THAT CROSSES CANYON, 21 FEET EAST OF THE WESTERLY FORK OF DIRT ROAD AND 3 FEET WEST OF TBAR POST.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

FROM LONE JACK RD AND FORTUNA RANCH RD GO EAST ON FORTUNA RANCH RD 1 MI TO THE END OF PAVEMENT. CONTINUE EAST ALONG DIRT RD 700 FT TO A FORK AT CANYON DE ORO RD, TAKE LEFT FORK GO NE'LY ALONG CANYON DE ORO RD 500 FT TO THE INTERSECTION WITH RANCHO SUMMIT DR. TURN LEFT GO NORTH 0.4 MI ON RANCHO SUMMIT DR TO A LOCKED GATE AT THE SECOND RESIDENCE ALONG ROAD. CONTINUE NORTH THROUGH GATE 0.5 MILES UP HILL TO THE FENCED WATER TANKS. TURN LEFT GO WEST 0.1 MI ALONG FENCE TO CORNER, TURN RIGHT GO NW ALONG FENCE 200 FT TO SECOND DIRT RD, TURN LEFT GO WEST DOWNHILL ON DIRT RD 0.4 MILES TO A LOCKED GATE, CONTINUE ALONG DIRT ROAD 0.2 MI TO A SPLIT IN THE ROAD, TAKE LEFT FORK GO SOUTH 200 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED 150 FT NORTH OF DUAL POWER POLES ADJACENT TO AN SDG&E TRANSMISSION LINE.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º4'41.63586"N
Longitude:	117º12'28.55095"W
Ellipsoid Height:	340.423
Northing:	1973439.595
Easting:	6268234.997
NGVD29 Elevation:	452.25
NAVD88 Elevation:	454.416
Combined Scale Factor	0.99994775
Convergence:	- 0 31 35.039
Horizontal Order:	FIRST

Monument Sketch:

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Point Number: 1014 **Station Name:** ENC-14

Monument Description:

FD. 2" IRON PIPE WITH 1 1/2" ALUMINUM COUNTY OF SAN DIEGO DISC STAMPED HORIZ. CONTROL SURVEY MONUMENT AT THE TOP OF SLOPE BETWEEN 2 DIRT ROADS HEADING NORTH INTO ABANDONED DUMP SITE NORTH OF THE NORTH END OF RANCHO SUMMIT DRIVE.

Established By: HUNSAKER & ASSOCIATES SAN

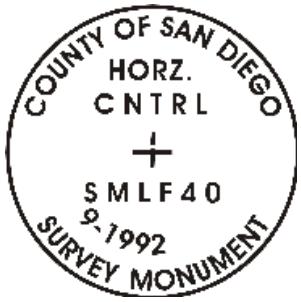
Date Established:

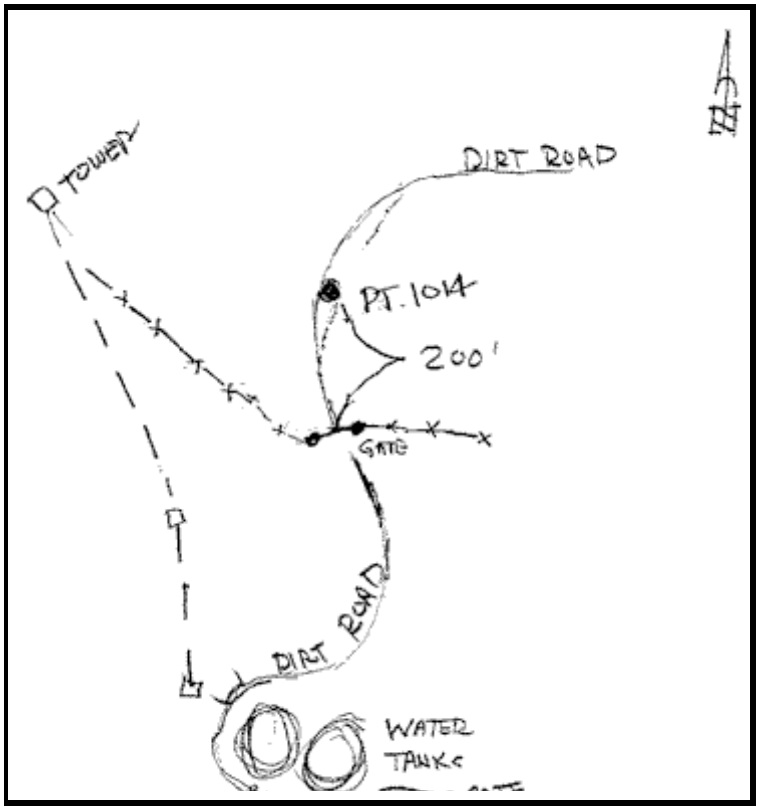
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º5'7.41312"N
Longitude:	117º11'55.83884"W
Ellipsoid Height:	724.765
Northing:	1976019.333
Easting:	6271042.049
NGVD29 Elevation:	836.316
NAVD88 Elevation:	838.481
Combined Scale Factor	0.99992882
Convergence:	- 0 31 17.063
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM CANYON DE ORO RD AND RANCHO SUMMIT DR. GO NORTH 0.4 MI ON RANCHO SUMMIT DRIVE TO A LOCKED GATE AT THE SECOND RESIDENCE. CONTINUE NORTH 0.5 MI UP HILL TO THE FENCED WATER TANKS. TURN LEFT GO WEST 0.1 MI ALONG FENCE TO COR, TURN RIGHT GO NW, NORTH AND NE 0.2 MI ALONG FENCE AROUND TANK TO THE NORTH SIDE OF THE SOUTH TANK AND A GRAVEL ROAD TO THE LEFT. TURN LEFT GO NORTH ALONG GRAVEL RD 0.3 MI TO A LOCKED GATE TO CLOSED COUNTY DUMP SITE, GO PAST GATE 200 FT TO THE MONUMENT IN THE SPLIT OF THE DIRT ROAD. THE MONUMENT IS LOCATED AT THE TOP OF SLOPE FOR THE LOWER ROAD, 5 FEET WEST OF THE EDGE OF UPPER GRAVEL ROAD, 3 FEET EAST OF THE TOP OF SLOPE, 13 FEET NORTH OF 18"X18" CONC. PEDESTAL FOR ELECTRIC BOX AND 1 FOOT EAST OF TBAR POST.

Monument Sketch:





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Fax (760) 633-2818

Point Number: 1015 **Station Name:**
Monument Description:
INTENTIONALLY DELETED

Established By:
Date Established:

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet
Latitude:
Longitude:
Ellipsoid Height:
Northing:
Easting:
NGVD29 Elevation:
NAVD88 Elevation:
Combined Scale Factor
Convergence:
Horizontal Order:

Monument "To Reach" Description:

Monument Sketch:

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Phone (760) 633-2770
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Point Number: 1016 **Station Name:** ENC-16

Monument Description:

SET 2" IRON PIPE WITH 2.5" CITY OF ENCINITAS BRASS DISC ON THE WEST SIDE OF CANYON DE ORO, 150 FEET NORTH OF PAINT MOUNTAIN ROAD AND 150 FEET SOUTH OF POWER LINES.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED 150 FEET NORTHERLY ALONG CANYON DE ORO FROM THE INTERSECTION WITH PAINT MOUNTAIN ROAD AND 16 FEET WESTERLY OF THE WESTERLY EDGE OF PAVEMENT.

GPS # 1016

A 16' ↓

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º4'11.80468"N
Longitude:	117º11'12.7314"W
Ellipsoid Height:	435.625
Northing:	1970366.072
Easting:	6274659.095
NGVD29 Elevation:	547.165
NAVD88 Elevation:	549.325
Combined Scale Factor	0.99994385
Convergence:	- 0 30 53.375
Horizontal Order:	FIRST

Monument Sketch:

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Phone (760) 633-2770
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Point Number: 1017 **Station Name:** ENC-17

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN DROP INLET ON THE NORTH SIDE OF FORTUNA RANCH ROAD AND 50 FEET SOUTH OF ADAM'S RUN.

Established By: HUNSAKER & ASSOCIATES SAN

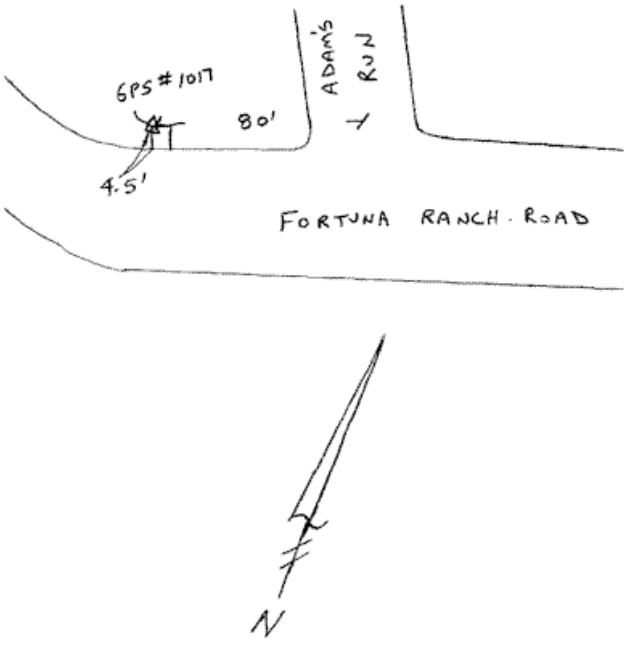
Date Established: 4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'56.73537"N
Longitude:	117º12'1.024007"W
Ellipsoid Height:	313.864
Northing:	1968880.278
Easting:	6270535.796
NGVD29 Elevation:	425.72
NAVD88 Elevation:	427.877
Combined Scale Factor	0.99995001
Convergence:	- 0 31 19.913
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE NORTHWESTERLY CORNER OF A DRAINAGE BOX INLET 80 FEET SOUTHWESTERLY ALONG FORTUNA RANCH ROAD FROM THE CENTERLINE INTERSECTION WITH ADAMS RUN, 16 FEET NORTHWESTERLY OF THE CENTER OF FORTUNA RANCH ROAD AND 4.5 FEET NORTHWESTERLY OF CURB.

Monument Sketch:



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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1018 **Station Name:** ENC-18

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN CONCRETE SLAB FOR FIRE HYDRANT, 800 FEET NORTH OF THE END OF BUMANN ROAD.

Established By: HUNSAKER & ASSOCIATES SAN

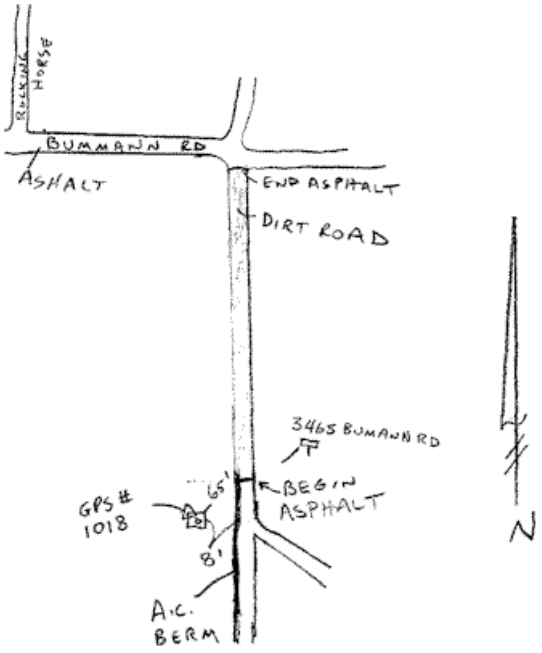
Date Established: 4/15/2004

Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º3'29.85549"N
Longitude:	117º12'8.617915"W
Ellipsoid Height:	195.766
Northing:	1966169.552
Easting:	6269864.753
NGVD29 Elevation:	307.765
NAVD88 Elevation:	309.922
Combined Scale Factor	0.99995628
Convergence:	- 0 31 24.086
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF BUMANN ROAD AND ROCKING HORSE CIRCLE, GO EASTERLY 300 FEET TO AN INTERSECTION TURN RIGHT GO SOUTH ONTO A DIRT ROAD 0.2 MILES TO THE BEGINNING OF AC PAVEMENT, A DIRT DRIVEWAY TO THE LEFT AND THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE NORTHWESTERLY CORNER OF A CONCRETE PEDESTAL FOR A FIRE HYDRANT, 8 FEET WEST OF AC BERM, 12 FEET SOUTHERLY OF THE BEGINNING OF PAVEMENT AND 65 FEET SOUTHWESTERLY OF ADDRESS SIGN ON FENCE "3465 BUMANN ROAD".

Monument Sketch:



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Phone (760) 633-2770
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Point Number: 1019 **Station Name:** ENC-19

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE EAST END OF A 1'X7' HEADWALL ON THE SOUTH SIDE OF CIRCA DE TIERRA, 210 FEET WEST OF THE CUL-DE-SAC AT THE SOUTH END OF ROAD AND 9.5 FEET OFF CURB.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

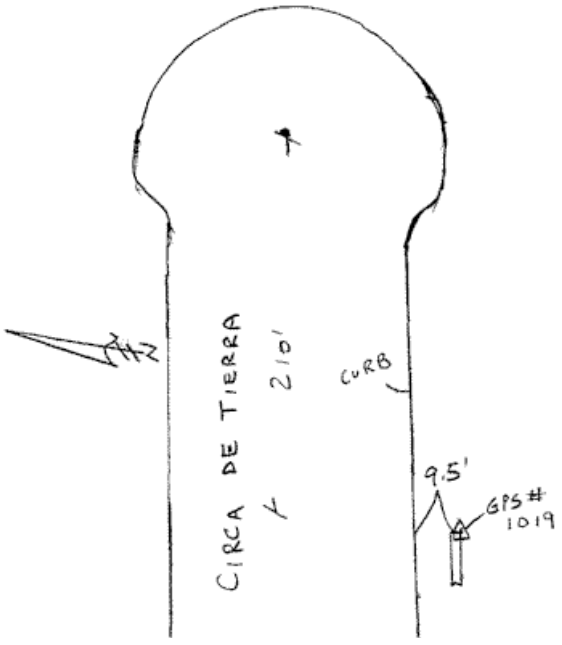
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º3'1.540924"N
Longitude:	117º13'3.818207"W
Ellipsoid Height:	-6.72
Northing:	1963351.198
Easting:	6265140.355
NGVD29 Elevation:	105.67
NAVD88 Elevation:	107.826
Combined Scale Factor	0.99996663
Convergence:	- 0 31 54.419
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF VAL SERENO DRIVE AND CIRCA DE TIERRA, GO NORTHEASTERLY ON CIRCA DE TIERRA 0.4 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE EAST END OF A 1 FOOT WIDE BY 7 FEET LONG HEADWALL, 210 FEET WESTERLY OF THE CENTER OF A CUL-DE-SAC, AND 9.5 FEET SOUTH OF THE SOUTHERLY CURB.

Monument Sketch:



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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1020 **Station Name:** ENC-20

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF CONCRETE PEDESTAL FOR FIRE HYDRANT ON THE EAST SIDE OF RANCHO SANTA FE ROAD AND 100 FEET SOUTH OF EL CAMINO DEL NORTE.

Established By: HUNSAKER & ASSOCIATES SAN

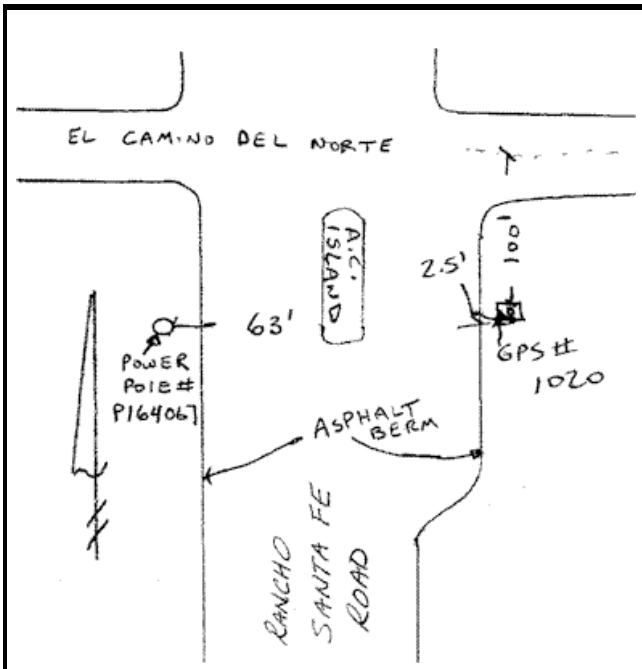
Date Established: 4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º2'59.04227"N
Longitude:	117º13'59.89789"W
Ellipsoid Height:	5.726
Northing:	1963143.331
Easting:	6260364.873
NGVD29 Elevation:	118.41
NAVD88 Elevation:	120.564
Combined Scale Factor	0.9999661
Convergence:	- 0 32 25.236
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE SOUTHWEST CORNER OF A CONCRETE PEDESTAL FOR A FIRE HYDRANT ON THE EAST SIDE OF RANCHO SANTA FE ROAD, 100 FEET SOUTHERLY OF THE MIDDLE OF EL CAMINO DEL NORTE, 2.5 FEET EASTERLY OF AN AC. BERM AND 63 FEET WEST OF POWER POLE NO. P164067.

Monument Sketch:



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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1021 **Station Name:** ENC-21

Monument Description:

FD. WELL MONUMENT WITH A 2.5" BRASS DISC STAMPED RCE9416 ON CENTERLINE OF VILLAGE PARK WAY AT A BEGINNING OF CURVE 340 FEET SOUTHWEST OF WILLOW SPRINGS DRIVE.

Established By: HUNSAKER & ASSOCIATES SAN

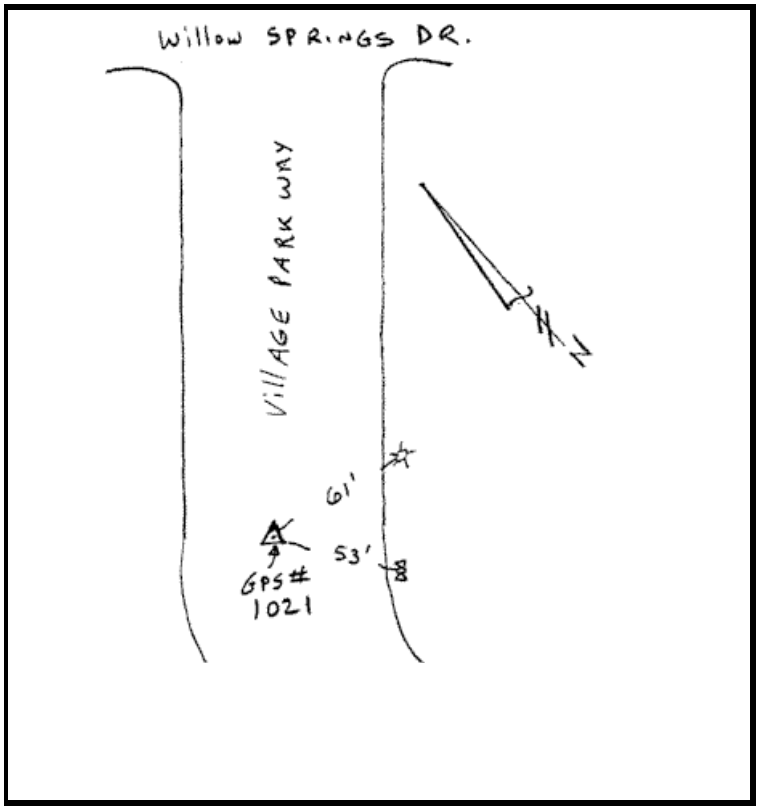
Date Established:

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'19.75599"N
Longitude:	117º14'38.9077"W
Ellipsoid Height:	149.354
Northing:	1965268.244
Easting:	6257064.577
NGVD29 Elevation:	262.17
NAVD88 Elevation:	264.323
Combined Scale Factor	0.99995874
Convergence:	- 0 32 46.673
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE MIDDLE OF VILLAGE PARK WAY, 340 FEET SOUTHERLY OF THE INTERSECTION WITH WILLOW SPRINGS DRIVE, 61 FEET SOUTHWESTERLY OF A STREET LIGHT AND 53 FEET NORTHWESTERLY OF A FIRE HYDRANT.

Monument Sketch:



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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1022 **Station Name:** ENC-22

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN TOP OF CURB NOSE IN THE MIDDLE OF EL CAMINO REAL IN THE 3'RD ISLAND APPROXIMATELY 700 FEET SOUTH OF GARDEN VIEW ROAD.

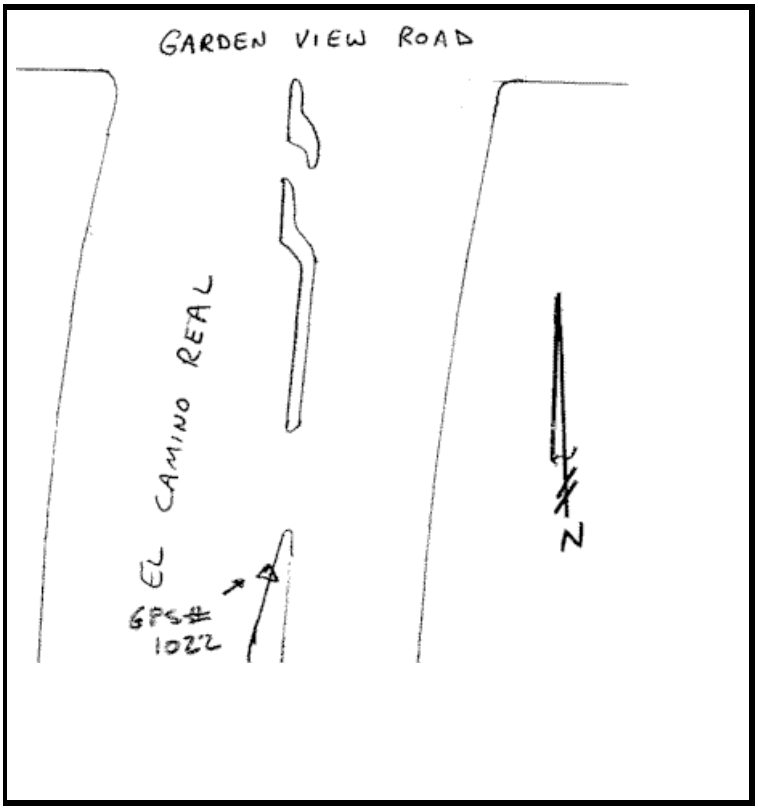
Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE WESTERLY CURB OF THE 3'RD MEDIAN ISLAND BEING 700 FEET SOUTHERLY FROM THE MIDDLE OF GARDEN VIEW ROAD AND 10 FEET SOUTHERLY OF CURB NOSE.

DESTROYED



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º3'23.72283"N
Longitude:	117º15'44.82821"W
Ellipsoid Height:	26.818
Northing:	1965723.139
Easting:	6251458.126
NGVD29 Elevation:	139.97
NAVD88 Elevation:	142.124
Combined Scale Factor	0.99996451
Convergence:	- 0 33 22.897
Horizontal Order:	FIRST

Monument Sketch:

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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1023 **Station Name:** 134WCCS2

Monument Description:

FD. 2." DISK IN MEDIAN ISLAND OF LEUCADIA BLVD. 141 FT. + WESTERLY OF LEFT TURN ISLAND GORE NOSE AT QUAIL GARDENS DRIVE

Established By: COUNTY OF SAN DIEGO

Date Established:

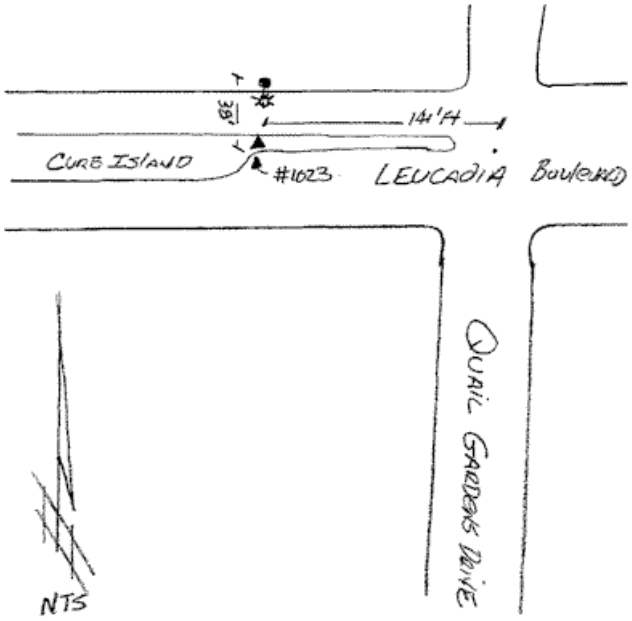
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'55.14932"N
Longitude:	117º16'44.47678"W
Ellipsoid Height:	204.893
Northing:	1968948.942
Easting:	6246412.993
NGVD29 Elevation:	318.266
NAVD88 Elevation:	320.417
Combined Scale Factor	0.99995526
Convergence:	- 0 33 55.675
Horizontal Order:	FIRST

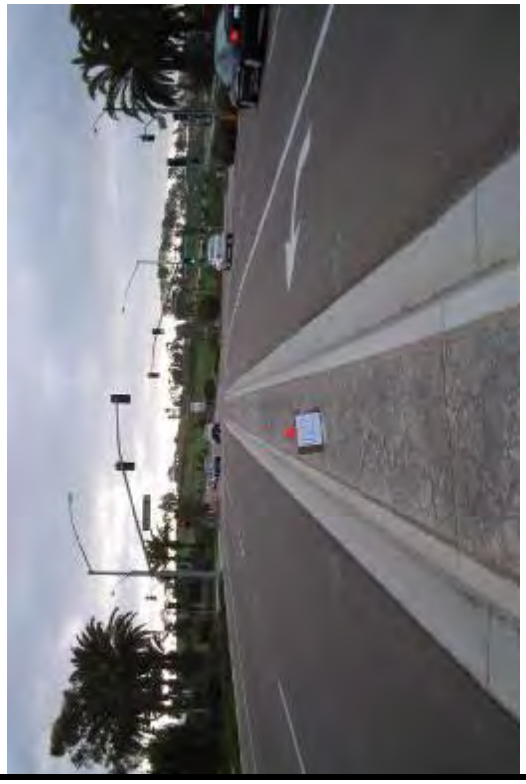
Monument "To Reach" Description:

MONUMENT IS 141 FT. WESTERLY OF LEFT TURN ISLAND GORE NOSE OF LEUCADIA BLVD. AT QUAIL GARDENS DRIVE. 38 FT. SOUTHERLY OF A STREET LIGHT.

Monument Sketch:

SD CO SURVEYOR
SURV. MON
134WCCS2
1999





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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1024 **Station Name:** 134WCCS1

Monument Description:

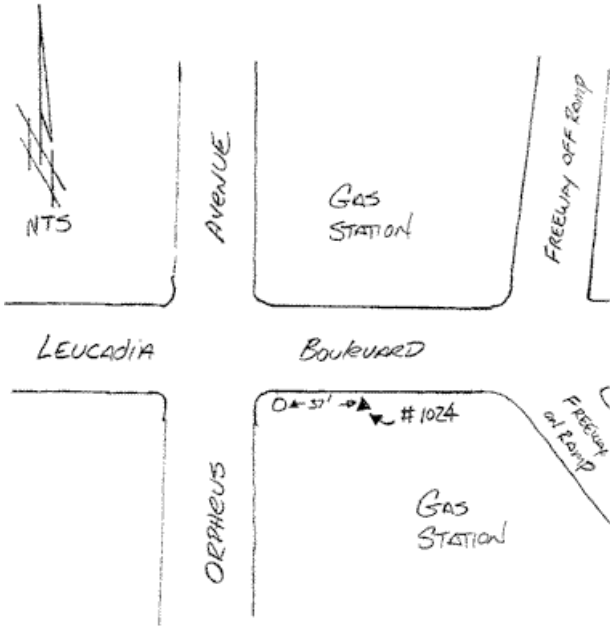
FD. 2.5" DISK IN SIDEWALK IN THE SOUTHEAST QUADRANT LEUCADIA BLVD. AND ORPHEUS AVENUE, 37' EASTERLY OF TRAFFIC SIGNAL.

Established By: COUNTY OF SAN DIEGO

Date Established:

Monument "To Reach" Description:

MONUMENT IS IN ENCINITAS AT THE SOUTHEAST QUADRANT OF THE INTERSECTION OF LEUCADIA BLVD. AND ORPHEUS ST. IN THE SOUTHERLY SIDEWALK OF LEUCADIA BLVD. 3 FT. FROM FACE OF CURB AND 37 FT. EASTERLY OF TRAFFIC SIGNAL ON THE CORNER.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'53.78226"N
Longitude:	117º17'36.30436"W
Ellipsoid Height:	62.727
Northing:	1968854.614
Easting:	6242001.192
NGVD29 Elevation:	176.391
NAVD88 Elevation:	178.543
Combined Scale Factor	0.9999621
Convergence:	- 0 34 24.155
Horizontal Order:	FIRST

Monument Sketch:

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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1025 **Station Name:** ENC-25

Monument Description:

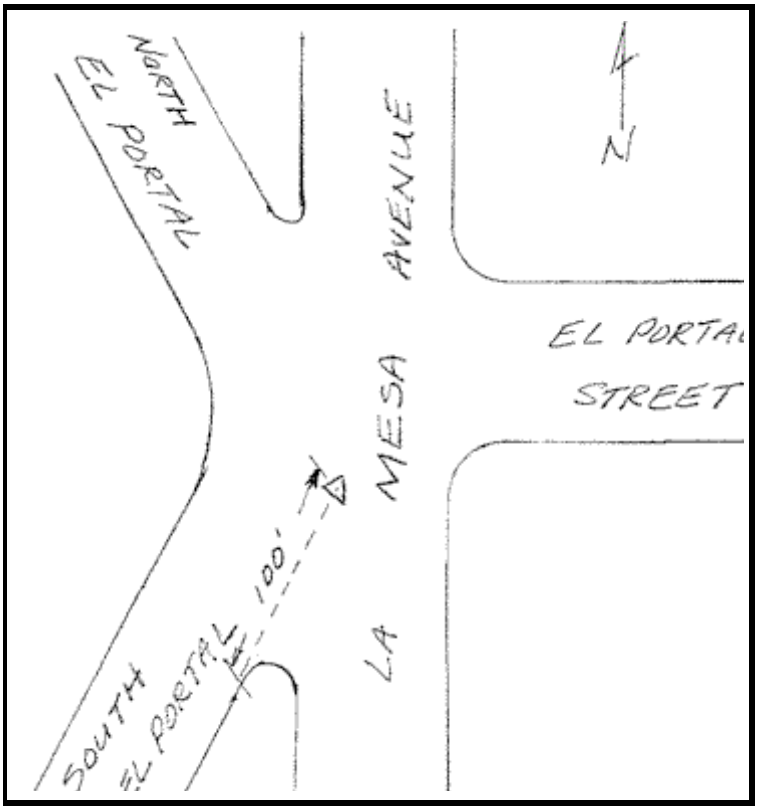
SET 2.5" CITY OF ENCINITAS BRASS DISC IN WELL MONUMENT IN THE INTERSECTION OF SOUTH EL PORTAL STREET AND LA MESA AVENUE, 100 FEET NORTH ALONG THE SOUTHEASTERLY CURB LINE OF SOUTH EL PORTAL STREET.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE MIDDLE OF THE INTERSECTION OF SOUTH EL PORTAL STREET AND LA MESA AVENUE.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'21.08803"N
Longitude:	117º17'59.56625"W
Ellipsoid Height:	-55.445
Northing:	1965570.266
Easting:	6239988.375
NGVD29 Elevation:	58.449
NAVD88 Elevation:	60.601
Combined Scale Factor	0.9999685
Convergence:	- 0 34 36.938
Horizontal Order:	FIRST

Monument Sketch:

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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1026 **Station Name:** ENC-26

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE SOUTHWEST CORNER OF A DRAINAGE INLET BOX AT THE WEST SIDE OF PARKING LOT FOR OFFICE BUILDINGS ON THE SOUTH SIDE OF SAXONY PLACE, 200 FEET WEST OF SAXONY ROAD.

Established By: HUNSAKER & ASSOCIATES SAN

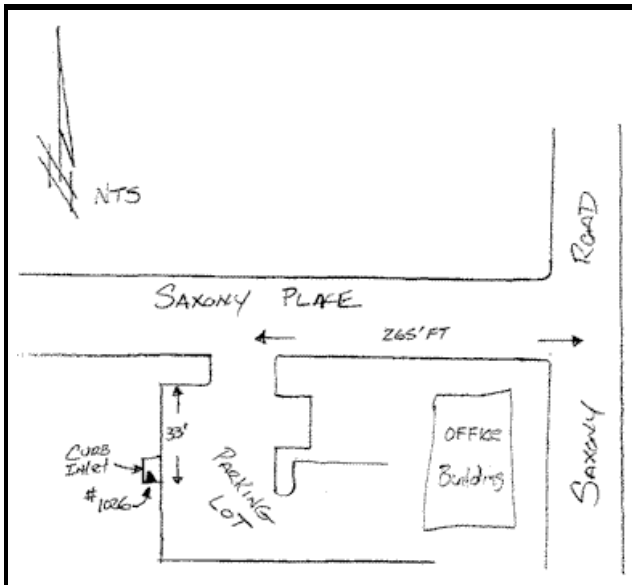
Date Established: 4/15/2004

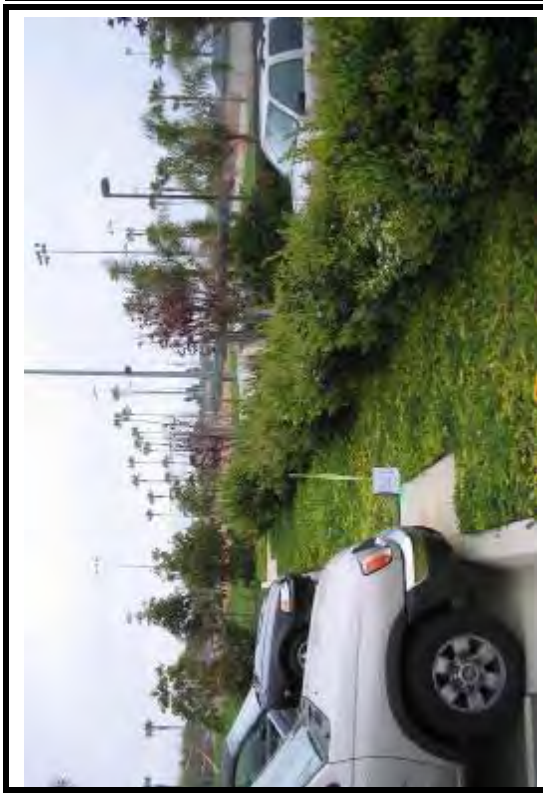
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º3'16.94918"N
Longitude:	117º17'11.48965"W
Ellipsoid Height:	59.399
Northing:	1965111.036
Easting:	6244075.873
NGVD29 Elevation:	173.04
NAVD88 Elevation:	175.189
Combined Scale Factor	0.99996311
Convergence:	- 0 34 10.519
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF SAXONY ROAD AND SAXONY PLACE, GO WEST ON SAXONY PLACE 265 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE SOUTHWEST CORNER OF A DRAINAGE BOX INLET AT THE WEST END OF THE FIRST PARKING LOT, 2 FEET WEST OF CURB AND 33 FEET SOUTH OF THE NORTHWEST CORNER OF THE PARKING LOT.

Monument Sketch:





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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1027 **Station Name:** ENC-27

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN TOP OF CURB AT THE NORTH END OF HANDICAP RAMP ON THE NORTH SIDE OF CYPRESS HILLS DRIVE AT PASEO DE LAS VERDES.

Established By: HUNSAKER & ASSOCIATES SAN

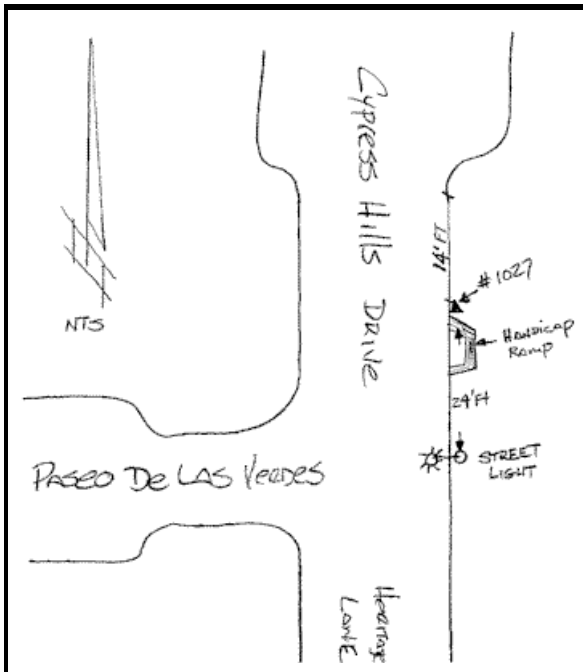
Date Established: 4/15/2004

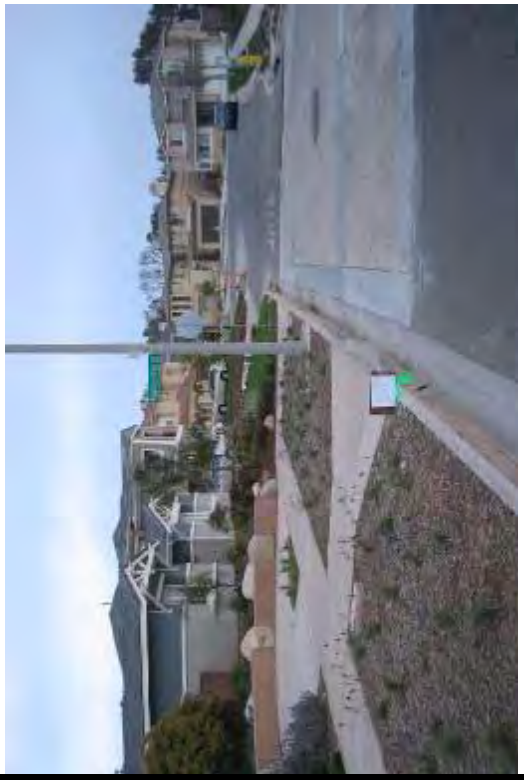
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º3'21.02753"N
Longitude:	117º16'26.84418"W
Ellipsoid Height:	197.031
Northing:	1965485.663
Easting:	6247879.619
NGVD29 Elevation:	310.417
NAVD88 Elevation:	312.567
Combined Scale Factor	0.99995642
Convergence:	- 0 33 45.986
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE TOP OF THE EASTERLY CURB AT THE INTERSECTION OF PASEO DE LAS VERDES AND CYPRESS HILLS DRIVE AT THE NORTH END OF A HANDICAP RAMP AND 24' NORTHERLY OF A STREET LIGHT.

Monument Sketch:





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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1028 **Station Name:** ENC-28

Monument Description:

FD. WELL MONUMENT AT CENTERLINE INTERSECTION OF TURNER AVENUE AND SHIELDS AVENUE.

Established By: HUNSAKER & ASSOCIATES SAN

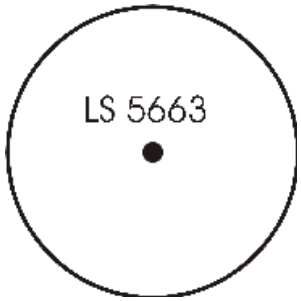
Date Established:

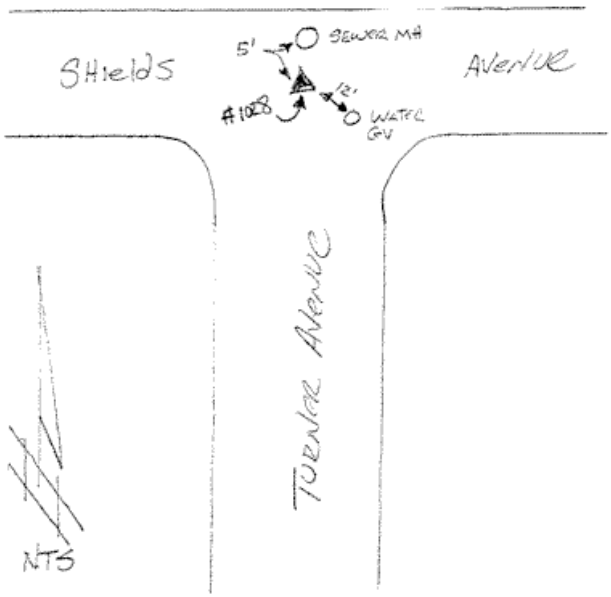
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º3'0.079692"N
Longitude:	117º15'17.87815"W
Ellipsoid Height:	135.247
Northing:	1963311.462
Easting:	6253728.722
NGVD29 Elevation:	248.33
NAVD88 Elevation:	250.48
Combined Scale Factor	0.99995988
Convergence:	- 0 33 08.088
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE CENTERLINE INTERSECTION OF TURNER AVENUE AND SHIELDS AVENUE, 5 FEET SOUTH OF A SEWER MANHOLE AND 12 FEET NORTHWESTERLY OF A WATER GATE VALVE.

Monument Sketch:





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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1029 **Station Name:** ENC-29

Monument Description:

FD. WELL MONUMENT IN AC. ON CENTERLINE OF ENCINITAS BOULEVARD, 300' EAST OF INTERSECTION WITH WILLOW SPRINGS AT BEGINNING OF LEFT TURN POCKET.

Established By: HUNSAKER & ASSOCIATES SAN

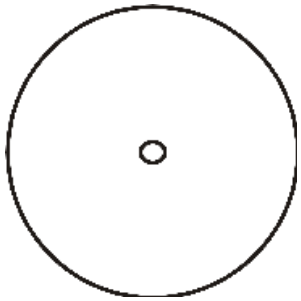
Date Established:

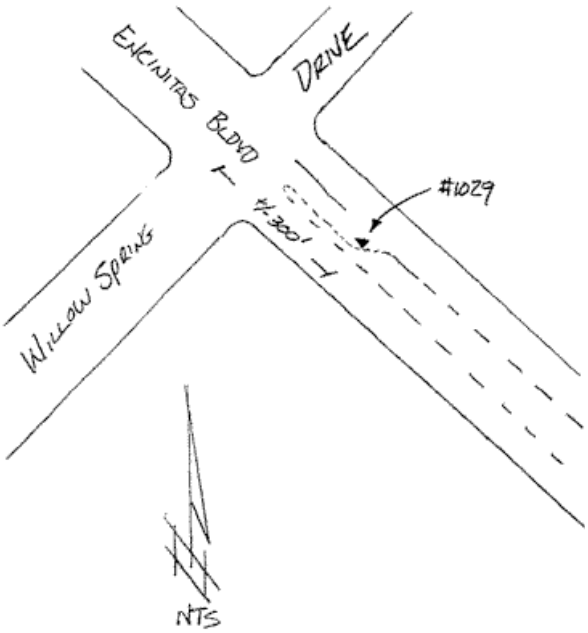
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º2'29.26913"N
Longitude:	117º14'38.74311"W
Ellipsoid Height:	102.97
Northing:	1960165.668
Easting:	6257029.935
NGVD29 Elevation:	215.95
NAVD88 Elevation:	218.103
Combined Scale Factor	0.99996217
Convergence:	- 0 32 46.582
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE SOUTHEAST END OF THE LEFT TURN POCKET FROM NORTHBOUND ENCINITAS BOULEVARD TO WILLOW SPRINGS DRIVE WESTBOUND.

Monument Sketch:





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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1030 **Station Name:** ENC-30

Monument Description:

FD. WELL MONUMENT AT CENTER OF CUL-DE-SAC, NORTH END OF OAK CREST PARK DRIVE AT ENTRANCE TO OAK CREST MIDDLE SCHOOL.

Established By: HUNSAKER & ASSOCIATES SAN

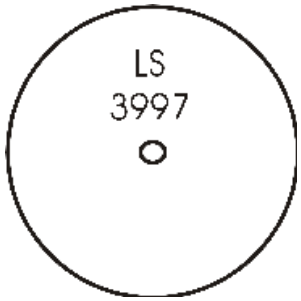
Date Established:

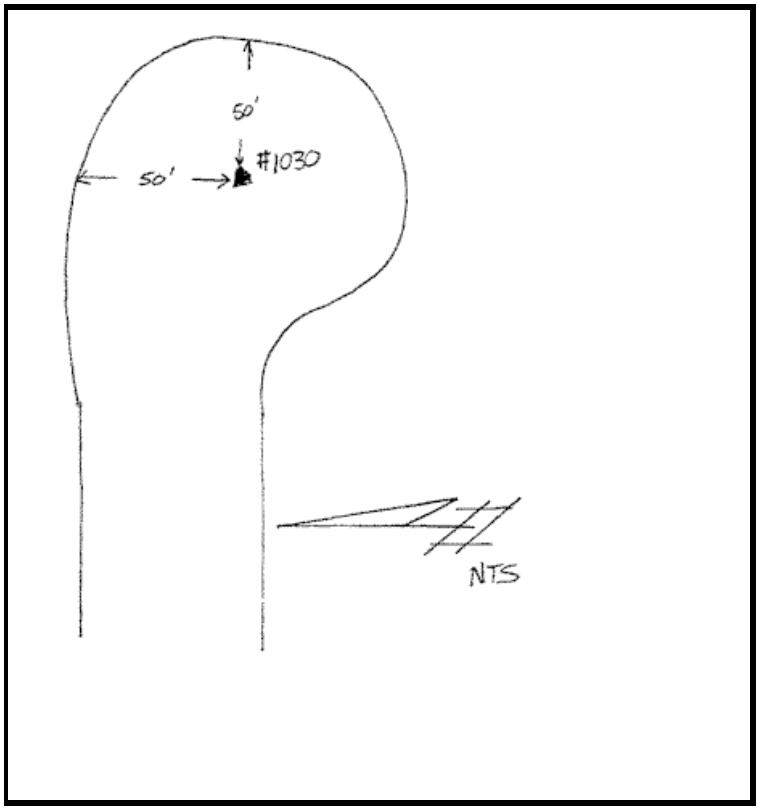
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º2'37.31437"N
Longitude:	117º15'58.25528"W
Ellipsoid Height:	272.961
Northing:	1961044.005
Easting:	6250269.682
NGVD29 Elevation:	386.33
NAVD88 Elevation:	388.479
Combined Scale Factor	0.99995384
Convergence:	- 0 33 30.276
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE CENTER OF A 50 FOOT CURB RADIUS AT THE ENTRANCE TO THE OAK CREST MIDDLE SCHOOL.

Monument Sketch:





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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1031 **Station Name:** ENC-31

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE NORTHWEST CORNER OF DRAINAGE BOX ON NORTH SIDE OF ENCINITAS BOULEVARD AND 700 FEET EAST OF WESTLAKE STREET.

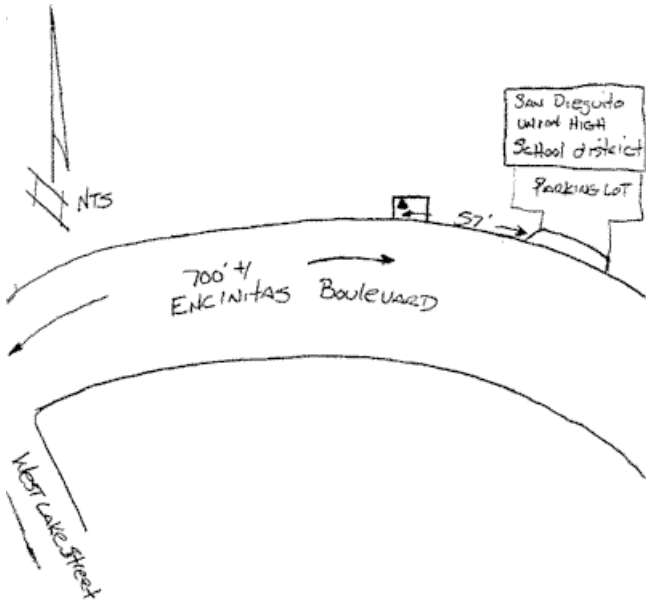
Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º2'55.71902"N
Longitude:	117º16'36.59662"W
Ellipsoid Height:	67.333
Northing:	1962936.036
Easting:	6247024.425
NGVD29 Elevation:	180.85
NAVD88 Elevation:	182.995
Combined Scale Factor	0.99996323
Convergence:	- 0 33 51.345
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF ENCINITAS BOULEVARD AND WESTLAKE STREET GO EAST 700 FEET ALONG ENCINITAS BOULEVARD TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE NORTHWEST CORNER OF A DRAINAGE BOX CURB INLET ON THE NORTH SIDE OF ENCINITAS BOULEVARD 4.5 FEET NORTH OF CURB AND 57 FEET WEST OF DRIVEWAY INTO THE SAN DIEGITO UNION HIGH SCHOOL DISTRICT OFFICES.

Monument Sketch:



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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1032 **Station Name:** ENC-32

Monument Description:

FD. 2" SD. CO. ENG. DEPT. BRASS DISC SET IN TOP OF CURB EAST SIDE OF VULCAN AVENUE, 200 FEET NORTH OF E STREET.

Established By: HUNSAKER & ASSOCIATES SAN

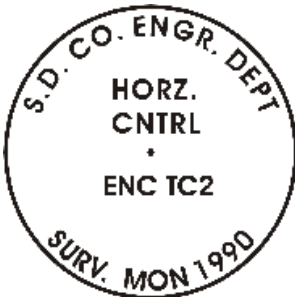
Date Established:

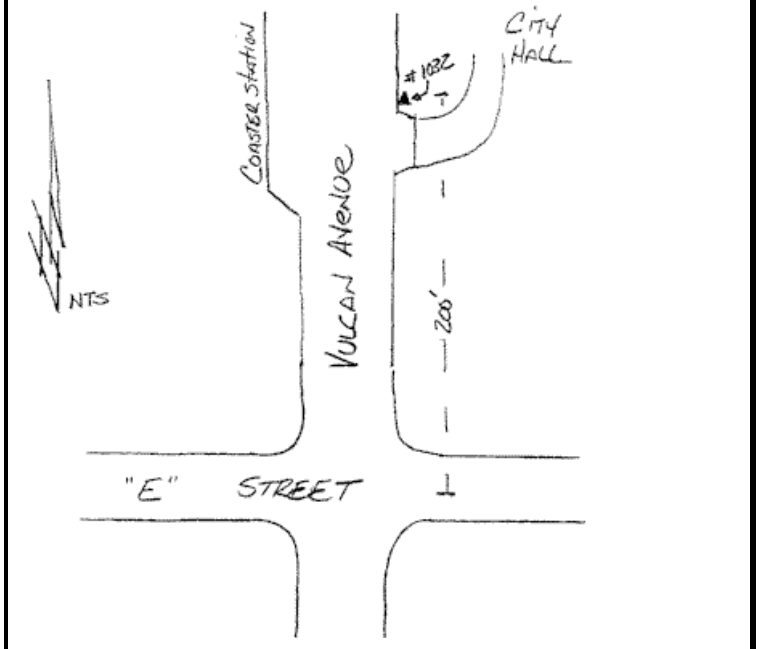
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º2'43.37287"N
Longitude:	117º17'32.63929"W
Ellipsoid Height:	-24.004
Northing:	1961735.615
Easting:	6242241.939
NGVD29 Elevation:	89.86
NAVD88 Elevation:	92.004
Combined Scale Factor	0.9999679
Convergence:	- 0 34 22.141
Horizontal Order:	FIRST

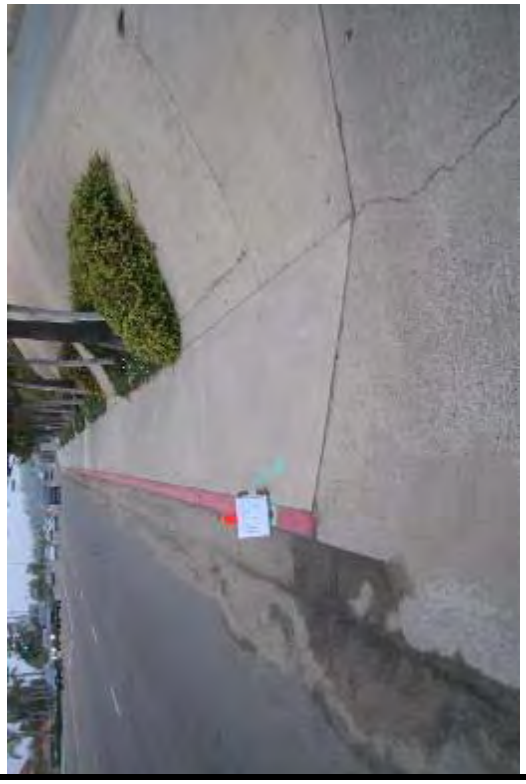
Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE TOP OF EAST CURB OF VULCAN AVENUE 200 FEET NORTH OF E STREET AND 2.5 FEET NORTH OF THE DRIVEWAY INTO THE ENCINTAS CITY ADMINISTRATION OFFICES.

Monument Sketch:







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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1033 **Station Name:** ENC-33

Monument Description:

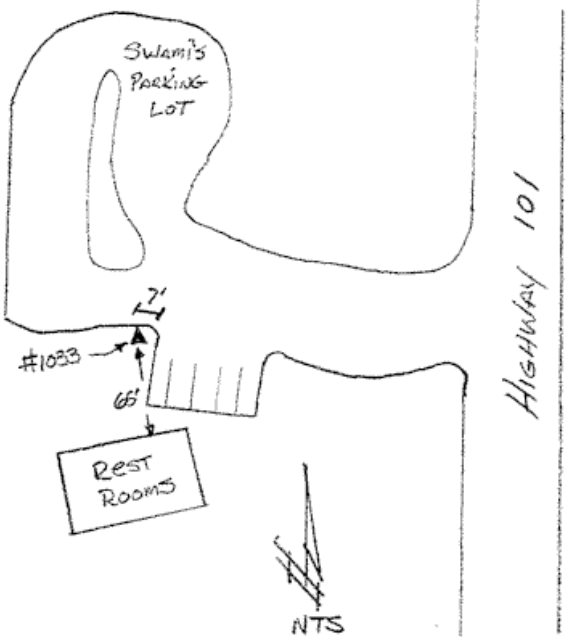
SET 2.5" CITY OF ENCINITAS BRASS DISC IN CURB ON THE SOUTH SIDE OF THE PARKING LOT FOR THE CITY OF ENCINITAS SWAMIS PARK IN RED CURB NORTH OF RESTROOMS.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

FROM HE INTERSECTION OF CHESTERFIELD DRIVE AND HIGHWAY 101 GO NORTH 1.2 MILES TO THE ENTRANCE TO SWAMI'S CITY PARK, TURN LEFT INTO PARKING LOT AND THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE TOP OF CURB ON THE SOUTH SIDE OF THE PARKING LOT ADJACENT TO THE RESTROOMS, 65 FEET NORTH OF RESTROOMS AND 7 FEET WEST OF PARKING BAY.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º2'5.329634"N
Longitude:	117º17'30.46162"W
Ellipsoid Height:	-34.041
Northing:	1957888.951
Easting:	6242388.878
NGVD29 Elevation:	79.93
NAVD88 Elevation:	82.081
Combined Scale Factor	0.99996932
Convergence:	- 0 34 20.945
Horizontal Order:	FIRST

Monument Sketch:

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SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1034 **Station Name:** ENC-34

Monument Description:

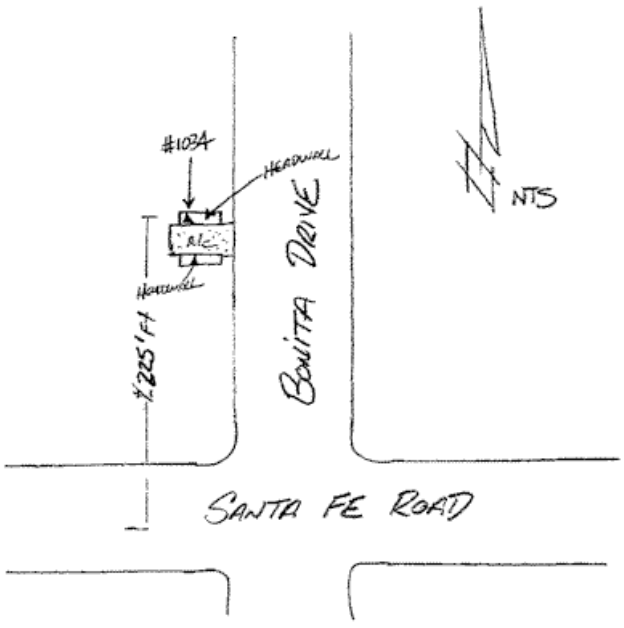
SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE WEST END OF A 1'X5' HEADWALL ON THE NORTH END OF PIPE UNDER DRIVEWAY ON THE WEST SIDE OF BONITA DRIVE, 225 FEET NORTH OF SANTA FE DRIVE.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN THE WEST END OF THE NORTHERLY HEADWALL FOR A PIPE UNDER A DRIVEWAY ON THE WEST SIDE OF BONITA DRIVE 225 FEET NORTH OF THE MIDDLE OF SANTA FE ROAD.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º2'12.91573"N
Longitude:	117º16'22.58958"W
Ellipsoid Height:	166.999
Northing:	1958598.426
Easting:	6248174.178
NGVD29 Elevation:	280.574
NAVD88 Elevation:	282.723
Combined Scale Factor	0.99995951
Convergence:	- 0 33 43.648
Horizontal Order:	FIRST

Monument Sketch:

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Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1035 **Station Name:** ENC-35

Monument Description:

FD. WELL MONUMENT AT CENTER OF CUL-DE-SAC, EAST END OF ORANGE VIEW DRIVE.

Established By: HUNSAKER & ASSOCIATES SAN

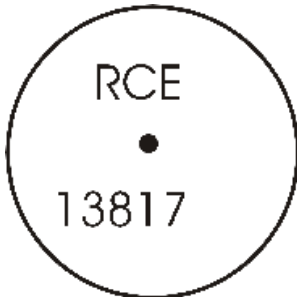
Date Established:

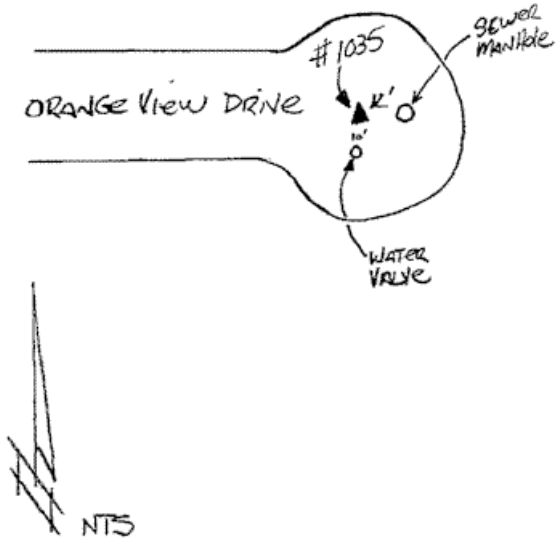
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º2'8.54187"N
Longitude:	117º15'16.52875"W
Ellipsoid Height:	127.849
Northing:	1958101.705
Easting:	6253793.387
NGVD29 Elevation:	241.09
NAVD88 Elevation:	243.238
Combined Scale Factor	0.99996149
Convergence:	- 0 33 07.346
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE CENTER OF THE CUL-DE-SAC AT THE EAST END OF ORANGE VIEW DRIVE, 12 FEET WEST OF A SEWER MANHOLE AND 10 FEET NORTH OF A WATER GATE VALVE.

Monument Sketch:





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Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1036 **Station Name:** ENC-36

Monument Description:

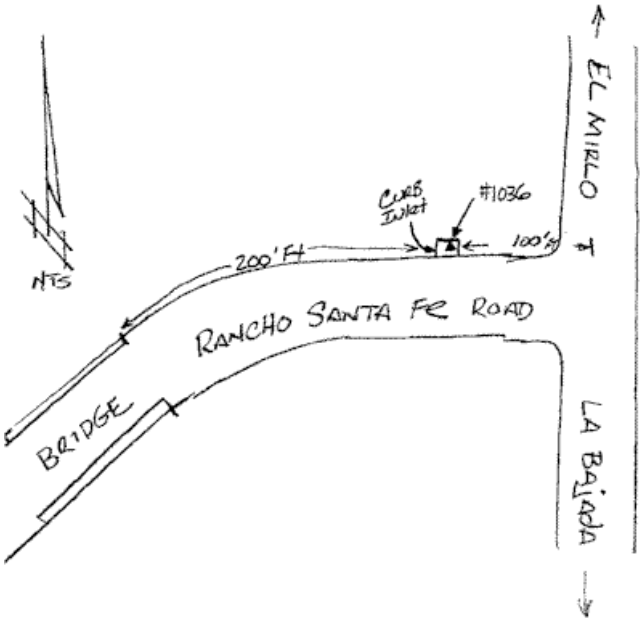
SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE NORTHEAST CORNER OF DRAINAGE INLET ON THE NORTH SIDE OF RANCHO SANTA FE ROAD, 200' WEST OF THE INTERSECTION WITH LA BAJADA AND EL MIRLO.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE NORTHSIDE OF RANCHO SANTA FE ROAD, 200 FEET WEST OF THE INTERSECTION WITH LA BAJADA AND EL MIRLO, 200 FEET EASTERLY OF THE EAST END OF THE RANCHO SANTA FE ROAD BRIDGE OVER ESCONDIDO CREEK AND 4.5 FEET NORTH OF CURB.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º2'1.233183"N
Longitude:	117º14'5.607246"W
Ellipsoid Height:	-77.744
Northing:	1957305.454
Easting:	6259823.741
NGVD29 Elevation:	35.16
NAVD88 Elevation:	37.309
Combined Scale Factor	0.99997151
Convergence:	- 0 32 28.373
Horizontal Order:	FIRST

Monument Sketch:

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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1037 **Station Name:** ENC-37

Monument Description:

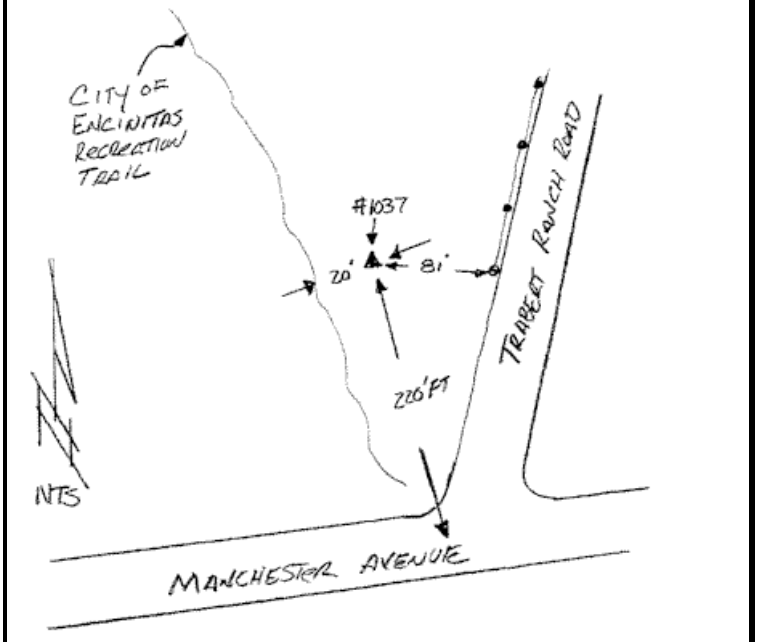
SET 2" IRON PIPE WITH CONCRETE COLLAR AND 2.5" CITY OF ENCINITAS BRASS DISC 220 FEET NORTH OF MANCHESTER AVENUE AND 85 FEET WEST OF TRABERT RANCH ROAD.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED 220 FEET NORTH OF MANCHESTER AVENUE, 85 FEET WEST OF TRABERT RANCH ROAD, 20 FEET EAST OF A CITY MAINTAINED TRAIL AND 81 FEET WEST OF THE SOUTHERLY END OF A WOOD SPLIT RAIL FENCE.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'45.22778"N
Longitude:	117º14'36.50699"W
Ellipsoid Height:	-59.691
Northing:	1955712.83
Easting:	6257177.865
NGVD29 Elevation:	53.42
NAVD88 Elevation:	55.569
Combined Scale Factor	0.99997106
Convergence:	- 0 32 45.353
Horizontal Order:	FIRST

Monument Sketch:

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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1038 **Station Name:** ENC-38

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN NE CORNER OF DRAINAGE CURB INLET ON THE EAST SIDE OF MANCHESTER AVENUE O.1 MILE SOUTH OF THE INTERSECTION WITH EL CAMINO REAL .

Established By: HUNSAKER & ASSOCIATES SAN

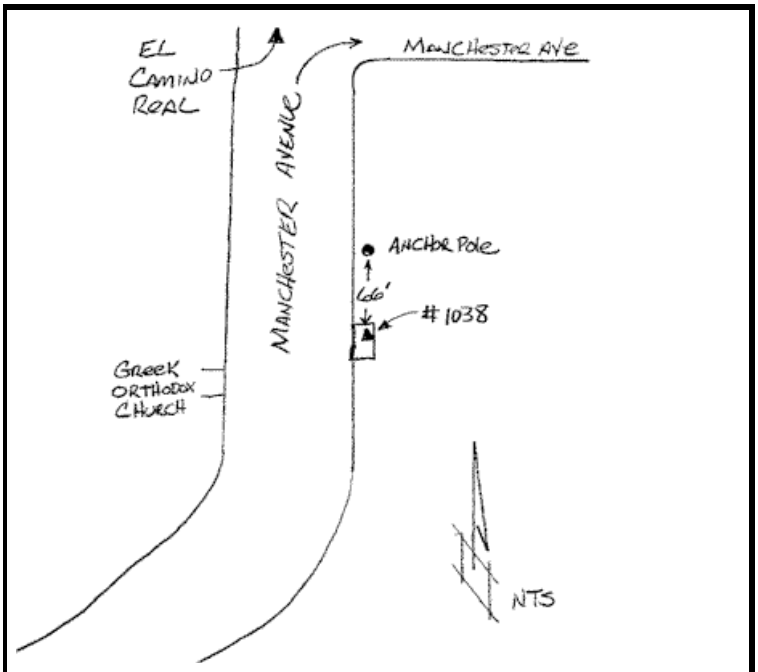
Date Established: 4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'8.892039"N
Longitude:	117º15'19.53597"W
Ellipsoid Height:	-78.074
Northing:	1952075.692
Easting:	6253479.259
NGVD29 Elevation:	35.37
NAVD88 Elevation:	37.521
Combined Scale Factor	0.99997288
Convergence:	- 0 33 08.999
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF EL CAMINO REAL AND MANCHESTER AVENUE GO SOUTH ON MANCHESTER AVENUE 0.1 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE NORTHEAST CORNER OF A DRAINAGE CURB INLET, 4.5 FEET FROM CURB AND 66 FEET SOUTH OF AN ANCHOR POLE.

Monument Sketch:



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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1039 **Station Name:** ENC-39

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN THE TOP OF CURB, NORTHWEST QUADRANT OF BIRMINGHAM DRIVE AND LAKE DRIVE IN THE MIDDLE OF RETURN.

Established By: HUNSAKER & ASSOCIATES SAN

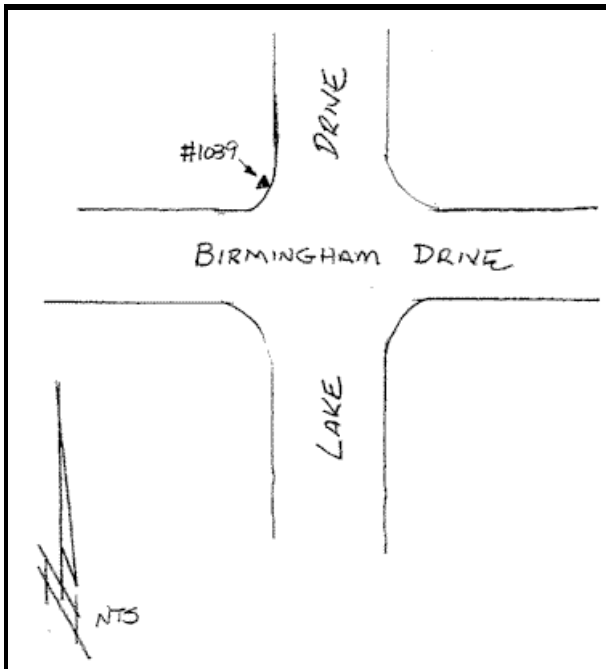
Date Established: 4/15/2004

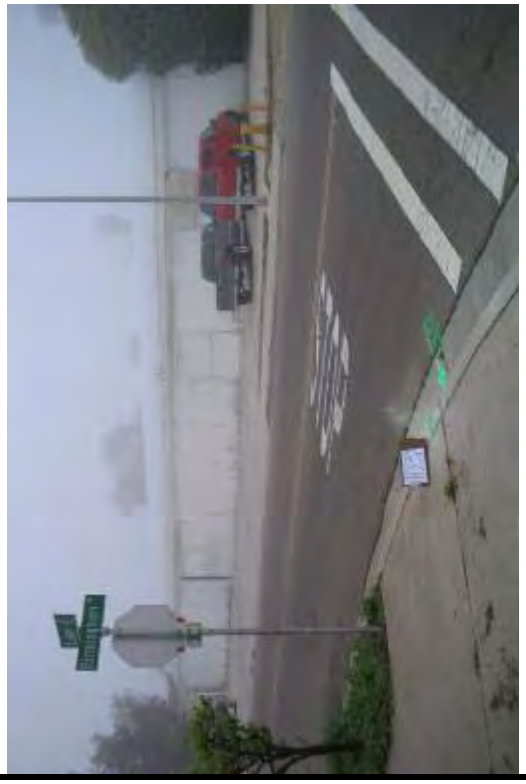
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'31.73741"N
Longitude:	117º15'59.51433"W
Ellipsoid Height:	208.253
Northing:	1954417.55
Easting:	6250097.897
NGVD29 Elevation:	321.833
NAVD88 Elevation:	323.983
Combined Scale Factor	0.99995858
Convergence:	- 0 33 30.967
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE NORTHWEST QUADRANT OF BIRMINGHAM DRIVE AND LAKE DRIVE, 35 FEET NORTH OF THE CENTER OF BIRMINGHAM DRIVE AND 15 FEET WEST OF THE CENTER OF LAKE DRIVE.

Monument Sketch:





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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1040 **Station Name:** ENC-40

Monument Description:

FD. WELL MONUMENT AT THE CENTER OF CUL-DE-SAC, SOUTH END OF BULRUSH LANE.

Established By: HUNSAKER & ASSOCIATES SAN

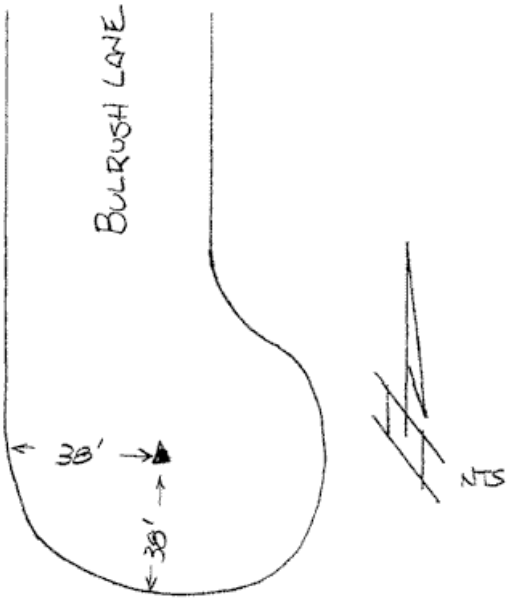
Date Established: 4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'5.763073"N
Longitude:	117º16'14.1565"W
Ellipsoid Height:	106.36
Northing:	1951804.65
Easting:	6248825.615
NGVD29 Elevation:	220.097
NAVD88 Elevation:	222.245
Combined Scale Factor	0.99996414
Convergence:	- 0 33 39.014
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED AT THE CENTER OF A 38 FOOT CURB RADIUS CUL-DE-SAC AT THE SOUTH END OF BULRUSH LANE.

Monument Sketch:



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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1041 **Station Name:** ENC-41

Monument Description:

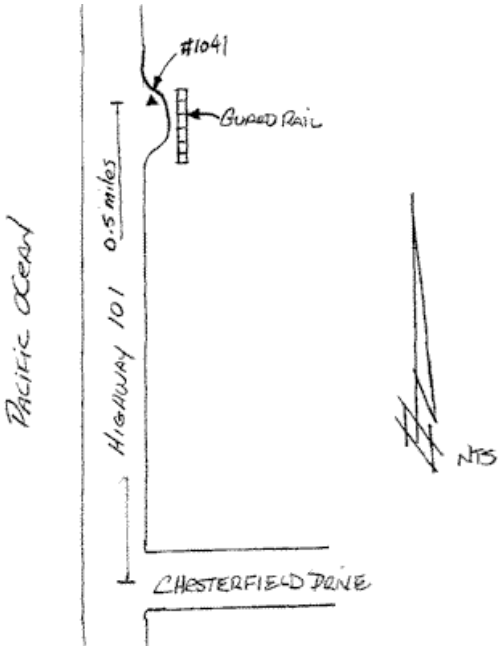
SET 2" IRON PIPE IN AC. WITH 2.5" CITY OF ENCINITAS BRASS DISC IN A TURNOUT ON THE EAST SIDE OF NORTHBOUND HIGHWAY 101, 0.5 MILES NORTH OF CHESTERFIELD AND 10 FEET WEST OF THE NORTH END OF GUARD RAIL.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

FROM THE INTERSECTION OF HIGHWAY 101 AND CHESTERFIELD DRIVE GO NORTH ON HIGHWAY 101 0.5 MILES TO A TURNOUT AND THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED 10 FEET WESTERLY AND OPPOSITE THE NORTH END OF A GUARD RAIL IN THE AC. PAVEMENT.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º1'32.15962"N
Longitude:	117º17'10.03222"W
Ellipsoid Height:	-42.496
Northing:	1954519.319
Easting:	6244094.667
NGVD29 Elevation:	71.463
NAVD88 Elevation:	73.612
Combined Scale Factor	0.99997057
Convergence:	- 0 34 09.718
Horizontal Order:	FIRST

Monument Sketch:

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Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1042 **Station Name:** ENC-42

Monument Description:

FD 2.5" SD. CO. ENGINEERS DISC STAMPED "OC 136, 1968" IN EAST WING WALL OF THE NORTH END OF THE NORTHBOUND HIGHWAY 101 BRIDGE OVER SAN ELIJO LAGOON.

Established By: HUNSAKER & ASSOCIATES SAN

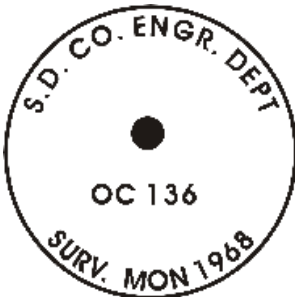
Date Established:

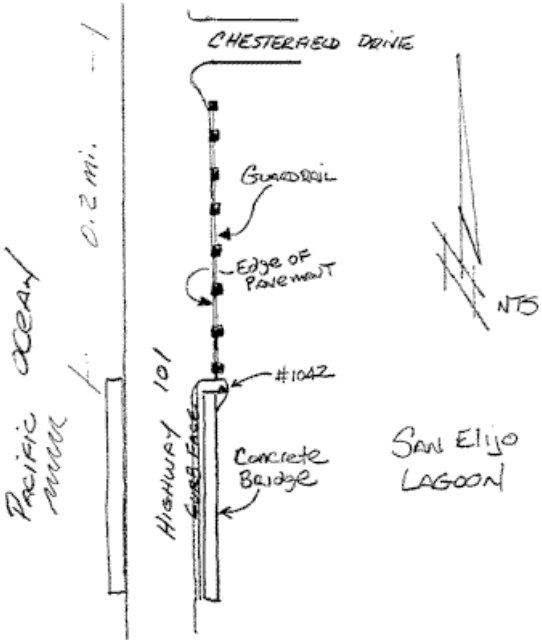
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º0'58.74282"N
Longitude:	117º16'51.35117"W
Ellipsoid Height:	-99.165
Northing:	1951126.311
Easting:	6245651.712
NGVD29 Elevation:	14.793
NAVD88 Elevation:	16.938
Combined Scale Factor	0.99997416
Convergence:	- 0 33 59.453
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF CHESTERFIELD DRIVE AND HIGHWAY 101, GO SOUTH ON HIGHWAY 101 0.2 MILES TO THE BRIDGE OVER THE SAN ELIJO LAGON AND THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE EAST WING WALL OF THE NORTH END OF BRIDGE, 9 FEET EAST OF EAST CURB AND 3.8 FEET SOUTH OF NORTH CURB.

Monument Sketch:





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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1043 **Station Name:** ENC-43

Monument Description:

FD. 3.5" NATIONAL GEODETIC SURVEY DISC IN HEADWALL, 0.2 MILES NORTH OF SOLANA VISTA DRIVE ON THE EAST SIDE OF NORTHBOUND HIGHWAY 101, 3 FEET OFF SHOULDER AND 6 FEET WEST OF CARDIFF BY THE SEA SIGN.

Established By: HUNSAKER & ASSOCIATES SAN

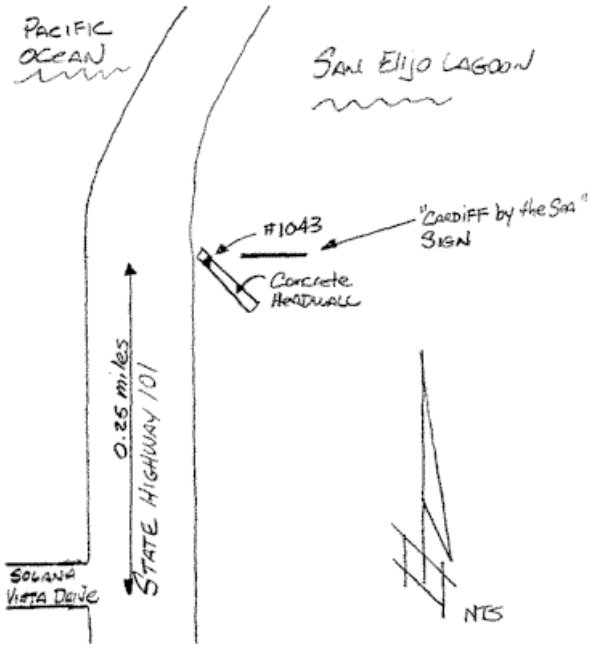
Date Established:

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º0'5.759233"N
Longitude:	117º16'35.18547"W
Ellipsoid Height:	-81.538
Northing:	1945757.987
Easting:	6246975.431
NGVD29 Elevation:	32.509
NAVD88 Elevation:	34.664
Combined Scale Factor	0.99997476
Convergence:	- 0 33 50.569
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF SOLANA VISTA DRIVE AND HIGHWAY 101, GO NORTH ON HIGHWAY 01 0.25 MILES TO THE MONUMENT ON THE RIGHT. THE MONUMENT IS LOCATED ON THE EAST SIDE OF HIGHWAY 101, THE TOP OF THE HILL BEFORE THE BEGINNING OF A LONG CURVE TO THE RIGHT, ON THE NORTHWEST END OF A DRAINAGE PIPE HEADWALL, 3 FEET EAST OF AC. BERM AND 6 FEET WEST OF "CARDIFF BY THE SEA" SIGN.

Monument Sketch:



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PH: (858) 558-4500 FX: (858) 558-1414

CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1044 **Station Name:** ENC-44

Monument Description:

FD. 3.5" DIAMETER CORPS OF ENGINEERS-US ARMY BRASS DISC STAMPED "SEV 104, 1974" SET IN CONCRETE STRUCTURE OF THE OLIVENHAIN PUMP STATION IN THE NORTHWEST QUADRANT OF MANCHESTER AVENUE AND THE NORTHBOUND INTERSTATE 5 OFF RAMP TO MANCHESTER AVENUE.

Established By: HUNSAKER & ASSOCIATES SAN

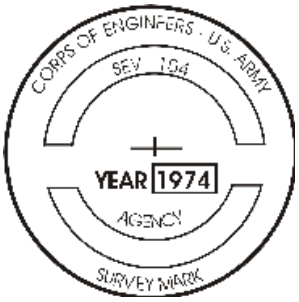
Date Established:

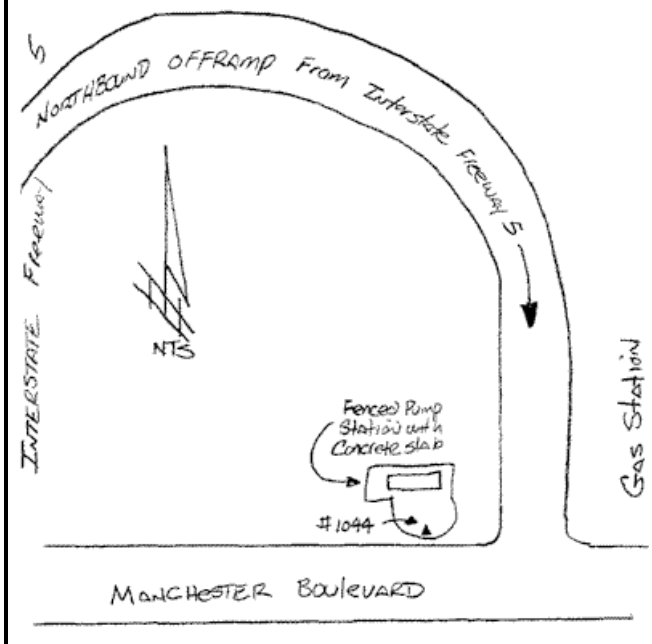
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º0'39.39813"N
Longitude:	117º15'49.93719"W
Ellipsoid Height:	-97.284
Northing:	1949119.976
Easting:	6250861.825
NGVD29 Elevation:	16.41
NAVD88 Elevation:	18.56
Combined Scale Factor	0.99997459
Convergence:	- 0 33 25.705
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE NORTH SIDE OF MANCHESTER AVENUE, 65 FEET WESTERLY OF THE CENTER OF THE NORTHBOUND INTERSTATE HIGHWAY 5 FREEWAY OFF RAMP, IN THE MIDDLEOF THE SOUTHERLY EDGE OF A CONCRETE SLAB FOR AN OLIVENHAIN MUNICIPAL WATER DISTRICT PUMP STATION,

Monument Sketch:





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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1045 **Station Name:** ENC-45

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN WESTERLY CORNER OF CONCRETE DROP INLET, EAST SIDE OF STONEBRIDGE LANE AND 450 FEET WEST OF EL CAMINO REAL.

Established By: HUNSAKER & ASSOCIATES SAN

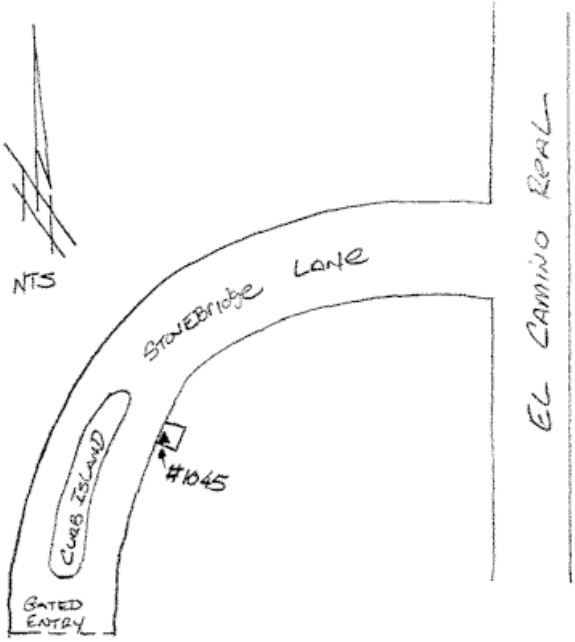
Date Established: 4/15/2004

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'13.25676"N
Longitude:	117º14'32.07798"W
Ellipsoid Height:	-90.497
Northing:	1952478.1
Easting:	6257524.17
NGVD29 Elevation:	22.691
NAVD88 Elevation:	24.841
Combined Scale Factor	0.99997336
Convergence:	- 0 32 42.920
Horizontal Order:	FIRST

Monument "To Reach" Description:

FROM THE INTERSECTION OF STONEBRIDGE LANE AND EL CAMINO REAL, GO SOUTHWESTERLY ON STONEBRIDGE LANE 450 FEET TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED IN THE SOUTHWEST CORNER OF A DRAINAGE BOX INLET ON THE SOUTH SIDE OF STONEBRIDGE LANE, 0.5 FEET FROM CURB.

Monument Sketch:



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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1046 **Station Name:** ENC-46

Monument Description:

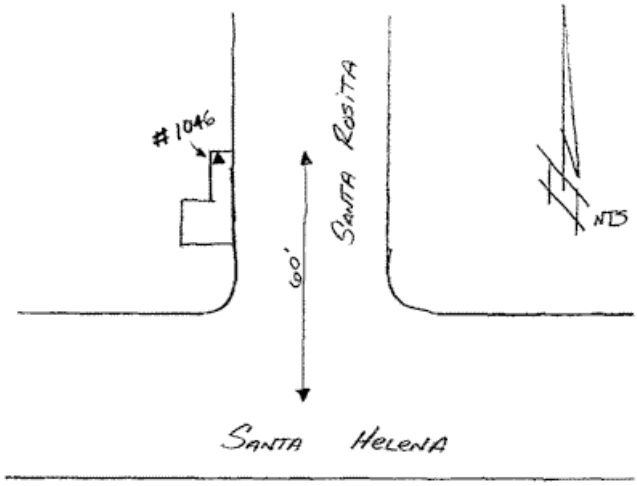
SET 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHWEST CORNER OF CONCRETE DROP INLET IN THE NORTHWEST QUADRANT OF THE INTERSECTION OF SANTA HELENA AND SANTA ROSITA STREETS.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

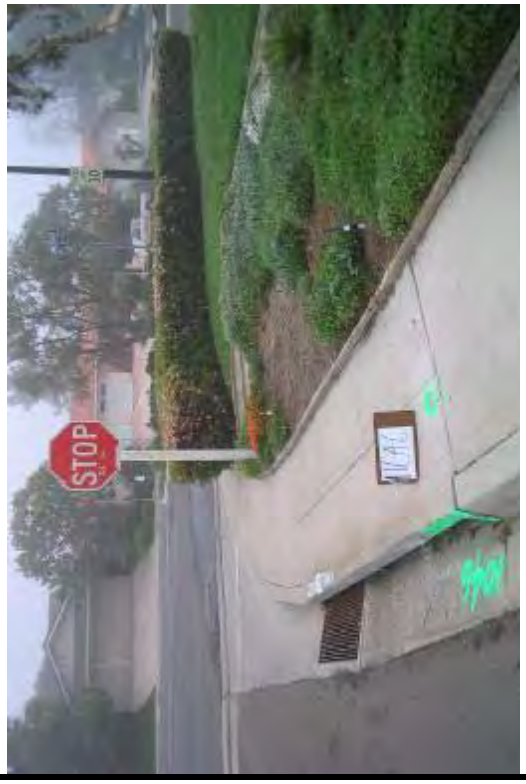
THE MONUMENT IS LOCATED 60 FEET NORTH OF THE CENTER OF SANTA HELENA AND 20 FEET WEST OF THE CENTER OF SANTA ROSITA, 2 FEET WEST OF CURB.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	32º59'59.72188"N
Longitude:	117º15'17.63672"W
Ellipsoid Height:	54.509
Northing:	1945083.493
Easting:	6253573.589
NGVD29 Elevation:	168.162
NAVD88 Elevation:	170.313
Combined Scale Factor	0.99996842
Convergence:	- 0 33 07.955
Horizontal Order:	FIRST

Monument Sketch:



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505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1047 **Station Name:** CADT 11-DC

Monument Description:

FD. 3.5" CALIFORNIA DEPARTMENT OF TRANSPORTATION ALUMINUM DISC IN THE SIDEWALK OVER THE SOUTHEAST END OF THE NORTHEAST ABUTMENT OF THE MACKINNON AVENUE BRIDGE OVER INTERSTATE HIGHWAY 5.

Established By: HUNSAKER & ASSOCIATES SAN

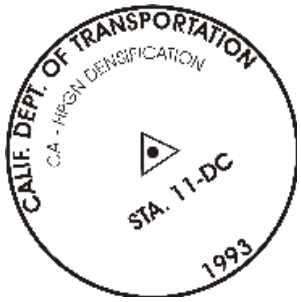
Date Established:

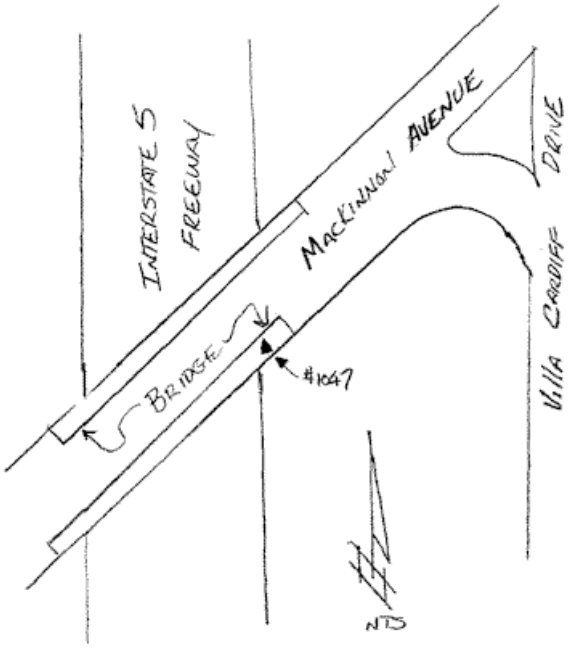
Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33º1'50.2424"N
Longitude:	117º16'37.92064"W
Ellipsoid Height:	115.81
Northing:	1956319.791
Easting:	6246846.538
NGVD29 Elevation:	229.539
NAVD88 Elevation:	231.691
Combined Scale Factor	0.99996253
Convergence:	- 0 33 52.072
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE SOUTH EAST SIDE OF MACKINNON AVENUE OVER THE NORTHEAST ABUTMENT FOR THE BRIDGE OVER INTERSTATE HIGHWAY 5, IN THE CENTER OF SIDEWALK.

Monument Sketch:





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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1048 **Station Name:** ENC-48

Monument Description:

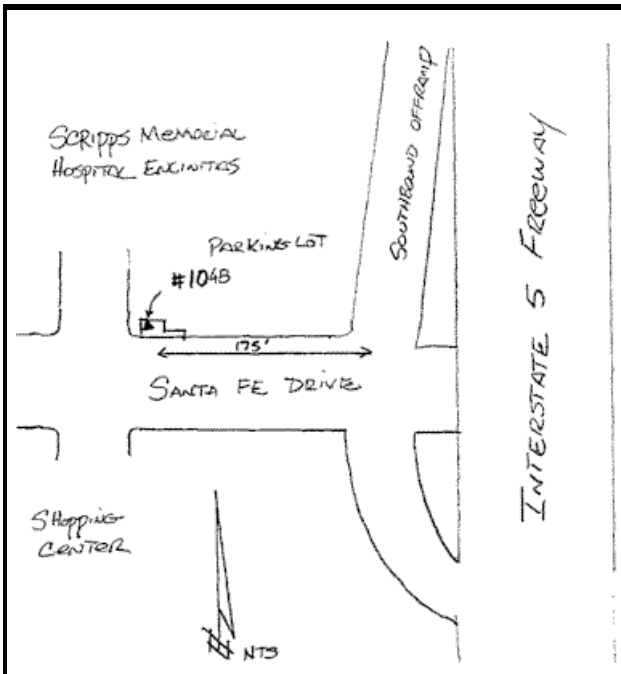
SET 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHWEST CORNER OF CONCRETE DROP INLET ON NORTH SIDE OF SANTA FE DRIVE WEST OF INTERSTATE HIGHWAY 5 AT THE NORTHEAST RETURN INTO SCRIPPS MEMORIAL HOSPITAL, ENCINITAS.

Established By: HUNSAKER & ASSOCIATES SAN

Date Established: 4/15/2004

Monument "To Reach" Description:

THE MONUMENT IS LOCATED ON THE NORTH SIDE OF SANTA FE DRIVE, 175 FEET WEST OF THE INTERSTATE HIGHWAY 5 SOUTHBOUND OFF RAMP TO SANTA FE DRIVEIN THE NORTHWEST CORNER OF A DRANAGE CURB INLET, 4 FEET NORTH OF CURB.



Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet

Latitude:	33º2'10.80474"N
Longitude:	117º16'59.20084"W
Ellipsoid Height:	57.446
Northing:	1958415.809
Easting:	6245055.513
NGVD29 Elevation:	171.227
NAVD88 Elevation:	173.376
Combined Scale Factor	0.9999648
Convergence:	- 0 34 03.766
Horizontal Order:	FIRST

Monument Sketch:

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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1049 **Station Name:** ENC-49

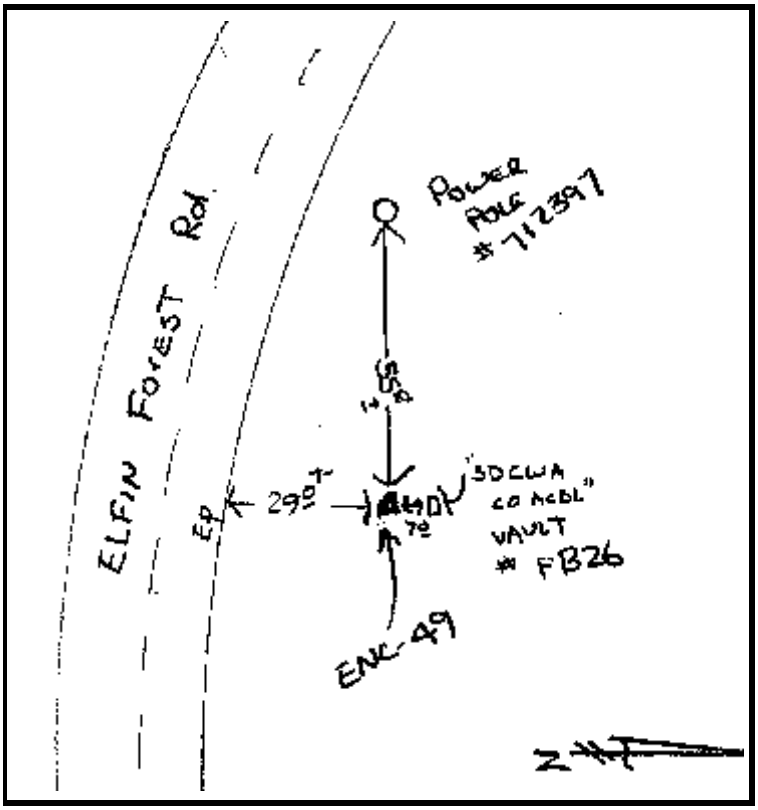
Monument Description:

SET 2" IRON PIPE WITH CONCRETE COLLAR AND 2.5" CITY OF ENCINITAS BRASS DISC IN NORTHERLY RIGHT OF WAY OF ELFIN FOREST ROAD 0.1 MILES EASTERLY OF FORTUNA DEL NORTE, 29 FEET NORTH OF PAVEMENT.

Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	7/8/2004

Monument "To Reach" Description:

FROM THE INTERSECTION OF ELFIN FOREST ROAD WITH FORTUNA DEL NORTE AND FORTUNA DEL SUR, GO EASTERLY ON ELFIN FOREST ROAD 0.1 MILES TO THE MONUMENT ON THE LEFT. THE MONUMENT IS LOCATED 29 FEET NORTHERLY OF THE EDGE OF PAVEMENT, 7 FEET SOUTHERLY OF THE CENTER OF A "SDCWA COMCBLE" VAULT NO. FB26, AND 55 FEET EASTERLY OF POWER POLE NO. 712397.



Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º5'3.93872"N
Longitude:	117º11'5.93642"W
Ellipsoid Height:	475.531
Northing:	1975629.836
Easting:	6275284.558
NGVD29 Elevation:	586.829
NAVD88 Elevation:	588.991
Combined Scale Factor	0.99994082
Convergence:	- 0 30 49.641
Horizontal Order:	FIRST

Monument Sketch:

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CITY OF ENCINITAS
SURVEY CONTROL NETWORK

Engineering Department
505 S. Vulcan Avenue
Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1050 **Station Name:** ENC-50

Monument Description:

SET 2.5" CITY OF ENCINITAS BRASS DISC IN CONCRETE MEDIAN CURB NEAR CENTERLINE OF EL CAMINO REAL IN THE NORTH END OF THIRD MEDIAN SOUTH OF GARDEN VIEW RD., 700 FEET SOUTHERLY OF INTERSECTION. (REPLACES ENC-22 DESTROYED BY CONSTRUCTION)

Established By: HUNSAKER & ASSOCIATES SAN DIEGO, INC

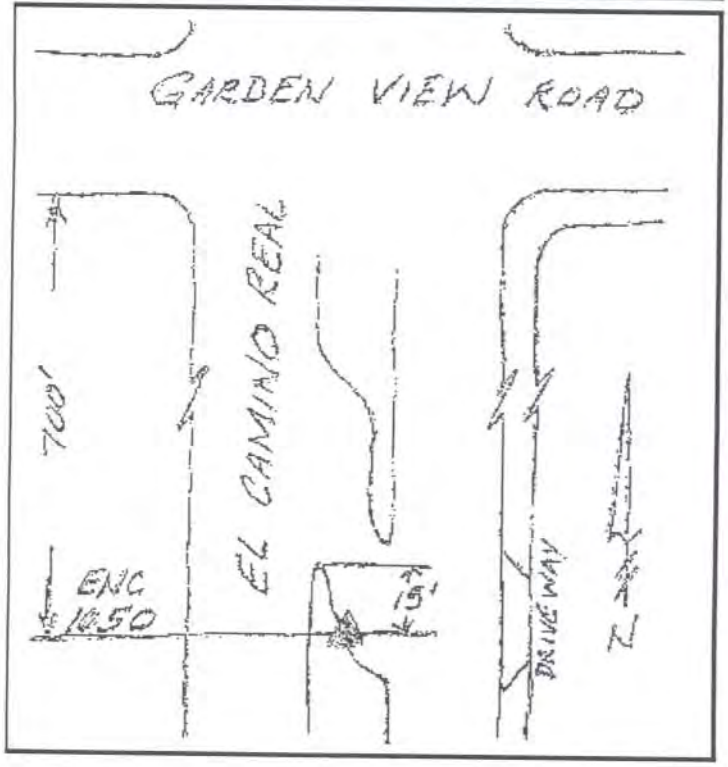
Date Established: 11/28/2005

Datum: CCS 83, 1991.35 Epoch, U.S. Survey Feet	
Latitude:	33°3'24.28824"N
Longitude:	117°15'45.01015"W
Ellipsoid Height:	25.476
Northing:	1965780.432
Easting:	6251443.198
NGVD29 Elevation:	138.627
NAVD88 Elevation:	140.779
Combined Scale Factor	0.99996456
Convergence:	- 0 33 22.997
Horizontal Order:	FIRST

Monument "To Reach" Description:

THE MONUMENT IS LOCATED IN CONCRETE MEDIAN CURB NEAR CENTERLINE OF EL CAMINO REAL IN THE NORTH END OF THIRD MEDIAN SOUTH OF GARDEN VIEW ROAD, 700 FEET SOUTHERLY OF OF INTERSECTION AND 15 FEET SOUTHERLY OF CURB NOSE.

Monument Sketch:



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SURVEY CONTROL NETWORK

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Encinitas, CA 92024-3633

Phone (760) 633-2770
Fax (760) 633-2818

Point Number: 1052 **Station Name:** ENC-52

Monument Description:

SET 2.5" BRASS DISK IN EAST END OF CENTERLINE ISLAND TOP OF CURB ON WEST SIDE OF PEDESTRIAN CROSSING

Established By:	HUNSAKER & ASSOCIATES SAN
Date Established:	8/28/2020

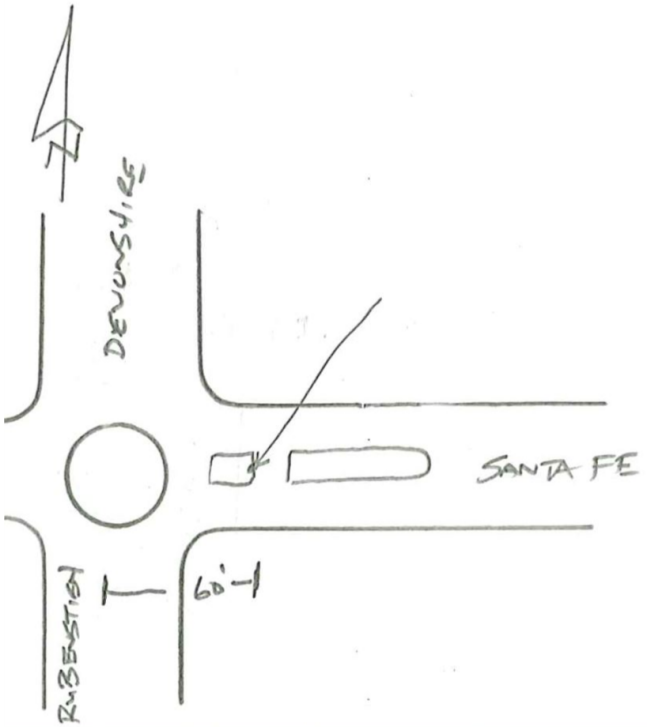
Datum:	**CCS 83, 1991.35 Epoch, U.S. Survey Feet**
Latitude:	33º02'10.36016"N
Longitude:	117º17'08.43016"W
Ellipsoid Height:	61.976
Northing:	1958378.672
Easting:	6244269.411
NGVD29 Elevation:	174.016'
NAVD88 Elevation:	176.164'
Combined Scale Factor	0.999964596
Convergence:	- 0 34 09
Horizontal Order:	FIRST

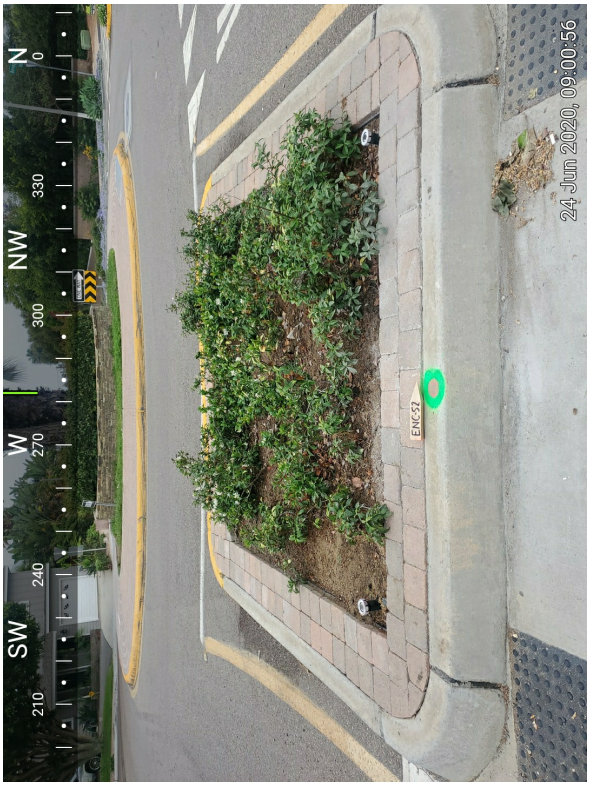
Monument "To Reach" Description:

MONUMENT IS IN THE EASTERLY SIDE OF THE ROUNDABOUT AT THE INTERSECTION OF SANTE FE DRIVE AND DEVONSHIRE DRIVE/RUBENSTEIN AVENUE ON THE CENTER OF THE TOP OF CURB AT PEDESTRIAL CROSS WALK OF SANTE FE DRIVE 60' EASTERLY OF THE INTERSECTION.

Monument Sketch:

LOCATION SKETCH & FIELD TIES





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9707 Waples Street, San Diego, CA 92121
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CITY OF ENCINITAS SURVEY CONTROL NETWORK AND MONUMENT DESCRIPTION SHEETS

ROS 19739

RECORD OF SURVEY NO. 19379

SHEET 1 OF 1 SHEETS

PROCEDURE OF SURVEY:

THE PURPOSE OF THIS SURVEY IS TO REPLACE A HORIZONTAL GEODETIC CONTROL STATION IN THE CITY OF ENCINITAS TO BE UTILIZE FOR GIS PURPOSES AND SUBSEQUENT MAPPING SURVEYS IN THE CITY.

TO ACCOMPLISH THIS TASK A GPS SURVEY WAS CONDUCTED USING FOUR LEICA SYSTEM 500 SYSTEMS COMPRISED OF AT502 L1,L2 MICROSTRIP ANTENNAS, AND SR 530 DUAL FREQUENCY RECEIVERS UTILIZING "FAST AMBIGUITY RESOLUTION" TECHNIQUES. ALL OCCUPATIONS UTILIZED EITHER FIXED HEIGHT POLES OR ANTENNA TRIPODS. THE MONUMENT USED FOR THIS SURVEY WAS SELECTED IN AN UNOBSTRUCTED LOCATION ALONG EL CAMINO REAL FOR FUTURE USE.

THE NETWORK SURVEY WAS CONDUCTED IN COMPLIANCE WITH ACCURACY STANDARDS PER THE CALIFORNIA GEODETIC CONTROL COMMITTEE (C.G.C.C.) DOCUMENT "SPECIFICATIONS FOR GEODETIC CONTROL NETWORKS USING HIGH-PRODUCTION GPS SURVEYING TECHNIQUES" VERSION 2.0, JULY 1996 FOR BAND V (1cm), 1'ST ORDER EQUIVALENT AS DEFINED IN THE CALIFORNIA PUBLIC RESOURCES CODE SECTION 8801-8819.

THE NETWORK CONTROL TIES CONSISTS OF FOUR CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) STATIONS 2 OF WHICH ARE SANCTIONED BY THE NGS FOR 2004.0 EPOCH COORDINATE VALUES. ADDITIONALLY THIS NETWORK TIED TO 3 ADJACENT EXISTING FIRST ORDER MONUMENTS IN THE CITY OF ENCINITAS CONTROL NETWORK PER R.O.S. 18416. THE NETWORK CONTROL TIES WERE SURVEYED ON NOVEMBER 28, 2005 CONCURRENTLY WITH THE OVERALL NETWORK. STATION DATA LOGGING OCCUPATION TIMES TO THE EXISTING CORS STATIONS RANGED FROM 60 TO 120 MINUTES.

THE OVERALL NETWORK INCLUDED ONE STATION ESTABLISHED ON THIS SURVEY (7 STATIONS IN TOTAL ADJUSTMENT). STATION DATA LOGGING OCCUPATION TIMES TO THE EXISTING FIRST ORDER STATIONS RANGED FROM 60 TO 80 MINUTES.

THE OVERALL NETWORK WAS CONSTRAINED IN TWO ADJUSTMENTS ON TWO SEPARATE DATUMS. THE CCS83 ZONE 6, 1991.35 EPOCH HORIZONTAL DATUM WITH THE NGVD 29 VERTICAL DATUM TO CORRESPOND WITH THE EXISTING HIGH ORDER CITY OF ENCINITAS CONTROL SURVEY PER R.O.S. 18416, AND ALSO CONSTRAINED TO THE CCS83 ZONE 6, 2004.0 EPOCH HORIZONTAL DATUM WITH THE NAVD88 VERTICAL DATUM PER CORS STATIONS AND NGS DATASHEETS AS THE MOST CURRENT HIGH PRECISION GEODETIC NETWORK (HPGN) SURVEY ADJUSTMENT.

THE NETWORK STATION POSITION DATA IS THE RESULT OF CONSTRAINED BASELINE ADJUSTMENTS USING "MOVE 3 VERSION 3.2.2" LEAST SQUARES ADJUSTMENT SUBROUTINE IMBEDDED IN "LEICA SKI PRO VERSION 3.0" GPS SOFTWARE. THE ADJUSTMENT WAS CONSTRAINED TO THE HORIZONTAL AND VERTICAL MONUMENTS LISTED UNDER "BASIS OF COORDINATES" AND "BASIS OF ELEVATIONS" AS NOTED.

COMPUTATIONS PERFORMED WITH THE "LEICA " LEAST SQUARES ADJUSTMENT WERE SPECIFIED TO 2-SIGMA (95%) CONFIDENCE REGIONS. GEOID 2003 PUBLISHED BY THE NATIONAL GEODETIC SURVEY (NGS) WAS THE GEOID MODEL UTILIZED TO COMPUTE GEOID SEPARATIONS FOR THE ADJUSTMENTS. THE RESULTS OF THE NETWORK ADJUSTMENT ACCURACY CONFORMS TO FIRST ORDER AS DEFINED BY THE FEDERAL GEODETIC CONTROL COMMITTEE (F.G.C.C.) BY DOCUMENT ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", VERSION 5.0, REPRINTED WITH CORRECTIONS AUGUST 1, 1989 AND CONFORMS TO THE 1 CENTIMETER HORIZONTAL LOCAL ACCURACY CLASSIFICATION AS DEFINED BY THE FEDERAL GEODETIC CONTROL SUBCOMMITTEE (F.G.C.S.) BY DOCUMENT ENTITLED "GEOSPATIAL POSITIONING ACCURACY STANDARDS PART 2: STANDARDS FOR GEODETIC NETWORKS" (FGDC-STD-007.2-1998).

BASIS OF COORDINATES: CCS83, ZONE 6, 2004.0 EPOCH PER NGS DATASHEETS:

THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 2004.0 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR TWO CONTROL MONUMENTS OF B-ORDER ACCURACY OR BETTER.

NO.	NAME	NORTHING	EASTING	ELL. HGT	SOURCE	ORDER
OGHS	ORANGE GLEN HS	1992066.979	6319281.696	610.3	NGS DATASHEET	(CORS)
SIO3	SCRIPPS NO. 3	1895871.559	6254482.497	116.8	NGS DATASHEET	(CORS)

NAVD88 ELEVATIONS PER CORS STATION GPS BENCHMARKS:
THE HEREIN LISTED NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR ONE GPS STATION AND NGS GEOID 2003 GEOID MODEL.

NO.	NAME	ORTHO HGT	SOURCE	ORDER
1007	CLSB-004	84.68	R.O.S. 18416	3RD LEVELS R.O.S. 18416

BASIS OF COORDINATES: CCS83, ZONE 6, 1991.35 EPOCH PER R.O.S. 18416.

THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 1991.35 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR THREE CONTROL MONUMENTS OF FIRST ORDER ACCURACY.

NO.	NAME	NORTHING	EASTING	SOURCE	ORDER
1007	CLSB-004	1969591.693	6251923.819	R.O.S.18416	FIRST
1021	ENC-21	1965268.244	6257064.577	R.O.S.18416	FIRST
1023	134WCCS2	1968948.942	6246412.993	R.O.S.18416	FIRST

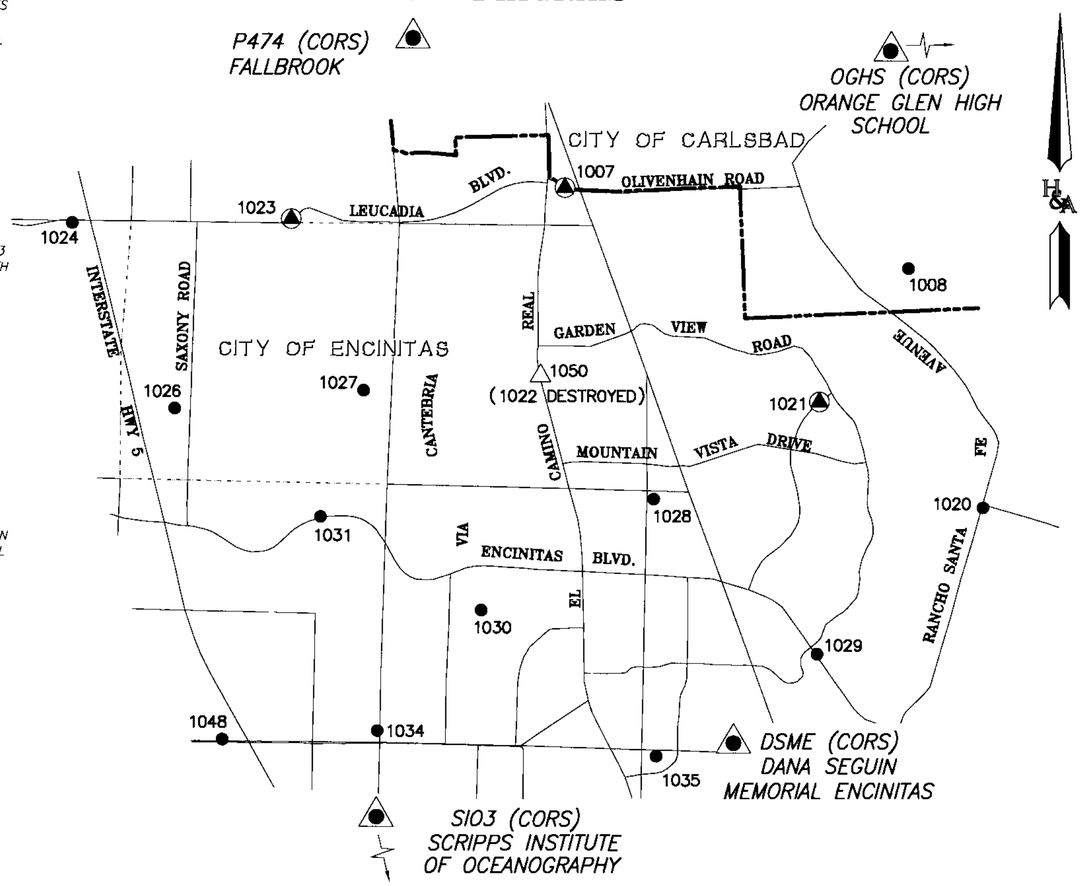
NGVD29 ELEVATIONS PER R.O.S 18416 GPS BENCHMARKS:
THE HEREIN LISTED NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR THREE GPS STATIONS AND NGS GEOID 2003 GEOID MODEL.

NO.	NAME	ORTHO HGT	SOURCE	ORDER
1007	CLSB-004	82.53	R.O.S. 18416	3RD
1021	ENC-21	262.17	R.O.S. 18416	3RD
1023	134WCCS2	318.266	R.O.S. 18416	3RD

CONTROL SURVEY
CITY OF ENCINITAS

CONTROL DIAGRAM

2000 0 2000 4000 6000
SCALE 1"=2000'



VICINITY MAP

CCS83 Zone 6 - 2004.0 Epoch Values

Point	Northing	Easting	Orth. Hgt	Geoid-Sep	Convergence	C.G.F.	Latitude	Longitude	Ell. Hgt	Point
1007	1969593.095	6251922.671	84.677	-113.005	-0° 3'3 20.140"	0.99996627	33° 4' 2.055690"N	117° 15' 39.811249"W	-28.333	1007
1021	1965269.628	6257063.447	264.347	-112.816	-0° 32' 46.680"	0.99995863	33° 3' 19.769568"N	117° 14' 38.921127"W	151.531	1021
1023	1968950.367	6246411.835	320.468	-113.373	-0° 33' 55.683"	0.99995516	33° 3' 55.163305"N	117° 16' 44.490555"W	207.094	1023
1050	1965781.836	6251442.051	140.779	-113.152	-0° 33' 23.005"	0.99996445	33° 3' 24.302020"N	117° 15' 45.023773"W	27.628	1050
DSME	1958365.581	6255350.059	300.051	-113.139	-0° 32' 57.315"	0.99995860	33° 2' 11.300614"N	117° 14' 58.273665"W	186.912	DSME
OGHS	1992066.979	6319281.696	718.657	-108.352	-0° 26' 06.297"	0.99993120	33° 7' 50.169284"N	117° 2' 30.313223"W	610.305	OGHS
P474	2074323.983	6256719.410	712.361	-109.400	-0° 32' 55.645"	0.99992536	33° 21' 18.675114"N	117° 14' 55.235574"W	602.961	P474
SIO3	1895871.559	6254482.497	231.789	-114.715	-0° 32' 59.044"	0.99998186	32° 51' 52.915244"N	117° 15' 1.420883"W	117.074	SIO3

CCS83 Zone 6 - 1991.35 Epoch Values

Point	Northing	Easting	Orth. Hgt	Geoid-Sep	Convergence	C.G.F.	Latitude	Longitude	Ell. Hgt	Point
1007	1969591.693	6251923.819	82.530	-113.005	-0° 33' 20.133"	0.99996637	33° 4' 2.041930"N	117° 15' 39.797602"W	-30.485	1007
1021	1965268.244	6257064.577	262.174	-112.816	-0° 32' 46.673"	0.99995873	33° 3' 19.755985"N	117° 14' 38.907696"W	149.377	1021
1023	1968948.942	6246412.993	318.266	-113.373	-0° 33' 55.675"	0.99995526	33° 3' 55.149324"N	117° 16' 44.476778"W	204.943	1023
1050	1965780.432	6251443.198	138.627	-113.152	-0° 33' 22.997"	0.99996456	33° 3' 24.288236"N	117° 15' 45.010148"W	25.476	1050
DSME	1958364.176	6255351.205	297.900	-113.139	-0° 32' 57.307"	0.99995870	33° 2' 11.286820"N	117° 14' 58.260042"W	184.761	DSME
OGHS	1992065.583	6319282.863	716.505	-108.352	-0° 26' 06.290"	0.99993131	33° 7' 50.155541"N	117° 2' 30.299428"W	608.152	OGHS
P474	2074322.589	6256720.566	710.201	-109.400	-0° 32' 55.638"	0.99992546	33° 21' 18.661425"N	117° 14' 55.221795"W	600.801	P474
SIO3	1895870.127	6254483.635	229.653	-114.715	-0° 32' 59.037"	0.99998196	32° 51' 52.901208"N	117° 15' 1.407359"W	114.938	SIO3

RECORD OF SURVEY

A GEODETIC CONTROL SURVEY TO REPLACE FIRST ORDER CONTROL STATION, NO. 1022 WHICH WAS DESTROYED BY CONSTRUCTION IN THE CITY OF ENCINITAS SURVEY CONTROL NETWORK, IN THE CITY IF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

SURVEYORS STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYOR'S ACT AT THE REQUEST OF THE CITY OF ENCINITAS IN DECEMBER, 2005.

LICENSED LAND SURVEYOR
DAVID W. AMBLER
L.S. 7322
Exp. 12-31-07
STATE OF CALIFORNIA

7-12-2006

DAVID W. AMBLER L.S. 7322
EXP. 12-31-07

LEGEND

- INDICATES CONTINUOUSLY OPERATING REFERENCE STATION (CORS)
- INDICATES EXISTING FIRST OR "B" ORDER CONTROL MONUMENT HELD IN ADJUSTMENT (SEE BASIS OF COORDINATES)
- INDICATES EXISTING GROUP C 1'ST ORDER MONUMENT IN CITY OF ENCINITAS CONTROL NETWORK (SEE R.O.S. 18416),
- △ INDICATES A MONUMENT ESTABLISHED (SET) AS A PART OF THIS SURVEY.

STATION NAME DESCRIPTIONS:
(MONUMENTS WITH STATION NAMES WHICH HAVE THE FOLLOWING DESIGNATION)

(CORS) - INDICATES AN EXISTING CONTINUOUSLY OPERATING REFERENCE STATION (CORS) MONUMENT IN SAN DIEGO COUNTY FROM THE SOUTHERN CALIFORNIA INTEGRATED GPS NETWORK.

SURVEYORS NOTE

DESCRIPTIONS FOR THE EXISTING CONTROL IS ON FILE WITH THE CITY OF ENCINITAS ENGINEERING DEPARTMENT, R.O.S. 18416 OR AVAILABLE IN THE NGS DATABASE.

POINT 1050
2 1/2" BRASS DISK STAMPED "ENC-50, LS 7322, 2005" SET IN CONCRETE MEDIAN CURB NEAR CENTERLINE OF EL CAMINO REAL IN THE NORTH END OF THIRD MEDIAN ISLAND SOUTH OF GARDEN VIEW ROAD. 700 FEET SOUTHERLY OF INTERSECTION AND 15 FEET SOUTHERLY OF CURB NOSE.

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYORS ACT THIS 18th. DAY OF JULY, 2006.

LICENSED LAND SURVEYOR
PHILIP J. GIURBINO
L.S. 4424
Exp. 9-30-07
STATE OF CALIFORNIA

PHILIP J. GIURBINO
L.S. 4424, COUNTY SURVEYOR

RECORDER'S STATEMENT

FILE NO. 2006-0514654

FILED THIS 21st DAY OF July, 2006, AT 9:51 O'CLOCK, A.M. IN BOOK OF RECORD OF SURVEY MAPS AT PAGE — AT THE REQUEST OF DAVID W. AMBLER.

GREGORY J. SMITH
COUNTY RECORDER
BY: _____ DEPUTY

FEE $8.00

HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING - ENGINEERING - SURVEYING
10179 HUENNEKENS STREET - SAN DIEGO, CA 92121
R:\0460\&Map\RS Encinitas 1022 Replacement 01.dwg 1891 Jul-11-2006 10:39 W.O. 2531-1
(858) 558-4500 - FAX (858) 558-1414

CCI: 306-1675

CITY OF ENCINITAS SURVEY CONTROL NETWORK AND MONUMENT DESCRIPTION SHEETS

ROS 20188

RECORD OF SURVEY NO. 20188

SHEET 1 OF 1 SHEET

CONTROL SURVEY
CITY OF ENCINITAS

PROCEDURE OF SURVEY

THE PURPOSE OF THIS SURVEY IS TO REPLACE A HORIZONTAL GEODETIC CONTROL STATION IN THE CITY OF ENCINITAS TO BE UTILIZED FOR GIS PURPOSES AND SUBSEQUENT MAPPING SURVEYS IN THE CITY.

TO ACCOMPLISH THIS TASK A GPS SURVEY WAS CONDUCTED USING FOUR LEICA SYSTEM 500 SYSTEMS COMPRISED OF AT502 L1,L2 MICROSTRIP ANTENNAS, AND SR 530 DUAL FREQUENCY RECEIVERS UTILIZING "FAST AMBIGUITY RESOLUTION" TECHNIQUES. ALL OCCUPATIONS UTILIZED EITHER FIXED HEIGHT POLES OR ANTENNA TRIPODS. THE MONUMENT USED FOR THIS SURVEY WAS SELECTED IN AN UNOBSTRUCTED LOCATION ALONG BONITA DRIVE FOR FUTURE USE.

THE NETWORK SURVEY WAS CONDUCTED IN COMPLIANCE WITH ACCURACY STANDARDS PER THE CALIFORNIA GEODETIC CONTROL COMMITTEE (C.G.C.C.) DOCUMENT "SPECIFICATIONS FOR GEODETIC CONTROL NETWORKS USING HIGH-PRODUCTION GPS SURVEYING TECHNIQUES" VERSION 2.0, JULY 1996 FOR BAND V (1cm), 1'ST ORDER EQUIVALENT AS DEFINED IN THE CALIFORNIA PUBLIC RESOURCES CODE SECTION 8801-8819, AND MEET THE NETWORK REQUIREMENTS FOR 2cm STANDARDS PER FEDERAL GEOGRAPHIC DATA COMMITTEE FGDC-STD-007.2-1998.

THE NETWORK CONTROL TIES CONSISTS OF FOUR CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) STATIONS 2 OF WHICH ARE SANCTIONED BY THE NGS FOR 2007.0 EPOCH COORDINATE VALUES. ADDITIONALLY THIS NETWORK TIED TO 4 ADJACENT EXISTING FIRST ORDER MONUMENTS IN THE CITY OF ENCINITAS CONTROL NETWORK PER R.O.S. 18416. THE NETWORK CONTROL TIES WERE SURVEYED ON JANUARY 16, 2008 CONCURRENTLY WITH THE OVERALL NETWORK. STATION DATA LOGGING OCCUPATION TIMES TO THE EXISTING CORS STATIONS RANGED FROM 60 TO 120 MINUTES.

THE OVERALL NETWORK INCLUDED ONE STATION ESTABLISHED ON THIS SURVEY (8 STATIONS IN TOTAL ADJUSTMENT). STATION DATA LOGGING OCCUPATION TIMES TO THE EXISTING FIRST ORDER STATIONS RANGED FROM 40 TO 90 MINUTES.

THE OVERALL NETWORK WAS CONSTRAINED IN TWO ADJUSTMENTS ON TWO SEPARATE DATUMS. THE CCS83 ZONE 6, 1991.35 EPOCH HORIZONTAL DATUM WITH THE NGVD 29 VERTICAL DATUM TO CORRESPOND WITH THE EXISTING HIGH ORDER CITY OF ENCINITAS CONTROL SURVEY PER R.O.S. 18416, AND ALSO CONSTRAINED TO THE CCS83 ZONE 6, 2007.0 EPOCH HORIZONTAL DATUM WITH THE NAVD88 VERTICAL DATUM PER CORS STATIONS AND NGS DATASHEETS AS THE MOST CURRENT HIGH PRECISION GEODETIC NETWORK (HPGN) SURVEY ADJUSTMENT.

THE NETWORK STATION POSITION DATA IS THE RESULT OF CONSTRAINED BASELINE ADJUSTMENTS USING "MOVE 3 VERSION 3.3.1" LEAST SQUARES ADJUSTMENT SUBROUTINE IMBEDDED IN "LEICA GEO OFFICE VERSION 4.0" GPS SOFTWARE. THE ADJUSTMENT WAS CONSTRAINED TO THE HORIZONTAL AND VERTICAL MONUMENTS LISTED UNDER "BASIS OF COORDINATES" AND "BASIS OF ELEVATIONS" AS NOTED.

COMPUTATIONS PERFORMED WITH THE "LEICA " LEAST SQUARES ADJUSTMENT WERE SPECIFIED TO 2-SIGMA (95%) CONFIDENCE REGIONS. GEOID 2003 PUBLISHED BY THE NATIONAL GEODETIC SURVEY (NGS) WAS THE GEOID MODEL UTILIZED TO COMPUTE GEOID SEPARATIONS FOR THE ADJUSTMENTS. THE RESULTS OF THE NETWORK ADJUSTMENT ACCURACY CONFORMS TO FIRST ORDER AS DEFINED BY THE FEDERAL GEODETIC CONTROL COMMITTEE (F.G.C.C.) BY DOCUMENT ENTITLED "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES", VERSION 5.0, REPRINTED WITH CORRECTIONS AUGUST 1, 1989 AND CONFORMS TO THE 1 CENTIMETER HORIZONTAL LOCAL ACCURACY CLASSIFICATION AS DEFINED BY THE FEDERAL GEODETIC CONTROL SUBCOMMITTEE (F.G.C.S.) BY DOCUMENT ENTITLED "GEOSPATIAL POSITIONING ACCURACY STANDARDS PART 2: STANDARDS FOR GEODETIC NETWORKS" (FGDC-STD-007.2-1998).

BASIS OF COORDINATES: CCS83, ZONE 6, 2007.0 EPOCH PER NGS DATASHEETS:

THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 2007.0 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR TWO CONTROL MONUMENTS OF B-ORDER ACCURACY OR BETTER.

NO.	NAME	NORTHING	EASTING	ELL. HGT	SOURCE	ORDER
OGHS	ORANGE GLEN HS	1992067.316	6319281.451	610.2	NGS DATASHEET	(CORS)
SIO3	SCRIPPS NO. 3	1895871.895	6254482.247	116.9	NGS DATASHEET	(CORS)

NAVD88 ELEVATIONS PER CORS STATION GPS BENCHMARKS:
THE HEREIN LISTED NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR ONE GPS STATION AND NGS GEOID 2003 GEOID MODEL.

NO.	NAME	ORTHO HGT	SOURCE	ORDER
1030	ENC-30	388.479	R.O.S. 18416	3RD LEVELS R.O.S. 18416

BASIS OF COORDINATES: CCS83, ZONE 6, 1991.35 EPOCH PER R.O.S. 18416.

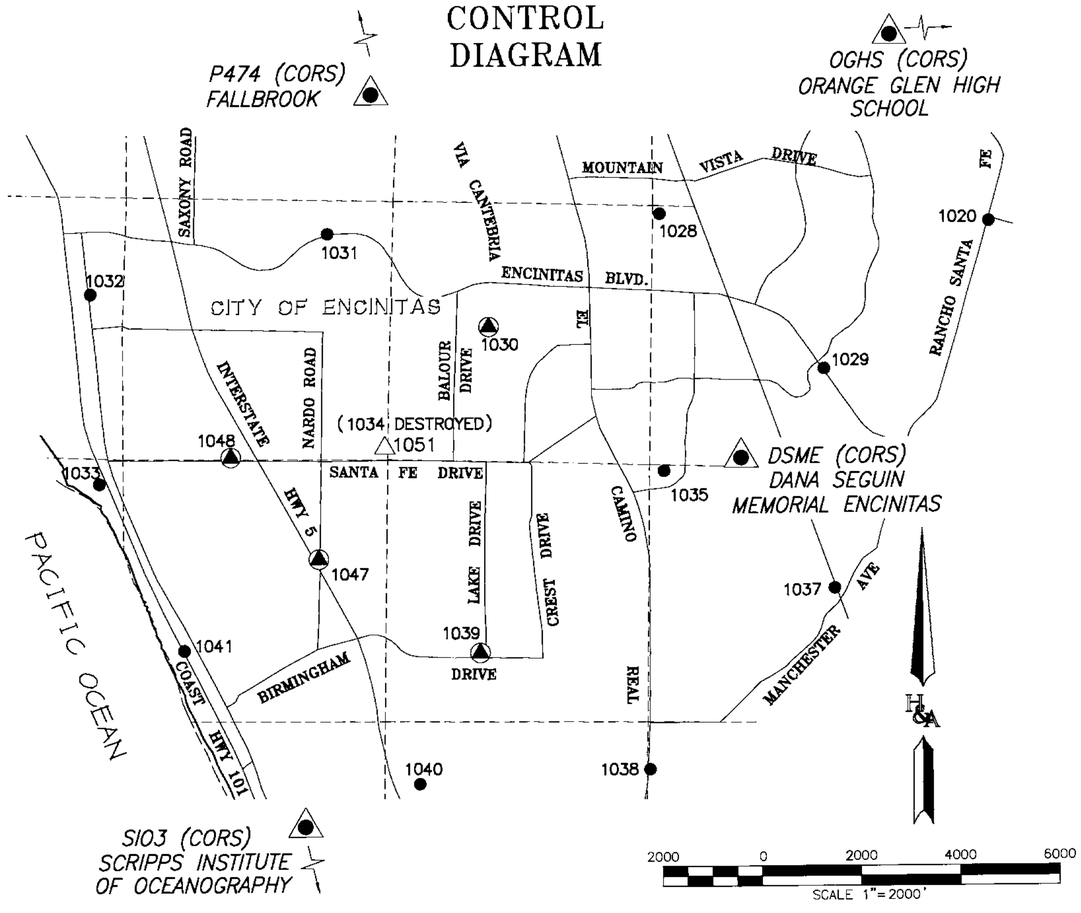
THE HEREIN-LISTED NORTH AMERICAN DATUM OF 1983 (NAD83) LATITUDES, LONGITUDES AND ELLIPSOID HEIGHTS, AND, THE HEREIN-LISTED CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 PLANE COORDINATES ALL PER EPOCH 1991.35 ARE BASED IN THE HORIZONTAL COMPONENT UPON THE FOLLOWING VALUES FOR FOUR CONTROL MONUMENTS OF FIRST ORDER ACCURACY.

NO.	NAME	NORTHING	EASTING	SOURCE	ORDER
1030	ENC-30	1961044.005	6250269.682	R.O.S.18416	FIRST
1039	ENC-39	1954417.550	6250097.897	R.O.S.18416	FIRST
1047	ENC-47	1956319.791	6246846.538	R.O.S.18416	FIRST
1048	ENC-48	1958415.809	6245055.513	R.O.S.18416	FIRST

NGVD29 ELEVATIONS PER R.O.S 18416 GPS BENCHMARKS:
THE HEREIN LISTED NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) ORTHOMETRIC HEIGHTS ARE BASED IN THE VERTICAL COMPONENT UPON THE FOLLOWING VALUES FOR ONE GPS STATION AND NGS GEOID 2003 GEOID MODEL.

NO.	NAME	ORTHO HGT	SOURCE	ORDER
1030	ENC-30	386.330	R.O.S. 18416	3RD

CONTROL DIAGRAM



VICINITY MAP

CCS83 Zone 6 - 2007.0 Epoch Values

Point	Northing	Easting	Orth. Hgt	Geoid-Sep	Convergence	C.G.F.	Latitude	Longitude	Ell. Hgt	Point
1030	1961045.749	6250268.325	388.479	-113.370	-0° 33' 30.284"	0.99995373	33° 2' 37.331493"N	117° 15' 58.271426"W	275.109	1030
1039	1954419.276	6250096.521	323.963	-113.580	-0° 33' 30.976"	0.99995848	33° 1' 31.754353"N	117° 15' 59.530683"W	210.383	1039
1047	1956321.512	6246845.205	231.672	-113.729	-0° 33' 52.081"	0.99996243	33° 1' 50.259297"N	117° 16' 37.936488"W	117.943	1047
1048	1958417.542	6245054.162	173.343	-113.781	-0° 34' 03.775"	0.99996470	33° 2' 10.821758"N	117° 16' 59.216899"W	59.562	1048
1051	1958784.555	6248184.825	292.088	-113.570	-0° 33' 43.591"	0.99995891	33° 2' 14.758279"N	117° 16' 22.485968"W	178.518	1051
DSME	1958365.928	6255349.824	300.380	-113.139	-0° 32' 57.316"	0.99995858	33° 2' 11.304028"N	117° 14' 58.276459"W	187.241	DSME
OGHS	1992067.316	6319281.451	718.826	-108.352	-0° 26' 06.299"	0.99993119	33° 7' 50.172580"N	117° 2' 30.316180"W	610.474	OGHS
P474	2074324.333	6256719.146	712.171	-109.400	-0° 32' 55.647"	0.99992537	33° 21' 18.678545"N	117° 14' 55.238732"W	602.771	P474
SIO3	1895871.895	6254482.247	231.783	-114.715	-0° 32' 59.046"	0.99998186	32° 51' 52.918570"N	117° 15' 1.423830"W	117.068	SIO3

CCS83 Zone 6 - 1991.35 Epoch Values

Point	Northing	Easting	Orth. Hgt	Geoid-Sep	Convergence	C.G.F.	Latitude	Longitude	Ell. Hgt	Point
1030	1961044.005	6250269.682	386.330	-113.370	-0° 33' 30.276"	0.99995384	33° 2' 37.314368"N	117° 15' 58.255282"W	272.960	1030
1039	1954417.550	6250097.897	321.833	-113.580	-0° 33' 30.967"	0.99995858	33° 1' 31.737405"N	117° 15' 59.514325"W	208.253	1039
1047	1956319.791	6246846.538	229.539	-113.729	-0° 33' 52.072"	0.99996253	33° 1' 50.242397"N	117° 16' 37.920638"W	115.810	1047
1048	1958415.809	6245055.513	171.227	-113.781	-0° 34' 03.766"	0.99996480	33° 2' 10.804740"N	117° 16' 59.200831"W	57.446	1048
1051	1958782.825	6248186.179	289.958	-113.570	-0° 33' 43.582"	0.99995901	33° 2' 14.741297"N	117° 16' 22.469862"W	176.388	1051
DSME	1958364.198	6255351.179	298.249	-113.139	-0° 32' 57.307"	0.99995868	33° 2' 11.287039"N	117° 14' 58.260353"W	185.110	DSME
OGHS	1992065.583	6319282.816	716.697	-108.352	-0° 26' 06.290"	0.99993130	33° 7' 50.155538"N	117° 2' 30.299979"W	608.344	OGHS
P474	2074322.615	6256720.501	710.029	-109.400	-0° 32' 55.638"	0.99992547	33° 21' 18.661682"N	117° 14' 55.222564"W	600.629	P474
SIO3	1895870.166	6254483.598	229.653	-114.715	-0° 32' 59.037"	0.99998196	32° 51' 52.901589"N	117° 15' 1.407795"W	114.939	SIO3

RECORD OF SURVEY

A GEODETIC CONTROL SURVEY TO REPLACE FIRST ORDER CONTROL STATION, NO. 1034 WHICH WAS DESTROYED BY CONSTRUCTION IN THE CITY OF ENCINITAS SURVEY CONTROL NETWORK, IN THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYOR'S ACT AT THE REQUEST OF THE CITY OF ENCINITAS IN JANUARY 2008.

LICENSED LAND SURVEYOR
DAVID W. AMBLER
L.S. 7322
Exp. 12-31-09
STATE OF CALIFORNIA

David W. Ambler 5/08/2008
DAVID W. AMBLER, L.S. 7322 DATE
EXP. 12-31-09

LEGEND

- INDICATES CONTINUOUSLY OPERATING REFERENCE STATION (CORS)
- INDICATES EXISTING FIRST OR "B" ORDER CONTROL MONUMENT HELD IN ADJUSTMENT (SEE BASIS OF COORDINATES)
- INDICATES EXISTING GROUP C 1'ST ORDER MONUMENT IN CITY OF ENCINITAS CONTROL NETWORK (SEE R.O.S. 18416),
- △ INDICATES A MONUMENT ESTABLISHED (SET) AS A PART OF THIS SURVEY.

STATION NAME DESCRIPTIONS:
(MONUMENTS WITH STATION NAMES WHICH HAVE THE FOLLOWING DESIGNATION)

(CORS) - INDICATES AN EXISTING CONTINUOUSLY OPERATING REFERENCE STATION (CORS) MONUMENT IN SAN DIEGO COUNTY FROM THE SOUTHERN CALIFORNIA INTEGRATED GPS NETWORK.

SURVEYORS NOTE

DESCRIPTIONS FOR THE EXISTING CONTROL IS ON FILE WITH THE CITY OF ENCINITAS ENGINEERING DEPARTMENT, R.O.S. 18416 OR AVAILABLE IN THE NGS DATABASE.

POINT 1051
2 1/2" BRASS DISK STAMPED "ENC-51, LS 7322, 2008" SET IN CONCRETE ON THE TOP OF A CATCH BASIN ON THE WEST SIDE OF BONITA DRIVE, 16.5 FEET NORTHERLY OF THE NORTHERLY BCR OF THE DRIVEWAY ENTRANCE OF THE SAN DIEGUITO UNION HIGH SCHOOL DISTRICT TRANSPORTATION DEPARTMENT. 400 FEET NORTHERLY OF SANTA FE DRIVE.

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE PROFESSIONAL LAND SURVEYOR'S ACT THIS 15th DAY OF MAY, 2008.

LICENSED LAND SURVEYOR
TERRENCE T. CONNORS
L.S. 5099
Exp. 6-30-09
STATE OF CALIFORNIA

TERRENCE T. CONNORS
L.S. 5099, COUNTY SURVEYOR

RECORDER'S STATEMENT

FILE NO. 2008-0266054

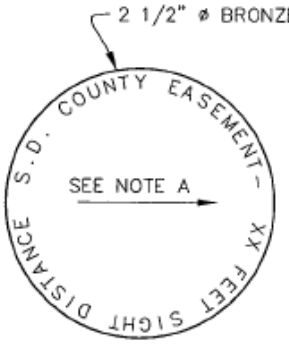
FILED THIS 16th DAY OF May, 2008, AT 3:44 O'CLOCK, P.M. IN BOOK OF RECORD OF SURVEY MAPS AT PAGE _____ AT THE REQUEST OF DAVID W. AMBLER.

GREGORY J. SMITH
COUNTY RECORDER
BY: DEPUTY

FEE $10.00

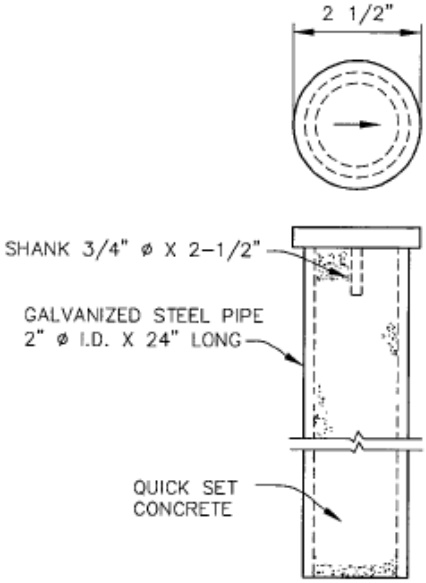
HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING - ENGINEERING - SURVEYING
9707 WAPLES STREET - SAN DIEGO, CA 92121
R:\0460\&Map\RS Encinitas 1034 Replacement 01.dwg[]May-08-2008 10:18 W.O. 2452-3
(858) 558-4500 - FAX (858) 558-1414

CCI: 306-1675

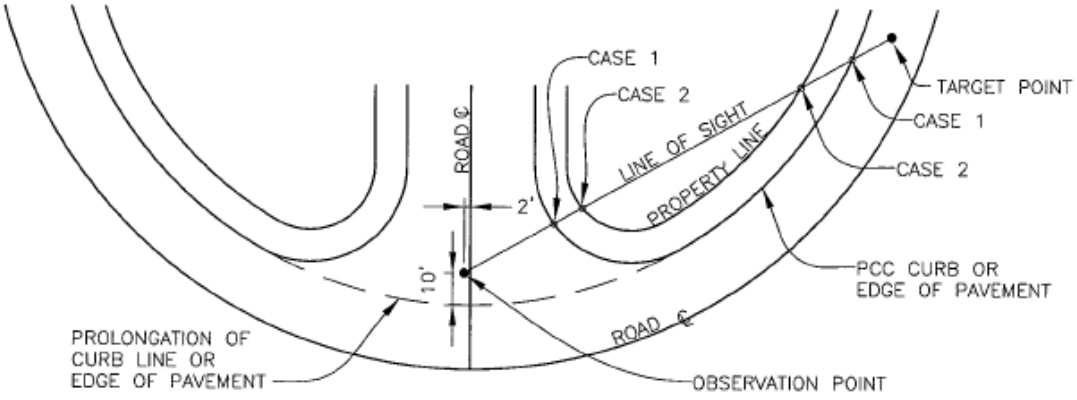


BRONZE MARKER
NO SCALE

NOTE A:
ROTATE ARROW TO INDICATE LOCATION OF TARGET POINT. SHOW SIGHT DISTANCE (XX) IN FEET



CASE 2 MARKER
NO SCALE



INTERSECTION DETAIL
NO SCALE

NOTES:

CASE 1: BRONZE MARKER TO BE SET IN PCC CURB WHERE LINE-OF-SIGHT INTERSECTS CURB.

CASE 2: IF NO PCC CURB, SET BRONZE MARKER IN CONCRETE IN 2" ø X 24" LONG GALVANIZED STEEL PIPE AT THE INTERSECTION OF THE LINE-OF-SIGHT AND PROPERTY LINE.

CLEAR SPACE EASEMENTS FOR SIGHT DISTANCE, WHERE SPECIFIED ON PLANS, SHALL BE DESIGNATED BY A BRONZE MARKER ACCORDING TO CASE 1 OR CASE 2 ABOVE.

DRAWN BY: SS	CHECKED BY: LMC	SAN DIEGO COUNTY DESIGN STANDARD	REVISION	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY					
APPROVED BY:		CLEAR SPACE EASEMENT MARKERS			
DOUGLAS M. ISBELL, COUNTY ENGINEER					
RCE # 18634	EXP. 06/2007		DRAWING NUMBER	DS-16	

Fee: $_____

RECORDING REQUESTED BY:
(Surveyor or Engineer)

WHEN RECORDED MAIL TO:
(Name)
(Address)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

CERTIFICATE OF CORRECTION
For Map Modification

PURSUANT TO Section 66472.1 of the Subdivision Map Act, NOTICE IS GIVEN that (Map No.) (Parcel Map No.) in the City of Encinitas, County of San Diego, State of California, filed in the Office of the County Recorder of San Diego County on _____, 20 ___, is being modified in accordance with said section as follows:

(List each item.)

I certify that the following are the names of all the fee owners of the real property reflected on the date of the filing or recording of the original recorded map:

(Information required by County Recorder in order to index document in the Grantor/Grantee Index.)

CERTIFICATE OF SURVEYOR OR ENGINEER:

I further certify that the above Certificate of Correction was prepared by or under the direction and control of the undersigned professional land surveyor, or registered civil engineer.

Name: _____

(Seal) License Number: _____

(If a monument changes location or character, a pre-1982 civil engineeer must sign, if not a post-1982 civil engineer can sign.)

I, _____, City Engineer for the City of Encinitas in the County of San Diego, State of California, certify that I have examined the foregoing Certificate of Correction and I find that the only changes shown hereon are changes provided for by Section 66472.1 of the Subdivision Map Act.

Name: _____

(Seal) License Number: _____

Fee: $_____

RECORDING REQUESTED BY:
(Surveyor or Engineer)

WHEN RECORDED MAIL TO:
(Name)
(Address)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

CERTIFICATE OF CORRECTION
For Map Error

PURSUANT TO (Section 66469 of the Subdivision Map Act) (Section 8770.5 of the Land Surveyors Act), NOTICE IS GIVEN that (Map No.) (Parcel Map No.) (Record of Survey Map No.) in the City of Encinitas, County of San Diego, State of California, filed in the Office of the County Recorder of said County _____, 20___, is in error and is corrected in accordance with (Section 66469 of the Subdivision Map Act) (or Section 8770.5 of the Land Surveyors Act) as follows:

(List items, action taken to correct problems, what was shown on map, reason for corrections.)

I certify that the following are the names of all the fee owners of the real property reflected on the date of the filing or recording of the original recorded map: *(Information required by County to properly index document.)*

CERTIFICATE OF SURVEYOR OR ENGINEER:

I further certify that the above Certificate of Correction was prepared by or under the direction and control of the undersigned professional land surveyor, or registered civil engineer.

Name: _____

(Seal) License Number: _____

(If a monument changes location or character, a pre-1982 civil engineeer must sign; if not, a post-1982 engineer can sign.)

I, _____, City Engineer for the City of Encinitas in the County of San Diego, State of California, certify that I have examined the foregoing Certificate of Correction and I find that the only changes shown hereon are changes provided for by Section 66472.1 of the Subdivision Map Act.

Name: _____

(Seal) License Number: _____

CONDOMINIUM CONVERSION / PARCEL MAP WAIVER PROCEDURES & REQUIREMENTS

Minor Conversions – Four or Fewer Units

CC

Chapter 24.40 of the Municipal Code contains procedures for condominium conversion of residential for minor airspace subdivisions (four or fewer units). Section 24.60.050 of the Municipal Code allows for condominiums to be approved via the parcel map waiver process. This process deletes the requirement to file a final parcel map, substituting a certificate of compliance. The parcel map waiver is an administrative process and requires no public hearing, under normal circumstances.

The purpose of this handout is to summarize the procedures and submittal requirements. For complete information, please refer to Municipal Code sections referenced above.

In addition, the project must meet the City's General Plan policy for condominium conversions (Exhibit A) and Coastal Regulations (Exhibit B).

A. Submittal Requirements

1. A completed administrative application.

2. Appropriate public notice package.

3. Copy of vesting deed.

4. Ten (10) copies of Parcel Map Waiver Plat (shall provide all information as required by the Municipal Code for a tentative parcel map). Plat shall be prepared by a registered surveyor or a civil engineer. Maps are to be folded to 8 ½ x 11. **Two (2) of the ten (10) copie s shall be wet signatures (signed, sealed, and dated from all parties).**

5. Physical elements and pest control reports.

6. Soils report (new construction).

7. Evidence of notice to tenants (Sections 66452.8 and 66452.9 of the State Subdivision Map Act), certifying that any current tenants (or prospective tenants) have received notice of intent to condominiumize at least 60 days prior to application submittal (see attachment).

8. Statement of any planned improvements.

9. Evidence supporting any known legal non-conforming condition of any aspect of the structure not conforming to current code standards.

10. Applicable fees.

11. A statement of justification detailing how the project meets the findings in Chapter 24.40.100 of the Municipal Code (attached) and Housing Element Policy 1.5 of the General Plan (Exhibit A).

12. Income Verification Form **(VF)**. As noted in Section 24.40.100 (Findings for Conversions) of the Encinitas Municipal Code, "The conversion would not displace predominantly low and moderate income families or tenants without adequate provisions for suitable relocation of such families or tenants." Please provide an Income Verification Form (contained herein) for each tenant of the units being converted.

B. Initial Process

1. Application is submitted to the Planning and Building Department and reviewed by appropriate in-house departments.

2. The City Engineer, after determining that the application conforms with required standards, shall sign the Final Parcel Map Waiver Plat.

3. The Planning and Building Department, after determining that all City departments requirements are satisfied, shall issue a Notice of Decision providing tentative approval of the subdivision. Tentative approval is valid for two years, allowing time for recordation of certificates of compliance.

C. Final Process

1. Copies of closure calculations and record of survey are given to the Planning and Building Department for review.

2. The City Engineer reviews the new documents to ensure their correctness and provides written confirmation to the Director of Planning and Building that all the above items are correct and in order.

3. The Director of Planning and Building then prepares and records one certificate of compliance, indicating the total number of units of the condominium.

CHAPTER 24.40

CONVERSION OF RESIDENTIAL PROPERTY

24.40.010 Purpose. The purpose of this Chapter is: (Ord. 87-10)

A. To establish criteria for the conversion of existing housing to condominiums or s tock cooperative.

B. To reduce the impact of such conversions on residents in rental housing who may be required to relocate due to the conversion of apartments to condominiums by providing for procedures for notification and adequate time and assistance for such relocation.

C. To assure that purchasers of converted housing have been properly informed as to the physical conditions of the structure which is offered for purchase.

D. To insure that converted housing achieves a high degree of appearance, quality, and safety and is consistent with the goals of the City.

24.40.020 Physical Elements Report. A report on the physical elements of all structures and facilities shall be submitted with the

tentative subdivision or parcel map. The report shall include, but not be limited to, the following:

A. A report by a licensed engineer detailing the structural condition of all elements of the property including foundations, electrical, plumbing, utilities, walls, ceiling, windows, recreational equipment, parking facilities and appliances. Regarding each such element, the report shall state, to the best knowledge or estimate of the applicant, when such element was built; the condition of each element; when said element was replaced; the approximate condition of each element; the approximate date upon which said application for conversion was filed and accepted by the City. The report shall identify any defective or unsafe elements and set forth the proposed corrective measures to be employed.

B. A report from a licensed structural pest control operator, approved by the City, on each structure and each unit within the structure.

C. A report by a licensed geotechnical engineer on any known soil and geological conditions regarding soil deposits, rock formations, faults, groundwater, and landslides or other geological hazards in the vicinity of the project and a statement regarding any known evidence of soils problems relating to the structures. Reference shall be made to any previous soils reports for the site and a copy submitted with said report.

D. A statement of repairs and improvements to be made by the subdivider necessary to refurbish and restore the project to achieve a high degree of appearance and safety.

24.40.030 Acceptance of Reports. The final form of the physical elements report and other documents shall be subject to approval by the City. The reports in their accepted form shall remain on file with the community development department for review by any interested persons. The report shall be referenced in the subdivision report to the authorized agency.

24.40.040 Copy to Buyers. The subdivider shall provide each purchaser with a copy of all reports (in their final, accepted form), prior to said purchaser executing any purchase agreement or other contract to purchase a unit in the project and said developer shall give the purchaser sufficient time to review said reports. Copies of the reports shall be made available at all times at the sales office and shall

be posted at various locations, as approved by the City, at the project site.

24.40.050 Physical Standards for Condominium Conversions.

A. To achieve the purpose of this Chapter, the City shall require that all condominium conversions conform to the Municipal Code in effect at the time of tentative map approval except as otherwise provided in this Chapter.

B. All provisions of the Municipal Code must be met and violations corrected prior to the approval of the final map.

24.40.060 Specific Physical Standards. The City shall require conformance with the standards of this section in approving the map.

A. Building Regulations. The project shall conform to the applicable standards of the City building code in effect at the time the application for conversion was accepted by the City except as herein provided.

B. Zoning Regulations. The project shall conform to all applicable standards of the Zoning Ordinance, in effect at the time the application for conversion was accepted by the City except as herein provided. Except, if the applicant demonstrates that some aspect of the property or improvements is legally nonconforming, the structure may be converted so long as the nonconforming aspect is not expanded. In cases where modification of the nonconformity can be reasonably achieved in terms of financial or structural feasibility, the City shall require such modification as a condition of approval for conversion.

C. Fire Prevention.

1. Smoke Detectors. Each living unit shall be provided with approved detectors of products of combustion other than heat conforming to the latest Uniform Building Code standards, mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to rooms used for sleeping purposes.

2. Maintenance of Fire Protection Systems. All fire hydrants, fire alarm systems, portable fire extinguishers and other fire protective appliances shall be retained in an operable condition at all times.

D. Sound Transmission.

1. Shock Mounting of Mechanical Equipment. All permanent mechanical equipment such as motors, compressors, pumps, and compactors which is determined by the Department of Planning and Community Development to be a source of structural vibration or structure-borne noise shall be shock mounted with inertia blocks or bases and/or vibration isolators in a manner approved by the Department of Planning and Community Development.

2. Noise Standards. The structure shall conform to all interior and exterior sound transmission standards of the Uniform Building Code. In such cases where present standards cannot reasonably be met, the authorized agency may require the applicant to notify potential buyers of the noise deficiency currently existing within these units.

E. Utility Metering. Each dwelling unit shall be separately metered for gas and electricity. A plan for equitable sharing of communal water metering shall be developed prior to final map approval and included in the covenants, conditions and restrictions. In such cases where the subdivider can demonstrate that this standard cannot or should not reasonably be met, this standard may be modified by the authorized agency.

F. Private Storage Space. Each unit shall have at least 200 cubic feet of enclosed weather-proofed and lockable private storage space in addition to closets customarily provided. Such space may be provided in any location approved by the Department of Planning and Community Development, but shall not be divided into two or more locations. In such cases where the subdivider can demonstrate that this standard cannot or should not reasonably be met, this standard may be modified by the authorized agency.

G. Laundry Facilities. A laundry area shall be provided in each unit; or if common laundry areas are provided, such facilities shall

consist of not less than one automatic washer and dryer for each five units or fraction thereof. In such cases where the subdivider can demonstrate that this standard cannot or should not reasonably be met, this standard may be modified by the authorized agency.

H. Landscape Maintenance. All landscaping shall be restored as necessary and maintained to achieve a high degree of appearance and quality.

I. Condition of Equipment and Appliances. The developer shall provide written certification to the buyer of each unit at the close of escrow that any dishwashers, garbage disposals, stoves, refrigerators, hot water tanks, and air conditioners that are provided are in operable working condition as of the close of escrow. At such time as the homeowners' association takes over management of the development, the developer shall provide written certification to the association that any pool and pool equipment (filter, pumps, chlorinator) and any appliances and mechanical equipment to be owned in common by the association is in operable working condition.

24.40.070 Notice to Tenants.

A. The authorized agency shall not approve a final map or parcel map for a subdivision to be created from the conversion of residential real property into a condominium project, a community apartment project, or a stock cooperative project unless it makes all of the findings set forth in Section 66427.1 of the Act relating to notices and offers to tenants.

B. The subdivider shall give notice to prospective tenants in accordance with Section 66452.8 of the Act.

C. In accordance with Section 66452.9 of the Act, subdivider shall give notice of the filing of the tentative map or tentative parcel map.

D. Subdivider shall provide evidence of receipt of each tenant of the notices required herein.

24.40.080 Stock Cooperatives Owners' Vote. In accordance with Section 66452.10 of the Act, a stock cooperative will not be converted

to a condominium unless a majority of the owners have voted in favor of the conversion.

24.40.090 Conversion to Stock Cooperative. The City shall approve or disapprove the conversion of an existing building to a stock cooperative within 120 days following receipt of a completed application for approval of such conversion. (Gov. Code Section 66427.2)

24.40.100 Findings. The authorized agency shall not approve an application for conversion unless the authorized agency finds that:

A. All provisions of this Chapter are met;

B. The proposed conversion is not inconsistent with any objectives or policies in the City General Plan specifically directed to the conversion;

C. The proposed conversion will conform to the Municipal Code in effect at the time of tentative map approval except as otherwise provided in this Chapter;

D. The overall design and physical condition of the conversion achieves a high degree of appearance, quality and safety; and

E. The conversion would not displace predominantly low and moderate income families or tenants without adequate provision for suitable relocation of such families or tenants.

24.60.050 Parcel Map Waiver. Under the circumstances and subject to the provisions specified in this Section, in lieu of the requirements to file and receive approval of a tentative and final parcel map and to record a final parcel map, a subdivider may file for approval of a parcel map waiver. (Ord. 88-10)

A. A parcel map waiver may be applied to the following types of subdivisions:

    1. Lot consolidations resulting in the creation of one (1) single lot; or

    2. A condominium conversion when no new units or lots are being created. (Ord.92-39)

B. Prior to approval of a parcel map waiver, the following finding shall be made: The proposed subdivision and each of the lots proposed to be created comply with requirements as to area, on-site improvements, design, access, floodwater drainage control, adequate boundary monumentation, dedications of right-of-way, payment of development fees, appropriate improved public streets and other off-site improvements, sanitary disposal facilities, water supply availability, fire protection facilities, environmental review and protection, grading, and any and all other requirements of this Title and the State Subdivision Map Act which would be applicable to review and approval of a tentative final parcel map. (Ord. 92-39)

C. For purposes of consideration of a parcel map waiver application, the Director shall be the authorized agency. Any determination of the Director may be *appealed to the next higher approval authority as provided under this Title. (Ord. 92-14). (*See Chapter 1.12.010 through 1.12.060).

D. An application for a parcel map waiver shall be submitted on such form and with such material as shall be determined by the Director. Such material shall include a parcel map waiver plat, which shall provide all information required by this Title to be provided on a tentative parcel map. Such fee, as may be adopted by the City for a parcel map waiver application, shall be paid. The application shall be distributed for review and comment as determined by the Director. Such distribution shall include review by the City Engineer to determine compliance with technical requirements applicable under the state Subdivision Map Act.

E. After receipt of all comments and review of the proposed subdivision, the Director shall determine if the required findings can be made and the application for parcel map waiver is approved or denied. Prior to any determination of approval, acceptance by the City Engineer by signature on the Final Parcel Map waiver plat shall be obtained. A letter of determination shall be provided to the applicant. An approval shall be valid for a period of one (1) year from the date of approval, within which time the remaining procedures under paragraph F below shall be completed, otherwise said approval shall expire. (Ord. 88-10)

F. If no appeal is filed or if approval is granted after an appeal, upon notification of approval the applicant(s) for a parcel map waiver shall have a site survey done and have a record of survey prepared and recorded at the County Recorder's office conforming to the lots and lot lines approved in the parcel map waiver application. The applicant(s) shall also have prepared and recorded new deeds of property ownership to conform to the lots approved. The applicant(s) shall deliver to the Director copies of the recorded record of survey plat and the recorded deeds of ownership, together with closure calculations for each of the new lots. Upon confirmation that these instruments are in substantial compliance with the parcel map waiver application as approved, the Director shall have prepared and recorded a certificate of compliance for each of the new lots. Recordation of the certificate(s) of compliance shall complete the parcel map waiver process for an approved application. (Ord. 92-14)

Exhibit A

General Plan Housing Element Policy 1.5

If a diminishing inventory of rental housing creates an imbalance, the City should make every effort to preserve the existing stock of quality rental housing by discouraging apartment conversions to condominiums. [V-b]

Exhibit B

Coastal Overlay Zone Affordable Housing Replacement Regulations

Purpose of Coastal Zone Affordable Housing Replacement Regulations (143.0810):

The purpose of these regulations is to preserve existing dwelling units within the Coastal Overlay Zone that are occupied by *low income* or *moderate income families* as defined by Government Code Section 65590(b). These regulations are intended to implement Government Code Section 65590, by providing for replacement housing within the Coastal Overlay Zone.

When Coastal Overlay Zone Affordable Housing Replacement Regulations Apply (143.0815):

a) Any *development* that proposes the conversion or demolition of dwelling units within the Coastal Overlay Zone that are occupied by persons or *families* of *low income* or moderate income, except as provided in Section 143.0820.

b) The following *development* types shall be reviewed for compliance with the regulations in this division:

    1) Conversion from rental units to condominium units (cooperative or similar form of ownership);
    2) Conversion from residential to nonresidential use; and
    3) Demolition of a residential *structure* with three or more dwelling units or demolition of at least eleven units when two or more *structures* are involved.

c) Contiguous *lots* or *structures* owned by the *applicant* are considered as one project.

Exemption from the Coastal Overlay Zone Affordable Housing Replacement Regulations (143.020):

This division is not applicable to the following:

a) The demolition of a residential structure that has been declared a *public nuisance*;
b) The conversion or demolition of a residential *structure* to nonresidential use that is coastal-dependant or coastal-related, as defined by the California Coastal Act of 1976, as amended, when the nonresidential use is consistent with the applicable *land use plan*;
c) The conversion or demolition of a residential *structure* that contains less than three dwelling units; and
d) The conversion or demolition of 10 or fewer dwelling units on a *premises* with more than one residential *structure.*

VF

THE CITY OF ENCINITAS
INCOME VERIFICATION FORM
(One form needed per tenant)

ADDRESS OF UNIT: _____

_____

NAME OF OWNER: _____

_____

Please provide the following information regarding the person/s currently occupying the unit.

HOUSING OCCUPANTS

ADULT'S NAMES	AGE	CHILDREN'S NAMES	AGE
1. _____	_____	1. _____	_____
2. _____	_____	2. _____	_____

Same tenant as previous year? Yes_____No_____

HOUSEHOLD INCOME: $_____per_____(weekly, bi-weekly, monthly, annually)
Household income means the combined gross income of each adult member of the household. It is possible that City may require more than one document be used to verify income. Household income worksheets and instructions are available through the City of Encinitas Planning and Building Department.

(Please attach one or more of the following):

Tax Return		Social Security		Self-Certification		Other	
Pay Stubs		Bank Statements		Letter From Employer		Other	

RENTAL RATE: $_____per_____ (week, month, year)

UTILITIES paid by tenant (check all that apply):
☐ Gas/Electricity ☐ Water ☐Sewer ☐ Trash

Please assist us in maintaining accurate demographic information by indicating one or more of the household types below:
Elderly_____ Small Family (1-4)_____ Single Parent_____

Farmworker _____ Disabled____ Large Family (5+) _____

Other _____

CERTIFICATION

I/We have read the information submitted above, and certify that the information is accurate and complete to my/our knowledge (*persons residing in the residence may be eligible for relocation assistance, so the accurate reporting of the income information is very important*). I/We acknowledge and understand that a material misstatement fraudulently made in this affidavit or in any other statement made by me/us in connection with the affordability restriction recorded against this property will constitute a federal violation punishable by fine and abatement of use of subject property, which will be in addition to any criminal penalty imposed by law.

Owner/s

Signature	Date	Signature	Date

Tenant/s

Signature	Date	Signature	Date

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT REGARDING REAL PROPERTY:
HOLD CITY HARMLESS FOR (BLUFF FAILURE) (DRAINAGE)

Assessor's Parcel No. _____ Project No.:_____

A. _____
("OWNER" hereinafter) is the owner of real property which is commonly known as _____
(''PROPERTY" hereinafter) and which is described as follows:

See Attachment A attached hereto and made a part hereof.

B. In consideration of_____
by the City of Encinitas ("CITY" hereinafter), OWNER hereby covenants and agrees for the benefit of CITY, to do the following:

See Attachment B attached hereto and made a part hereof.

C. This Covenant shall run with the land and be binding upon and inure to the benefit of the future owners, encumbrancers, successors, heirs, personal representatives, transferees and assigns of the respective parties.

D. OWNER agrees that OWNER's duties and obligations under this Covenant are a lien upon the PROPERTY. Upon notice and opportunity to respond, CITY may add to the property tax bill of the PROPERTY any past due financial obligation owing to CITY by way of this Covenant.

E. If either party is required to incur costs to enforce the provisions of this Covenant, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorneys' fees, from the other party.

F. Failure of OWNER to comply with the terms of this Covenant shall constitute consent to the filing by CITY of a Notice of Violation of Covenant.

ACCEPTED AND AGREED:

OWNER:

OWNER Signature: _____ Dated: _____

Print Name: _____

(Notarization of OWNER signature is attached.)

CITY OF ENCINITAS:

CITY Signature: _____ Dated: _____

Print Name: _____

Title: _____

(Notarization not required)

ATTACHMENT A TO
COVENANT REGARDING REAL PROPERTY:
HOLD CITY HARMLESS FOR (BLUFF FAILURE)(DRAINAGE)

PROJECT NO. _____

PROPERTY DESCRIPTION

ATTACHMENT B TO
COVENANT REGARDING REAL PROPERTY:
HOLD CITY HARMLESS FOR (BLUFF FAILURE) (DRAINAGE)

PROJECT NO. _____

OWNER'S DUTIES AND OBLIGATIONS

1. For claims that are alleged to have arisen, directly or indirectly, from any (bluff failure or erosion) (drainage) associated with the PROPERTY or the plans, design, construction or maintenance of OWNER' s improvements, OWNER unconditionally waives all present and future claims against CITY and CITY's officers, officials, employees, and agents. This waiver does not apply to claims that are alleged to have arisen out of the sole, active negligence or deliberate, wrongful act of CITY.

2. It is further understood and agreed that all of OWNER'S rights under §1542 of the Civil Code of, the State of California and any similar law of any state or territory of the United States are hereby expressly waived. 9 1542 reads as follows:

> 1542. Certain claims not affected by general release. A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him must have materially affected his settlement with the debtor.

3. OWNER agrees to indemnify and hold CITY and CITY's officers, officials, employees and agents harmless from, and against any and all liabilities, claims, demands, causes of action, losses, damages and

costs, including all costs of defense thereof, arising out of, or in any manner connected directly or indirectly with, any acts or omissions of OWNER or OWNER's agents, employees, subcontractors, officials, officers or representatives. Upon demand, OWNER shall, at its own expense, defend CITY and CITY's officers, officials, employees and agents, from and against any and all such liabilities, claims, demands, causes of action, losses, damages and costs.

OWNER' s obligation herein includes, but is not limited to, alleged defects in the plans, specifications and design of the improvements; but does not extend to liabilities, claims, demands, causes of action, losses, damages or costs that arise out of a defect in the plans, specifications or design that is a result of a change required by CITY to the OWNER's proposed plans, specifications or design so long as such change is objected to, in writing, by OWNER, and the writing is filed with the City Engineer more than ten days prior to the commencement of work.

OWNER's obligation herein includes, but is not limited to, alleged defects in the construction of the improvements; alleged defects in the materials furnished in the construction of the improvements; alleged injury to persons or property; and any alleged inverse condemnation of property as a consequence of the design, construction, or maintenance of the improvements.

By approving the improvement plans, specifications and design or by inspecting or approving the improvements, CITY shall not have waived

the protections afforded herein to CITY and CITY's officers, officials, employees and agents or diminished the obligation of OWNER who shall remain obligated in the same degree to indemnify and hold CITY and CITY's officers, officials, employees and agents, harmless as provided above.

OWNER's obligation herein does not extend to liabilities, claims, demands causes of action, losses, damages or costs that arise out of the CITY's intentional wrongful acts, CITY's violations of law, or CITY's sole active negligence.

4. OWNER hereby agrees not to develop in any manner the PROPERTY except as authorized by CITY's ordinances and then only in accordance with issued permits. Among other things, but without limitation, this shall prohibit the alteration of land forms, removal of vegetation and the erection of structures of any type, except as permitted or authorization by CITY.

5. This Covenant does not Preclude OWNER taking emergency, protective measures as approved by CITY.

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

PRIVATE FACILITIES MAINTENANCE AGREEMENT

Assessor's Parcel No. _____ Project No.: _____
Case No.: _____

THIS AGREEMENT for the periodic maintenance and repair of certain private facilities, the legal description and/or plat of which is set forth in Exhibits attached hereto and made a part hereof, is entered into by _____ (hereinafter referred to as "Developer") for the benefit of future owners who will use the private facilities (hereinafter referred to as " owners", which shall include the Developer to the extent the Developer retains any ownership interest in any land covered by this agreement.

WHEREAS, this Agreement is required as a condition of approval by the City of Encinitas of a subdivision project as defined in Section 21065 of the Public Resources code and pursuant to City of Encinitas Municipal Code Section 24.16.060 and Section 24.29.040; and

WHEREAS, Developer is the owner of certain real property and developed as Exhibit "A" that will use and enjoy the benefit of said private facilities. Said real property is hereinafter referred to as the "property"; and

WHEREAS, it is the desire of the Developer that said private landscape and irrigation system as shown on Exhibit “B” be maintained in a safe and usable condition by the owners; and

WHEREAS, it is the desire of the Developer to establish a method for the periodic maintenance and any necessary repairs of said private facilities and for the apportionment of the expense of such maintenance and repair among existing and future owners; and

WHEREAS, there exists a benefit to the public the private facilities be adequately maintained on a regular and periodic basis in compliance with the schedule set forth in Exhibit “C”; and

WHEREAS, it is the intention of the Developer that this Agreement constitute a covenant running with the land, binding upon each successive owner of all or any portion of the property. NOW THEREFORE, IT IS HEREBY AGREED AS FOLLOWS:

1. The property is benefited by this Agreement, and present and successive owners of all or any portion of the property are expressly bound hereby for the benefit of the land.

2. The cost and expense of maintaining the private facilities shall be paid by the owner of the heirs, assigns and successors in interest or each such owner.

3. In the event any of the herein described parcels of land are subdivided further, the owners, heirs, assigns and successors in interest of each such newly created parcel shall be liable under this Agreement for their then pro rata share of expenses and such pro rata shares of expenses shall be computed to reflect such newly created parcels.

4. The repairs and maintenance to be performed under this Agreement shall be limited to the following: reasonable improvements and maintenance work to adequately maintain said private facilities and other work reasonably necessary and proper to repair and preserve the private facilities.

5. The professional landscape service engaged to perform the maintenance and repair of the landscaping and irrigation shall be expressly approved by the City.

6. If there is a covenant, agreement, or other obligation imposed as a condition of the development, the obligation to repair and maintain the private facilities as herein set forth shall commence when improvements have been completed and approved by the City.

7. Any extraordinary repair required to correct damage to said private facilities that results from action taken or contracted for by the owners or their successors in interest shall be paid for by the party taking action or party contracting for work which caused the necessity for the extraordinary repair. The repair shall be such as to restore the private facilities to the condition existing prior to said damage.

8. Any liability of the owners for personal injury to an agent hereunder, or to any worker employed to make repairs or provide maintenance under this Agreement, or to third persons, as well as any liability of the owners for damage to the property of agent, or any such worker, or of any third persons, as a result of or arising out of repairs and maintenance under this Agreement, shall be borne, by the owners as they bear the costs and expenses of such repairs and maintenance. Owners shall be responsible for and maintain their own insurance, if any. By this Agreement, the Developer does not intend to provide for the sharing of liability with respect to personal injury or property damage other than that attributable to the repairs and maintenance undertaken under this Agreement.

9. Owners shall jointly and severally defend and indemnify and hold harmless City, City's engineer and its consultants and each of its officials, directors, officers, agents and employees from and against all liability, claims, damages, losses, expenses, personal injury and other costs, including costs of defense and attorney's fees, to the agent hereunder or to any owner, any contractor, any subcontractor, any user of the private facilities, or to any other third persons arising out of or in any way related to the use of, repair or maintenance of, or the failure to repair or maintain the private facilities.

10. Nothing in the Agreement, the specifications or other contract documents or City's approval of the plans and specifications or inspection of the work is intended to include a review, inspection acknowledgement of a responsibility for any such matter, and City, City's engineer and its consultants, and each of its officials, directors, officers, employees and agents, shall have no responsibility or liability therefore.

11. The foregoing covenants shall run with the land and shall be deemed to be for the benefit of the land of the owners and each and every person who shall at anytime own all or any portion of the property referred to herein.

12. It is understood and agreed that the covenants herein contained shall be binding on the heirs, executors, administrators, successors, and assignees of each of the owners.

13. It is the purpose of the signatories hereto that this instrument be recorded to the end and intent that the obligation hereby created shall be and constitute a covenant running with the land and any subsequent purchaser of all or any portion thereof, by acceptance of delivery of a deed and/or conveyance regardless of form, shall be deemed to have consented to and become bound by these presents, including without limitation, the right of any person entitled to enforce the terms of this Agreement to institute legal action as provided in Paragraph 8 hereof, such remedy to be cumulative and in addition to other remedies provided in this Agreement and to all other remedies at law or in equity.

14. The terms of this Agreement may be amended in writing upon majority approval of the owners and consent of the City.

15. This Agreement shall be governed by the laws of the State of California. In the event that any of the provisions of this Agreement are held to be unenforceable or invalid by any court of competent jurisdiction, the validity, and enforceability of the remaining provisions shall not be affected thereby.

16. The City is authorized to collect sums as appropriate for recovery of the costs for abatement of any landscape and irrigation facility maintenance violation should the property owner fail to voluntarily comply.

17. The Owner, its successors or assigns, hereby grants permission to the City and its authorized Agents and employees, to enter upon the Property and to inspect the private facilities upon reasonable notice whenever the City deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The City shall provide the Owner, its successors and assigns, copies of the inspection findings and a written directive to commence with the specified repairs if necessary.

18. In the event the Owner, its successors or assigns, fails to maintain the private facilities in good working condition acceptable to the City, the City, its Agents, or its contractors, may enter upon the Property and take the steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Owner, its successors or assigns. In the event the City pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Owner, its successors and assigns, shall reimburse the City upon written demand within thirty (30) days of receipt thereof for all actual costs incurred by the City hereunder. If said funds are not paid in a timely manner, City reserves the right to file an assessment lien on the real property with the County Recorder of the County of San Diego. It is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

19. The existing landscape and lighting district does not cover the costs of maintaining the proposed landscaping; therefore, the developer cannot join a landscape and lighting district at this time. If, in the future, a subzone of the landscape and lighting district is established for the proposed landscaping within the median, the developer shall join and pay the required fees at the discretion of the City Engineer.

20. If the Property constitutes a "Common Interest Development" as defined in California Civil Code Section 1351(c) which will include membership in or ownership of an "Association" as defined in California Civil Code Section 1351(a), anything in this Agreement to the contrary notwithstanding, the following provisions shall apply at and during such time as (i) the Property is encumbered

by a "Declaration" (as defined in California Civil Code Section 1351(h), and (ii) the Common Area of the property (including the private facilities) is managed and controlled by an Association:

(a) The Association, through its Board of Directors, shall repair and maintain the private facilities and shall be deemed the "agent" as referred to in Paragraph 7 above. The Association, which shall not be replaced except by amendment to the Declaration, shall receive no compensation for performing such duties. The costs of such maintenance and repair shall be assessed against each owner and his subdivision interest in the Property pursuant to the Declaration. The assessments shall be deposited in the Association's corporate account.

(b) The provisions in the Declaration which provide for assessment liens in favor of the Association and enforcement thereof shall supersede Paragraph 8 of the Agreement in its entirety. No individual owners shall have the right to alter, maintain or repair any of the Common Area (as defined in California Civil Code Section 1351(b) in the Property except as may be allowed by the Declaration.

(c) This Agreement shall not be interpreted in any manner, which reduces or limits the Association's rights and duties pursuant to its Bylaws and Declaration.

IN WITNESS WHEREOF, the parties have executed this Agreement:

DEVELOPER:

DEVELOPER Signature: _____ Dated: _____

Print Name: _____

Signature of DEVELOPER must be notarized. Attach the appropriate acknowledgement.

EXHIBIT "A"
LEGAL DESCRIPTION OF REAL PROPERTY
APN _____

EXHIBIT "B"
PLAT OF PRIVATE FACILITIES

EXHIBIT "C"
SCHEDULE FOR MAINTENANCE
OF PRIVATE FACILITIES

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT REGARDING REAL PROPERTY: PUBLIC IMPROVEMENTS REQUIRED AS CONDITION ON FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY

Assessor's Parcel No. _____ Project No.: _____
W.O. No.: _____

A. _____ ("SUBDIVIDER" hereinafter) is the owner of real property which is commonly known as _____ ("PROPERTY" hereinafter) and which is described as follows:

See Exhibit A which is attached hereto and made a part hereof.

B. The tentative subdivision of the PROPERTY was approved with the final approval subject to certain conditions requiring the construction of public improvements by SUBDIVIDER. SUBDIVIDER has applied for final approval of the subdivision but has not constructed the required public improvements. In consideration of the final approval of the subdivision of the PROPERTY by the City of Encinitas ("CITY" hereinafter), SUBDIVIDER hereby covenants and agrees for the benefit of CITY, to do the following:

See Exhibit B which is attached hereto and made a part hereof.

C. This Covenant shall run with the land and be binding upon and inure to the benefit of the future owners, encumbrances, successors, heirs, personal representatives, transferees and assigns of the respective parties.

D. SUBDIVIDER agrees that SUBDIVIDER's duties and obligations under this Covenant are a lien upon the PROPERTY. Upon notice and opportunity to respond, CITY may add to the property tax bill of the PROPERTY any past due f financial obligation owing to CITY by way of this Covenant.

E. If either party is required to incur costs to enforce the provisions of this Covenant, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorneys fees, from the other party.

F. Failure of SUBDIVIDER to comply with the terms of this Covenant shall constitute consent to the filing by CITY of a Notice of Violation of Covenant.

G. Upon SUBDIVIDER's satisfactory completion of SUBDIVIDER's duties and obligations contained herein, SUBDIVIDER may request and CITY shall execute a Satisfaction of Covenant.

H. By action of the City Council, CITY may assign to a person or persons impacted by the performance of this Covenant, the right to enforce this Covenant against SUBDIVIDER.

ACCEPTED AND AGREED:

SUBDIVDER:

_____ _____

Signature Dated

Developer Name, Title

Company

CITY OF ENCINITAS:

_____ _____

Signature Dated

Director of Engineering Services

Notarization of SUBDIVIDER signature attached; notarization of Director not required.

ATTACHMENT A TO

COVENANT REGARDING REAL PROPERTY:

IMPROVEMENTS REQUIRED AS CONDITION ON

FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY.

PROJECT NO._____

PROPERTY DESCRIPTION

ATTACHMENT B TO
COVENANT REGARDING REAL PROPERTY:
PUBLIC IMPROVEMENTS REQUIRED AS CONDITION ON
FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY.

PROJECT NO. ____
SUBDIVIDER'S DUTIES AND OBLIGATIONS

Name of SUBDIVIDER: _____
Tract or Parcel Map Number: _____
Name of subdivision: _____
Resolution of Approval Number: _____Adopted: _____
Estimated total cost of improvements: _____

1.0 IMPROVEMENTS REQUIRED

1.1 SUBDIVIDER agrees at SUBDIVIDER's own cost and expense to furnish all the labor, equipment and materials to perform and complete, in accordance with the plans and specifications and to the satisfaction and approval of the City Engineer, all of the private improvements referred to below:

Improvement plan drawing no. _____ sheets ____ through ____ prepared by _____ on file with CITY in City Engineer's office and incorporated herein as though fully set forth at length.

1.2 Further, SUBDIVIDER agrees to perform the following Conditions:

Public improvements pursuant to resolution of approval _____

2.0 PROGRESS OF WORK

2.1 Time is of the essence with this Covenant. SUBDIVIDER shall commence substantial construction of the public improvements required by this Covenant no later than one year from the Public Improvements Plans _____ and shall complete the public improvements no later than two years from the date of approval of said Improvement Plans.

In the event good cause exists, as determined by the City Engineer, the time for commencement of construction or completion of the private improvements hereunder may be extended. Any such extension may be granted without notice to SUBDIVIDER's Surety or Sureties, if any, and shall in no way affect the validity of this Covenant or release the Surety or Sureties on any security given f or the faithful performance of this Covenant. The City Engineer shall be the sole and final judge as to whether or not good cause has been shown to entitle SUBDIVIDER to an extension. As a condition of such extensions, the City Engineer may require SUBDIVIDER to furnish new security guaranteeing performance of this Covenant, as extended, in an increased amount as necessary to compensate for any increase in construction costs as determined by the City Engineer.

2.2 If any of the private improvements are to be constructed or installed on land not owned by SUBDIVIDER, no construction or installation shall be commenced prior to SUBDIVIDER demonstrating to CITY that SUBDIVIDER has acquired the appropriate property interests.

2.3 SUBDIVIDER shall, at SUBDIVIDER's expense, obtain all necessary permits and licenses for the construction of the private improvements and give all necessary notices and pay all fees and taxes required by law.

2.4 SUBDIVIDER shall notify the City Engineer in writing at least 15 days prior to the commencement of work hereunder. No construction work shall begin until authorized by CITY.

2.5 SUBDIVIDER shall not be entitled to obtain occupancy permits for the buildings constructed on any lot created by the subdivision until all required improvements have been provided to the satisfaction of the City Engineer.

2.6 SUBDIVIDER shall at all times maintain safe construction facilities, and provide safe access, for inspection CITY, to all parts of the work and to the shops wherein the work is in preparation.

2.7 SUBDIVIDER shall give good and adequate warning to the public to each and every existing danger relating to the construction of the private improvements, and shall protect the public from such dangers.

3.0 INSPECTION/APPROVAL OF IMPROVEMENTS

3.1 The City Engineer or his duly authorized representative**,** upon request of SUBDIVIDER, shall inspect, at SUBDIVIDER's expense the private improvements herein agreed to be constructed and installed by SUBDIVIDER. If determined to be in accordance with applicable CITY standards and the other terms of this Covenant, the City Engineer shall approve the improvements.

3.2 SUBDIVIDER agrees to pay for each inspection of the improvements required by the City Engineer.

3.3 Approval of the private improvements by CITY shall not constitute a waiver by CITY of any defects in the improvements.

3.4 Until such time as the private improvements required by this Covenant are fully completed by SUBDIVIDER and approved by the City Engineer. SUBDIVIDER will be responsible for the care, maintenance, repair and replacement of such private improvements.

4.0 HOLD HARMLESS

4.1 SUBDIVIDER agrees to indemnify and hold CITY and CITY's officers, officials, employees, and agents harmless from, and against any and all liabilities. Claims, demands. causes of action, losses, damages and costs, including all costs of defense thereof, arising out of, or in any manner connected directly or indirectly with, any acts or omissions of SUBDIVIDER or SUBDIVIDER's agents, employees, subcontractors, officials, officers or representatives. Upon demand SUBDIVIDER shall, at its own expense, defend CITY and CITY's officers, officials, employees and agents, from and against any and all such liabilities, claims, demands, causes of action, losses, damages and costs.

4.2 SUBDIVIDER's obligation herein includes, but is not limited to, alleged defects in the plans, specifications and design of the private improvements; but does not extend to liabilities, claims, demands, causes of action, losses, damages or costs that arise out of a defect in the plans, specifications or design that is a result of a change required by CITY to SUBDIVIDER's proposed plans, specifications or design so long as such change is objected to, in writing, by SUBDIVIDER, and the writing is filed with the City Engineer more than ten days prior to the commencement of work.

4.3 SUBDIVIDER's obligation herein includes, but is not limited to, alleged defects in the construction of the private improvements; alleged defects in the materials furnished in the construction of the private improvements; alleged injury to persons or property; alleged inverse condemnation of property or a consequence of the design,

construction, or maintenance of the work or the private improvements; and any accident, loss or damage to the work or the private improvements prior to the approval of the construction of the private improvements by CITY.

4.4 By approving the improvement plans, specifications and design or by inspecting or approving the private improvements, CITY shall not have waived the protections afforded herein to CITY and CITY's officers, officials, employees and agents or diminished the obligation of SUBDIVIDER who shall remain obligated in the same degree to indemnify and hold CITY and CITY's officers, officials, employees and agents, harmless as provided above.

4.5 SUBDIVIDER's obligation herein does not extend to liabilities, claims, demands, and causes of action. losses, damages or costs that arise out of CITY's intentional wrongful acts, CITY's violations of law or CITY's sole active negligence.

5.0 INSURANCE

5.1 SUBDIVIDER shall obtain and maintain a policy of motor vehicle liability, public liability, general liability and property damage insurance from an insurance company approved by CITY and authorized to do business in the State of California, in an insurable amount of not less than one million dollars ($1,000,000.00) for each occurrence. The insurance policy shall provide that the policy shall remain in force during the life of this COVENANT and shall not be cancelled, terminated, or allowed to expire without thirty- (30) days prior written notice to CITY from the insurance company.

5.2 CITY shall be named as an additional insured on SUBDIVIDER's policies.

5.3 SUBDIVIDER shall furnish certificates of said insurance to CITY prior to commencement of work under this AGREEMENT.

6.0 REPAIR, MAINTENANCE AND REPLACEMENT

6.1 As a condition on the approval by CITY of the satisfactory construction of the private improvements, SUBDIVIDER shall prepare, have executed. and record a covenant, in a form satisfactory to CITY, whereby property owners who will be served by the private improvements will be obligated to provide for the repair, maintenance and replacement of the private improvements and to indemnify and hold CITY and CITY's officers, officials, employees and agents, harmless.

7.0 NOTICES

7.1 Any notices to be given under this COVENANT, or otherwise, shall be served by certified mail.

7.2 For the purposes hereof, unless otherwise provided in writing by the parties hereto, the address of CITY and the proper person to receive any such notice on its behalf is:

City Engineer
City of Encinitas
505 S. Vulcan Avenue
Encinitas, CA 92024

And the address of SUBDIVIDER and the proper person to receive any such notice on its behalf is:

Name
Address

8.0 SUBDIVIDER's CERTIFICATION OF AWARENESS OF IMMIGRATION REFORM AND CONTROL ACT OF 1986

8.1 SUBDIVIDER certifies that SUBDIVIDER is aware of the requirements of the Immigration Reform and Control Act of 1986 (8 USC SS 1101-1525) and will comply with these requirements, including but not limited to verifying the eligibility for employment of all agents, employees, subcontractors and consultants that are included in, satisfy the duties and obligations contained herein.

9.0 GENERAL PROVISIONS

9.1 Neither SUBDIVIDER nor any of SUBDIVIDER's agents or contractors are or shall be considered to be agents of CITY in connection with the performance of SUBDIVIDER's duties and obligations under this Covenant.

9.2 Sale or other disposition of the PROPERTY will not relieve SUBDIVIDER from the duties and obligations set forth herein.

9.3 SUBDIVIDER shall provide the improvements as an independent contractor and in pursuit of SUBDIVIDER's independent calling, and not as an employee of CITY. SUBDIVIDER shall not be under control of CITY except as to the result to be accomplished. SUBDIVIDER may confer with CITY as required to perform this Covenant.

9.4 No verbal agreement or conversation with any officer, official, agent or employee of CITY, either before, during or after the execution of this Covenant, shall effect or modify any of the terms or obligations herein contained.

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

CITY CLERK
CITY OF ENCINITAS
505 SOUTH VULCAN AVENUE
ENCINITAS, CA 92024

SPACE ABOVE FOR RECORDER'S USE

ENCROACHMENT MAINTENANCE AND REMOVAL COVENANT
ENCROACHMENT PERMIT NO. _____

A.P.N._____ Plan No. _____

Case No. _____

An encroachment permit is hereby granted to the Permittee designated in paragraph one, Attachment "A", as the owner of the Benefited property described in paragraph two, Attachment "A," to encroach upon City Property described in paragraph three, Attachment "A", as detailed in the diagram, Attachment "B". Attachments "A" and "B" are hereby incorporated herein by this reference as though fully set forth at length. In consideration of the issuance of this encroachment permit, Permittee hereby covenants and agrees, for the benefit of the City, as follows:

1. This covenant shall run with the land and be binding upon and inure to the benefit of the future owners, encumbrancers, successors, heirs, personal representatives, transferees, and assigns of the respective parties.

2. Permittee shall use and occupy the City Property only in the manner and for the purpose described in paragraph four, Attachment "A".

3. By accepting the benefits herein, Permittee acknowledges title to the City Property to be in the City and waives all right to contest that title.

4. The term of the encroachment permit is indefinite and may be revoked by the City and abandoned by Permittee at any time. The city shall mail written notice of revocation to Permittee, addressed to the Benefited Property which shall set forth the date upon which the benefits of encroachment permit are to cease.

5. City is entitled to remove all or a portion of the improvements constructed by Permittee in order to repair, replace, or install public improvements. City shall have no obligation to pay for or restore Permittee's improvements.

6. Permittee agrees to hold harmless, defend and indemnify from and against all claims, demands, costs, losses, damages, injuries, litigation, and liability arising out of or related to the use, construction, encroachment or maintenance to be done by the Permittee or Permittee's agents, employees or contractors on City Property.

7. Upon abandonment, revocation, completion, or termination, Permittee shall, at no cost to the city, return City Property to its pre-permit condition within the time specified in the notice of revocation or prior to the date of abandonment.

8. If Permittee fails to restore the City Property, the City shall have the right to enter upon the City Property, after notice to the Permittee, delivered at the Benefited Property, and restore the City Property to its pre-permit condition to include the removal and destruction of any improvements and Permittee agrees to reimburse the city for the costs incurred. Notice may be given by first class mail sent to the last known address of the Permittee, which shall be deemed effective three calendar days after mailing, or by any other reasonable method likely to give actual notice.

9. If either party is required to incur costs to enforce the provisions of this covenant, the prevailing party shall be entitled to full reimbursement for all costs, including reasonable attorney's fees.

10. Permittee shall agree that Permittee's duties and obligations under this covenant are a lien upon the Benefited Property. Upon 30-day notice, and an opportunity to respond, the City may add to the tax bill of the Benefited Property any past due financial obligation owing to city by way of this covenant.

11. Permittee waives the right to assert any claim or action against the City arising out of or resulting from the revocation of this permit or the removal of any improvements or any other action by the City, its officers, agents, or employees taken in a manner in accordance with the terms of the permit.

12. Permittee recognizes and understands that the permit may create a possessory interest subject to property taxation and that the permittee may be subject to the payment of property taxes levied on such interest.

13. As a condition precedent to Permittee's right to go upon the City Property, the agreement must first be signed by the Permittee, notarized, executed by the City and recorded with the County Recorder of the County of San Diego. The recording fee shall be paid by Permittee.

AGREED AND ACCEPTED

Dated:_____

PERMITTEE

_____

_____
Printed Name

_____
Title

_____
Company

(Notarization of PERMITTEE signature is attached)

Approved and issued by the City of Encinitas, California:

CITY OF ENCINITAS

Dated:_____

_____

_____
Printed Name

_____
Title

_____
Company

ATTACHMENT 'A' TO COVENANT
REGARDING ENCROACHMENT PERMIT NO. _____-PE

PARAGRAPH ONE:
Permitee: [*Owners' Name(s) as Vested on Grant Deed]*

PARAGRAPH TWO:
Benefited Property: *[Address]*
[APN]
[Full Legal Description]

PARAGRAPH THREE:
City Property: *[THAT PORTION OF THE WESTERLY HALF OF COAST HIGHWAY 101 LAYING ADJACENT AND EASTERLY TO THE PROPERTIES AS DESCRIBED IN PARAGRAPH TWO AND THAT PORTION OF THE SOUTHERLY HALF OF WEST 'G' STREET LAYING ADJACENT AND NORTHERLY TO THE PROPERTY AS DESCRIBED IN PARAGRAPH TWO AND AS SHOWN IN EXHIBIT 'B'.*

PARAGRAPH FOUR:
Purpose: *[Encroachment for Flagstone Walkway in Right-of-Way]*

ATTACHMENT 'B' TO COVENANT
REGARDING ENCROACHMENT PERMIT NO. _____-PE
DETAIL OF ENCROACHMENT

Exhibit/ Plat showing a detail of the proposed encroaching facilities to be prepared by the engineer of work.

THIS PAGE INTENTIONALLY

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THIS PAGE INTENTIONALLY

LEFT BLANK.

THIS PAGE INTENTIONALLY

LEFT BLANK.

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT REGARDING REAL PROPERTY:
PUBLIC IMPROVEMENTS REQUIRED AS CONDITION ON
FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY.

Assessor's Parcel No. _____ Project No.: _____
W.O. No.: _____

A. _____ ("SUBDIVIDER" hereinafter) is the owner of real property which is commonly known as _____ ("PROPERTY" hereinafter) and which is described as follows:

See Exhibit A which is attached hereto and made a part hereof.

B. The tentative subdivision of the PROPERTY was approved with the final approval subject to certain conditions requiring the construction of public improvements by SUBDIVIDER. SUBDIVIDER has applied for final approval of the subdivision but has not constructed the required public improvements. In consideration of the final approval of the subdivision of the PROPERTY by the City of Encinitas ("CITY" hereinafter), SUBDIVIDER hereby covenants and agrees for the benefit of CITY, to do the following:

See Exhibit B which is attached hereto and made a part hereof.

C. This Covenant shall run with the land and be binding upon and inure to the benefit of the future owners, encumbrances, successors, heirs, personal representatives, transferees and assigns of the respective parties.

D. SUBDIVIDER agrees that SUBDIVIDER's duties and obligations under this Covenant are a lien upon the PROPERTY. Upon notice and opportunity to respond, CITY may add to the property tax bill of the PROPERTY any past due f financial obligation owing to CITY by way of this Covenant.

E. If either party is required to incur costs to enforce the provisions of this Covenant, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorneys fees, from the other party.

F. Failure of SUBDIVIDER to comply with the terms of this Covenant shall constitute consent to the filing by CITY of a Notice of Violation of Covenant.

G. Upon SUBDIVIDER's satisfactory completion of SUBDIVIDER's duties and obligations contained herein, SUBDIVIDER may request and CITY shall execute a Satisfaction of Covenant.

H. By action of the City Council, CITY may assign to a person or persons impacted by the performance of this Covenant, the right to enforce this Covenant against SUBDIVIDER.

ACCEPTED AND AGREED: DEVELOPER

_____ _____
Dated

_____ _____
Dated

Notarization of OWNER signature attached; notarization of Director not required.

CITY OF ENCINITAS
By: _____ Date: _____
Director of Engineering Services

ATTACHMENT A TO
COVENANT REGARDING REAL PROPERTY:
IMPROVEMENTS REQUIRED AS CONDITION ON
FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY.

PROJECT NO._____

PROPERTY DESCRIPTION

ATTACHMENT B TO
COVENANT REGARDING REAL PROPERTY:
PUBLIC IMPROVEMENTS REQUIRED AS CONDITION ON
FINAL APPROVAL OF SUBDIVISION OF REAL PROPERTY.

PROJECT NO. _____

SUBDIVIDER's DUTIES AND OBLIGATIONS

Name of SUBDIVIDER: _____
Tract or Parcel Map Number: _____

Name of subdivision: _____

Resolution of Approval Number: _____Adopted: _____

Estimated total cost of improvements: _____

1.0 IMPROVEMENTS REQUIRED

1.1 SUBDIVIDER agrees at SUBDIVIDER's own cost and expense to furnish all the labor, equipment and materials to perform and complete, in accordance with the plans and specifications and to the satisfaction and approval of the City Engineer, all of the private improvements referred to below:

Grading plan drawing no._____ sheets 1 through __ dated ___ and prepared by_____ as approved on _____ by the City Engineer together with any subsequent amendments approved in writing by the City Engineer; on file with CITY in City Engineer's office and incorporated herein as though fully set forth at length.

1.2 Further, SUBDIVIDER agrees to perform the following conditions:

All improvements, conditions and work pursuant to Conditions of Approval for _____.

2.0 PROGRESS OF WORK

2.1 Time is of the essence with this Covenant. SUBDIVIDER shall commence substantial construction of the private improvements required by this Covenant no later than _____and shall complete the private improvements no later than _____.

In the event good cause exists, as determined by the City Engineer, the time for commencement of construction or completion of the private improvements hereunder may be extended. Any such extension may be granted without notice to SUBDIVIDER's Surety or Sureties, if any, and shall in no way affect the validity of this Covenant or release the Surety or Sureties on any security given f or the faithful performance of this Covenant. The City Engineer shall be the sole and final judge as to whether or not good cause has been shown to entitle SUBDIVIDER to an extension. As a condition of such extensions, the City Engineer may require SUBDIVIDER to furnish new security guaranteeing performance of this Covenant, as extended, in an increased amount as necessary to compensate for any increase in construction costs as determined by the City Engineer.

2.2 If any of the private improvements are to be constructed or installed on land not owned by SUBDIVIDER, no construction or installation shall be commenced prior to SUBDIVIDER demonstrating to CITY that SUBDIVIDER has acquired the appropriate property interests.

2.3 SUBDIVIDER shall, at SUBDIVIDER's expense, obtain all necessary permits and licenses for the construction of the private

improvements and give all necessary notices and pay all fees and taxes required by law.

2.4 SUBDIVIDER shall notify the City Engineer in writing at least 15 days prior to the commencement of work hereunder. No construction work shall begin until authorized by CITY.

2.5 SUBDIVIDER shall not be entitled to obtain occupancy permits for the buildings constructed on any lot created by the subdivision until all required improvements have been provided to the satisfaction of the City Engineer.

2.6 SUBDIVIDER shall at all times maintain safe construction facilities, and provide safe access, for inspection CITY, to all parts of the work and to the shops wherein the work is in preparation.

2.7 SUBDIVIDER shall give good and adequate warning to the public to each and every existing danger relating to the construction of the private improvements, and shall protect the public from such dangers.

3.0 INSPECTION/APPROVAL OF IMPROVEMENTS

3.1 The City Engineer or his duly authorized representative**,** upon request of SUBDIVIDER, shall inspect, at SUBDIVIDER's expense the private improvements herein agreed to be constructed and installed by SUBDIVIDER. If determined to be in accordance with applicable CITY standards and the other terms of this Covenant, the City Engineer shall approve the improvements.

3.2 SUBDIVIDER agrees to pay for each inspection of the improvements required by the City Engineer.

3.3 Approval of the private improvements by CITY, shall not constitute a waiver by CITY of any defects in the improvements.

3.4 Until such time as the private improvements required by this Covenant are fully completed by SUBDIVIDER and approved by the City Engineer. SUBDIVIDER will be responsible for the care, maintenance, repair and replacement of such private improvements.

4.0 HOLD HARMLESS

4.1 SUBDIVIDER agrees to indemnify and hold CITY and CITY's officers, officials, employees, and agents harmless from, and against any and all liabilities. claims, demands. causes of action, losses, damages and costs, including all costs of defense thereof, arising out of, or in any manner connected directly or indirectly with, any acts or omissions of SUBDIVIDER or SUBDIVIDER's agents, employees, subcontractors, officials, officers or representatives. Upon demand. SUBDIVIDER shall, at its own expense, defend CITY and CITY's officers, officials, employees and agents, from and against any and all such liabilities, claims, demands, causes of action, losses, damages and costs.

4.2 SUBDIVIDER's obligation herein includes, but is not limited to, alleged defects in the plans, specifications and design of the private improvements; but does not extend to liabilities, claims, demands, causes of action, losses, damages or costs that arise out of a defect in the plans, specifications or design that is a result of a change required by CITY to SUBDIVIDER's proposed plans, specifications or design so long as such change is objected to, in writing, by SUBDIVIDER, and the writing is filed with the City Engineer more than ten days prior to the commencement of work.

4.3 SUBDIVIDER's obligation herein includes, but is not limited to, alleged defects in the construction of the private improvements; alleged defects in the materials furnished in the construction of the private improvements; alleged injury to persons or property; alleged inverse condemnation of property or a consequence of the design, construction, or maintenance of the work or the private improvements; and any accident, loss or damage to the work or the private improvements prior to the approval of the construction of the private improvements by CITY.

4.4 By approving the improvement plans, specifications and design or by inspecting or approving the private improvements, CITY shall not have waived the protections afforded herein to CITY and CITY's officers, officials, employees and agents or diminished the obligation of SUBDIVIDER who shall remain obligated in the same degree to indemnify and hold CITY and CITY's officers, officials, employees and agents, harmless as provided above.

4.5 SUBDIVIDER's obligation herein does not extend to liabilities, claims, demands, causes of action. losses, damages or costs that arise out of CITY's intentional wrongful acts, CITY's violations of law. or CITY's sole active negligence.

5.0 INSURANCE

5.1 SUBDIVIDER shall obtain and maintain a policy of motor vehicle liability, public liability, general liability and property damage insurance from an insurance company approved by CITY and authorized to do business in the State of California, in an insurable amount of not less than one million dollars ($1,000,000.00) for each occurrence. The insurance policy shall provide that the policy shall remain in force during the life of this COVENANT and shall not

be cancelled, terminated, or allowed to expire without thirty (30) days prior written notice to CITY from the insurance company.

5.2 CITY shall be named as an additional insured on SUBDIVIDER's policies.

5.3 SUBDIVIDER shall furnish certificates of said insurance to CITY prior to commencement of work under this AGREEMENT.

6.0 REPAIR, MAINTENANCE AND REPLACEMENT

As a condition on the approval by CITY of the satisfactory construction of the private improvements, SUBDIVIDER shall prepare, have executed. and record a covenant, in a form satisfactory to CITY, whereby property owners who will be served by the private improvements will be obligated to provide for the repair, maintenance and replacement of the private improvements and to indemnify and hold CITY and CITY's officers, officials, employees and agents, harmless.

7.0 NOTICES

7.1 Any notices to be given under this COVENANT, or otherwise, shall be served by certified mail.

7.2 For the purposes hereof, unless otherwise provided in writing by the parties hereto, the address of CITY and the proper person to receive any such notice on its behalf is:

City Engineer
City of Encinitas
505 S. Vulcan Avenue
Encinitas, CA 92024

and the address of SUBDIVIDER and the proper person to receive any such notice on its behalf is:

Name

Addresss

8.0 SUBDIVIDER's CERTIFICATION OF AWARENESS OF IMMIGRATION REFORM AND CONTROL ACT OF 1986

SUBDIVIDER certifies that SUBDIVIDER is aware of the requirements of the Immigration Reform and Control Act of 1986 (8 USC SS 1101-1525) and will comply with these requirements, including but not limited to verifying the eligibility for employment of all agents, employees, subcontractors and consultants that are included in, satisfy the duties and obligations contained herein.

9.0 GENERAL PROVISIONS

9.1 Neither SUBDIVIDER nor any of SUBDIVIDER's agents or contractors are or shall be considered to be agents of CITY in connection with the performance of SUBDIVIDER's duties and obligations under this Covenant.

9.2 Sale or other disposition of the PROPERTY will not relieve SUBDIVIDER from the duties and obligations set forth herein.

9.3 SUBDIVIDER shall provide the improvements as an independent contractor and in pursuit of SUBDIVIDER's independent calling, and not as an employee of CITY. SUBDIVIDER shall not be under control of CITY except as to the result to be accomplished. SUBDIVIDER may confer with CITY as required to perform this Covenant.

9.4 No verbal agreement or conversation with any officer, official, agent or employee of CITY, either before, during or after the execution of this Covenant, shall effect or modify any of the terms or obligations herein contained.

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT REGARDING REAL PROPERTY
FUTURE PARK, TRAFFIC, AND FLOOD CONTROL FEES

Assessor's Parcel Number:_____ Project No. _____

A. _____ ("OWNER" hereinafter) is the owner of real property ("PROPERTY" hereinafter) and which is legally described as follows:

As Exhibit "A" which is attached hereto and made a part hereof.

B. In consideration of _____ by the City of Encinitas ("CITY" hereinafter), OWNER hereby covenants and agrees for the benefit of CITY, to do the following:

See Attachment "B" which is attached hereto and made a part hereof.

C. This Covenant shall run with the land and be binding upon and inure to the benefit of the future owners, encumbrancers, successors, heirs, personal representatives, transferees and assigns of the respective parties.

D. OWNER agrees that OWNER's duties and obligations under this Covenant are a lien upon the PROPERTY. Upon notice and opportunity to respond, CITY may

add to the property tax bill of the PROPERTY any past due financial obligation owing to CITY by way of this Covenant.

E. If either party is required to incur costs to enforce the provisions of this Covenant, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party.

F. Failure of the OWNER to comply with the terms of this Covenant shall constitute consent to the filing by CITY of a Notice of Violation of Covenant.

G. Upon OWNER's satisfaction of OWNER's duties and obligations contained herein, OWNER may request and CITY shall execute a "Satisfaction of Covenant".

H. By action of the City Council, CITY may assign to a person or persons impacted by the performance of this Covenant, the right to enforce this Covenant against OWNER.

ACCEPTED AND AGREED:

OWNER

_____ _____

Signature Dated

_____

Title

Notarization of OWNER signature is attached.

CITY OF ENCINITAS

_____ _____

Signature Dated
City Planner

Notarization of City Planner Signature not required.

ATTACHMENT "A" TO
COVENANT REGARDING REAL PROPERTY
PROJECT NO. _____
PROPERTY DESCRIPTION

ATTACHMENT "B" TO
COVENANT REGARDING REAL PROPERTY
PROJECT NO. _____
OWNER'S DUTIES AND OBLIGATIONS

A. In accordance with Municipal Code Chapter 23.98 in effect at time of fees being paid, park fees for the development shall be paid prior to Final Occupancy approval.

B. In accordance with the Municipal Code Chapter 23.94 in effect at time of fees being paid, traffic fees for the development shall be paid prior to Final Occupancy approval.

C. In accordance with the Municipal Code Chapter 23.96 in effect at time of fees being paid, flood control fees shall be assessed and collected during the building permit processing prior to the construction of any impervious surfaces.

Fee: $_____

RECORDING REQUESTED BY:
City of Encinitas

WHEN RECORDED MAIL TO:
City Clerk
City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

SPACE ABOVE THIS LINE FOR RECORDER'S USE

HOMEOWNER MAINTAINED PRIVATE STORM WATER TREATMENT AND STORM WATER POLLUTION CONTROL MAINTENANCE AGREEMENT

APN:_____ Project No.: _____
Site Address:_____

THIS AGREEMENT is between the City of Encinitas, a municipal corporation, hereinafter referred to as the "City", and _____ _____, its heirs, successors, and assigns, collectively hereinafter referred to as "Owner", owner(s) of that certain real property, hereinafter referred to as "Property", that is described in Exhibit "A" which is attached hereto and made a part hereof. This Agreement is for the periodic maintenance and repair of certain private storm water treatment and pollution control facilities, hereinafter referred to collectively as "Storm Water Facilities". Storm Water Facilities include but are not limited to Best Management Practices (BMPs), Integrated Management Practices (IMPs), Low Impact Development (LID) features, Structural storm water treatment devices, and drainage facilities. The description and plat of Storm Water Facilities is set forth in Exhibit "B" which is attached hereto and made a part hereof.

WHEREAS, this Agreement is required by the City as a condition of approval of a City permit pursuant to City of Encinitas Municipal Code Chapter

20.08 and Chapter 23.24 as well as the City of Encinitas Storm Water Manual; and

WHEREAS, the Storm Water Facilities benefit said Property and are used by OWNER; and

WHEREAS, the Property benefits and uses the Storm Water Facilities, which are described in Exhibit “B”; and

WHEREAS, it is the desire of the City and the responsibility of the Owner that said Storm Water Facilities be maintained in a safe and usable condition by the Owner in accordance with the minimum maintenance schedule set forth in Exhibit “C” which is attached hereto and made a part hereof; and

WHEREAS, there exists a benefit to the public that the Storm Water Facilities be adequately maintained on a regular and periodic basis in compliance with Exhibit “C”, the City of Encinitas Municipal Code, the City of Encinitas Storm Water Manual, and other related City policies and requirements; and

WHEREAS, it is the intention of the Owner and the City that this Agreement constitute a covenant running with the land, binding upon each successive owner of all or any portion of the Property into perpetuity.

NOW THEREFORE, IT IS HEREBY AGREED FOR VALUABLE CONSIDERATION AS FOLLOWS:

1) This agreement establishes requirements for Owner maintained Storm Water Facilities. The term maintenance when used in this agreement shall include; inspection by the Owner or qualified individual hired by the Owner to identify deficiencies in Storm Water Facilities, maintenance and upkeep of Storm Water Facilities to proper working

order as determined by the City, and preparation and submittal of the inspection report to the City as set forth in subparagraph 1.i) through 1.iii).

i) The Owner shall inspect Storm Water Facilities after all major storms. A major storm for the purpose of this agreement shall apply to all storms with intensities equal or higher than a 10-year storm. In addition the Owner shall inspect the Storm Water Facilities at the minimum frequency specified in Exhibit "C" but not less than twice per year.

ii) The Owner shall maintain and repair all deficiencies identified in the Owner's inspections no later than 30 days following the inspection. The minimum maintenance frequency shall be consistent with the Exhibit "C" but not less than once per year.

iii) The Owner shall obtain City of Encinitas Storm Water Inspection Report from the City website or the City Hall, complete the report form, and submit the inspection report to the City. Prior to the submittal of the report the Owner shall perform an inspection on the Storm Water Facilities, identify deficiencies, repair and correct all deficiencies and then submit the inspection report to the City. The inspection report shal be submitted to the City once a year between August 1 to September 30.

2) The Property is benefited by this Agreement, and it is the purpose of the signatories hereto that this instrument be recorded to the end and intent that the obligation hereby created shall be and constitute a covenant running with the land. Any heirs, executors, administrators, assignees, and/or successors in interest to all or any portion of the Property, by acceptance of delivery of a deed and/or conveyance regardless of form, shall be deemed to have consented to and become

expressly bound by these presents, including without limitation, the right of any person entitled to enforce the terms of this Agreement to institute legal action as provided in Paragraph 13 hereof, such remedy to be cumulative and in addition to other remedies provided in this Agreement and to all other remedies at law or in equity.

3) The Storm Water Facilities shall be constructed and maintained by the Owner, in accordance with the terms and conditions of this agreement and approved Grading Plan Number XXXXX-G which is on file as a permanent public record in the City of Encinitas.

4) The cost and expense of repairing and maintaining the Storm Water Facilities shall be paid by the Owner.

5) In the event the Property is subdivided in the future, the owners, heirs, assigns, and successors in interest of each such newly created parcel shall be liable under this Agreement for their then pro rata share of expenses reflecting such newly created parcels.

6) The repairs and maintenance to be performed under this Agreement shall include improvements and maintenance work to adequately maintain the Storm Water Facilities. The owner shall ensure the Storm Water Facilities are in proper working order as determined by the City Engineer for the rainy season, which starts on October 1. Repairs and maintenance under this Agreement shall include, but are not limited to, repairing access roadbeds; repairing and maintaining drainage structures; removing debris, sediment, oil, grease, and other pollutants as determined by the City; perpetually maintaining adequate groundcover and/or other erosion control measures within the Property in order to prevent erosion; and the management of materials, pollutants, and hazardous waste to prevent pollution of the storm water system or Municipal Separate Stormwater Sewer System (MS4)

as referenced in local and State codes. Maintenance shall also include other work necessary to repair and preserve the Storm Water Facilities for their intended purposes as well as the restoration of the Storm Water Facilities following any non-permitted modification. The restoration shall be as required to restore the Storm Water Facilities to the condition existing prior to damage or alteration.

7) Any liability of the Owner for personal injury to any worker employed to make repairs or provide maintenance under this Agreement, or to third persons, as well as any liability of the Owner for damage to the property of any third persons, as a result of or arising out of repairs and maintenance under this Agreement, shall be borne by the Owner.

8) Owner shall jointly and severally defend, indemnify, and hold harmless the City, City's engineer, its consultants, and each of its officials, directors, officers, agents, and employees from and against all liability, claims, damages, losses, expenses, personal injury, and other costs, including costs of defense and attorney's fees, to any contractor, any subcontractor, any user of the Storm Water Facilities, or to any other third persons arising out of or in any way related to the use, repair, or maintenance of, or the failure to repair or maintain the Storm Water Facilities. This Agreement imposes no liability of any kind whatsoever on the City and the Owner agrees to hold the City harmless from any liability in the event the Storm Water Facilities fail to operate properly.

9) Nothing in this Agreement, the specifications, other contract documents, the City's approval of the plans and specifications, or the City's inspection of the work constitutes an acknowledgement of any City responsibility for any such item or the material contained therein, and the City, City's engineer, its consultants, and each of its officials, directors, officers, employees and agents, shall have no responsibility or liability therefore.

10) The Owner shall provide access to the Storm Water Facilities within the Property to City's inspectors, employees, agents, and contractors within 48 hours of receipt of a written notification by the City. The access shall be provided unconditionally and without any obstruction, interference, or hazard. Any animals kept on the Property shall be secured outside of the area subject to the City's inspection.

11) The Owner hereby grants permission to the City, its authorized agents, and its employees, to enter upon the Property and to inspect the Storm Water Facilities following a 48 hour notice whenever the City deems necessary. The purpose of inspection is to evaluate the condition and performance of the Storm Water Facilities, to follow-up on reported deficiencies, to respond to citizen complaints, and/or to comply with State and City requirements for City inspection of such facilities. The City shall provide the Owner with copies of the inspection findings and a directive to commence with any repairs deemed necessary.

12) In the event the Owner fails to maintain the Storm Water Facilities in good working condition as determined by the City Engineer, the City , its agents, employees, or its contractors, may enter upon the Property and take the steps deemed necessary to correct deficiencies and shall charge the costs of such repairs to the Owner. In the event the City pursuant to this Agreement, performs work of any nature, or expends any funds for attorney's fees, administrative costs, contractors, employees, consultants, materials, or other costs in the performance of said work, the Owner shall reimburse the City in full. Such reimbursement shall be due within thirty (30) days of receipt of a notification for all costs incurred by the City, including any administrative costs and attorney's fees. If said funds are not paid by Owner within (30) days, City reserves the right to take legal action for

cost recovery and to file with the County Recorder of San Diego County an assessment lien on the Property. It is expressly understood and agreed that the City is under no obligation to maintain or repair said Storm Water Facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

13) The terms of this Agreement may be amended in writing following Owner's request and upon written approval by the City Engineer.

14) This Agreement shall be governed by the laws of the State of California. In the event that any of the provisions of this Agreement are held to be unenforceable or invalid by any court of competent jurisdiction, the validity, and enforceability of the remaining provisions shall not be affected thereby.

IN WITNESS HEREOF, the parties have executed this Agreement.

OWNER:

_____ _____

Owners Name Here Date

Signature of OWNER must be notarized.

CITY OF ENCINITAS:

_____ _____

Signature Date

Director of Engineering Services

EXHIBIT 'A'

LEGAL DESCRIPTION OF REAL PROPERTY
APN _____

EXHIBIT 'B'
PLAT OF STORM WATER POLLUTION CONTROL FACILITIES
APN _____

EXHIBIT "C"
MINIMUM MAINTENANCE REQUIREMENTS FOR
PRIVATE STORM WATER POLLUTION CONTROL FACILITIES
APN _____

RESOLUTION NO. 2009-52

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS RELATIVE TO A GRANT OF EASEMENT FOR PUBLIC STREET RIGHTS-OF-WAY

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS RELATIVE TO A GRANT OF EASEMENT FOR PUBLIC STREET RIGHTS-OF-WAY

TERMS AND CONDITIONS RELATIVE TO A GRANT OF EASEMENT FOR PUBLIC STREET RIGHTS-OF-WAY, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Dedication of Easement for Public Street Right-of-Way

The dedication or irrevocable offer of dedication made by the Grantor named in the document dedicating or offering the dedication of the public street easement for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for use as public street right-of-way, including the installation, construction, maintenance, repair, replacement, reconstruction and inspection of public utilities, including, but not limited to, electric, gas, telephone, cable television, sewer, water, storm drain, appurtenant facilities, and all structures incidental thereto, as well as other public right-of-way uses deemed necessary by Grantee, together with the perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed by Grantee necessary for the construction and maintenance of facilities within said easement, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors or assigns and in addition thereto, to remove soil and other materials within said right-of-way and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said public utilities or structures incidental thereto.

To have and to hold said easement and right-of-way unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement and right-of-way by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described on the document dedicating or irrevocably offering the dedication.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement and right-of-way any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from crossing over said real property and agrees that the Grantors, their heirs, successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated.

Grantor for himself, his successors and assigns, hereby waives claim for any and all damages to Grantor's remaining property contiguous to the public street right-of-way conveyed by the dedication or offer of dedication by reason on the location, construction, landscaping, or maintenance of said public road right-of-way.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication of easement for public street right-of-way.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.

RESOLUTION NO. 2009-53

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC EASEMENT FOR PRIVATE STREET

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR A GRANT OF PUBLIC EASEMENT FOR PRIVATE STREET

TERMS AND CONDITIONS FOR A GRANT OF PUBLIC EASEMENT FOR PRIVATE STREET, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Public Easement for Private Street

The grant of public easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The public easement for private street shall be for a perpetual easement upon, through, under, over, and across the hereinafter described real property for use as a public easement over a private street, which purposes shall include the erection of public signage; and also the installation, construction, maintenance, repair, replacement, reconstruction and inspection of public utilities, including, but not limited to, electric, gas, telephone, cable television, public sewer, public water, public storm drain, fire hydrants, appurtenant facilities, and all structures incidental thereto; as well as other public right-of-way uses deemed necessary by Grantee; together with the perpetual right of ingress and egress for the construction, maintenance, or alteration of any public utility equipment or facility situated in or on said easement; and also the perpetual right of ingress and egress of emergency access vehicles for emergency purposes; and also the perpetual right to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors or assigns and in addition thereto; and also to remove soil and other materials within said right-of-way and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said public utilities or structures incidental thereto.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described on the document granting the easement.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the public easement for private street.

Grantor agrees that Grantor's duties and obligations under this easement are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-58

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC DRAINAGE EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PUBLIC DRAINAGE EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PUBLIC DRAINAGE EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Public Drainage Easement

The grant of public drainage easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The public drainage easement shall be for a perpetual easement upon, through, under, over, and across the hereinafter described real property for drainage and for the installation, construction, maintenance, repair, replacement, reconstruction, and inspection of public storm drain, appurtenant facilities, and all structures and facilities incidental thereto, and for the flowage of any waters in, over, upon, and through said easement, together with the perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed by Grantee necessary for the construction and maintenance of facilities within said easement, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors, or assigns, and in addition thereto, to remove soil and other materials within said easement and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said drainage facilities or structures incidental thereto.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described in the document granting the easement.

The Grantors may, at their own risk, use the surface of the above described real property in a manner that will not interfere with or be detrimental to the use of said easement by Grantee, its successors and assigns, provided no trees shall be planted or grown thereon.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from crossing over said real property and agrees that the Grantors, their heirs,

successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated. The Grantee hereby covenants and agrees that after the installation of any pipe line by it in any excavation made by it in the above described easement and right-of-way it will backfill any such excavation made by it so as to fill said excavation as nearly as practicable to the level of the surrounding ground, and will replace any oiled, asphalt or concrete surface with like material and will replace any fence removed by it unless the fence interferes with the easement use.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication of drainage easement.

Grantor agrees that Grantor's duties and obligations under this easement upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-54

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Dedication of Public Sewer Easement

The dedication or irrevocable offer of dedication made by the Grantor named in the document dedicating or offering the dedication of public sewer easement for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for the installation, construction, operation, maintenance, repair, replacement, and reconstruction of sewer pipe lines and/or mains, manholes, sewer lateral pipe lines, and all structures incidental thereto, for ingress and egress for public sewer maintenance and repair, together with the perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed by Grantee necessary for the construction and maintenance of facilities within said easement, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors or assigns and in addition thereto, to remove soil and other materials within said right-of-way and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said sewer lines or structures incidental thereto.

To have and to hold said easement and right-of-way unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement and right-of-way by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is more particularly described in the document dedicating or offering to dedicate the sewer easement.

The Grantors may, at their own risk, use the surface of the above described real property in a manner that will not interfere with or be detrimental to the use of said easement and right-of-way by Grantee, its successors and assigns, provided no trees shall be planted or grown thereon.

The Grantors hereby covenant and agree for themselves, their heirs, successors and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement and right-of-way any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from

crossing over said real property and agrees that the Grantors, their heirs, successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated; and the Grantee hereby covenants and agrees that after the installation of any pipe line by it in any excavation made by it in the above described easement and right-of-way it will backfill any such excavation made by it so as to fill said excavation as nearly as practicable to the level of the surrounding ground, and will replace any oiled, asphalt or concrete surface with like material and will replace any fence removed by it.

The Grantee, its successors and assigns, shall be responsible for operating, maintaining, and keeping in good repair the described works of improvement.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California. The termination and abandonment may be made by the Grantee.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication or offer of dedication of sewer easement.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.

RESOLUTION NO. 2009-55

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER OR DRAINAGE ACCESS EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER OR DRAINAGE ACCESS EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PUBLIC SEWER OR DRAINAGE ACCESS EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Sewer or Drainage Access Easement

The grant of public sewer and drainage access easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The public sewer and drainage access easement shall be for a perpetual easement upon, through, under, over, and across the hereinafter described real property for providing vehicular access to the public sewer and drainage facilities, installation, maintenance, repair, and replacement of paved surface, drainage ditches, and any flowage of surface runoff, perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed necessary by Grantee, to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement by Grantee, its successors or assigns and in addition thereto, to perform grading within said easement.

Should a portion or entire said access easement be located within a paved driveway or access road for the benefit of Grantor's property, then the Grantor is responsible for installation and maintenance of the pavement within said access easement. The Grantor shall construct the pavement within the access easement to withstand the heavy truck loading that may be necessary to access the sewer or drainage easement. The Grantee shall not be responsible for damages to the pavement due to Grantee's maintenance or emergency truck traffic.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described in the document granting the easement.

The Grantors may, at their own risk, use the surface of the above described real property in a manner that will not interfere with or be detrimental to the use of said easement by Grantee, its successors and assigns, provided no trees shall be planted or grown thereon.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained within the above easement any building or structure of any nature or kind that will interfere with the use of said easement by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from crossing over said real property and agrees that the Grantors, their heirs, successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the grant of drainage easement.

Grantor agrees that Grantor's duties and obligations under this easement are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-56

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF FLOWAGE EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF FLOWAGE EASEMENT

TERMS AND CONDITIONS FOR GRANT OF FLOWAGE EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Flowage Easement

The grant of flowage easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is subject to the following terms and conditions. The grant of flowage easement shall be for a perpetual easement for the flowage of waters in, over, upon, and through said easement.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described in the document granting the easement.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that the Grantors shall not construct~~ed~~ within said easement any building or structure, walls, fences, or undertake the planting or growing of trees or shrubs, or changing the surface grade.

Grantor is responsible to use the easement in accordance with the conditions and restrictions stated herein and prevent any impacts to free flowage of water within said easement. Grantor is responsible for maintenance of the flowage easement. Nothing contained herein shall be construed to assign flowage maintenance responsibilities to the City of Encinitas.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the grant of flowage easement.

Grantor agrees that Grantor's duties and obligations under this easement are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the

performance of this easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-57

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF CLEAR SPACE EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF CLEAR SPACE EASEMENT

TERMS AND CONDITIONS FOR GRANT OF CLEAR SPACE EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Clear Space Easement

The grant of clear space easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is subject to the following terms and conditions. The grant of clear space easement shall be for a perpetual easement upon, through, under, over, and across the hereinafter described real property for the purposes of maintaining proper vehicular sight distance, together with the perpetual right to perform grading, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement by Grantee, its successors, or assigns.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described in the document granting the easement.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained within said easement any building, walls, fences, structures, monument signs or, landscaping more than six inches in height, nor shall there be any changing of the surface grade.

Grantor is responsible to use the easement in accordance with the conditions and restrictions stated herein and prevent any impacts to the sight visibility through, upon and over the said easement. Grantor is responsible for maintenance of the site visibility easement. Nothing contained herein shall be construed to assign clear space maintenance responsibilities to the City of Encinitas.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the grant of flowage easement.

Grantor agrees that Grantor's duties and obligations under this easement are a lien_upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-59

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC SLOPE EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PUBLIC SLOPE EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PUBLIC SLOPE EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Grant of Slope Easement

The grant of public slope easement made by the Grantor named in the easement document for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The public slope easement shall be for a perpetual easement upon, through, over, and across the hereinafter described real property for the installation, construction, maintenance, repair, replacement, and reconstruction of earth embankment slopes and embankments and facilities incidental thereto. The slope easement prohibits installation of any buildings, structures, fences, trees, shrubs, landscape, underground or above ground utilities, and changing the surface grade, or placement of other facilities that may interfere with the use of the easement by the Grantee.

The Grantors grants to the Grantee continued use of the said easement and the right to grade within the easement and remove buildings, structures, fences, trees, shrubs, landscape, underground or above ground utilities, or any facilities that interfere with the use of the easement by the Grantee, to remove soil and other materials within said easement and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said slope easement.

To have and to hold said easement unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described in the document granting the easement.

The Grantors may, at their own risk, use the surface of the above described real property in a manner that will not interfere with or be detrimental to the use of said easement by Grantee, its successors and assigns, provided no trees shall be planted or grown thereon.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, the terms and conditions of this easement.

The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from crossing over said real property and agrees that the Grantors, their heirs, successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated. The Grantee hereby covenants and agrees that after the installation and completion of the slope in the above described easement it will restore landscape, irrigation, erosion

control, any utilities, and any fence removed by the construction, unless the fence interferes with the easement use.

This easement may be terminated in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California unless an expiration date is specified in the easement grant.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the grant of public drainage easement.

Grantor agrees that Grantor's duties and obligations under this easement are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this easement.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this easement, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this public slope easement the right to enforce this easement against the Grantor.

RESOLUTION NO. 2009-60

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PUBLIC RECREATIONAL TRAIL EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PUBLIC RECREATIONAL TRAIL EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PUBLIC RECREATIONAL TRAIL EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Dedication of Public Recreational Trail Easement

The dedication or irrevocable offer of dedication made by the Grantor named in the document dedicating or offering the dedication of public recreational trail easement for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for public recreational trail purposes which include, without limitation, use by members of the public to walk, jog, run, ride horses, and operate non-motorized bicycles.

The real property referred to above is situated in the City of Encinitas, County of San Diego, State of California, and is more particularly described in the document dedicating or irrevocably offering to dedicate the public recreational trail easement.

Grantor hereby further offers to Grantee the privilege and right to perform grading and to extend drainage structures and excavation and embankment slopes beyond the limits of the herein described land where deemed necessary by Grantee for the construction and maintenance of said public recreational trails. RESERVING unto Grantor, successors or assigns, the right to eliminate such slopes and/or drainage structures or portions thereof, when in the written opinion of the Grantee, the necessity therefore is removed by substituting other protection, support and/or drainage facility, provided such substitution is first approved in writing by Grantee.

Grantor hereby further offers to Grantee all trees, growths (growing or that may hereafter grow), and road building materials within said trail easement, including the right to take water, together with the right to use the same in such manner and at such locations as Grantee may deem proper, needful, or necessary, in the construction, reconstruction, improvement, or maintenance of said public Trails.

Grantee, for itself, its successors and assigns, hereby waives claim for any and all damages to Grantee's remaining property contiguous to the trail easement hereby conveyed by reason of the location, construction, landscaping, or maintenance of said public recreational trails.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California. The termination and abandonment may be made by the Grantee.

This dedication or offer of dedication shall be irrevocable and shall run with the land and be binding upon and inure to the benefit of future owners,

encumbrances, successors, heirs, personal representatives, transferees, and assigns of the respective parties.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication or offer of dedication of recreational trail easement.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.

RESOLUTION NO. 2009-61

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS, DRAINAGE, AND GENERAL UTILITY EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS, DRAINAGE, AND GENERAL UTILITY EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS, DRAINAGE, AND GENERAL UTILITY EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Dedication of Pedestrian Access, Drainage, and General Utility Easement

The dedication or irrevocable offer of dedication made by the Grantor named in the document dedicating or offering the dedication of pedestrian access, drainage, and general utility easement for benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for pedestrian access and use, for drainage, and for the installation, construction, maintenance, repair, replacement, reconstruction and inspection of public utilities, including, but not limited to, electric, gas, telephone, cable television, sewer, water, storm drain, appurtenant facilities, and all structures incidental thereto, together with the perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed by Grantee necessary for the construction and maintenance of facilities within said easement, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors or assigns and in addition thereto, to remove soil and other materials within said right-of-way and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said public utilities or structures incidental thereto.

To have and to hold said easement and right-of-way unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement and right-of-way by this grant is situated in the City of Encinitas, County of San Diego, State of California, and is particularly described on the document dedicating or irrevocably offering the dedication.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement and right-of-way any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California. The termination and abandonment may be made by the Grantee.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication of pedestrian access, drainage, and general utility easement.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.

RESOLUTION NO. 2009-62

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS EASEMENT

TERMS AND CONDITIONS FOR GRANT OF PEDESTRIAN ACCESS EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for
Dedication of Pedestrian Access Easement

The dedication or irrevocable offer of dedication made by the Grantors named in the document dedicating or offering the dedication of public pedestrian access easement for the benefit of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for pedestrian access purposes.

The real property referred to above is situated in the City of Encinitas, County of San Diego, State of California, and is more particularly described in the document dedicating or irrevocably offering to dedicate the pedestrian access easement.

Grantors hereby further offer to Grantee the privilege and right to perform grading and to extend drainage structures and excavation and embankment slopes beyond the limits of the herein described land where deemed necessary by Grantee for the construction and maintenance of said pedestrian access. Reserving unto Grantors, their successors or assigns, the right to eliminate such slopes and/or drainage structures or portions thereof, when in the written opinion of the Grantee, the necessity therefore is removed by substituting other protection, support and/or drainage facility, provided such substitution is first approved in writing by Grantee.

Grantors hereby further offer to Grantee all trees, growths (growing or that may hereafter grow), and road building materials within said pedestrian access easement, including the right to take water, together with the right to use the same in such manner and at such locations as Grantee may deem proper, needful, or necessary, in the construction, reconstruction, improvement, or maintenance of said pedestrian access.

Grantee, for itself, its successors and assigns, hereby waives claim for any and all damages to Grantee's remaining property contiguous to the pedestrian access easement hereby conveyed by reason of the location, construction, landscaping, or maintenance of said pedestrian access.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California. The termination and abandonment may be made by the Grantee.

This dedication or offer of dedication shall be irrevocable and shall run with the land and be binding upon and inure to the benefit of future owners, encumbrances, successors, heirs, personal representatives, transferees, and assigns of the respective parties.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication or offer of dedication of pedestrian access easement.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantors by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.

RESOLUTION 2009-63

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING TERMS AND CONDITIONS FOR GRANT OF GENERAL UTILITY EASEMENT

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the appendix of the Engineering Design Manual contains documents that list terms and conditions associated with the granting and maintenance of specified public easements; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF TERMS AND CONDITIONS FOR GRANT OF GENERAL UTILITY EASEMENT

TERMS AND CONDITIONS FOR GRANT OF GENERAL UTILITY EASEMENT, Attachment 1 to this resolution, is hereby adopted by the City Council and is to become a part of each recorded document used by the City of Encinitas when an easement for the stated purpose is granted to the City of Encinitas.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of language setting forth terms and conditions relative to a grant of a public easement will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the granting of the public easement will not directly result in development; any development permit associated with the granting of the public easement may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

Terms and Conditions for Dedication of General Utility Easement

The dedication or irrevocable offer of dedication made by the Grantor named in the document dedicating or offering the dedication of the general utility easement for benefit the of the City of Encinitas, hereinafter Grantee, is for valuable consideration and is subject to the following terms and conditions. The dedication or irrevocable offer of dedication shall be for a perpetual easement and right-of-way upon, through, under, over, and across the hereinafter described real property for the installation, construction, maintenance, repair, replacement, reconstruction and inspection of public utilities, including, but not limited to, electric, gas, telephone, cable television, sewer, water, storm drain, appurtenant facilities, and all structures incidental thereto, together with the perpetual right to perform grading, to extend embankment slopes beyond the limits of the dedicated easement as deemed by Grantee necessary for the construction and maintenance of facilities within said easement, and to remove buildings, structures, trees, bushes, undergrowth, flowers, and any other obstructions interfering with the use of said easement and right-of-way by Grantee, its successors or assigns and in addition thereto, to remove soil and other materials within said right-of-way and to use the same in such manner and at such locations as said Grantee may deem proper, needful, or necessary in the construction, reconstruction, and maintenance of said public utilities or structures incidental thereto.

To have and to hold said easement and right-of-way unto itself and unto its successors and assigns forever, together with the right to convey said easement, or any portion of said easement, to other public agencies.

The real property referred to herein and made subject to said easement and right-of-way by this grant is situated in the County of San Diego, State of California, and is particularly described on the document dedicating or irrevocably offering the dedication.

The Grantor may, at its own risk, use the surface of the above-described real property in a manner that will not interfere with or be detrimental to the use of said easement and right-of-way by Grantee, its successors and assigns, provided that no trees shall be planted or grown thereon and the entire area encumbered by the general utility easement shall be graded flat and unobstructed at all times, unless authorized by the Grantee in writing.

The Grantors hereby covenant and agree for themselves, their heirs, successors, and assigns, that there shall not be constructed or maintained upon the above described real property or within said easement and right-of-way any building or structure of any nature or kind that will interfere with the use of said easement and right-of-way by Grantee, its successors or assigns, or that will interfere with the ingress or egress along said easement by said Grantee, its successors or assigns.

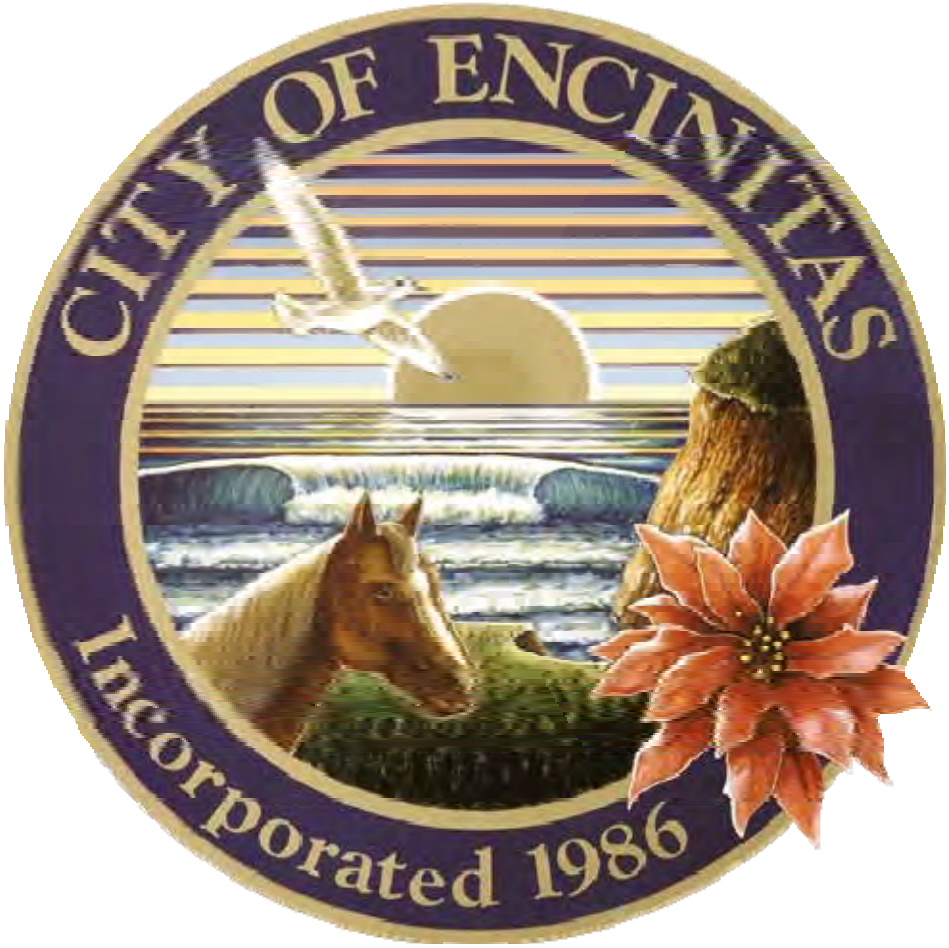
The Grantee hereby covenants and agrees for itself, its successors and assigns, not to prevent the Grantors, their successors or assigns, from crossing over said real property and agrees that the Grantors, their heirs, successors and assigns, may enjoy the continued use of the surface of said real property herein described, subject to the conditions above stated.

This dedication may be terminated and the right to accept the irrevocable offer of dedication may be abandoned in accordance with the vacation procedures in Section 8300 et seq. of the Streets and Highways Code of the State of California. The termination and abandonment may be made by the Grantee.

At time of acceptance of this offer, any and all trust deed(s) and easement(s) shall be subordinated to the dedication of the general utility easement.

Grantor agrees that Grantor's duties and obligations under this offer of dedication are a lien upon the subject property. Upon notice and opportunity to respond, Grantee may add to the tax bill of the Grantor any past due financial obligation owing to the Grantor by way of this offer of dedication.

If either Grantor or Grantee is required to incur costs to enforce the provisions of this offer of dedication, the prevailing party shall be entitled to full reimbursement of all costs, including reasonable attorney's fees, from the other party. The Grantee may assign to persons impacted by the performance of this offer of dedication the right to enforce this offer of dedication against the Grantor.



CHAPTER 2: PERMITS AND PROCESSING GUIDELINES

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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RESOLUTION 2009-40

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING CHAPTER 2 OF THE ENGINEERING DESIGN MANUAL

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the first six chapters of the Engineering Design Manual have been made available for review by members of the public and the professional community in public workshops and on the City of Encinitas web page; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF CHAPTER 2 OF THE ENGINEERING DESIGN MANUAL

Chapter 2 of the Engineering Design Manual, Attachment 1 to this resolution, is hereby adopted by the City Council and is to be a comprehensive guide to the policies and processes for processing Engineering permits.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of Chapter 2 of the Engineering Design Manual will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the Design Manual will not directly result in development; any development permit processed as a result of the policies and processes contained within the Engineering Design Manual may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone

Deborah Cervone, City Clerk

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CHAPTER 2

PERMITS AND PROCESSING GUIDELINES

2.100 GENERAL INFORMATION.

2.101 *PURPOSE OF THIS CHAPTER.*

The intent of this chapter is to briefly describe the variety of permits issued by the Engineering Department and the processes of permit issuance and project construction/ inspection. General Engineering permit requirements applicable to all permits are given below. Descriptions of Engineering permits, the plan check process, and the emergency grading permit process are discussed in Sections 2.200 through 2.500 below. The construction/ inspection process and the Department's procedures for addressing unauthorized work are discussed in Sections 2.600 and 2.700, respectively.

2.102 *GENERAL ENGINEERING PERMIT REQUIREMENTS.*

A number of Engineering permits may be issued without the preparation of a record drawing. These permits require, at a minimum, the following:

A. A completed Engineering Development Application (see Appendix 1.2).

B. Payment of applicable fees (see Appendix 1.3).

C. Preparation and approval of a plot plan or exhibit, if required.

D. Preparation and approval of a traffic control plan, if required.

E. Approval by the Engineering Department.

F. A City of Encinitas business license for any contractor who will perform work under a permit issued by the City.

G. Liability insurance meeting the City's requirements.

2.200 ENGINEERING DEPARTMENT PERMITS NOT REQUIRING A RECORD DRAWING.

The Engineering Department issues a variety of permits, some of which require record drawings and others which do not. Those permits not requiring a record drawing are discussed in Section 2.200 below. Grading and Improvement permits, which require the preparation of a record drawing, are discussed in Section 2.300 below.

2.201 *PERMANENT ENCROACHMENT PERMIT.*

A Permanent Encroachment Permit is required prior to the construction or placement within public rights-of-way/ easements of permanent private improvements such as newsracks or private walkways, landscaping, or irrigation. The encroachment of private facilities which impair the public beneficial use, health, and/or safety of public rights-of-way or easements cannot be allowed; refer to Municipal Code Section 15.08 and the Permanent Encroachment Application and Procedure Sheet included in Appendix 2.1 of this manual for further information. A sample permit for newsracks in the public right-of-way is included as Appendix 2.2(a).

Prior to issuance of a Permanent Encroachment Permit, the applicant shall obtain from the City an Encroachment Maintenance and Removal Covenant standard document. The executed document, including the associated description and exhibit of the proposed encroachment, must be submitted for City consideration; if approved, the covenant will be recorded against the property. The applicant is responsible for the recordation fees charged by the San Diego County Recorder. A sample Encroachment Maintenance and Removal Covenant is attached as Appendix 1.21 of this manual. See Section 2.102 of this manual for general permit requirements.

2.202 *SIDEWALK CAFÉ/ OUTDOOR DINING PERMIT.*

A permit for a sidewalk café/ outdoor dining area is a special type of Permanent Encroachment Permit. A Permanent Encroachment Permit is required for a sidewalk/outdoor café proposing to utilize area within a

public right-of-way or easement. The applicant shall submit to the City a plat showing the proposed placement of all tables and chairs for staff consideration. The plat shall meet all applicable Municipal Code requirements (see Municipal Code 30.48.050) and shall be approved prior to issuance of the Permanent Encroachment Permit. A copy of the restaurant business registration is also required prior to permit issuance. See Section 2.102 of this manual for general permit requirements and Appendix 2.2(b) for a sample permit.

2.203 *TEMPORARY ENCROACHMENT PERMIT.*

A Temporary Encroachment Permit is required for any object proposed to be placed within a public right-of-way or easement on a temporary basis. A traffic control plan may be required by the City based upon the nature of the proposed temporary encroachment. The encroachment of facilities which impair the public beneficial use, health, and/or safety of public rights-of-way or easements will not be allowed. See Section 2.102 of this manual for general permit requirements.

2.204 *BEACH ENCROACHMENT PERMIT.*

A Beach Encroachment Permit is required for work requiring beach access and/or temporary beach encroachment, which may include work such as the construction of seawalls, tree trimming, bluff maintenance, or bluff stabilization. See Section 2.102 of this manual for general permit requirements.

2.205 *UTILITY CONSTRUCTION PERMIT.*

A Utility Construction Permit is required for any public utility company operating under a franchise agreement with the City, State, or federal government and proposing to perform minor construction or maintenance work in the public right-of-way. Major work within public rights-of-way or easements may require additional permits. The right-of-way construction permit standard conditions form included in Appendix 2.3 must be signed and attached to the standard development application, and a traffic control plan shall be submitted to the City and approved prior to

the start of work. In addition to other permit fees, applicants for Utility Construction Permits proposing trenching in excess of 200 linear feet will be required to pay an inspection fee in the amount of 5% of the approved cost estimate for the proposed work.

Trench repairs shall be done as per the City of Encinitas standard trench repair detail, included as Appendix 2.4 of this manual. The City trenching moratorium restricts work from being performed on a street paved within the preceding two years, unless an exception is approved by the City Engineer. Refer to Appendix 2.5 for the trenching moratorium. See Section 2.102 of this manual for general permit requirements.

2.206 *MAJOR AND MINOR RIGHT-OF-WAY CONSTRUCTION PERMITS.*

Public Improvement Permits are required for improvements within the existing or proposed public right-of-way. If, at the discretion of the City Engineer, the proposed work is deemed to be relatively insignificant in nature and no public record drawings will be required for future reference, the applicant may be allowed to conduct the work under a Minor or Major Right-of-Way Construction Permit. The required type of Right-of-Way Construction Permit, Major or Minor, is determined by the nature of the work proposed, as described below.

A Minor Right-of-Way Construction Permit is required for work proposed within a public right-of-way or easement that is associated with the development of a single-family home and does not exceed any of the thresholds necessitating a Major Right-of-Way Construction Permit discussed in the paragraph below.

A Major Right-of-Way Construction Permits is required for work proposed within a public right-of-way or easement that is not associated with the development of a single family home, any work including more than one trench, trench work equal to or greater than 200 feet in length, and work having a City-approved cost estimate exceeding $10,000.00.

Both Major and Minor Right-of-Way Construction Permits require the contractor performing work within the public right-of-way to have a type 'A' California State license and one-million-dollar liability insurance on file at the City of Encinitas Engineering Department. The City requirements for proof of insurance are attached as Appendix 2.6 of this manual. In addition, the applicant shall provide with the application for the permit a signed Right-of-Way Construction Permit Standard Conditions sheet with the application, acknowledging the City rules for work within the public right-of-way; see Appendix 2.3 of this manual. In addition to other permit fees, applicants for right-of-way construction permits proposing trenching in excess of 200 linear feet will be required to pay an inspection fee in the amount of 5% of the approved cost estimate for the proposed work. A traffic control plan as described in Section 2.208 is required. See Section 2.102 of this manual for general permit requirements.

Trench repairs shall be performed in conformance with the City of Encinitas standard trench repair detail, included as Appendix 2.4 of this manual. The City trenching moratorium restricts work from being performed on a street paved within the preceding two years, unless a modification to the restriction is approved by the City Engineer. Refer to Appendix 2.5 for the trenching moratorium.

An explanation of the Right-of-Way Construction Permit application and permit procedure is included in Appendix 2.7 of this manual.

2.207 *SEWER LATERAL CONSTRUCTION PERMIT.*

See Section 2.206 above for information on Right-of-Way Construction Permits.

2.208 *TRAFFIC CONTROL PLAN.*

A traffic control plan is required for work proposed within streets that have a speed limit of over 25 miles per hour (mph). The Traffic Engineering Division may also require Traffic Control Plans on streets with a speed limit of 25 mph or less after review of the proposed work. Projects

not requiring a traffic control plan must follow the standard procedures in the Work Area Traffic Control Handbook (W.A.T.C.H.).

Traffic control plans must have a TC-5 form (San Diego Regional Standard Drawings form) attached as the first sheet, and the plans shall follow the guidelines of the most recent Manual of Uniform Traffic Control Devices (MUTCD), the California Supplement, and the San Diego Regional Standard Drawings (SDRSD).

A plancheck fee is required in accordance with the current fee schedule. City processing time will be a minimum of 5 working days but may be longer depending upon the complexity of the plan. See Section 2.102 of this manual for general permit requirements.

2.209 *HAUL ROUTE PERMITS.*

A haul route is required when any soil or materials are being transported within the City. The Haul Route Permit is a no-fee permit that requires City approval and is issued over the counter. Engineering Department staff will determine the allowable route. If soil is proposed to be hauled to another location within the City, both the origin and the destination properties will be required to have active grading permits or have City approval for the removal and placement of the material. See Section 2.102 of this manual for general permit requirements and Appendix 2.8 for a sample Haul Route Permit.

2.210 *STREET NAME CHANGE.*

A street name change application is required whenever an applicant desires to change an existing street name to a proposed new name. The name change is subject to City approval. The street name change application and requirements are given in Appendix 2.9 of this manual.

2.211 *STREET VACATION.*

Street vacation requests require City Council approval. An application is given in Appendix 2.10 of this manual.

2.300 ENGINEERING PERMITS REQUIRING THE PREPARATION OF A PUBLIC RECORD DRAWING.

Record Drawing mylar plans are generally 24" x 36" in size. They are kept permanently in the City of Encinitas record system. Public record drawings are required for both Grading Plans and Improvement Plans, hereinafter referred to collectively as 'plans'. The Engineering Department plan check process for Grading Plans and Improvement Plans is described in Section 2.500 of this manual, and the Emergency Grading Permit process is discussed in Section 2.508. The Engineering Department non-permitting review of Building Plans is discussed in Section 2.400 below.

2.301 GRADING PERMIT.

Grading Permits are required for any earth movement, clearing and grubbing, remedial earthwork, drainage improvements, and for the creation of new impervious surface areas, unless the work is exempt per Municipal Code Section 23.24.

2.301.1 Simplified Grading Permit. A Simplified Grading Permit may, at the discretion of the City Engineer, be issued instead of a standard Grading Permit. The applicant is required to obtain from the City Engineer permission to submit an application for a Simplified Grading Plan instead of a standard Grading Plan prior to making the initial submittal. If discovered during plan check or construction that the requirements for a Simplified Grading Permit are not met, the applicant may be required to obtain from the City a standard Grading Permit, at the discretion of the City Engineer.

Typically, Simplified Grading Permits are intended for single family residence projects meeting certain conditions as described in Section 23.24.125 of the Municipal Code. Simplified Grading Plans follow the plan check process as described in Section 2.500 below with the following modifications:

A. The applicant will be required to obtain the Engineering Department approval signatures as described in Section 2.504 below but in most circumstances will not be

required to obtain the signatures of other City departments or other agencies or jurisdictions.

B. No engineer's cost estimate is required.

C. A simplified bond and fee letter will be issued for the project. If the simplified grading is not proposed in association with a Building Permit, a $2000.00 deposit is required, refundable upon satisfactory completion of the grading.

D. The applicant will be required to pay a flat fee covering both the Simplified Grading Plan check and its inspection.

2.301.2 Precise Grading Permit. In some situations, the Grading Plan initially approved for a project may not show sufficient detail with regards to existing and/or proposed structures, building pad elevations, building footprints, existing and proposed drainage, and proposed storm water pollution control best management practice measures. Other times, a pad is graded long before a structure is proposed to be built upon it, necessitating remedial earthwork to ensure the pad is suitable to receive the structure. In such situations, a second Grading Permit called a Precise Grading Permit may be required; Precise Grading Permits are discussed in Section 23.24.126 of the Municipal Code. If the proposed work for the precise grading is consistent with the standards for a Simplified Grading Permit as discussed in Municipal Code Section 23.24.125, the City Engineer may approve the proposed grading to be submitted as part of a Simplified Grading Permit, described in Section 2.301.1 above.

2.301.3 Emergency Grading Permits. Certain circumstances, such as imminent bluff failures, may require the issuance of an Emergency Grading Permit. In these cases, the City Engineer will determine whether a standard Grading Permit will be processed or whether an interim Grading Permit followed by a standard Grading Permit will be required. The Emergency Grading Permit process is discussed in Section 2.508 of this manual.

2.302 *PUBLIC IMPROVEMENT PERMIT.*

Public Improvement Permits are required for any improvements within the existing or proposed public right-of-way, such as street or sewer improvements. If, at the discretion of the City Engineer, the proposed work is deemed to be relatively insignificant in nature and no public record drawings will be required for future reference, the applicant may be allowed to conduct the work under other Engineering permits. A summary of right-of-way dedication and improvement requirements for various levels of residential and commercial development is included in Appendix 2.22 of this manual. Standard notes for the improvement plan title sheet, standard notes for sewer improvement plans, and an improvement plan checklist are given in Appendices 2.31, 2.32, and 2.33 of this manual, respectively.

2.400 ENGINEERING DEPARTMENT REVIEWS, FEES , AND INSPECTIONS FOR BUILDING PERMITS.

Although Building Permits are issued by the Building Department, the Engineering Department performs a non-permitting review of Building Plans in order to ensure compliance with Engineering Department requirements. Engineering review and approval of the Building Permit application is required prior to permit issuance. The items discussed here pertain only to the Engineering Department requirements for Building Permits; other departments will have additional requirements.

2.401 *REQUIREMENTS FOR BUILDING PLAN SUBMITTALS.*

For a Building Plan subject to Engineering review, the following documents shall be submitted:

A. Building Permit site plan including, at a minimum, the following information as applicable:

1. Proposed building footprint and footprint of all existing structures.

2. Existing and proposed drainage directions and systems. Proposed landscape drain systems must be shown.

3. Proposed soil remediation.

4. Any proposed grading or earth-moving work together with estimated quantities.

5. Existing and proposed elevation contours.

6. Elevation contours and existing improvements on the adjacent properties for up to 50 feet beyond the subject property on all sides, as required by the Engineering Department.

7. Shoring and proposed sloped or vertical excavations.

8. Post-construction storm water pollution control BMPs.

9. Existing and proposed hard-surface, paved, roof, and other impervious surface areas.

10. Location of any proposed pool.

B. Title report showing current property ownership and easements, if required by the Engineering Department.

C. Soils report, if required by the Engineering Department.

2.402 *ENGINEERING REVIEW OF BUILDING PLANS.*

2.402.1 Submittal of Building Plans. The applicant will submit all Building Plan materials directly to the Building Department, but Building will require that the applicant first present the plans to the Engineering Department for a determination of whether an Engineering review will be required. If determined that a Grading Permit is required for the proposed work, the Engineering Department will authorize the Building Plan submittal after a Grading Plan has been submitted for review. Once the Engineering Department has agreed to accept the Building Plans for submittal, the Building Department will accept the Building Permit application and route the plans to the Engineering Department for review, if required. The Engineering Department charges plancheck fees for the review of Building Plans; a schedule of fees is included in Appendix 1.3 this manual.

2.402.2 Engineering Department Building Plan Review. Engineering will review and comment on the plans, following as a guideline the Building Plan Checklist included as Appendix 2.11 of this manual. Building Plans will also be checked to ensure the presence of the required Engineering Department standard notes, attached as Appendix 2.12 of this manual. The completed Building Plan Checklist will be provided to the contact person listed on the application, and Engineering will verify that all required changes are made on the subsequent submittals. The Engineering Department may determine as a part of this review that a Grading Permit is required. If so, the approved Grading Plan will be attached to the back of the Building Plan set, and the

Engineering Department planchecker will verify agreement between the Grading plan and the Building Permit site plan.

2.402.3 Engineering Department Building Plan Approval. At such time as the Engineering Department determines that with the Building Plan meets all Engineering requirements, the planchecker will issue a preliminary approval and stamp the Building Plan as approved by Engineering. The applicant will be required to pay any Sewer Fees, and if there is an associated Grading Plan, to obtain rough grade approval prior to issuance of the Building Permit. Other Engineering Department fees, such as Flood Control and Traffic Mitigation Fees, may be deferred until the time the applicant requests permission for Building Occupancy to be issued. Sewer, Flood Control, and Traffic Mitigation Fees are discussed in Section 2.403 below.

2.403 *ENGINEERING DEPARTMENT FEES FOR BUILDING PERMITS.*

The City of Encinitas has adopted regulations that require the payment of fees to contribute to the funding of new infrastructure needed as a result of private development projects. The impact fees assessed by the Engineering Department in conjunction with Building Permits include Sewer Fees, Flood Control Fees, and Traffic Mitigation Fees. Impact fees assessed by other departments may also be applicable, such as Fire Mitigation, Parks and Recreation, School, and Water Fees.

2.403.1 Sewer Fees. Sewer Fees are assessed when projects include connection to the public sanitary sewer system in the former Cardiff Sanitation or Encinitas Sanitary districts, now administered by the City. Additional fees will also be charged for projects on properties currently connected to the sanitary sewer where the proposed development augments usage, such as the construction of a guest house or a proposed change in use of the property. The Engineering planchecker will determine the amount due for any Sewer Fees during the Building Plan check and will communicate the dollar amount to the applicant. Applicable Sewer Fees are required to be paid prior to issuance of the Building Permit. Projects under the jurisdiction of Leucadia

Wastewater District will be assessed any applicable fees by that district. If a project falls within an established sewer reimbursement district, additional payment in accordance with the terms of the reimbursement district will be required prior to issuance of the Building Permit. Information about sewer reimbursement districts can be found in Chapter 4, Section 4.600 of this manual, and a list of current sewer reimbursement districts and the associated reimbursement fees may be obtained at the Engineering front counter at City Hall.

2.403.2 Flood Control Fees. Flood Control Fees are assessed when projects include the construction of new impervious areas, such as driveways, roofs, or flatwork around pools. The fees are used to construct public drainage facilities needed for flood control. Flood control fees for any private improvements proposed on a Grading Plan will be assessed prior to issuance of the Grading Permit, and Flood Control Fees associated with construction proposed on a Building Plan will be assessed prior to the final inspection for the Building Permit. The Engineering planchecker will determine the amount of Flood Control Fees due during plancheck of the Building Plan and will communicate this amount to the applicant. The applicant may defer payment of the fee until such time as the final inspection for the Building Permit is requested. A form for the calculation of Building Permit Flood Control Fees is attached as Appendix 2.13 of this manual.

2.403.3 Traffic Mitigation Fees. Traffic Mitigation Fees are used to construct and improve main thoroughfares. The fee is based upon the estimated impact of the proposed development on the traffic, estimated in terms of peak hour trips. For larger projects, a traffic study may be prepared and submitted to the City, but for smaller projects, a standard usage table will be used for the assignment of peak hour trips to the proposed project. The table used as a guideline for the Traffic Mitigation Fee assessment is attached as Appendix 2.13 of this manual. For residential projects, the City also collects Regional Transportation Congestion Improvement Program (RTCIP) fees mandated by the SANDAG. The Engineering planchecker will determine the amount of these fees during plancheck of the

Building Plan and will communicate to the applicant the amount due. Traffic Mitigation and RTCIP fees are required to be paid prior to the final inspection for the Building Permit.

2.404 ***STORM WATER INSPECTION FOR BUILDING PERMITS.*** The Engineering Department conducts inspections to ensure that facilities required for storm water pollution control treatment (Best Management Practice measures, or BMPs) have been satisfactorily installed. Homeowners are required to maintain the BMP measures into perpetuity following inspection by the Engineering Inspector or Stormwater Inspector; modifications to the BMP measures may be made only with a permit from the Engineering Department. In conformance with State requirements, ongoing periodic BMP inspections are conducted by the City, and a catalogue of BMP installations is maintained in the GIS database and is available to the public.

2.404.1 Building Permits Associated with an Engineering Permit. For Building Permits with an associated Grading Permit, the Engineering Inspector, not a Stormwater Inspector, will verify proper installation of the required BMP measures. The inspection process for Grading and Improvement Permits is described in Section 2.4 of this manual. Installation and proper operation of the required BMPs to the satisfaction of the City Engineer is a prerequisite for the issuance of field clearance for building occupancy.

2.404.2 Building Permits Without an Associated Engineering Permit. For Building Permits without an associated Grading Permit, the stormwater inspection will be separate from other Building Permit inspections and will not be performed by the Building Inspector but instead by a Stormwater Inspector. When the stormwater pollution control BMPs shown on the Building Plan have been installed, the applicant or contractor shall contact the Stormwater Inspector to arrange a field verification of the facilities. The Stormwater inspections are mandated to be performed prior to foundation inspection and then again prior to the final inspection for the Building Permit. Once it has been determined that the BMPs are

satisfactory, the Stormwater Inspector will complete an inspection form and submit it to Engineering counter staff. Engineering staff will verify receipt of the stormwater inspection form prior to release of the Engineering Department holds placed on issuance of building occupancy. A sample of the stormwater inspection form is included as Appendix 2.15 of this manual.

2.500 THE GRADING AND IMPROVEMENT PLANCHECK PROCESS.

The process of obtaining a Grading or Improvement Permit including the plan submittal, plan examination, plan approval, permit issuance, construction changes, and as-built preparation are covered in this section. A flow chart illustrating the process from first submittal to permit issuance is included as Appendix 2.16 of this manual.

2.501 *GRADING AND IMPROVEMENT PLAN SUBMITTAL.*

2.501.1 Initial Submittal Requirement List. The Grading/ Improvement Plan Initial Submittal Requirement Lists in Appendices 2.17 and 2.18 and the Engineering Development Application in Appendix 1.2 shall be completed and accompany the plans when the plan review package is initially submitted to the Engineering Department for examination. Planning Department authorization to submit the plans is required prior to submittal of the initial plancheck package to the Engineering Department.

All applicable items on the Grading/ Improvement Plan Initial Submittal Requirement List must accompany the plans in the quantities specified on the list. Submittals without the required quantities of each item may not be accepted by the Engineering Department for submittal. A submittal discovered during plancheck to be incomplete will be returned by the planchecker to the engineer of work without benefit of a review.

2.501.2 Plancheck Fees and Refund Policy. Payment of applicable plancheck fees shall be made upon first submittal, and additional fees may be required upon subsequent submittals consistent with the City schedule of fees. The schedule of fees is available at the Engineering Department front counter at City Hall, on the City website, and is included in Appendix 1.3 of this manual. The fee schedules are subject to change. Additional plancheck fees as outlined in the then-current fee schedule may be required

if a plancheck remains inactive for a period of six months or longer.

Plancheck fees paid are specific to the submittal they accompany and are only refundable according to the Plancheck Refund Policy, attached as Appendix 2.14 of this manual.

2.502 *GRADING AND IMPROVEMENT PLAN EXAMINATION.*

Once the initial plan review submittal has been made, the Engineering Department planchecker will check the submittal package and work with the engineer of work to address review comments. When the plancheck items have been resolved and all associated requirements have been satisfied, the planchecker will coordinate final approval of the plans. The plan examination phase is discussed below; Section 2.503 discusses various requirements associated with Grading and Improvement Permits, and Section 2.504 covers the final approval process.

2.502.1 Plancheck Overview. The Engineering Department will check the plan for compliance with the conditions of approval for any associated discretionary permits and conformance with City codes and requirements. An improvement plan checklist is given in Appendix 2.33 of this manual. The plan review does not relieve the applicant's engineer of the ultimate responsibility for the design and sufficiency of the plans. The engineer of work and the applicant are responsible for reading the conditions of approval for any associated discretionary permits and for complying with all items.

When the reviewer has finished the plan examination, the plancheck package including a copy of the plans and accompanying documents will be returned to the engineer of work for corrections. Necessary corrections and missing items will be noted in red. Any missing items or corrections which may have been inadvertently overlooked on the first and/ or subsequent examinations are still the engineer of work's responsibility and must be complied with prior to the plans being considered for approval.

2.502.2 Plancheck By Other Departments and Agencies. The Engineering Department coordinates the submittal and checking of all materials related to Grading and Improvement Plans on behalf of the other City departments. The package returned to the engineer of work will include available comments from other City departments if those departments routed comments to the Engineering Department instead of to the engineer of work directly. In some cases, the plans may require the approval of a district or agency distinct from the City, such as Leucadia County Wastewater District, Olivenhain Municipal Water District, or the County Department of Environmental Health. In such cases, the engineer of work is required to process the plans separately with the autonomous district; the City does not coordinate this review. The engineer of work is responsible for communicating directly with other departments, agencies, and autonomous districts reviewing the plans as well as for resolving all plan review issues to ensure satisfaction with all departments and districts prior to plan approval.

2.502.3 Plancheck Resubmittals. After all of the requested plancheck corrections have been made to the plan and accompanying documents, the entire package including previous check prints, reference documents, and the requested number of revised plans and other documents shall be submitted to the Engineering Department for re-examination; see Section 2.501 of this manual regarding requirements for submittal completeness. This submittal process is repeated until all requests for correction have been addressed to the satisfaction of the City Engineer.

2.502.4 Plancheck Turnaround Time. The plan review turnaround time depends upon a number of factors, including City workload. The extent of plan review comments and the number of resubmittals required is dependent upon the complexity of the project, the adequacy of materials submitted for review, and the responsiveness of the engineer of work and applicant; the extent of the review comments may vary between projects. Plans are reviewed

in the order received; resubmittals do not receive priority over initial submittals in the plancheck queue. Most submittals will require at least two plan reviews before the plans are deemed ready for approval.

2.502.5 Release of Plancheck Package. Plancheck items shall not be released except to the engineer of work or authorized representative. If the engineer of work wishes to allow another individual, such as the applicant, to process the plan review on his or her behalf, a letter of permission to release materials to that person shall be submitted to the City. Approved plans are public record, and copies of such Record Drawings may be obtained from City files by any requestor. Mylars of public record plans on file with the City may be released only to licensed, bonded blueprint companies.

2.503 *CONSIDERATIONS FOR GRADING AND IMPROVEMENT PLAN APPROVAL.*

The planchecker must determine that all requirements associated with the plancheck have been satisfactorily completed prior to seeking plan approval. The determination that the plans are ready for approval may be made only when all plan corrections have been addressed to the satisfaction of the City Engineer, and all of the associated project items below have been satisfactorily addressed. Some requirements may not be applicable to a particular project.

A. All conditions of approval have been satisfied.

B. All required covenants and/or easements have been recorded with the County Recorder, conformed copies have been submitted to the City Engineer, and the recording information has been entered on the plans. Other than the exceptions noted below, these documents are prepared by the Engineering Department. A description of some of the typical covenants appears below.

1. Hold Harmless for Drainage. In cases where pre-development cross-lot drainage patterns will be maintained without the installation of a storm drain system and the grant of applicable public and/or private drainage easements, this covenant is required.

2. Maintenance Agreement for Private Street and Drainage Facilities. This document is required only when private street and drainage facilities are proposed.

3. Maintenance Agreement for Private Storm Water Pollution Control Facilities. This document is required for all projects meeting the definition of a "priority project" for storm water pollution control. The engineer is required to prepare the project legal description and a plat of the facilities being reserved for storm water pollution control treatment.

4. Emergency Vehicular Access Easement. In cases in which an access easement for emergency vehicles is required, the Fire Department will prepare this easement document.

5. Encroachment Covenant. This covenant will be required if an encroachment permit is approved to allow the permanent encroachment of private facilities within the existing or proposed public right-of-way. The document provides for the future removal of the private facilities by the City, without replacement, as necessary for public use of the right-of-way. Encroachment permits are discussed in Section 2.201 of this manual, and a sample Encroachment Maintenance and Removal Agreement is included as Appendix 1.21 of this manual.

6. Grant of City Highway Easement. This easement is required if the City determines that additional right-of-way dedication is required.

7. Grant of Miscellaneous Easements. Required easements may include drainage easements, sewer

easements, and other various easements, both public and private.

C. The engineer of work has acquired preliminary approval from all City Departments and from the San Dieguito Water District so that the plans will be able to be approved and signed by each of those concerned departments or agencies without modification. In some cases, projects will fall under the jurisdiction of an outside agency such as San Diego County Department of Environmental Health, Leucadia Wastewater District, or Olivenhain Municipal Water District; if so, the engineer of work shall acquire preliminary approval from the applicable agency or agencies prior to the Engineering Department considering the plans for final approval.

D. If required, a Notice of Intent (NOI) has been filed with the State Regional Water Quality Control Board (RWQCB) and a Storm Water Pollution Prevention Plan (SWPPP) has been reviewed and approved by the City.

E. The cost estimate prepared by the engineer of work has been reviewed and approved by the Engineering Department, and the following, when required, have been posted with or paid to the Engineering Department:

1. Security to ensure performance, labor, and materials for any associated grading, erosion control and/ or improvements. Forms of posted surety acceptable to the City are given in a list included as Appendix 1.7(a) of this manual.

2. Securities to ensure the performance of required utility undergrounding in the amount of the utility companies' estimates have been posted with the City; the City Engineer may prescribe a fixed unit cost for undergrounding, in which case the security posted with the City shall be based on that amount. Alternately, evidence of full payment to each utility company concerned may be provided, in which case the applicant may be required to post with the City only surety to guarantee the associated trenchwork.

3. Inspection, flood control, and NPDES inspection fees.

4. All other special deposits required by the conditions of approval.

5. Any deficit balances and all other required City fees, deposits, assessments, and charges.

F. The following documents have been reviewed and approved by the planchecker:

1. Drainage report.

2. Storm water pollution control BMP calculations, if required.

3. Soils/ geotechnical reports.

4. Erosion control plan.

5. A complete and signed BMP verification form, if required.

6. Landscape, shoring, or any other specialty plans, if required.

7. Letters of permission from adjacent property owners for offsite work, if work on adjacent private properties is proposed.

G. Any applicable public utility letters and/or joint use agreements have been submitted to and approved by the City Engineer.

H. The project soils reports and geotechnical documents have been reviewed and approved by the City Geotechnical Consultant, if required.

I. The project structural or shoring calculations and plans have been reviewed and approved by the City Structural Consultant, if applicable.

J. An encroachment permit has been issued for proposed encroachment into the public right-of-way, if applicable.

K. Wastewater discharge permits for the discharge of water from an excavation during construction have been issued by the Regional Water Quality Control Board and from the City.

2.504 *GRADING AND IMPROVEMENT PLAN APPROVAL.*

2.504.1 General Information. At such time as the plan prints are determined to be satisfactory and all associated requirements have been satisfied, the project planchecker will transmit to the engineer of work a request for the mylar plan to be processed for final approval.

The engineer of work will process the mylar original with each department or district to obtain approval signatures. All necessary City, San Dieguito Water District, and other district signatures, except Engineering Department signatures, must be obtained on the title sheet before the mylar plan is submitted to the Engineering Department. Only the approval signatures of the Engineering Department are not required prior to the submittal of the mylars for final approval. The process for obtaining the signatures from each department is described in Appendix 1.5(a) of this manual.

In some cases, the plans may require the signatures of an agency distinct from the City, such as Leucadia County Wastewater District, Olivenhain Municipal Water District, or the County Department of Environmental Health. In these cases, the engineer of work is required to process the plans during plancheck separately with the autonomous district and will be required to obtain the approval signature from that district on the mylar plan before it is submitted to the Engineering Department.

Once all signatures have been obtained on the mylar, the signed mylar plan together with the required number of prints and all previous plancheck items will be submitted in one complete package to the Engineering Department. The planchecker will coordinate acquisition of the approval signatures of the Development Review Division Senior Civil Engineer and the City Engineer. At such time as both

signatures have been obtained, the plans are approved and considered to be an official public record. The plans may then be released to a bonded blueprint company or the engineer of work for reproduction as required as per the bond and fee letter (see Section 2.205.2 below) and permit issuance requirements.

No stick-ons shall be allowed on Grading or Improvement Plan mylars submitted for final approval. Each owner listed on the title report shall sign the plan beneath the owner's certificate in permanent black ink; evidence of authority to sign for more complicated forms of ownership is discussed in Appendix 1.12 of this manual. The certificate of responsibility and each plan sheet shall be wet-signed and wet-stamped by the engineer of work in permanent black ink. Specialty plans such as structural, shoring, or landscape plans shall bear a wet-signed certificate of responsibility from the professional assuming professional responsibility for the design, and each specialty sheet shall be wet-signed and stamped by that individual.

Approval of the plans shall not be construed as approval of the gas, electric, telephone, and cable television service construction plans, which may require subsequent approval by the appropriate agencies.

2.504.2 Duration Plan Approval Remains Valid. If the permit is not issued within six months from the date of approval of the drawings, the plans will be subject to review by the City for compliance with current codes and regulations before a permit can be issued. Changes to the approved plans as well as additional plancheck, construction change, inspection, or other fees may be required.

2.504.3 Duration Permit Remains Valid. Work covered by an Engineering permit shall commence within 90 days of permit issuance or the permit shall become invalid. Engineering permits expire following 90 days of inactivity on the work covered by the permit; refer to Municipal Code Section 23.24.240 for further information. Permits may expire earlier due to contractor insurance expirations or other City requirements. An expiration notice may or may not be

issued to the applicant for a permit that is about to expire; a sample expiration notice for grading permits is included in Appendix 2.19.

2.504.4 Effects of Change in Engineering Standard. Standards and City requirements may from time to time change. Projects are required to comply with the current standards and requirements in accordance with the policy below.

A. Plans in Plancheck on the Date Change Takes Effect:
New submittals and plans in plancheck after the effective date of the standard or requirement change shall be required to comply with the new standard.

B. Plans Unpermitted on the Date Change Takes Effect:
Approved plans which have yet to be permitted at the time the new standard takes effect shall comply with the new standard.

C. Permit Issued Prior to Date Change Takes Effect:
Work under a permit issued prior to the date the change in standard takes effect may be constructed and as-built as approved and permitted. However, if the permit expires or is nullified for any reason, the project shall be required to comply with the new standard.

D. Extension of Tentative Map or Parcel Map Approval:
Where an extension of the tentative approval of the development is necessary, the corresponding plans may be required to comply with new standard. In some cases, an extension will not be granted for tentative maps or parcel maps required to conform with a new standard; consult the Planning Department for more information.

2.504.5 Appeal of Requirement Imposed by the City Engineer. An applicant may appeal a requirement imposed by the City Engineer to the City Council. The standard City Council appeals process is followed. The decision of the City Council is final and may not be appealed.

2.505 *DETERMINATION OF FEES AND POSTING OF SECURITIES.*

At such time as the planchecker has completed the plan examination, found the plans satisfactory, and determined that all the associated requirements are met, the planchecker will review and approve the engineer of work's cost estimate and issue a Bond and Fee letter listing all of the items required for issuance of the permit.

2.505.1 Preparation and Approval of the Engineer's Cost Estimate.

The cost estimate is prepared, stamped, and wet-signed by the engineer of work. The estimate is required to utilize the then-current City of Encinitas unit price list and required to include all public and private work proposed on the plan. The Unit Price List is attached as Appendix 3.14 of this manual. The planchecker will review the engineer of work's cost estimate for completeness relative to the work proposed on the final version of the plans and for conformance with the then-current City unit price list. Once the cost estimate is approved, the bond and fee letter may be issued, provided that all other requirements are satisfied. If a project falls under the jurisdiction of other agencies such as San Dieguito Water District, Leucadia Wastewater District, or Olivenhain Municipal Water District, those agencies may require separate bonds to be posted for the work within their purview.

In some cases, the planchecker may allow the preparation of two separate cost estimates, one including all the work shown on the plan and a second including only the items necessary to secure the site, to protect the public safety and welfare, and to protect storm water quality if construction is abandoned. In this case, the required surety for the project will be based upon the reduced cost estimate. If the work proposed includes both private and public improvements, separate estimates are to be prepared; one for the private grading and improvements and a second for public improvement work. A cost estimate from the utility companies concerned may also be needed if full payment for any required undergrounding work has not yet been made to the utility companies, or the City Engineer may prescribe a fixed unit cost to be used for undergrounding work. If full payment has already

been made, an estimate for only the trenchwork involved will be required.

2.505.2 Issuance of the Bond and Fee Letter. The planchecker will issue to the applicant and the engineer a bond and fee letter based upon the City-approved engineer's cost estimate. The bond and fee letter generally lists the amount of surety required to be posted to secure the work, the amount of inspection and other fees to be paid, and the type and quantity of items required to be submitted at the time permit issuance is sought. It may also include miscellaneous fees or requirements which are project specific and must be satisfied prior to issuance of the permit. The bond and fee letter also conveys a variety of information pertinent to permit issuance and the beginning of construction. A sample bond and fee letter is included as Appendix 2.20 of this manual.

2.505.3 Posting of Securities. Information on the requirements for securities is included in Appendix 1.7(a) of this manual. Instructions for the assignment of an account to the City and for the completion of an irrevocable standby letter of credit are included as Appendices 1.7(b) and 1.7(c), respectively. General requirements for posting security are discussed below.

A minimum of 20% and up to 100% of the security deposit for Grading Permits shall be in the form of cash, certificate of deposit, letter of credit, or an assignment of account. Up to 80% of the security deposit for Grading Permits may be in the form of auto-renewing performance, labor, and materials bonds issued by a State of California licensed surety company.

Up to 100% of the security deposits required for Improvement Permits, security for undergrounding of overhead utilities, and security for deferred monumentation may be in the form of auto-renewing labor and materials bonds issued by a State of California licensed surety company. Cash, certificates of deposit, letters of credit, and assignments of account are also acceptable financial instruments.

If a certificate of deposit (CD) will be utilized to post the entirety of the security required for a Grading or Improvement Permit, two separate CD's for 25% and 75% of the required amount should be obtained in order to facilitate any future partial release of those securities. The CD's may be of any term but must be auto-renewing. Any CD must specify the City of Encinitas as a certificate holder and include a clause that until the City of Encinitas provides a written request for release of the CD, the balance shall be available to the City upon its sole request.

Bonds posted as surety shall list the bonding company or brokerage firm name and address, the project permit number, and the name of the owner. In addition, bonds shall state that they are auto-renewing and shall be held until such time as the City provides a written request for the bond to be released.

The format of any financial instrument is subject to City approval, may be in the owner's name only, and must list the City of Encinitas as a Certificate Holder.

2.506 *PERMIT ISSUANCE.*

The applicant, engineer of work, or person acting on behalf of the applicant may acquire the Grading or Improvement Permit. To do so, each of the items listed in the Bond and Fee Letter shall be brought in the required quantities to the Engineering front counter at the time permit issuance is sought. The quantities of each item requested in the Bond and Fee Letter must be submitted; quantities may not be reduced, even if copies have previously been submitted to the City during the plancheck process. Incomplete or piecemeal packages will not be accepted, and the project planchecker will not accept any of the required items; they must be submitted to the Engineering front counter in one complete package. The applicant will be required to complete an Engineering Development Application and submit the application with the other required documents.

If any work is proposed within a public right-of-way or easement, the applicant will need to supply the name,

license number, and contact information of the contractor who will perform the work, prior to issuance of the permit. For work within the public right-of-way only, the contractor is required to have a current State of California Type A license; the contractor shall hold a valid liability insurance policy with at least one million dollars of coverage and with the City of Encinitas listed on the policy as "additionally insured". The insurance company is required to provide to the City evidence of this coverage prior to issuance of the permit. The requirements for proof of insurance are included in Appendix 2.6 of this manual. If any work within a public right-of-way or easement is proposed but not permitted by an Improvement Permit, a right-of-way construction permit will also be required. Right-of-Way Construction Permits are discussed in Section 2.206 of this manual.

The Engineering front counter staff will verify that all items required as per the Bond and Fee Letter have been provided, that the securities posted meet the City's minimum requirements, and that all fees listed in the Bond and Fee Letter and other required fees have been paid. Following the determination that each of these items has been satisfactorily addressed, the Engineering Department will assign a City inspector to the project and issue the permit.

2.507 *CONSTRUCTION CHANGES.*

Construction change approvals are required for any deviation from the approved plans, unless otherwise approved in advance by the City Engineer. At the discretion of the City Engineer, construction deviating from the approved plan and performed without an approved construction change may require removal or modification of the construction. Work on the construction of the proposed change may not begin until the City field inspector has received the approved construction change. The as-built process discussed in Section 2.611 is not a replacement for the construction change process; projects are required to first obtain construction change approval prior to performing the construction and prior to submitting as-builts.

2.507.1 Preparation of Construction Change Drawings. Only the engineer of work may modify the approved plan. The engineer of work shall obtain from the City the mylar original of the drawing bearing all the approval signatures, run print sets from it, and show the proposed changes in red ink on those print sets; changes to the mylar may not be made without prior City approval. Plans showing the proposed changes in red ink overlain on prints of the originally approved plans are called “redlines”.

Each revision is to be “clouded” on the plan and labeled with a “delta”. A corresponding “delta” for the proposed change shall be added to the title sheet and to each of the following sheets on which a change is being made. Construction change deltas are to be numbered in increasing sequential order, with the first change to the plan being “delta 1”. For example, the first time the plan is submitted for a construction change, the proposed changes on all sheets will be labeled as “delta 1”. The next time a new construction change is proposed, the changes on all sheets will be labeled as “delta 2”.

The engineer of work shall note a brief description of the proposed construction change in the lower left-hand corner of the title sheet and of each sheet on which a change is proposed. At such time as the City approves the construction change, the approval signature will be added beside that description.

2.507.2 Construction Change Fees. Construction change plancheck fees in accordance with the then-current fee schedule are due upon the initial submittal of the construction change. The construction change fee is a per-sheet amount that is charged for each modified sheet, including the title sheet. If, at the discretion of the City Engineer or the engineer of work, a plan sheet needs to be voided and a new sheet inserted in order to show the proposed changes clearly, the applicant will be charged the standard plancheck fee for the new sheet in lieu of the construction change fee. Construction change plancheck fees are non-refundable.

2.507.3 The Construction Change Plancheck Process. The required number of redlined prints made from the original, signed mylar are submitted to the Engineering Department front counter and routed to the project planchecker. The construction change plancheck process parallels the process described in Section 2.502 of this manual, with the exception that plans are not generally routed to all City departments. However, some construction changes will require approval from other agencies, districts, or departments prior to Engineering Department approval.

At such time as the proposed construction change is conceptually determined to be consistent with municipal standards and requirements, the planchecker will transmit to the engineer of work authorization to obtain the mylar from the City and make the changes, as they were authorized by the planchecker, on the original record drawing. The revised mylar is then submitted back to the City with all previous plancheck documents and with two fresh sets of redlines.

Upon receipt of the revised mylar, the planchecker will ensure the change meets the City's requirements and then obtain the City approval signature beside the new "delta" added to the plan revisions box in the lower left-hand corner of the title block. Once the signature is obtained, the mylar will once again be released back to the engineer of work, who will run an additional two sets of prints from the mylar. The engineer of work is then required to return to the Engineering front counter the mylar for re-filing and the prints for routing to the Engineering inspector. Work on the proposed change may commence once the final prints have been returned to the City and received by the project Engineering inspector.

2.507.4 Change of Engineer. If the applicant wishes to work with a different engineer, soils engineer, or engineering geologist following the original approval of the plan, a construction change showing the transfer of professional responsibility is required as per Municipal Code Section 23.24.360. The plan title sheet shall be revised with a new engineer's or soils engineer's statement of responsibility, wet-signed, and wet-stamped by the engineer assuming professional

responsibility. The proposed change will be submitted and follow the process outlined in Section 2.507.3 above. The following items shall also be provided prior to approval of the construction change:

A. The applicant shall submit a letter of notification verifying the change of the responsible professional as given in Appendix 2.21(c).

B. The new engineer of work shall submit an assumption of responsibility letter stating that s/he has reviewed all available prior reports, and/or plans [specified by date and title], and work performed by the prior responsible professional; concurs with the findings, conclusions, and recommendations; and is satisfied with the work performed. The letter must state the precise date on which the new engineer will assume all responsibility within professional purview. The letter format is given in Appendix 2.21(a) of this manual. Exceptions must be approved by the City Engineer.

C. The original engineer of work shall submit a release of responsibility letter. Language for the letter is given in Appendix 2.21(b) of this manual. In the event this letter cannot be obtained, the applicant may send a letter to the original engineer of work stating that the responsibility is shifting to a new engineer, naming that firm or individual, and including a date after which the original engineer will no longer be responsible for the project. A copy of the registered letter, proof of mailing, and the recipient's signature as proof of receipt shall be submitted to the City.

2.507.5 Change of Property Ownership. A construction change to reflect new ownership is required if the property is sold or title is transferred. The engineer of work shall revise the original mylar to include a new owner's certificate signed by the new owner with the new owner name and contact information appearing below it. A title report or grant deed less than six months old confirming the new ownership will also be required. The proposed change will be submitted and follow the process outlined in Section 2.507.3 above. Replacement surety shall be posted in the name of the new

owner prior to the release of any remaining surety under the name of the former owner.

2.507.6 Plan Change Requested by City Engineer. When plan revisions are deemed necessary by the City Engineer to protect the public health and safety, or as field conditions may require, a written requirement for modification shall be transmitted to the applicant or the engineer of work. The engineer shall revise the plans and transmit the originals to the City Engineer within the time specified by the City Engineer. Construction of all or a portion of the improvements may be stopped by the City Engineer until revised drawings have been submitted and approved.

2.508 THE EMERGENCY GRADING PERMIT PROCESS FOR BLUFF STABILIZATION.

Coastal bluff stabilization projects are required to obtain a standard Grading Permit prior to approval of any coastal development permit or an Emergency Grading Permit, as applicable. When an emergency project is submitted to the Coastal Commission, Coastal staff will route the emergency project application to the City for Engineering Department review and approval. The applicant is required to obtain either an interim Emergency Grading Permit first if, in the opinion of the City Engineer, the circumstances require it; a standard Grading Permit is also always required instead of or in addition to the Emergency Grading Permit. The processing for each of these permits is discussed below.

2.508.1 Emergency Grading Permit. If the emergency nature of the project does not allow enough time for the processing of a Grading Plan, the Engineering Department will process an expedited Interim Emergency Grading Permit in order to allow work to begin as quickly as possible. Subsequent to the issuance of the Interim Emergency Grading Permit, the applicant will be required to submit an application for a standard Grading Permit as described in Section 2.508.2 below. The fees charged for the processing of the Interim Emergency Grading Permit will be credited towards the fees due for the standard Grading Permit. The Engineering

Department processing of the Emergency grading Permit will include:

A. Routing plans to the Planning Department.

B. Routing the structural design and calculations to the City's third-party structural reviewer.

C. Routing the geotechnical items to the City's third-party geotechnical reviewer.

D. Conducting the Engineering Department review of the plans.

E. Collecting fees for interim permit plancheck and project inspection.

F. Ensuring that the minimum required security has been posted with the Engineering Department, as described in Section 2.508.2 below.

G. Issuing a Beach Encroachment Permit if the proposed work requires access from the beach.

H. Issuing an Interim Emergency Grading Permit after items (a) through (G) above are satisfied.

2.508.2 Standard Grading Permit for Bluff Stabilization. If the nature of the situation allows, Engineering will process only a standard Grading Plan for the Emergency Permit. If the critical nature of the necessary emergency work does not allow a standard Grading Plan to be processed initially, the City will first process and issue an Interim Emergency Grading Permit as described in Section 2.508.1 above in order to allow emergency work to begin quickly, then will initiate the processing of the standard Grading Permit as described below. The fees paid towards the Interim Emergency Grading Permit will be credited towards the processing of the standard Grading Permit. A cost estimate prepared by the engineer of work and consistent with the then-current City-approved price list shall be submitted, and the security posted for the project shall comply with the requirements listed below.

A. The cost estimate shall include 25% of the cost of the shoring and structural stabilization of the bluff (seawall, tie-backs, caissons, or other).

B. The cost estimate shall include 100% of the estimated cost of any grading, drainage, required landscaping and irrigation, and proposed driveway pavement.

C. The cost estimate shall include a line item for 100% of the finish surfacing of the seawalls based upon the then-current City unit price plus the City-approved mobilization cost.

D. The cost estimate shall include a line item for the restoration of the beach access if construction access from the beach is needed. The amount shall be based upon the then-current City-approved cost for beach access restoration.

E. A minimum of 20% of the cost estimate or $5,000.00, whichever is greater, shall be posted as cash, certificate of deposit (CD), or letter of credit. The balance of the security may be posted with a bond.

F. The Bond and Fee Letter for the project will indicate that the one-time partial release of up to 75% of the original bond amount will be subject to field inspections and approval. The allowed partial release may be less than 75% and may not be available to all projects.

G. The Bond and Fee Letter will indicate that the final grading approval and release of any remaining securities is subject to the approval of the Coastal Development Permit for the project as well and the approvals of the Planning Department and the Parks and Recreation Department.

2.600 THE CONSTRUCTION PROCESS FOR GRADI NG AND IMPROVEMENT PERMITS.

The construction process begins upon permit issuance and includes the preconstruction meeting, the construction process, meeting all City and third-party inspection requirements, issuance of certification when certain levels of completion have been attained, preparation of as-built drawings, project completion and signoff, the applicable warranty period, and partial and/or full release of project securities. A flow chart included in Appendix 2.23 of this manual illustrates the typical administrative process for the construction phase of the project. The sections below elaborate on each of the steps involved.

2.601 *PRECONSTRUCTION MEETING.*

At the time of permit issuance, the City will assign to the project an Engineering Inspector. The name and telephone number of this inspector will be printed on the permit given to the applicant. The applicant is required to schedule a preconstruction meeting with this inspector by calling the listed telephone number a minimum of two business days prior to the anticipated start of construction. The preconstruction meeting should include the inspector, geologist, civil engineer, contractor, and owner/ applicant. No work including grading, brushing, clearing, and public or private improvements may be performed before the preconstruction meeting has been held.

During the preconstruction meeting, the inspector will review the project plans with the applicant or agent, explain the sequence of events in the construction process, and discuss any special requirements. Construction may not begin until after the preconstruction meeting has been held.

2.602 *START OF CONSTRUCTION AND INSPECTION.*

Once construction has begun, the applicant can expect that the Engineering Inspector will visit the job site at pre-established meeting times and at times unannounced. The person performing the work is required to notify the Engineering Inspector a minimum of twenty-four hours prior to certain work being ready for inspection, as is described in

Section 23.24.290 of the Municipal Code. The inspector will observe the work in the field for compliance with the approved plans, applicable standards, and with generally accepted engineering and construction practice. Work performed without the benefit of inspection or work not consistent with the approved plans may be subject to removal and/ or correction.

2.603 *CONSTRUCTION CHANGES AND COMMUNICATION DURING CONSTRUCTION.*

All communications between the contractor, City, and applicant that may result in any changes to the approved plans shall be in writing. Neither the contractor nor the engineer of work shall modify the construction or the plans based upon a verbal agreement with the City Inspector or with any other City official. If a change to the plans, engineer of work, soils engineer, engineering geologist, or property owner is proposed after plan approval, a construction change must first be approved by the City. The construction change plancheck process is described in Section 2.507.3 above.

2.604 *AFTER-HOURS INSPECTIONS.*

If after-hours work is requested, the applicant shall submit An after-hours inspection request to the City a minimum of 48 hours prior to the date for which the after-hours inspection is requested. An additional inspection fee is assessed in order to cover the City's additional costs for the inspection; this fee is determined on a case-by-case basis. An After-Hours Inspection Request form is included as Appendix 2.24 of this manual.

2.605 *PERMIT SUSPENSION AND STOP-WORK NOTICES.*

The Engineering inspector may suspend a permit and issue a stop-work notice if work which is inconsistent with the approved plans, unpermitted, dangerous to the public health, safety, and/or welfare, or otherwise unacceptable has been or is being performed. The stop-work notice will detail the nature of the work causing the notice and will give contact information for the Engineering Inspector. The recipient of the notice shall contact the listed Engineering

Inspector to discuss steps to remedy the situation. Construction work may begin again when the stop-work notice has been lifted by the City Inspector.

2.606 *ROUGH GRADE APPROVAL FOR GRADING PLANS.*

At such time as the Engineering Inspector determines that the project work is nearing a level acceptable for rough-grade approval, the inspector may issue a punch list to the applicant listing which remaining tasks must be executed prior to issuance of rough grade approval. These tasks typically include, at a minimum, a pad certification and as-graded soils report as discussed in parts 2.606.1 and 2.606.2 below. The Engineering Inspector should be contacted for all questions relative to the punch list and the status of the rough grade approval. Standard requirements for rough grade approval are included the rough grade approval request form in Appendix 2.25 of this manual. When all of the general and project-specific requirements for rough grade approval have been addressed, the applicant may request rough grade approval by submitting the Rough Grading Approval Request form included in Appendix 2.25 of this manual. Following a satisfactory inspection and receipt of required documents, the Engineering Inspector will process paperwork with the City stating that rough grade approval has been issued. Engineering Department front counter staff will receive from the project inspector a copy of the rough grade approval.

In certain exceptional cases, the City Engineer may allow conditional rough grade approval to be issued. This is discussed in Section 2.607 below.

2.606.1 Pad Certification. The engineer of work is required to certify that the pad elevations as shown on the approved Grading Plan have been field verified and have been attained within a tolerance of 0.1 ft. The engineer of work shall also certify that all drainage devices, retaining walls, temporary and permanent erosion control devices, and manufactured slopes have been constructed in conformance with the approved plan. The pad certification shall be provided to the Engineering Inspector; the project planchecker cannot

accept the certification letter. A sample pad certification is included in Appendix 2.26 of this manual.

2.606.2 As-Graded Soils Report. The geotechnical engineer of work shall provide a geotechnical report certifying that the grading has been performed in accordance with the approved project soils report(s). The compaction test results shall be submitted to the City and approved by the Engineering Inspector.

2.607 *ROUGH GRADE CONDITIONAL APPROVAL FOR GRADING PLANS.*

In some circumstances, such as when a basement or subterranean garage is proposed, the Engineering Inspector may allow issuance of a conditional rough grade approval. The primary intention of the conditional rough grade approval is to facilitate the completion of rough grading associated with retaining walls that are also a part of the proposed building. The conditional rough grade approval allows for only the construction and Building Department inspection of foundations, footings, and certain retaining walls that are a part of the building, and not for delivery of timber to the site. When additional requirements have been met to the satisfaction of the City Engineer, the Engineering Inspector will issue the standard rough grade approval as discussed in Section 2.606 above. A sample rough grade conditional approval form is included in Appendix 2.27.

2.608 *BUILDING PERMIT CLEARANCE BY THE ENGINEERING DEPARTMENT.*

Both Grading and Building Permits may be required for a particular project. If so, the applicant must receive rough grade approval or conditional rough grade approval from the Engineering Inspector before the Engineering Department will allow the Building Permit to be issued, unless otherwise allowed by the City Engineer. In this case, the applicant shall request at the Engineering front counter a release of the hold on the Building Permit once the rough grade approval or conditional rough grade approval has been issued. Engineering front counter staff will verify that the Engineering Department review of the Building Plan is complete, any applicable Sewer Fees have been paid, and

that no further issues are required to be resolved before releasing the Engineering Department hold on the Building Permit. Other Engineering Department fees such as Flood Control and Traffic Mitigation Fees may be deferred until building occupancy. These fees are explained in Section 2.403 above.

2.609 *PARTIAL SECURITY RELEASE.*

Prior to obtaining the Grading or Improvement Permit, the applicant must post with the Engineering Department security ensuring performance of the work, in accordance with Section 2.505.3 of this manual. The applicant is eligible for a single partial release of up to 75% of those securities upon issuance of rough grade approval or as determined by the Engineering Inspector. The percentage amount of the one-time release will approximately correlate with the percentage of work performed. The partial release will be automatically initiated by the City upon receipt of the Engineering Inspector's approval; the applicant need not contact the City to request the release. The processing and release of securities may take up to 4 weeks after the release process is initiated by the project Engineering Inspector. Any cash releases will be mailed to the address on the Bond and Fee Letter unless the City is otherwise notified, and all letters mailed to a financial institution will be copied to the owner/ applicant listed thereon.

2.610 *ENGINEERING DEPARTMENT FIELD CLEARANCE FOR BUILDING OCCUPANCY.*

Certain projects may require a Building Permit in addition to the Engineering permits. The Engineering Department maintains a hold on the release of building occupancy until such time as an Engineering Inspector has issued field clearance for occupancy and the required Engineering Department fees have been paid. When requested, the Engineering Inspector will visit the site to certify that the precise grading and drainage is substantially complete. The inspector will then complete and provide to the Engineering front counter staff a signed Field Clearance for Occupancy form. At such time as the counter staff is in possession of the signed Field Clearance for Occupancy form, the project applicant may come to the Engineering front counter with

the project "Blue Card" issued for the project and pay the Traffic Control and Flood Control Fees that have been deferred until the time of building occupancy. The front counter staff will then clear the Engineering Department hold on the building occupancy. Sample Field Clearance to Allow Occupancy and "Blue Card" forms are included as Appendices 2.28 and 2.29 of this manual, respectively.

For those Building Permits not associated with a Grading Permit, the stormwater pollution control BMP inspection must be performed to verify satisfactory installation of the required BMPs prior to the Engineering Department releasing the hold on the issuance of building occupancy. In such case, the Engineering front counter will also require the completed BMP approval form to have been submitted by the Stormwater Inspector before the applicant may request signoff of the project "Blue Card".

2.611 *AS-BUILT (RECORD) DRAWINGS.*

Following full completion of all work shown on the proposed plans, the engineer of work shall submit two redlined prints made from the approved, signed plans showing deviations from the approved design. The red-lines will be reviewed both by field and office staff and will be returned to the engineer of work with comments, if any. The as-built process will continue until all outstanding items have been resolved. At such time, the City will release the original mylar for drafting of the as-built changes onto the mylar record drawing. The red-lined prints and the revised mylars should then be returned to the City for the final approval signatures. For Grading Permits, the engineer of work shall also submit a statement of compliance as described in Section 2.611.1 below.

No construction changes are allowed to be approved as as-builts, and plans that differ significantly from the approved drawing may be required, at the discretion of the City Engineer, to submit for a construction change before the processing of the as-builts will be allowed. The construction change process is discussed in Section 2.507.3 of this manual.

2.611.1 Engineer's Final Grading Certification. Upon submittal of the as-built drawings to the City, the engineer of work shall issue to the Engineering Inspector a statement of compliance certifying that the final grading and drainage are in substantial conformance with the approved plan, that the work has been performed consistent with Municipal Code requirements, and that the as-built drawings submitted to the City accurately reflect any deviations from the originally approved plan. The letter shall be signed and stamped by the engineer of work. A sample final grading certification letter is included in Appendix 2.30.

2.611.2 Soils Engineer's Final Grading Report. The geotechnical engineer of work shall provide a geotechnical report certifying that the final grading has been performed in accordance with the approved project soils report(s). The compaction test results shall be submitted to the City and approved by the Engineering Inspector.

2.612 *FINAL INSPECTION AND RELEASE OF GRADING OR IMPROVEMENT PERMIT.*

After the permitted work is entirely complete, the as-builts have been approved, and any other general or project-specific requirements have been satisfied to the satisfaction of the City Engineer, the Engineering Inspector will issue final approval of the Grading or Improvement Permit. For public Improvement Permits only, a one-year warranty period then commences, which is explained in Section 2.614 below.

2.613 *FINAL RELEASE OF SECURITIES.*

The complete release of project securities in the case of Grading Permits or the partial release of securities in the case of Improvement Permits is automatically initiated by the City after submission of satisfactory final as-built drawings to the City and approval by the project Engineering Inspector and Engineering staff. Satisfactory completion of the final inspection certified by the project Engineering Inspector is a prerequisite to full release of the security deposit for any Grading Permit. A sum in the amount of 25% of the securities posted for public

Improvement Permits will be held for a one-year warranty period, and a release is automatically initiated at the end of that warranty period. The improvement plan warranty period is discussed in Section 2.614 below.

Applicant requests for the release of securities cannot be addressed without prior release approval from the Engineering Inspector. The processing and release of securities may take up to four weeks after the release process is initiated by the project Engineering Inspector. Any cash releases will be mailed to the address on the Bond and Fee Letter unless the City is otherwise notified in writing, and all letters mailed to a financial institution will be copied to the owner of record.

2.614 *PUBLIC IMPROVEMENT PLAN WARRANTY PERIOD AND 25% SECURITY RETENTION.*

For all public improvements, 25% of the surety posted is retained by the City for a one-year warranty period. The contractor is required to guarantee all improvement work for a period of one year after the date of acceptance of the work by the City. The contractor shall repair or replace any and all such work, together with any other work which may be displaced during that construction, that may prove defective in workmanship and/or materials during the warranty period without any expense to the City. Ordinary unusual abuse and wear and tear are not subject to the warranty provisions.

Following the conclusion of the warranty period, the City will perform the final warranty inspection to ensure that no defects due to construction or workmanship have occurred. After the satisfactory inspection, the release of the balance of the surety will automatically be initiated by the City, with the release process as outlined in Section 2.613 above. If defects due to construction or workmanship are discovered, the City will contact the applicant to remedy the work prior to release of the remaining securities.

2.700 UNPERMITTED WORK.

In the event that unpermitted work is performed, the City Engineer will issue a stop-work notice and cause the work to be stopped until the necessary permit is obtained. In this case, the permit fee due will be twice that which would normally be required. If grading work is performed without a permit, the City Engineer may cause to be recorded with the County Recorder a notice of grading violation against the property. The notice of grading violation will be lifted at such time as the City Engineer deems the issue satisfactorily remedied. The permitting process to correct the unauthorized work may include, but shall not be limited to: Planning Department, Planning Commission, or other authorized body review of an application for a coastal development permit or other required permits, a review under the California Environmental Quality Act, a permit for development of constrained property, and the satisfaction of other requirements for the intended use of the property. No other permits may be issued until the violation is resolved. For more information, see Municipal Code Section 23.24.330 and Section 2.605 of this manual for information on stop-work procedures.

APPENDIX CHAPTER 2:
PERMITS AND PROCESSING GUIDELINES

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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PERMANENT ENCROACHMENT PERMIT APPLICATION AND PROCEDURE

Permanent Encroachment Permits are issued in order to allow the encroachment of non-standard works into the public right-of-way or a public easement. Prior review by the Field Operations Division is required. Typically, an Encroachment Maintenance and Removal Covenant, properly executed by the property owner(s), is to be recorded as an encumbrance against the real property and guarantees future compliance with the terms of the issued permit.

Special permanent encroachments as follows: *Sidewalk Cafe*, *Newsracks*, and *A-frame Signage* are not within the scope of this procedure and are discussed elsewhere.

Typical examples of permanent encroachments allowed per this process include as follows:

a) Driveway approaches constructed of hydraulic cement concrete where there is no established line and grade,
b) Parkway pavement of any material located between the flowline and property line in the area normally reserved for underground utilities and sidewalk,
c) Landscape amenities within the dirt parkway considered limited and non-intrusive,
d) Structural enhancements within older commercial zones considered limited and non-invasive,
e) Entry monumentation associated with planned development, and
f) Privately maintained streets, alleys, or storm drains, and their appurtenances; portions of manufactured slopes and their accessories on same.

Compliance with the following application procedure is required of the applicant:

1. Complete the part of the Engineering Development Application that is not for office use and where pertinent. Please provide an accurate and complete description of work. Sign and date.
2. Pay the non-refundable permit fee. Note that applications submitted in reaction to a Notice of Violation require a double permit fee.
3. Submit a site plan drawn on white paper, 8-1/2”X11”, that shows the proposed encroachment as it relates to existing improvements, property lines, and easement lines, and calls out dimensions, grades, and materials. The plan and all of its elements must be clearly legible.
4. Submit a clearly legible copy of the latest recorded grant deed affecting the property. Information regarding the vesting and the legal description is required. A substitute document, such as a preliminary title report or trust deed, may satisfy this requirement.

The Field Operations Division will review the proposed encroachment and make comment. Depending on workload, this process may take up to two weeks. An Engineering Technician will contact the applicant by telephone and give the results. An application may be approved, approved with conditions, or denied.

If an application is approved or approved with conditions, the applicant will need to revisit the Engineering Counter and be issued a Permanent Encroachment Permit. Either one or more of the following items may be conditions that need to be satisfied by the applicant prior to issuance and are generally described:

1. Typically, an Encroachment Maintenance and Removal Covenant will be required. The Engineering Technician will prepare the document. The property owner(s) will need to execute the document by signing and being properly acknowledged by a Notary Public. The applicant will need to pay the recording fee, payable to the County Recorder.
2. A Traffic Control Plan may also be required although not typically. Work to be done on or near Circulation Element roads are subject to this condition. The plan should show delineation, signage, barriers, and other warning devices, and schedules, all as needed to separate the job site from the flow of traffic, whether vehicular or pedestrian. The Traffic Engineering Division is charged with finding the plan acceptable. Call (760) 633-2704 for assistance.
3. A security deposit may be a condition. See Ordinance 93-24.
4. Proof of insurance may be a condition. See the applicable handout.

Under all circumstances, the date of issuance will be no less than forty-eight hours (i.e, two days that the City is open for normal business) prior to the start (or resumption, if previously in violation) of work. A pre-encroachment conference may be required. The Engineering Inspector will be assigned and a contact telephone number provided, all at issuance.

The applicant, now the permittee, has the continuing obligation to keep in proper contact with the assigned inspector. Proper contact is defined as follows: a)initial call prior to start of work, b)intermediate calls for inspection when truly ready and at the correct stage of work, and c)final call for inspection when job is complete to the satisfaction of the inspector. Problems are better resolved by calling the inspector, leaving messages, and making and keeping appointments in the field, if necessary.

When the assigned Engineering Inspector is satisfied that the job is complete, the permit will be countersigned and filed. Refund of any posted security deposit then will be initiated and may take up to thirty days. The permit will become part of the City's permanent record.

If an application for a Permanent Encroachment Permit is denied, the appeal process will be discussed. The applicant will have to submit an appeal request in writing to the Director of Engineering Services who will make a decision on the merits of the appeal. If the appeal is denied, the applicant may further appeal to the City Council through the City Clerk's office. Filing fees and appeal deadlines are applicable.

Any questions or concerns should be directed to the staff at the Engineering Counter, in person, or by telephone at (760) 633-2770.

NEWSRACK ENCROACHMENT PERMIT

_____-PE
APPLICATION NO.

DATE RECEIVED: _____ **PUBLICATION NAME:** _____

JOB SITE ADDRESS:
Various locations see list below.

BUSINESS OWNER INFORMATION:

_____
NAME
_____
MAILING ADDRESS
_____
CITY, STATE, ZIP CODE
_____
TELEPHONE NO.
_____
FAX NO.

DISTRIBUTOR INFORMATION:

_____
CONTACT NAME
_____
MAILING ADDRESS
_____
CITY, STATE, ZIP CODE
_____
TELEPHONE NO.
_____
FAX NO.

SITE LOCATION(S) :

_____
_____
_____
_____
_____

City staff approvals required:

Business registration verified: ☐

Proof of Insurance:

Coverage:
$_____
Company:
_____
Policy No.:
_____
Expiration Date:
_____

Permit Issued By:

_____

PERMIT FEE: See Engineering Fee Schedule for current Fees.

_____
Receipt No

NEWSRACK ENCROACHMENT PERMIT PROCEDURE

1) Submit completed application & pay applicable permitting fees.
2) Submit site plan(s) for approval, including all locations of newsracks, dimensions, and placement relative to the curb.
3) Submit Current Proof of General Liability Insurance to the Engineering Division, listing the City of Encinitas as "Additionally Insured."
4) Submit proof of current Business Registration.

Note to Permittee:

Permit term will be limited to dates insurance is valid. Violations, including lack of a permit or an invalid permit, may subject the permittee to a double fee assessment. Please ensure insurance is kept valid.

Certification of Permittee:

I have reviewed and agree to comply with the above terms and conditions of this Encroachment Permit.

_____ _____
Signature of Business Owner / Distributor Date

_____
Printed Name

_____
Title

Planning and Building Department:

Site Plan/Parking approved by:

_____ _____
Staff Signature Date

_____
Printed Name

_____
Title

Fire Prevention Department:

Fire safety approved by:

_____ _____
Staff Signature Date

_____
Printed Name

_____
Title

MUNICIPAL CODE CHAPTER 6.25
OPERATIONS PERMIT: NEWSRACK

CHAPTER 6.25

OPERATIONS PERMIT: NEWSRACK

6.25.010 Purpose.

A. The purpose of this Chapter is to establish regulations relating to newsracks located within public rights-of-way. (Ord. 92-08)

B. No person shall place, install, use, or maintain a newsrack which rests in whole or in part upon, in, or on a portion of a public right-of-way or which projects onto, into or over any part of the public right-of-way without having first obtained an Operations Permit: Newsrack, together with any other license or permit required by this Code.

C. Notwithstanding the provisions of this Chapter, proposed activities shall be subject to Zoning Regulations and Coastal Development requirements, pursuant to Title 30 of this Code. (Ord. 94-06)

6.25.020 Definitions.

"Newsrack" is any device for distributing publications which are coin operated, requires the deposit of money at the newsrack site, or dispenses such publications at no charge. Newsrack does not include a device which displays publications which require payment at some location other than at the site of the device.

6.25.030 Issuing Authority

The City Engineer is the issuing authority for Operations Permit: Newsrack.

6.25.040 Issuance of Permit

A. The Issuing Authority shall render a final determination within seven days on an application that is submitted in accordance with this Chapter.

B. A single permit will be prepared for each distributor, but covering all publications sold from newsracks and specifying locations where they are to be installed and maintained.

C. A permit is not transferable, but upon application may be amended to show different locations. A new distributor needs a new permit.

6.25.050 Newsrack Standards.

A. A newsrack shall not exceed 60 inches in height, 30 inches in width, and 24 inches in depth. A stacked assembly of modular units also shall not exceed 60 inches in height.

B. If the deposit of money is required the newsrack shall be equipped with a coin return mechanism to permit persons using the machine to secure an immediate refund in the event they are unable to receive the publication paid for. The coin return mechanism shall be maintained in good working order.

C. The newsrack shall have affixed at a place readily viewable to anyone using the newsrack a telephone number of a working telephone service to be used to report a malfunction, obtain a refund, or to give any notice provided for in this Code.

D. The design shall not create a danger to the persons using the newsrack in a reasonably foreseeable manner.

E. No newsrack shall be placed in such a manner that:

1. It is directly in front of any display window abutting a sidewalk, except near the curb;

2. It is within ten feet of the curb return of any intersection;

3. It is 5 feet ahead or 15 feet to the rear of any sign marking or designated bus stop;

4. It is in any location which reduces to less than 4 feet the clear space for a pedestrian passageway;

5. A total length of 8 feet is exceeded from the first to the last newsrack in a group. One group of newsracks shall be no closer than 4 feet to another group of newsracks.

F. Each newsrack shall be maintained in a neat and clean condition and shall be kept in good repair at all times. The newsrack shall be kept reasonably free of chipped, faded, peeling or cracked paint, be reasonably free of rust and corrosion, have no broken or cracked plastic or glass parts, and have no broken structural parts.

G. Allowing a newsrack to remain empty for a period of 30 consecutive days establishes a rebuttable presumption of abandonment and provides a basis for revoking a permit.

H. When placed on public right-of-way, newsracks shall only be located adjacent to property zoned General Commercial, Light Industrial, or Visitor Serving Commercial.

SIDEWALK CAFÉ ENCROACHMENT PERMIT

_____-PE
APPLICATION NO.

DATE RECEIVED: _____

APN: _____

JOB SITE ADDRESS:

_____

PROPERTY OWNER INFORMATION:

_____
NAME

_____
MAILING ADDRESS

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE NO.

BUSINESS NAME:

_____

BUSINESS REGISTRATION NO:

_____

BUSINESS OWNER INFORMATION:

_____
CONTACT NAME

_____
MAILING ADDRESS

_____
CITY, STATE, ZIP CODE

_____
TELEPHONE NO.

DESCRIPTION OF WORK TO BE DONE:

NUMBER OF TABLES: _____ **NUMBER OF CHAIRS:** _____

OTHER:

_____

Required City Staff Approvals:

Business registration verified: ☐

Planning approval: ☐
Fire Prevention approval: ☐

Proof of Insurance
Coverage: $_____
Company: _____
Policy No.: _____
Expiration Date: _____

Permit Issued By:

_____
Signature Date

Permit Fees:
Permit Fees are located on the Engineering Fee Schedule.

SIDEWALK CAFÉ ENCROACHMENT PERMIT PROCEDURE

1. A completed application and site plan is to be submitted to the Engineering Services Department for review and approval. Prior to permit issuance the business registration and liability insurance must be verified. Applicable fees must be paid at the time of application.

2. The Engineering Department will route the application to the Planning & Building Department and Fire Department for review and approval of application. Site plan must meet and maintain Encinitas Municipal Code requirements and comply with the Sidewalk Café Policy.

3. Upon permit issuance an inspection of the site, ensuring compliance with permit conditions and site plan, will occur. After the initial inspection the site may be inspected randomly throughout the year.

Notes to Permittee:

- Permit term will be limited to dates insurance is valid.
- Violations, including lack of permit or an invalid permit, may subject the permittee to a double fee assessment. Please ensure insurance is kept valid and an up to date copy is on file with the city at all times.
- A-frame promotional signage requires a separate encroachment permit.
- Permit is subject to the terms of the attached Sidewalk Café Encroachment Permit conditions.

Hold Harmless Statement: **By its signature below, Permittee agrees to hold harmless and indemnify the City of Encinitas, its elected officials and employees from any and all liability, property damage, bodily injury, and claims, including violations of the Americans with Disabilities Act and other applicable State and Federal accessibility regulations, and reasonable attorneys' fees for defense resulting from their operation under the Sidewalk Café Encroachment Permit.**

I have reviewed and agree to comply with the above terms and conditions of this Encroachment Permit.

_____ _____

Signature of Property Owner/Tenant Date

_____ _____

Print Name Title

Planning and Building Department:

Site Plan/Application approved by:

_____

Signature Date

_____

Print Name

_____

Title

Fire Prevention Department:

Site Plan/Application approved by:

_____

Signature Date

_____

Print Name

_____

Title

SIDEWALK CAFÉ ENCROACHMENT PERMIT PROCEDURE

Business Name: _____ **Application No.:** _____

1. This Sidewalk Café Encroachment Permit shall expire on April 30,_____. Applications for permit renewals must be submitted on or before April 1, or the next business day that City Hall is open if City Hall is closed April 1.
2. The operation of the sidewalk café shall comply with the City of Encinitas Sidewalk Café Policy and all other appropriate provisions of the Encinitas Municipal Code, including sign regulations.
3. The operation of the sidewalk cafe shall meet applicable requirements of the San Diego County Department of Environmental Health.
4. The pedestrian pathway must remain at least five (5) feet in width with free and clear passage for pedestrians at all times. The pedestrian pathway must exclude planter areas, fire hydrants, street lights, other street furniture, two (2) feet from the face of the curb for on-street auto parking overhang and door-opening area, and area for any approved A-frame signage. A plaque stating "A 5 FOOT WIDE CLEAR PATH MUST BE MAINTAINED ON SIDEWALK AT ALL TIMES" shall be posted in an unobstructed location at the front of establishment with the sidewalk café.
5. The area of the sidewalk cafe shall not remove any required parking areas and the cafe area shall not block access to the property or surrounding areas.
6. The hours of operation of the sidewalk café shall be limited to:

   ☐ The hours of operation of the associated eating and drinking establishment.

   ☐ _____ ___ M to _____ ___ M
7. The sidewalk cafe must be reviewed by and found to meet the standards of the Encinitas Fire Marshal relative to access and flammability.
8. Tables, furniture, heaters, café equipment, menu boards, etc. shall be located as shown on the approved site plan and shall not deviate from the depicted locations without an approved modification to the Sidewalk Dining Encroachment Permit.
9. The sidewalk café shall be limited to _____ tables and _____ chairs are approved as shown on the approved site plan.
10. The sidewalk café service area, tables, chairs, and other furniture and equipment shall not extend beyond the width of the associated establishment. Additionally (checked options apply):

    ☐ The sidewalk café service area, tables, chairs, and other furniture and equipment shall not extend more than five (5) feet from the property line where the associated establishment is located. At no time shall any table, chair, or other piece of furniture or restaurant/café equipment be placed near the curb. (For areas along South Coast Highway 101 where the sidewalk is improved for the full width from property line to curb.)

    ☐ The sidewalk café service area, tables, chairs, furniture, equipment, etc. are permitted near the curb as depicted on the approved sidewalk café site plan. These items shall not be located other than as shown on the approved sidewalk café site plan. (For areas along South Coast Highway 101 where the sidewalk is adjacent to the property line but not improved for the full width from property line to curb, and for lettered side streets and Second Street in the downtown area, and other locations throughout the City.)

    ☐ In no case shall any sidewalk café table, chair, or other furniture or equipment be located less than two (2) feet from the face of the curb. (For areas along South Coast Highway 101 where the sidewalk is adjacent to the property line but not improved for the full width from property line to curb.)
11. A sidewalk café may be allowed one (1) menu board subject to the following:

a. The menu board shall be limited to five (5) feet in height.

b. The menu board shall be limited to three (3) square feet in area.

c. The menu board shall not be specifically illuminated with any type of illumination, internal or external.

d. The menu board shall be portable, self-supporting and stable, and weighted or constructed to withstand overturning by wind or contact.

e. The menu board shall be located within the approved sidewalk café encroachment area.

f. The location of the menu board shall be clearly shown on the approved site plan for the sidewalk café.

12. Any freestanding heaters, canopies, awnings, umbrellas, or similar structures for the sidewalk café shall maintain a minimum vertical distance of seven (7) feet from the sidewalk surface.

13. No sound amplification device, musical instrument or sound reproduction device shall be operated or used with the sidewalk cafe.

14. Outdoor lighting for sidewalk café areas shall not have a measured light standard in excess of one foot-candle at the edge of the curbline or beyond the width of the establishment with which the sidewalk café area is associated. Outdoor lighting fixtures shall be fully shielded so as to cause all emitted sustained light to be projected below an imaginary horizontal plane passing through the lowest point of the luminary, lamp or light source used in the fixture.

15. In accordance with Section 9.28 of the Encinitas Municipal Code, no service or consumption of alcoholic beverages shall be allowed on the public right-of-way, including any sidewalk café establishments.

16. Storage of tables, chairs, or other furniture or equipment on the public right-of-way or visible therefrom shall be prohibited. All tables, chairs, and other furniture and equipment shall be stored inside when the associated establishment is not open for business, or preparing/closing down for the day.

17. A liability insurance policy for the sidewalk café establishment naming the City as additionally insured for $1,000,000 shall be maintained at all times, a copy of which shall be kept on file with the Permit at the City. The term of the Sidewalk Café Encroachment Permit shall be limited to the dates that the liability insurance is valid.

18. After initial inspection, the site will be inspected randomly at least one time per year.

19. Violations, including no permit or an invalid permit, may subject the permittee to a double fee assessment.

20. In the event of noncompliance, the City will steps to enforce the requirements as follows:

a. Inspect the site; write and deliver a Stop/Correct Work Notice.

b. If no effort is made to comply within 24 hours: Mail and hand deliver a written Notice of Intent to Revoke Encroachment Permit to permittee, setting forth a date and time within 48 hours of the Notice upon which the Sidewalk Dining Encroachment Permit will become invalid if the encroachment infraction is not corrected.

c. If two or more Stop/Correct Work Notices have been issued within the past 30 days, or if no effort is made to comply by the prescribed date: Revoke the permit and remove any and all sidewalk obstructions and encroachments. Removed items will be stored for 30 days and then discarded unless retrieved by the permittee.

d. If an encroachment permit is revoked, an encroachment permit shall not be issued for the same property for a period of one year.

e. Revocation of Sidewalk Café Encroachment Permit may be appealed to the City Council within 15 days of the date of revocation. Appeals will be considered by the City Council pursuant to Chapter 1.12 of the Municipal Code.

RIGHT-OF-WAY CONSTRUCTION PERMIT STANDARD CONDITIONS

The following standard conditions are a part of Permit No. _____.

1. No access or work shall be performed within the City right-of-way without the full knowledge of the assigned City Inspector who shall be given not less than 48 hours advance notice of the initiation of permitted use at (760) 633-2796 or 633-2797, or as stated on the permit.
2. At least 48 hours prior to starting work, **Underground Service Alert (USA)** shall be notified for location of underground utilities at 1-800-422-4133. The proposed dig area must be marked in white paint prior to contacting (USA).
3. All work covered by this permit shall be performed by a contractor possessing a valid California contractor's license of the appropriate class.
4. All traffic control within the construction area shall be subject to an approved traffic control plan and shall be flagged and barricaded to the satisfaction of the City Inspector in compliance with the "Work Area Traffic Control Handbook", latest edition published by Building News, Inc. In the event that the Inspector determines proper traffic control is not in place, all work shall cease and permittee authorizes the City Engineer or a duly authorized representative to order, on the rental basis, such traffic control devices as shall be necessary and proper to protect the public safety and further agrees to pay any and all costs and charges that the City may incur in providing said traffic control.
5. Applicant agrees that it shall be his responsibility to provide the contractor, subcontractor, or any other agent responsible for construction of permitted works within the City right-of-way, with a copy of the permit including these standard conditions and a complete set of approved plans. The permit, plans and Work Area Traffic Control Handbook shall be available at the permit site whenever work is in progress.
6. Permitted works shall be constructed in accordance with the City specifications and approved plans, subject to inspection and approval by the City Engineer or a duly authorized representative. Certification for all materials and work, including compaction tests, shall be furnished by the applicant upon request by the City Inspector. Payment for any compaction testing shall be by the permittee. Certification shall be made by a certified testing agency or firm acceptable to the City.
7. No work within the public right-of-way is permitted on Saturdays, Sundays, or holidays. Any deviation from the work schedule presented in these conditions must receive prior, written approval of the City Engineer or a duly authorized representative. Any questions regarding days City Hall is closed, call (760) 633-2770.
8. No work on any public roadway, excluding prime arterials and major roads, shall be started before 7:30 A.M. or continue after 5:00 P.M. on weekdays.
9. No work shall begin before 9:00 A.M. or continue after 3:00 P.M. on prime arterials and other major roads, unless authorized on the permit by the City Engineer. All work on prime arterials and other major roads, all as shown on the Circulation Element of the City's General Plan, will require a traffic control plan acceptable to the City Traffic Engineer whose office can be contacted at (760) 633-2704.
10. The roadway shall be clean and free of all obstructions and completely open to traffic at the end of each working day. (No later than 3:00 P.M. on major roads, defined herein.)
11. Two-way traffic shall be maintained at all times. Minimum travel lane width for motor vehicles shall be 12 feet. If street width prevents maintaining two-way traffic, permittee and City Engineer shall agree on an adequate traffic control plan prior to starting work, which shall include the use of a full-time flagman.
12. All excavations in existing pavement shall be saw cut to neat lines and AC replacement shall be made to the satisfaction of the City Engineer or a duly authorized representative.
13. Open trench must be backfilled and capped with at least 2" of cold mix asphalt or metal plated according to City specifications during non-working hours. Metal plates are required to have cold mix asphalt ramps on all (4) sides and must be maintained. Refer to the City's Standard Drawing.
14. Native material may be used upon approval of the City Engineer or a duly authorized representative. Refer to the City's Standard Drawing for Trench Backfill and Resurfacing, Appendix 2.4 of the Engineering Design Manual.
15. Tunneling beneath curb and gutter is not permitted, unless otherwise authorized by the City Engineer. Curb, gutter, and sidewalk requiring removal shall be replaced joint to joint for a neat appearance.
16. Two sack sand-cement slurry mix shall be required as backfill on all lateral excavations within prime arterials, major roads and collectors as well as all locations where the inspector deems the native material to be unacceptable for use as backfill.
17. Care shall be exercised to prevent water, soil and debris from depositing in gutters, streets and storm drains. No washing out of mixers or concrete pumps will be allowed on City streets. Violations will be referred for NPDES enforcement and penalties.
18. Any roadway striping damaged or removed during the operations of this permit shall be matched and replaced by the applicant using the latest edition of State Department of Transportation specifications for paint, all to the satisfaction of the City Engineer or a duly authorized representative. Thermoplastic legends and crosswalk markings shall be replaced with thermoplastic, not paint, to the satisfaction of the City Engineer.
19. All concrete work shall be transit mixed and conform to the Standard Specifications for Public Works Construction, Latest Edition, Section 201, and be approved by the City Engineer or a duly authorized representative.
20. Trenching for installations across any intersecting roadway open to traffic shall be progressive. Not more than half of the width of a traveled roadway shall be disturbed at one time and the remaining width shall be kept open to traffic by bridging or backfilling.
21. Where street dimensions and State Department of Health Services regulations allow, all pipes and conduits laid parallel to the roadway shall be placed at least five (5) feet from the edge of the pavement or graded traveled roadway, unless otherwise

authorized in writing by the City Engineer. The shallowest portion of any pipeline or other facility shall be installed not less than thirty (30) inches below the roadway surface.

☐ 21(a). Where street dimensions and State Department of Health Services regulations allow, all pipes and conduits laid parallel to existing utilities shall maintain a minimum separation of three (3) feet measured from the nearest edge of the facility. Any deviation from this requirement is not allowed unless approved by the City Engineer or a duly authorized representative.

22. All excavated material shall be cast away from the improved portion of the highway. After the work has been completed, all excess material, including trench spoils, shall be removed from the right-of-way. The roadway shall be left in neat and orderly condition.
23. All roadside drainage ditches shall be restored to true grades and the intake and outlet ends at all culverts shall be left free from all excess materials and debris.
24. All approaches to private driveways and intersecting roads and streets shall be kept open to traffic at all times, unless otherwise approved by the City Engineer.
25. Clay and earth which adhere to the paved surface of the roadway shall be removed by hand scraping, washing and sweeping, or by any other method which will leave a clean non-skid surface without impairing, damaging, or loosening the surface.
26. Permittee shall comply with any and all directives issued by the City Engineer or a duly authorized representative in order to prevent dust or other materials from becoming a nuisance or annoyance.
27. Temporary patching of trench is required on lateral cuts in surfaced streets immediately after backfilling. After completion of the refilling and compacting of the backfill material in the excavation, all as specified in the Standard Drawing dated September 30, 1996, and the removal of obstruction(s), the permittee shall promptly replace with temporary or permanent patching material, or repair any portion of the highway surface removed or damaged by the excavation, obstruction, or construction operations, all to the satisfaction of the City Engineer, and as specified elsewhere herein. The City Engineer may, at his option, elect to do the surfacing or repairing himself; in such case, the permittee shall bear the cost of such work. Temporary patching material may be left in place for up to 30 days, but must be continually maintained.
28. Where the pavement, except Portland Concrete Cement pavement, or other type of surface has been removed by others, the permittee shall replace it with a standard repair of four (4) inches AC over approved backfill or repair section shall be one (1) inch AC greater than existing structural section, whichever is greater. Refer to the most current Standard Drawing. Repairs to PCC pavement shall be made pursuant to the specifications of the assigned Engineering Inspector.
29. If, after the refilling of an excavation, the permittee fails or refuses to resurface or repair that portion of the surface of the roadway damaged by him, or if the City Engineer has elected to do such resurfacing or repairing, the City Engineer shall cause the repair to occur; and the permittee shall be charged with the cost thereof computed by the City Engineer.
30. When shoring is required, an engineered detail drawing will be required for approval by the City Engineer. All OSHA regulations shall be met.
31. All directional bores shall be subject to approval of the method in the field by the assigned Engineering Inspector, acting as the duly authorized agent of the City Engineer. A thorough examination of the subsurface conditions is a prerequisite. The applicant shall identify the bore method on the permit application either as auger, hammer, hydraulic, etc., and show the bore pits. Grouting and intermediate bore pits may be required.
32. All subsurface utilities shall be accurately shown on the applicant's site plan for those excavations in excess of 250 linear feet, traversing signalized intersections, crossing interconnect wires, or otherwise where the City Engineer has a special concern.
33. Pavement cuts in streets rehabilitated or newly constructed within the past two years shall be categorically denied.
34. This permit may be immediately revoked for reasons in the best interest of the City, for violation of permit conditions, or for the creation of a nuisance, all upon notice given by the City Engineer or a authorized representative. In the event of such revocation, applicant shall immediately cease all operations and restore City right-of-way as directed by the City Engineer or a duly authorized representative. After notification, City may take full possession of the area. Applicant shall pay to the City any and all costs involved, in the event the City has to restore City property or remove any items installed by the applicant.
35. This permit may become void in the event the use permitted is not started within sixty (60) calendar days from the date of issuance or in the event the permitted use is abandoned for a period exceeding sixty (60) calendar days after construction has begun. In such event, it shall be necessary to obtain a new permit and pay additional fees. Upon commencement of work, all operations, including cleanup and restoration of City right-of-way, shall be completed within the time limit specified by the permit.
36. The permittee guarantees to save, indemnify and hold harmless the City of Encinitas and all its agents, officers, employees and officials against all liabilities, judgments, costs and expenses, which may in any manner or form arise in consequence of the issue of this permit or any work performed in consequence thereof.
37. The permittee guarantees all work constructed, installed and effected under this permit for a period of one year from the date of final inspection. Any repairs required during the guarantee period shall be made at the expense of the permittee. At the option of the City Engineer, repair work may be performed by either the permittee or the City.
38. Permittee has read, understands and agrees to comply with all construction permit provisions and standard conditions.

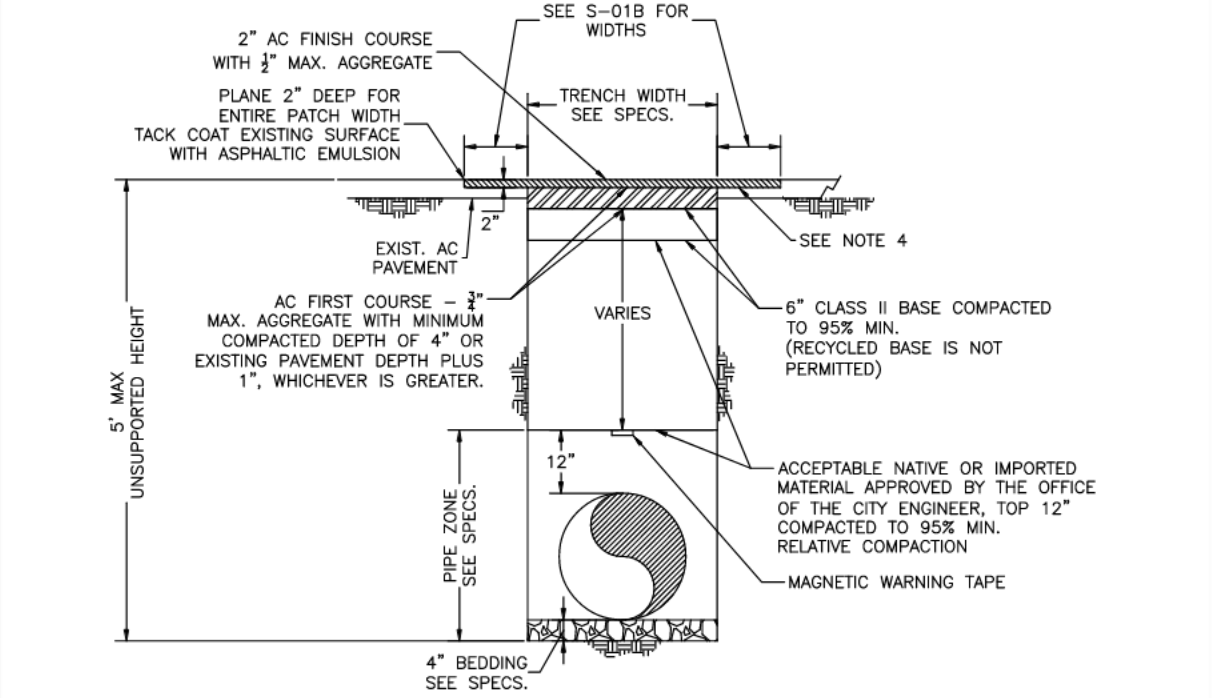
Signature:

_____

Permittee **Date**

_____

Printed Name/Title/Company



NOTES

1. FOR DEPTHS UP TO 5', NO TRENCH SUPPORT IS REQUIRED UNLESS WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED. FOR DEPTHS EXCEEDING 5', SHORING OR SOLID SHEATHING IS REQUIRED. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEATHING IS REQUIRED.
2. EXISTING A.C. SHALL BE SAW CUT AND REMOVED IN SUCH MANNER SO AS NOT TO TEAR, BULGE OR DISPLACE ADJACENT PAVEMENT. EDGE SHALL BE CLEAN AND VERTICAL, ALL CUTS SHALL BE PARALLEL OR PERPENDICULAR TO STREET C/L, WHEN PRACTICAL AND TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
3. CHIP OR SLURRY SEALING SHALL BE APPLIED AS REQUIRED BY THE CITY.
4. THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE MAY REQUIRE PAVEMENT REINFORCEMENT MEMBRANE (TRUPAVE, GLASSGRID, OR APPROVED EQUIVALENT) THAT EXTENDS 12" BEYOND EDGE OF TRENCH.
5. SEE ADDITIONAL NOTES ON S-01B.

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	SN	06/13
JILL BANKSTON, P.E. CITY ENGINEER — DATE		2	BS	10/23
DRAWING NUMBER: S-01A	STREET STANDARDS: UTILITY TRENCH RESURFACING			

ADDITIONAL NOTES

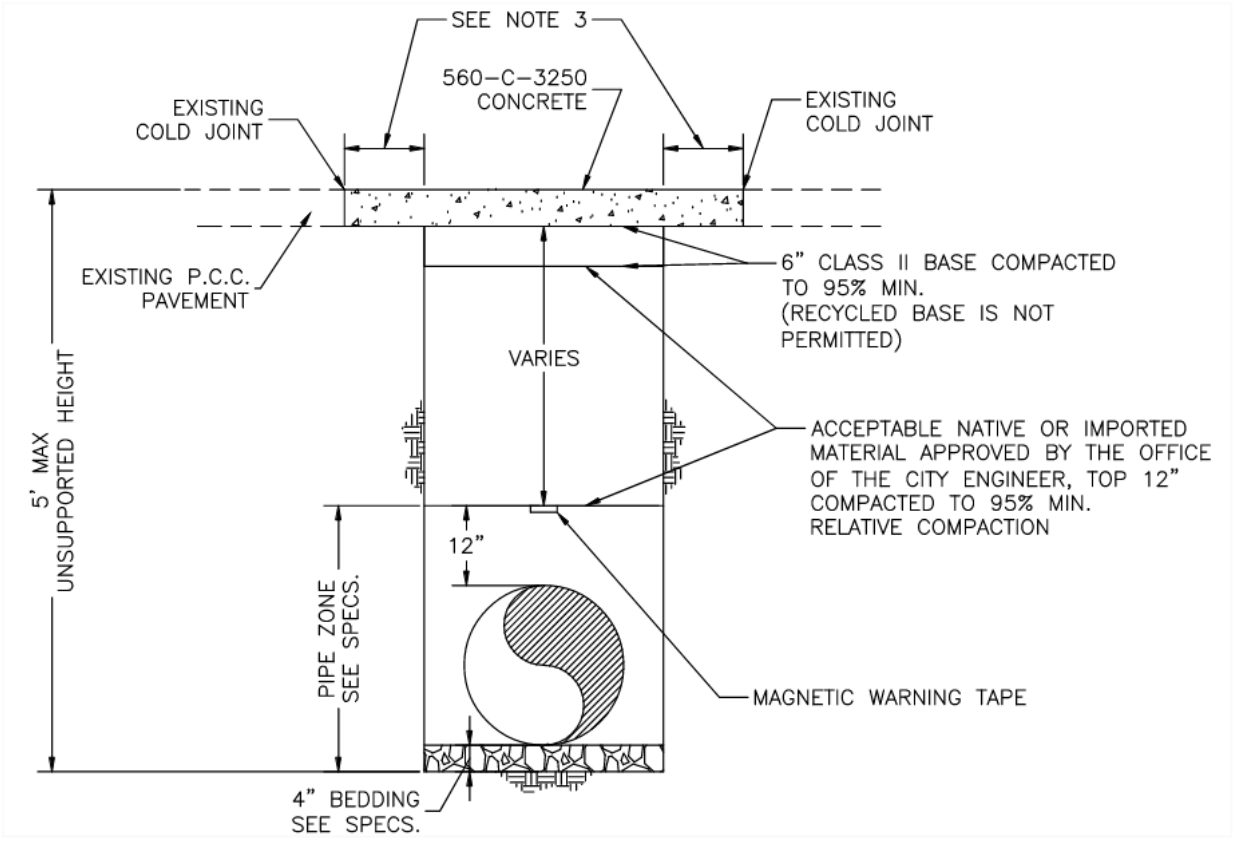
1. MINIMUM RESTORATION LIMITS APPLY UNLESS OTHERWISE DETERMINED BY THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
2. A TACK COAT OF ASPHALTIC EMULSION OR PAVING ASPHALT SHALL BE APPLIED TO EXISTING A.C. CONTACT SURFACES PRIOR TO RESURFACING PER SSPWC SECTION 302-5.
3. ASPHALT CONCRETE RESURFACING – BASE COURSE:
   a) MINIMUM TOTAL A.C. THICKNESS SHALL BE ONE INCH GREATER THAN EXISTING
   b) AC SHALL BE B-PG 64-10 or III B2-PG 61-10 OR III B3-PG 64-10 FOR BASE COURSE.
   c) BASE COURSE SHALL BE LAID DOWN WITH SELF PROPELLED PAVING MACHINE AND COMPACTED PER SSPWC SECTION 302-5a.
4. ASPHALT CONCRETE RESURFACING – FINISH COURSE:
   a) PROVIDE 2 INCH DEEP MILL AND A.C. FINISH COURSE C2-PG 61-10 OR III-C2-PG 64-10 OR III C2-PG 64-10.
   b) FINISH COURSE FOR RESURFACING SHALL BE LAID DOWN USING A SELF-PROPELLED PAVING MACHINE AND COMPACTED PER SSPWC SECTION 302-5a.
   c) SMOOTHNESS AND COMPACTION OF RESURFACING SHALL MEET THE REQUIREMENTS PER SSPWC SECTION 302-5 EXCEPT THAT THE SMOOTHNESS SHALL BE DETERMINED OVER THE LENGTH AND WIDTH OF PAVED AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS.
5. SURFACE TREATMENT TO MATCH EXISTING PAVEMENT SURFACE (SLURRY, CHIP SEAL, ETC.)
6. SLOUGHING OF TRENCH UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.
7. IF ANY PORTION OF A LONGITUDINAL PAVEMENT CUT AFFECTS A TRAVEL LANE, 2" AC MILL & OVERLAY FOR MINIMUM HALF ROADWAY REQUIRED OR FULL LANE AS DETERMINED BY THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
8. ALL LATERAL PAVEMENT CUTS MUST RESTORE A MINIMUM OF 4' ON EITHER SIDE OF THE TRENCH END IN ACCORDANCE WITH S-01A.
9. WHEREVER EXISTING CRACKED OR CHIPPED ASPHALT IS IN CLOSE PROXIMITY TO THE NEW CUT, THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE MAY REQUIRE REMOVAL OF THE EXISTING DEFICIENT PAVEMENT AND ANY INTERVENING PAVEMENT. DEPTH OF REPLACEMENT ASPHALT SHALL BE IN ACCORDANCE WITH S-01A.
10. MULTIPLE TRENCHES ON THE SAME STREET SEGMENT WILL REQUIRE FULL WIDTH MILL AND OVERLAY TO A DEPTH OF 2 INCHES MINIMUM. MULTIPLE TRENCHES INCLUDES MAIN LINE TRENCH WITH LATERAL TRENCHES OR PARALLEL TRENCHES ON THE SAME STREET SEGMENT.
11. ALL PERMANENT FINAL PATCHES SHALL BE RECTANGULAR IN SHAPE AND CONSTRUCTED TO BE PARALLEL AND PERPENDICULAR TO THE ROAD CENTERLINE TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23 JILL BANKSTON, P.E. CITY ENGINEER DATE		1	SN	06/13
		2	BS	10/23
DRAWING NUMBER: S-01B	STREET STANDARDS: UTILITY TRENCH RESURFACING			



NOTES

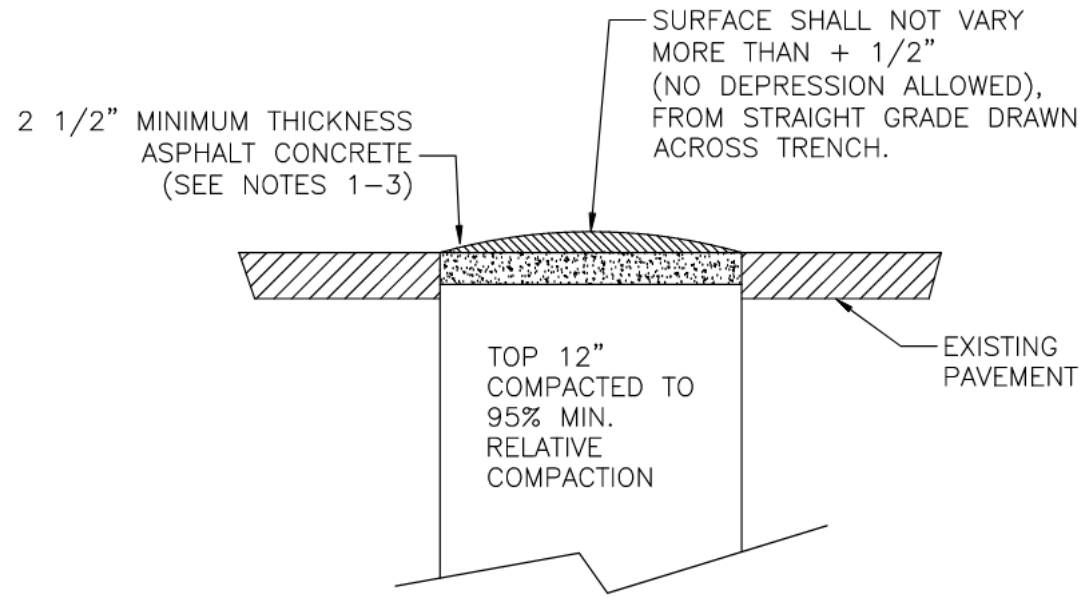
1. FOR DEPTHS UP TO 5', NO TRENCH SUPPORT IS REQUIRED UNLESS WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED. FOR DEPTHS EXCEEDING 5', SHORING OR SOLID SHEATHING IS REQUIRED. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEATHING IS REQUIRED.
2. EXISTING P.C.C. SHALL BE CUT AND REMOVED IN SUCH MANNER SO AS NOT TO TEAR, CRACK OR DISPLACE ADJACENT PANELS. EDGE SHALL BE CLEAN AND VERTICAL, ALL CUTS SHALL BE PARALLEL OR PERPENDICULAR TO STREET C/L, WHEN PRACTICAL.
3. MINIMUM RESTORATION SHALL BE TO REPLACE P.C.C. TO NEAREST COLD JOINT ON ALL SIDES.
4. NO MICROTRENCHING WILL BE PERMITTED ON P.C.C. SURFACED STREETS.
5. SURFACE TREATMENT TO MATCH EXISTING SURFACE (SLURRY, CHIP SEAL, ETC.)

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23 JILL BANKSTON, P.E. CITY ENGINEER DATE		1	BS	10/23
DRAWING NUMBER: S-02	STREET STANDARDS: UTILITY TRENCH RESURFACING – P.C.C. SURFACED STREETS			



NOTES

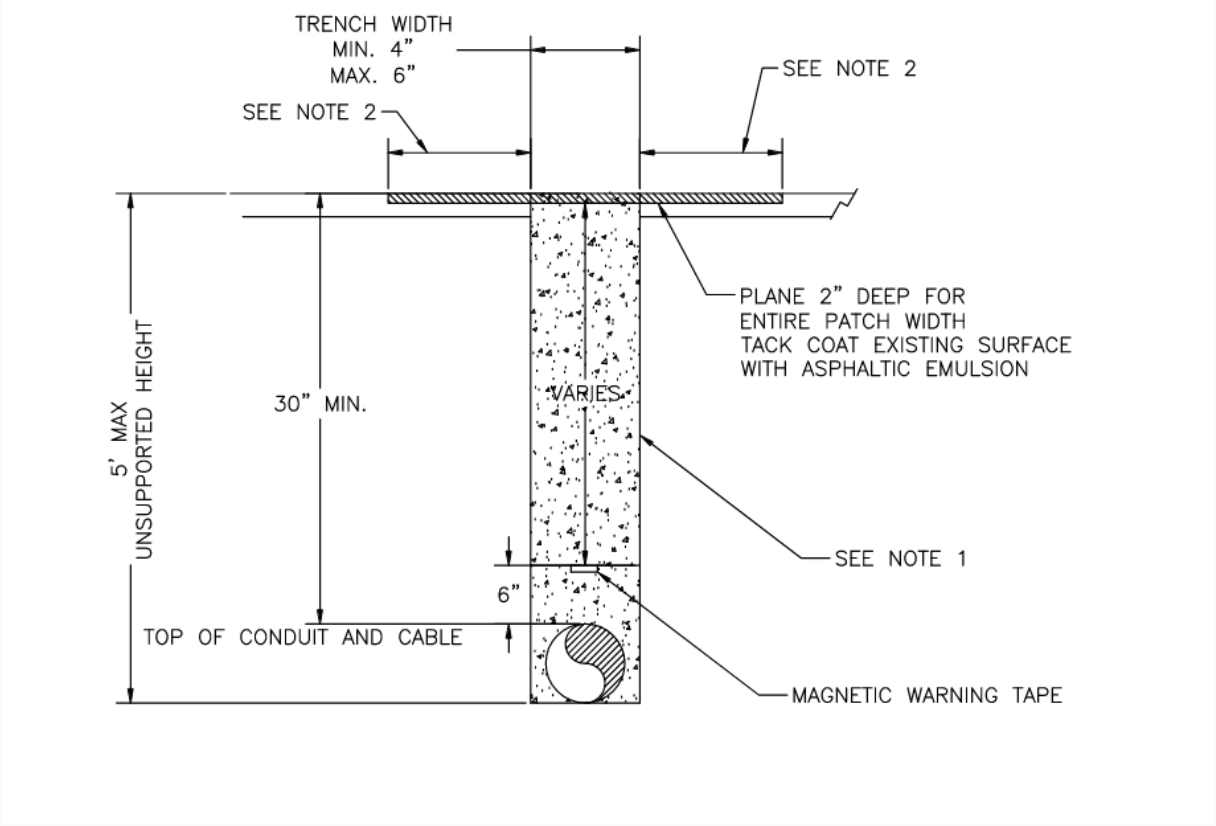
1. 30 DAYS MAX. ON NON–OCCUPIED RESIDENTIAL STREETS (COLD MIX PERMISSIBLE)
2. 10 DAYS MAX. ON OCCUPIED RESIDENTIAL STREETS (COLD MIX PERMISSIBLE)
3. 72 HOURS MAX. ON LOCAL COLLECTORS, MAJOR ROADS, AND PRIME ARTERIALS (HMA ONLY 3/4 AR–4000)
4. COMPACTION TESTS ARE REQUIRED ON A TEMPORARY TRENCH, AND MUST BE PERFORMED WITHIN 24 HOURS OF COMPLETION OF TRENCH BACKFILL. COMPACTION FAILURES SHALL BE CORRECTED IMMEDIATELY AND RETESTING IS REQUIRED.
5. COLD MIX WILL BE ALLOWED TO REMAIN AS SURFACING FOR A MAXIMUM OF 30 DAYS ON NON–OCCUPIED RESIDENTIAL STREETS. EARLIER REPLACEMENT WILL BE REQUIRED IF MAINTENANCE OF THE SURFACE IS DEEMED NECESSARY BY THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	BS	10/23
JILL BANKSTON, P.E. CITY ENGINEER — DATE	STREET STANDARDS: TEMPORARY TRENCH RESURFACING			
DRAWING NUMBER: S–03				



NOTES

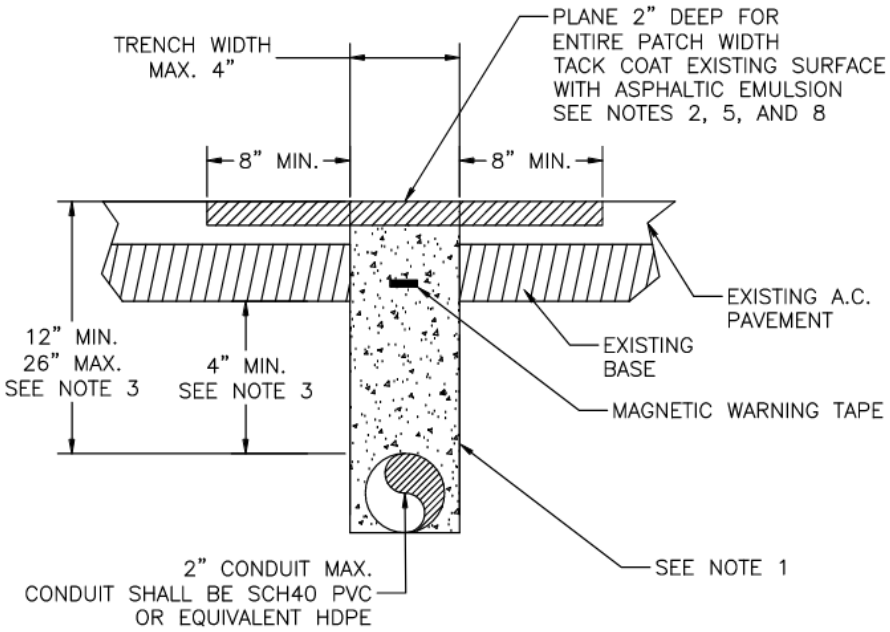
1. 190-E-400 CONCRETE, 6"-8" SLUMP SLURRY BACKFILL. ALLOW 72 HOURS TO CURE.
2. 2" AC MILL & OVERLAY AND RESTORATION LIMITS 12" MIN. BEYOND TRENCH EDGE. IF A TRENCH EDGE IS WITHIN 24" OF EDGE OF CURB, MINIMUM RESTORATION SHALL EXTEND TO EDGE OF CURB TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
3. SLURRY BACKFILL SHALL NOT EXCEED MORE THAN 1" OF EXISTING AC PAVEMENT.
4. SLOUGHING OF TRENCH UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	BS	10/23
JILL BANKSTON, P.E. CITY ENGINEER — DATE	STREET STANDARDS: UTILITY TRENCH RESURFACING – NARROW TRENCHES			
DRAWING NUMBER: S-04				



NOTES

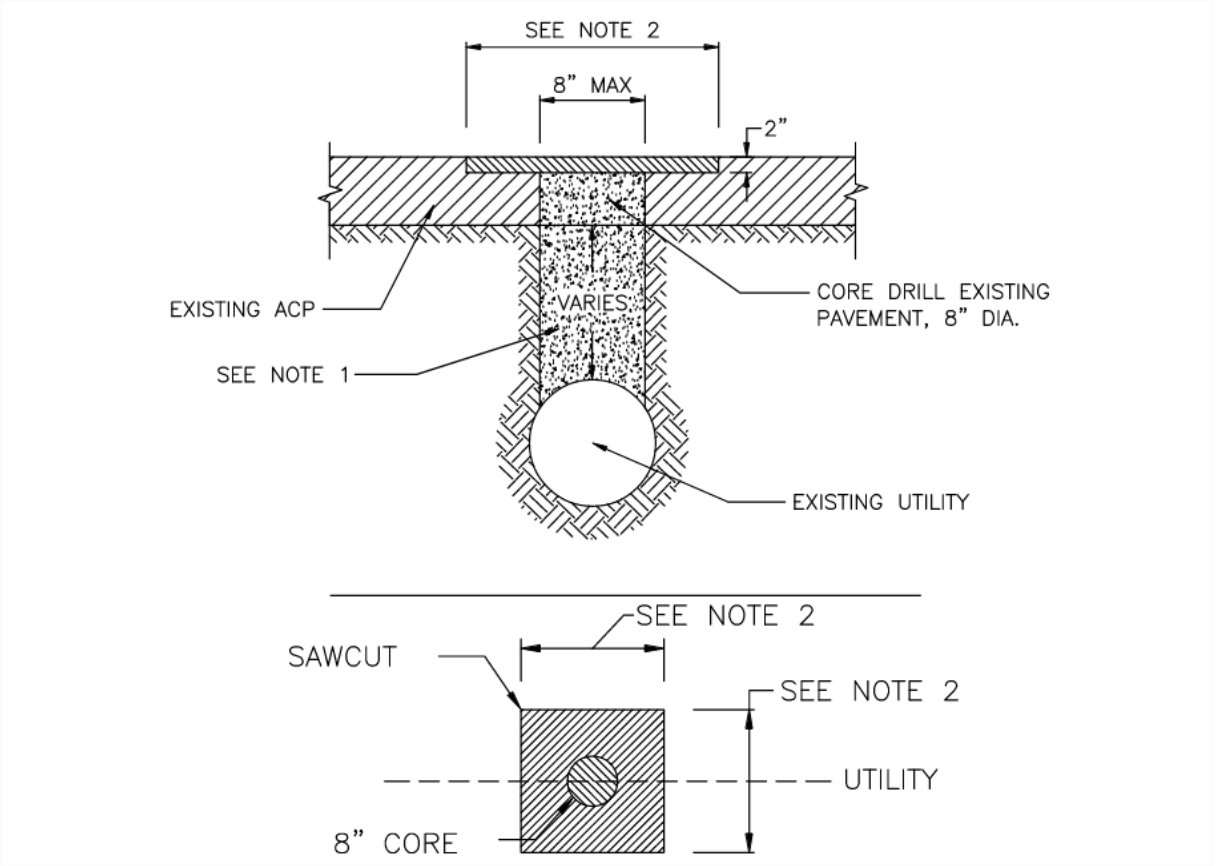
1. 190–E–400 CONCRETE, 6"–8" SLUMP SLURRY BACKFILL. ALLOW 3 HOURS TO CURE BEFORE OPENING TO TRAFFIC.
2. 2" AC MILL & OVERLAY AND RESTORATION LIMITS 8" MIN. BEYOND BOTH TRENCH EDGES.
3. THE TOP OF CONDUIT SHALL BE 12" MINIMUM FROM TOP OF PAVEMENT OR 4" FROM BOTTOM OF ROAD BASE, WHICHEVER IS GREATER.
4. SLURRY BACKFILL SHALL NOT EXCEED MORE THAN 1" OF EXISTING AC PAVEMENT.
5. EDGE OF ASPHALT RESTORATION SHALL BE AT LEAST 12" FROM EXISTING CONCRETE STRUCTURES, INCLUDING GUTTERS, UNLESS AN ALTERNATIVE RESTORATION PATCH IS APPROVED BY THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
6. TRENCH LOCATION SHALL AVOID WHEEL PATH OF TRAVEL TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
7. SLOUGHING OF TRENCH UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.
8. WHEN MICROTRENCHING IN BIKE LANES, THE CONTRACTOR SHALL RESTORE THE FULL WIDTH OF BIKE LANE. IF THE BIKE LANE IS LOCATED LESS THAN 12" FROM THE CURB OR EDGE OF ROAD, RESTORATION SHALL EXTEND UP TO THE CURB OR EDGE OF ROAD.

TRENCH CUT PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	BS	10/23
JILL BANKSTON, P.E. CITY ENGINEER — DATE	STREET STANDARDS: UTILITY TRENCH RESURFACING – MICROTRENCHES FOR BROADBAND			
DRAWING NUMBER: S–05				



NOTES

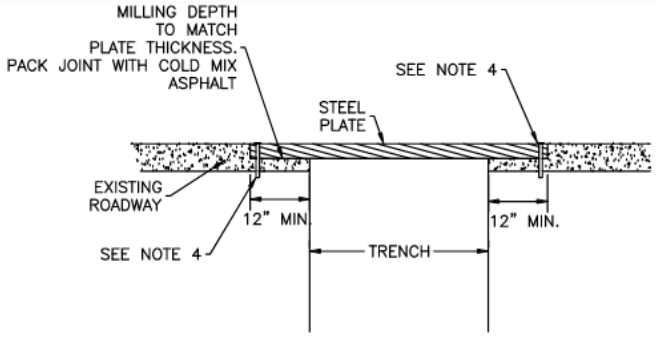
1. 190-E-400 CONCRETE, 6"-8" SLUMP SLURRY BACKFILL. ALLOW 72 HOURS TO CURE
2. 2" AC MILL & OVERLAY A SQUARE PATCH OF 4' SIDES FOR DESIGN-PHASE EXPLORATORY POTHOLES THAT WILL NOT BE PERMANENTLY RESTORED WITHIN 30 DAYS FOLLOWING SPECIFICATIONS IN S-01A & S-01B OR 18" SIDES FOR CONSTRUCTION-PHASE EXPLORATORY POTHOLES THAT WILL BE RESTORED FOLLOWING SPECIFICATIONS AND TIMELINES IN S-03 AND TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
3. MULTIPLE POTHOLES WITHIN 100 FT WILL REQUIRE A SINGLE RECTANGULAR PATCH FOR DESIGN-PHASE EXPLORATORY POTHOLES OR POTHOLES THAT WILL NOT BE PERMANENTLY RESTORED WITHIN 6 MONTHS TO THE SATISFACTION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
4. SLOUGHING OF POTHOLE UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.

TRENCH CUT PAVEMENT MORATORIUM

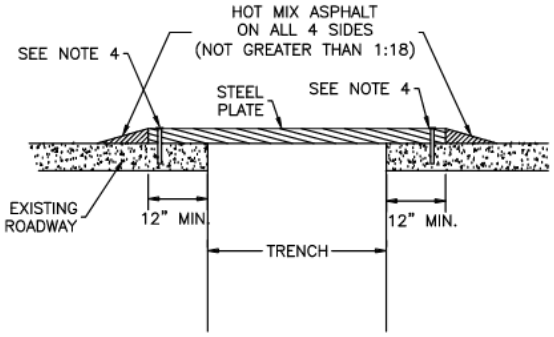
FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND THREE (3) YEAR MORATORIUM FOR SEAL COATS SUCH AS SLURRY SEAL

REPAIRS IN THIS STANDARD DRAWING ARE FOR STREETS NOT UNDER MORATORIUM. ANY POTHOLING IN STREETS UNDER MORATORIUM REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER AND MORE EXTENSIVE PAVEMENT RESTORATION REQUIREMENTS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	BS	10/23
JILL BANKSTON, P.E. CITY ENGINEER — DATE	STREET STANDARDS: UTILITY POTHOLE ROAD RESURFACING			
DRAWING NUMBER: S-06				



RECESS SURFACE (DEFAULT, SEE NOTE 7)



TRANSITION SURFACE (SEE NOTE 7)

NOTES

1. MINIMUM 12" LAP OF STEEL PLATE ON EACH SIDE OF TRENCH SHALL BE PROVIDED TO ASSURE NO SLIPPING OR COLLAPSING OF TRENCH WALL.
2. BEFORE STEEL PLATE INSTALLATION, ADEQUATELY SHORE OR BRACE TRENCHES AND EXCAVATIONS TO WITHSTAND TRAFFIC LOADS. COMPLY WITH OSHA REQUIREMENTS.
3. WHEN TWO OR MORE PLATES ARE USED, WELD AT EACH CORNER AND CENTER TO REDUCE VERTICAL MOVEMENT.
4. SECURELY ANCHOR PLATES TO PAVEMENT TO PREVENT MOVEMENT. ANCHOR PLATES TO EACH CORNER WITH PINS MADE OF #4 REBAR OR RAILROAD SPIKE, OR EQUIVALENT DIAMETER STEEL ROD, WITH A MINIMUM LENGTH OF 6" OR MAXIMUM 12".
5. ALL PLATES SHALL MEET REQUIRED TRAFFIC LOADS AND BE OF A NON-SKID SURFACE.
6. STEEL PLATE BRIDGING OVER TRENCHES GREATER THAN 5 FEET IN DEPTH OR 4 FEET IN SPAN REQUIRE AN ENGINEERED DESIGN STAMPED BY A REGISTERED CIVIL ENGINEER.
7. RECESS STEEL PLATES ON MAJOR STREETS. RECESS STEEL PLATES ON LOCAL STREETS AT THE DISCRETION OF THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE.
8. UNLESS PRIOR AUTHORIZATION IS GIVEN BY THE CITY ENGINEER OR THEIR DESIGNATED REPRESENTATIVE, THE MAXIMUM DURATION FOR RECESS PLATES IS 72 HOURS AND MAXIMUM DURATION FOR TRANSITION PLATES IS 48 HOURS.

APPROVED BY THE CITY OF ENCINITAS	CITY OF ENCINITAS STANDARD DRAWING	REV	BY	DATE
10/31/23		1	BS	10/23
JILL BANKSTON, P.E. CITY ENGINEER — DATE	STREET STANDARDS: TRENCH PLATE BRIDGING			
DRAWING NUMBER: S-07				

TRENCHING MORATORIUM

The City of Encinitas implemented a trench cut moratorium in 2009 to limit developers, utility companies, and City crews from damaging newly paved or resurfaced streets. This policy was updated in 2019 under City Council Resolution No. 2019-95, which approved the following trench cut moratorium policy.

PROCUEDURES

1) Trench Cut Moratorium
    - 3-year moratorium for pavement cuts on streets receiving a seal coat, such as a slurry seal or chip seal.
    - 5-year moratorium for pavement cuts on newly constructed and reconstructed streets and for streets receiving overlays and treatments one-inch thick or greater.
    - The moratorium shall be in force during the construction period for projects that include seal coats, or new street construction or street reconstruction, and the moratorium period will begin upon the filing of the Notice of Completion for the construction project including the affected streets.
    - For streets that receive a seal coat, the moratorium shall begin to be enforced when the streets are sealed, and the timed moratorium period will begin upon the filing of the Notice of Completion.
    - For newly constructed or reconstructed streets, the moratorium shall begin to be enforced when the streets are given the final pavement cap, and the timed moratorium period will begin upon the filing of the Notice of Completion.

2) Trench Repair Requirements for Streets Under Moratorium
    - If trenching is justified and a waiver is approved by the City Engineer, the City shall require resurfacing at least the length of excavation from curb to curb or from curb line to the raised median.
    - Lateral trenches (perpendicular to the curb) – Extend T-cut grind and overlay limits to 10-feet beyond each side of the trench and over the entire lane that is impacted (regardless of street classification).
    - Longitudinal trenches (parallel to the curb) – if the asphalt depth is four inches or deeper, grind two inches minimum and place two inches minimum overlay over the entire lane or lanes (curb to curb or curb to median curb) that are impacted (regardless of street classification). If the existing asphalt depth is less than four inches, grind the full depth of asphalt and replace asphalt in-kind (minimum two inches) over the entire lane or lanes (curb to curb or curb to median curb) that are impacted (regardless of street classification).
    - If the existing AC depth is greater than 4-inches, grind 2-inches minimum and place 2-inches minimum overlay over the entire lane that is impacted (regardless of street classification) curb to curb.
    - If the existing AC depth is less than 4-inches, the entire lane will need to be resurfaced to meet the City's minimum structural section of 4-inches AC over 6-inches of Class II Base.
    - Use Current City of Encinitas Standard Drawings.

3) Excavations of Streets not Under Utility Trench Moratorium
    - Use Current City of Encinitas Standard Drawings.

4) Proposed Waivers
    - The City Engineer may grant a waiver if one or more of the following conditions are present:
        a) A bona fide emergency exists that endangers the health and safety or property of the citizenry and requires an excavation in order to remediate the emergency.
        b) New service to a specific location cannot be provided either through existing conduit, where trenchless technology is impractical due to soil conditions, proximity of facilities or economically impractical, and the public utility demonstrates to the City Engineer's satisfaction that the service cannot be provided from another location.
        c) The installation or relocation of facilities by a non-government owned public utility is both required by the City, County, State or Federal Government and not required as a result of an underground utility district.
        d) Only a non-linear excavation or exploratory excavation will be made.
        e) Work is initiated by municipal improvement projects.
        f) Where geological conditions prohibit boring.
        g) Where there is a lack of working space for bore pits at each end of the street crossing bore.
        h) An open trench is required to expose existing distribution facilities in street to terminate or establish service lines, or to provide emergency repair of existing underground facilities.
        i) Existing facilities in the street conflict with the proposed bore.
        j) Joint trench use is required and if within 200 feet of an open sewer or water trench, consideration will be given to an open trench.
        k) Unusual circumstances are present and the City Engineer finds that the public interest is best served by allowing such a cut.

For the most up-to-date information regarding streets currently under moratorium, contact the Engineering Department by emailing engineering@encinitasca.gov or calling 760-633-2770.

REQUIREMENTS FOR PROOF OF INSURANCE

The following information is applicable to Public Improvement Permits, Sewer Construction Permits, Construction Permits, Permanent Encroachment Permits, and Temporary Encroachment Permits.

PRIOR TO ISSUANCE OF A PERMIT TO WORK IN THE PUBLIC RIGHT-OF-WAY OR ANY PUBLIC EASEMENT, THE FOLLOWING REQUIREMENTS FOR PROOF OF INSURANCE AS SHOWN ON A VALID CERTIFICATE OF INSURANCE SHALL BE MET:

1.) Submittal of an original certificate of insurance document.

2.) Name, address, and telephone number of insurance agency.

3.) Name, address, and telephone number of insured who shall at all times be the contractor properly licensed to accomplish the work and identified as such on the permit to be issued. In cases of engineering investigations the Engineer of Work is considered the contractor for insurance purposes. Similarly, where permits are issued for temporary traffic control and a licensed professional need not do the work, the applicant is also the insured.

4.) Company (ies) affording coverage.

5.) Statement clearly certifying validity of document as proof of insurance coverage.

6.) Provision and identification of the type of insurance as General Liability with a minimum limit of $1,000,000.00 for each occurrence and aggregate for combined bodily injury and property damage. The policy number, policy effective date and policy expiration date shall be provided. Coverage must be current, in force and the policy expiration date must not precede the permit expiration date.

7.) Provision and identification of the City of Encinitas as Additional Insured.

8.) Provision and identification of the City of Encinitas as Certificate Holder using the following address:

City of Encinitas
Attn: Engineering Services
505 South Vulcan Avenue
Encinitas, CA 92024

9.) Notification regarding Cancellation Procedure limited to the following:

"Should any of the above described policies be canceled before the expiration date thereof the issuing company will mail 30 days written notice to the Certificate Holder named."

Any exceptions to the above declaration are unacceptable and shall be deleted or crossed out.

10.) Original signature of authorized representative of insurance carrier.

Facsimile copies of Certificate of Insurance are acceptable provided that the original document has been mailed and is forthcoming. Should the City of Encinitas fail to receive the original document the permit shall be declared invalid retroactive to the date of issuance and thereby revoked.

RIGHT-OF-WAY CONSTRUCTION PERMIT APPLICATION AND PROCEDURE

Ordinances 87-02, 87-12, 87-47, 88-08; Resolutions Re: Public Road Standards

Right-of-way Construction Permits are issued for the installation, repair, and/or replacement of standard works in the public right-of-way or a public easement. Adherence to the City of Encinitas *Public Road Standards*, City of Encinitas *Standard Details, San Diego Regional Standard Drawings,* and American Public Works Association *Standard Specifications for Public Works Construction* is usually required. Typically, a fully refundable security deposit is to be posted to guarantee performance and warranty repair.

Work within a pipe/conduit zone regulated by a Special District, Subsidiary District, or a Public Utility is not within the scope of this procedure and is discussed elsewhere.

Typical examples of construction authorized per this process include as follows:

1. Driveway approaches constructed of Portland cement concrete (PCC) on fully improved streets or of asphalt cement concrete (AC) on streets in a state of lesser condition,
2. Excavation/backfill/resurfacing to install, repair, or replace regulated utilities such as for potable water, sanitary sewer, electricity, natural gas, telephone, and community antennae television, or to repair a previous job to install same, and not per a Utility Construction Permit,
3. PCC curb/gutter/sidewalk or AC berms on streets having engineered line and grade and for the projects having no requirement for submittal and approval of an Improvement Drawing, whether repair, replacement, or a new installation,
4. Other minor appurtenances to existing public road and drainage improvements if an Improvement Drawing is not required (e.g., street light, sidewalk underdrain, pedestrian ramp),
5. Public road and/or drainage improvements complimentary to a lead Improvement Permit but by a different qualifying construction contractor or if the lead governing jurisdiction is not the City of Encinitas,
6. Minor public road and drainage improvements as a substitute for an Improvement Permit or if shown on a Grading Drawing,
7. Capital Improvement Projects,
8. Assessment Districts,
9. Construction with private party participation and agreement/settlement with a public agency.

Compliance with the following application procedure is required of the applicant.

1. Complete the part of the *Engineering Department Application* that is not for office use and where pertinent. Please provide an accurate and complete description of work. Sign and date.
2. Pay the non-refundable permit fee of $300.00, $900.00 or, in cases of long trenches or emplacements, an inspection deposit based on linear footage (LF). For precise instructions, see the *Schedule of Fees for Engineering Development Projects.* If cost effective and determinable, the fee can be calculated as for an Improvement Permit or, in cases of long trenches or emplacements, $250,00/500LF non-prorated. Note that applications submitted in reaction to a Notice of Violation require a double permit fee.
3. Submit a site plan drawn on white paper, 81/2" x 11", ….14", or …17", that shows the proposed construction as it relates to existing improvements, property lines, and easement lines, calls out

dimensions, grades, and materials, and explains the ultimate purpose. A blueline copy of a Grading Drawing or an Improvement Drawing, modified if needed, is acceptable or, in certain cases, preferred or required. Reference to governing standards should be made if applicable.

The Subdivision Engineering Division will review the proposed construction and may be able to issue the permit at time of application. Depending on the type of work to be authorized, a design or review process of variable timing may be involved. The type of process, and whether short, long, or immediate, is typically obvious. An application may be approved, approved with conditions, or denied. If an application is approved or approved with conditions, the applicant will be issued a Right-of-way Construction Permit.

One or more of the following items may be conditions of permit issuance:

1. A governing standard or engineered drawing is to be applied.
2. The *Right-of-way Construction Permit Standard Conditions* is to be read, signed and dated.
3. A construction contractor possessing a valid state license of the correct type is always required. The name, address, telephone number, and license number and type will need to be provided. State law as interpreted and enforced by the Contractors State License Board shall govern what type of license is needed for the proposed construction. For example, a Type "A" *General Engineering* license is considered acceptable for any work; a Type "C-8" *Concrete* as noted, a Type "C-12" *Grading and Paving* as noted.
4. Proof of insurance as possessed by the construction contractor will be a condition. See the *Requirements for Proof of Insurance.*
5. Posting of a refundable security deposit will be a condition. See *Ordinance 93-24*.
6. A Traffic Control Plan may be required. Work to be done on or near Circulation Element roads is subject to this condition. The plan should show delineation, signage, barriers, and other warning devices, and schedules, all as needed to separate the job site from the flow of traffic, whether vehicular or pedestrian. The Traffic Engineering Division is charged with finding the plan acceptable. Call (760) 633-2704 for assistance.

The date of issuance will be no less than forty-eight business hours prior to the start (or resumption, if previously in violation) of work. A pre-construction conference may be required. The Engineering Inspector will be assigned and a contact telephone number provided, all at issuance.

The applicant, now the permittee, has the continuing obligation to keep in proper contact with the assigned inspector. Proper contact is defined as follows:

a) Initial call prior to start of work,
b) Intermediate calls for inspection when ready and at the correct stage of work, and
c) Final call for inspection when job is complete.

When the assigned Engineering Inspector is satisfied that the job is complete, the permit will be countersigned and filed. As-builts may be required. Refund of any posted security deposit will then be initiated and may take up to thirty days. A 1-year warranty retention with subsequent warranty inspection may be required. The permit will become part of the City's permanent record.

If an application for a Right-of-way Construction Permit is denied (e.g., a conflict with the *Pavement Cut Moratorium* on recently resurfaced streets), an appeal may be filed in writing with the City Engineer, who will make a decision on the merits of the appeal. If the appeal is denied, the applicant may further appeal to the City Council through the City Clerk's office. Filing fees and appeal deadlines are applicable.

HAUL ROUTE PERMIT APPLICATION

Permit No.: _____

Company Name: _____ Telephone No.: _____

Address: _____ 24-HR Phone No.: _____

City, State: _____ Zip: _____ Contact Person: _____

Export Permit #: _____ Site Address: _____

Import Permit #: _____ Site Address: _____

Plan checker: _____ Inspector: _____

Material to be hauled: _____

Dates From: _____ To: _____ Quantity: _____ yd^3 No. of Trucks: _____

Type of Trucks: _____

Origin: _____ Destination: _____

The permittee guarantees to save, indemnify, and hold harmless the City of Encinitas and all its agents, officers, employees, and officials against all liabilities, judgements, costs, and expenses which may in any manner or form arise in consequent of the issue of this permit or any work performed in consequence thereof. I hereby agree to adhere to the conditions of Encinitas Municipal Code 23.24.410, Import and Export of Materials (see reverse side).

APPLICANT'S SIGNATURE _____ **DATE** _____

PRINT NAME _____ **TITLE** _____

FOR CITY USE ONLY

Route through Encinitas: _____

Map Attached? Y / N (circle one)

Additional Conditions: _____

Certificate of Insurance:

Carrier Company: _____ Coverage: $_____

Policy No._____ Expiration Date:_____

Approved by: _____ Date: _____

Extension approved by: _____ Date: _____

HAUL ROUTE PERMIT APPLICATION

The Encinitas Municipal Code states the following with regard to the import and export of materials:

23.24.410 Import and Export of Materials

Where transport of earth is proposed on public roadways from or to the site of an earth grading operation, the following requirements in subsections A through D of this section shall apply. In those instances where an excess of 2,000 cubic yards of earth per project site is transported on public roadways, in addition to the requirements of subsections A through D of this section, the requirements of subsections E through G of this section shall also apply.

A. Either water or dust palliative, or both, must be applied for the alleviation or prevention of excessive dust resulting from the loading or transportation of earth from or to the project site on public roadways. The permittee shall be responsible for maintaining public rights-of-way used for handling purposes in a condition free of dust, earth, or debris attributed to the grading operation.

B. Loading and transportation of earth from or to the site must be accomplished within the time of operation limitations established in this chapter.

C. Access roads to the premises shall be only at points designated on the approved grading plan.

D. The last 50 feet of the access road, as it approaches the intersection with the public roadway, shall have a grade not to exceed three percent. There must be 300 feet clear, unobstructed sight distance to the intersection from both the public roadway and the access road. If the 300 foot sight distance cannot be obtained, contractor personnel for traffic control shall be posted in the locations approved by the City Traffic Engineer.

E. A stop sign conforming to the requirements of the California Vehicle Code shall be posted at the entrance of the access road to the public roadway.

F. An advance warning sign must be posted on the public roadway 400 feet on either side of the access intersection, carrying the words “truck crossing.” The sign shall be diamond shape, each side being 30 inches in length, shall have a yellow background, and the letters thereon shall be five inches in height. The sign shall be placed six feet from the edge of the pavement and the base of the sign shall be five feet above the pavement level. The advance warning sign shall be covered or removed when the access intersection is not in use.

G. Appropriate security as determined by the City Engineer may be required to guarantee maintenance and repair of City streets used during grading and moving of import or export materials. (Ord. 2008-03)

APPLICATION FOR STREET NAME CHANGE

Application No.: _____

Non-map item

Please complete the following application; please print. This application is for existing streets only. Information regarding the procedure to be followed by City staff is on the reverse side.

CURRENT STREET NAME: _____

PROPOSED STREET NAME: _____
(Please list at least two alternate street name choices)

1. _____

2. _____

REASON FOR CHANGE: _____

_____

SOURCE/MEANING/BACKGROUND OF NEW NAME(S): _____

_____

_____

INFORMATION REGARDING APPLICANT/CONTACT PERSON:

NAME: _____

MAILING ADDRESS: _____
No. Street

_____
City State Zip

_____ (_____) _____
Signature Telephone

RELATIONSHIP TO STREET: Property Owner/Tenant/Lien Holder/ Other _____ (circle one)

OTHER INTERESTED PARTIES: (Provide names and addresses please.)

_____

_____

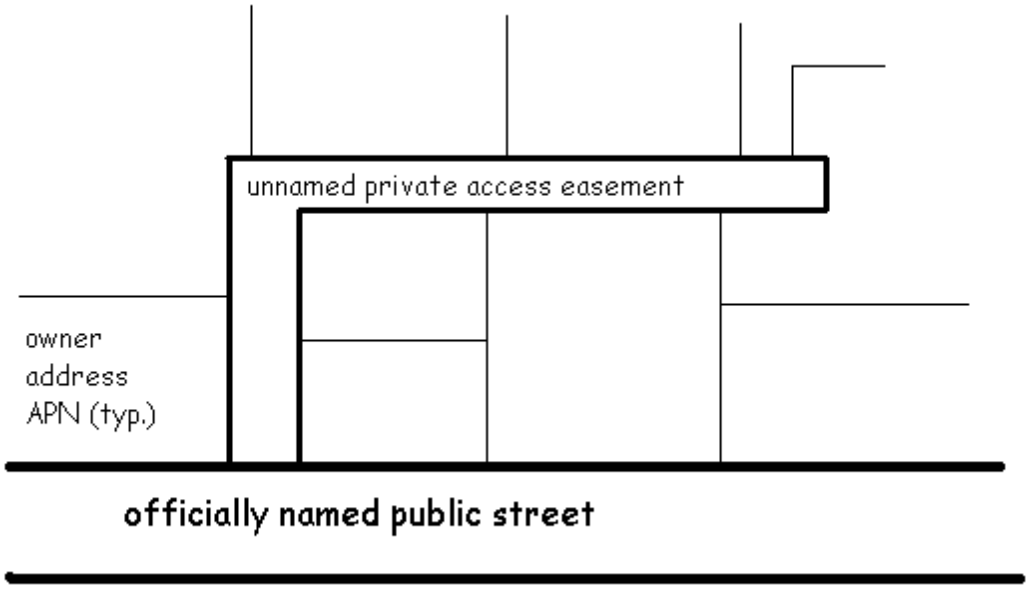
_____

APPLICATION FOR STREET NAME CHANGE SUBMITTAL REQUIREMENTS

The applicant shall submit the following items:

1. Completed application
2. Submittal of Street Name Change Application Fee
3. 500' radius map (prepared on assessor's pages) showing all the effected parcels and APN numbers.
4. 3 stamped sets (If it is a Public Street) 2 stamped sets (If it is a Private Street) of all the current property owners and tenants that may be affected, within 500' from the property boundaries (with Assessor Parcel Numbers on the labels)
5. Check for cost of each new street name sign
6. List of all property owners and affected tenants within 500'
7. 8 ½ x 11 map showing existing street and all affected parcels with cross streets

Sample Map:



To be completed by staff

Final action on application: _____ Date: _____

APPLICATION FOR STREET NAME CHANGE
PROCEDURES FOR RENAMING PUBLIC AND PRIVATE STREETS

Procedure for Renaming Private Streets:

1. A request for Street Name Change is submitted in the form of a completed application. City staff processes the application into a petition.

2. The petition is mailed out by City staff to all the property owners, as established by the County Assessor's roll, who may be affected by the proposed street name change.

3. Appropriate public agencies are notified of the proposal and are requested to comment on it. (30 days)

4. Staff analyzes the feedback from the circulated petition and any comments from the above public agencies.

5. If there are no objections, the name will be recommended to the City Engineer for approval.

6. Notices will be mailed by the City to affected parties to inform them of the decision and that the Planning Department will be changing the addresses.

7. Benefited property owners are responsible for purchasing and installing new signage.

Procedure for Renaming Public Streets:

1. A request for Street Name Change is submitted in the form of a completed application. City staff processes the application into a petition.

2. The petition is mailed out by City staff to all the property owners, as established by the County Assessors roll, who may be affected by the proposed street name change.

3. Appropriate public agencies are notified of the proposal and are requested to comment on it.

4. Staff will analyze the feedback from the circulated petition and any comments from the above public agencies.

5. A notice will be mailed out to the property owners informing them of the results of the circulated petition and of a date of hearing by the City Council.

6. At the scheduled public hearing, staff will provide the City Council with the results of the circulated petition and feedback from public agencies.

7. City Council will then take action to approve, deny, or continue the request to another scheduled City Council meeting. They may also require staff to provide other alternatives or information before they make a final decision.

8. Once the street name change is approved, the Resolution will be recorded at the County Recorder's Office.

9. Notices will be mailed by the City to affected agencies.

10. Sign changes: City may require the benefitted property owners to pay the actual costs of labor and materials.

VACATION OF PUBLIC RIGHT-OF-WAY APPLICATION FORM

Current Application Fee: _____ File No.: _____

Applicant: _____ Phone No.:_____

Applicant's Address:_____

City: _____ State: _____ Zip: _____

Owner: _____ Phone No.:_____

Owner's Address: _____

City: _____ State: _____ Zip: _____

Assessor's Parcel No.:_____ Planning Case:_____

Related Projects: _____

1. List the names of all persons having a financial interest in the application. Person is defined as "Any individual, firm, co-partnership, joint venture association, social club, fraternal organization, corporation, estate, trust receiver, syndicate, this and any other county, city and county, city municipality, district or other political subdivision, or any group of combination acting as a unit."

   _____

   _____

2. List the names of all persons having any ownership interest in the property involved.

   _____

   _____

3. Please describe the intended purpose/benefit of the proposed vacation.

   _____

   _____

   _____

4. Submit a legal description and plat on 8 ½" x 11" paper describing and illustrating the portion of the public right-of-way to be vacated. Provide a traverse closure.

5. Applicants for projects requiring public hearings are responsible for providing current, accurate, and complete public notification materials to the City. Any errors and/or omissions in the packet of noticing information may invalidate the public hearing and result in additional cost and delays to the applicant.

   The following information must be submitted to the City Engineering Department before a project can be placed on an agenda for hearing by the Planning Commission or City Council:

   a. Assessor maps at a true scale of 11 x 17 inches with a 500-foot radius from the boundaries of the subject property indicated on the map. The subject property must be highlighted and the radius drawn to scale. Reduced copies of maps are not acceptable. Please note: If the 500-foot radius encompasses fewer than twenty individual property owners, then the radius must be expanded to include a minimum of twenty individual property owners. The 500-foot radius will be used in most cases.
   b. Assessor property owner list.
   c. Two sets of mailing labels for each assessor-identified owner of property within a 500-foot radius of the site and the subject property; an assessor parcel number shall be included for each. Tally the number of owners to be notified and provide sufficient postage stamps for those mailings plus 20 extra for additional agency notifications as may be necessary; for instance, if 100 owners are identified to receive mailings, provide 120 stamps. Additional stamps will be necessary if a second round of mailings is determined to be necessary. Any unused stamps will be returned to the applicant.
   d. Applicants are responsible for all advertising costs when vacations are required to be placed in local publications.

6. Submit a title report for the subject property. The title report must be a maximum of 30 days old and must include a plat showing all easements on the property to be acceptable.

Please contact the City Engineering Department at (760) 633-2770 with any questions.

_____ _____

Signature Date Print or Type Name of Applicant

VACATION OF PUBLIC RIGHT-OF-WAY REQUEST FORM

Date: _____

Applicant: _____ Phone No.:_____

Applicant's Address:_____

City: _____ State: _____ Zip: _____

Owner: _____ Phone No.:_____

Owner's Address: _____

City: _____ State: _____ Zip: _____

Location of Proposed Vacation: _____

_____

Requested Width/Area: _____

Purpose/Benefit of Vacation: _____

_____

Staff Comments: _____

_____

_____

_____

Reviewed By: _____ Date: _____

*The vacation of public right-of-way is at the discretion of the City Council. Staff processing of the vacation request does not ensure approval by Council.

CITY OF ENCINITAS- DEPARTMENT OF ENGINEERING
BUILDING SITE PLAN CHECKLIST

Owner's Name: _____ **Permit #:** _____

Site Address: _____ **Set#:** _____

Project Description: _____ **APN:** _____

Contact Person: _____ **Phone:** _____

Planning Case: _____ **Date:** _____

Plan Checker:_____

Satisfactory? **P C Phone:** _____

- ☐ 1. Detailed vicinity map.
- ☐ 2. North arrow.
- ☐ 3. Scale of drawing
- ☐ 4. Dimensions and bearings of property lines.
- ☐ 5. Assessor's parcel number and legal description.
- ☐ 6. Locations, names, and widths of existing/proposed border streets, right-of-way, road easements, and alleys.
- ☐ 7. Location of easements and floodplain.
- ☐ 8. Dedication of Right-of-Way required. Show ultimate Right-of-Way.
- ☐ 9. Existing and proposed improvements within Right-of-Way. Work in R-O-W requires separate Eng. permit(s).
- ☐ 10. Location and dimensions of existing/ proposed buildings, structures, utilities, parking, and landscape areas.
- ☐ 11. Location, width, surfacing, and maximum slope of existing/proposed driveway.
- ☐ 12. Existing/proposed drainage facilities (pipes, inlets/outlets, swales, etc.) No increase in cross lot drainage allowed.
- ☐ 13. Direction of water flow onto and off the property, with flow line elevations.
- ☐ 14. Contour lines of existing/proposed topography to continue at least 15 feet beyond property lines.
- ☐ 15. Finished grades; contours and/or spot elevations including finished pad elevation.
- ☐ 16. Quantities of grading including cut, fill, import/export, and over-excavation & re-compaction.
- ☐ 17. Grading and/or improvement plan required.
- ☐ 18. Total area of new impervious surface note w/ quantity filled in.

☐ 19. Label all objects on plan as either existing or proposed.

☐ 20. Reference other plans that are a part of this project (Planning Case and/or Grading/Improvement Plan).

☐ 21. Place both pages of standard Engineering and Storm Water notes on plan.

☐ 22. Slip sheet APPROVED Grading/Improvement plan # _____

☐ 23. Rough Grade Approval required prior to building plan approval.

☐ 24. Undergrounding of overhead utilities/ public improvements required.

☐ 25. Undergrounding of overhead utility SERVICE required. Provide a copy of SDG&E workorder showing that all overhead utility service lines are to be undergrounded. Overhead service must be undergrounded prior to final inspection.

☐ 26. Provide some form of biofiltration BMP to treat the increased runoff from new impervious surfaces and label all Best Management Practices as "BMP: Not to be paved or altered without a City permit".

☐ Storm Water Best Management Practices (B.M.P.'s)

Priority Project?

Maintenance Agreement Required?

☐ Flow Based (Landscaped Area BMP, Grass Lined Swale, Gravel Lined Swale)

☐ Volume Based (Detention Basin, Retention Basin, Infiltration Basin, Underground Storage)

☐ Other (Describe):

Additional Comments:

AP / PAP / COR / REJ

Applicant Notified:

Sewer Fees Due: CSD / ESD

Traffic Mitigation Fees Due:

Flood Control Fees Due:

ENGINEERING DEPARTMENT
STANDARD NOTES FOR BUILDING PLANS

Right-of-Way Note
Owner is to obtain a construction permit from the Engineering Department at least 48 hours prior to working in the public right of way. Failure to do so will result in an issuance of a stop work notice and double permit fees. It is the responsibility of the owner to know the location of the property line.

Utility Note
All utilities serving this site shall be installed underground.

Drainage Note
No concentrated drainage flows are permitted over adjacent property lines.
Water is to drain away from structures for a minimum of 5 feet at 2 percent and be conveyed to an approved drainage facility.

Earthwork Note
Earthwork, cut or fill, which is over 50 cubic yards, requires an additional Engineering Grading Permit.
Provide earthwork quantities:
____ cubic yards cut, ____cubic yards fill, ____ cubic yards import/export
____ cubic yards over-excavation and re-compaction

Construction Best Management Practices (BMP) Note
Erosion control measures (e.g. bonded fiber matrix, vegetative cover, jute matting) must be implemented where applicable to prevent soil erosion on site. Sediment control measures (e.g. silt fencing, fiber rolls, detention basins) must be in place to prevent eroded soil from leaving site. Materials management BMP must also be followed to ensure no contact of rainwater with materials that may contribute to water quality degradation downstream (e.g. concrete or stucco washout areas, covered storage areas for hazardous materials, placement of portable toilets over a pervious surface).

Post-Construction Best Management Practices (BMP) Note
No directly connected impervious areas (DCIA) shall be allowed. DCIA means storm runoff generated and conveyed via impervious areas, such as roof, roof drain, driveway, and street. BMP measures shall be identified on the site plan. Most common measures are designated turf areas, which receive roof drains and runoff from impervious areas. Turf and landscaped areas that are designed for BMP's shall be delineated on plans and a note placed on plans prohibiting modification or removal of the BMP landscape areas without a City permit.

Grading/Improvement Plans/Permits
If a grading/improvement plan/permit is approved for the project site, it shall supersede all grading, drainage, onsite, offsite, and storm water Best Management Practice improvements contained in these plans in the event of conflict.

Total Area of New Impervious Surfaces = _____
(Increase to building footprint, patios, decks, hardscape, etc.)

Please Note: The Storm Water Pollution Control Notes (see Appendix 3.5 of the Engineering Design Manual) shall also be added to all building plans.

CITY OF ENCINITAS
FLOOD CONTROL AND TRAFFIC MITIGATION FEE FORM

Building Permit Number: _____ - _____

Assessor's Parcel Number: _____

Grading Plan Number: _____

Applicant Name: _____Site Address: _____

Flood Control Fee (BPFC)

$.21/sf of new impervious surface = $_____
(23900000-349.1)

Traffic Mitigation Fee

City Traffic Mitigation Fee (BPTM) *See Note 1 below.
(23300000-349.1)
_____ Low Income Unit(s) x $2,741.97

_____ Rural Residential Adder x $548.39 $_____

RTCIP Traffic Mitigation Fee (BPRT) (Res. ONLY)
(23400000-349.1)
_____ Residential Unit(s) x $2,741.97 $_____

SANDAG RTCIP Admin. Fee (BPPU) (Res. ONLY)
(23400000-241)
_____ Residential Unit(s) x $20 $_____
(Low income units are exempt)

City Traffic Mitigation Fee * (BPTM)
(23300000-349.1)
_____ Non-Residential Dev. ($ Varies) $_____

TOTAL DUE: $_____

* Note 1: For residential permits issued before July 1, 2008 and for new moderate, low, very low, and extremely low income residential units as defined in Health & Safety Code Sections 50079.5, 50093, 50105, 50106, and by reference in Government Code section 65585.1. Also for the rural residential adder (the $548.39/unit portion of fee above the RTCIP fee of $2,741.97/unit).

ENGINEERING STAFF:

_____ _____
Prepared By Date

CASHIER: Date: Receipt Number: Cashier's Initials:

_____ _____ _____

FLOOD CONTROL FEES

What is the Purpose of the Flood Control Fee?

The funds generated from Flood Control fees are used to provide for flood control facilities needed to serve the development. Funds will be used to construct planned drainage facilities for the removal of surface and storm waters as shown in the San Diego County Flood Plan of 1977.

How Much is the Flood Control Fee?

The fee is calculated as $0.21 per square foot of new impervious surfaces.

The Following Facilities are Exempt:

- Swimming pools
- Fences
- Construction of impervious surfaces not exceeding 500 sq. ft. cumulatively over any five-year period
- Projects for public or governmental purposes
- Replacement within 6 months after a fire or other calamity

How are Flood Control Fees Calculated and Collected?

Fees determined by the Engineering Department and collected by the Finance Office prior to:

- Approval of final map for a new subdivision
- Issuance of Hardscape Construction permit
- Final inspection of a Building permit
- Issuance of a Grading or Improvement permit

The Applicant is Required to Provide the Following Information During Plancheck:

Type of Impervious Area	**Installed within Past 5 Yrs**	**Proposed Now**
Structure or New Addition	Sq. ft.	Sq. ft.
Sidewalks	Sq. ft.	Sq. ft.
Patios	Sq. ft.	Sq. ft.
Driveway	Sq. ft.	Sq. ft.
Streets	Sq. ft.	Sq. ft.
Parking (and Circulation)	Sq. ft.	Sq. ft.
Other Impervious Surface	Sq. ft.	Sq. ft.
Total Area:	**Sq. ft.**	**Sq. ft.**
Total Fee = New Proposed Sq. Ft. x $0.21 =		**$**

TRAFFIC MITIGATION FEES

What is the Purpose of the Traffic Mitigation Fee?

Traffic Mitigation Fees are used to pay for traffic facilities needed to serve the development. Funds will be used to construct and improve main thoroughfares as identified on the Circulation Element Road Map.

How Much are Traffic Mitigation Fees?

The fee is calculated based upon $2,741.97 per peak hour trip as assigned to the appropriate project category, as shown in Items A and B below. A $20 SANDAG RTCIP Admin fee will be added per residential unit. Fees are adjusted July 1 of each year based upon the increases approved annually by the SANDAG Board of Directors.

A. Residential	Highest AM/PM Peak Hour Trip	Traffic Fee Per DU	# of DU's	Total Fees
• Single-Family Detached	1.0	$2,741.97	_____	_____
• Rural Residential	1.2	$3,290.36	_____	_____
• Other Residential	N/A	$2,741.97	_____	_____

B. Other Developments (Non-Residential)

Total Fee = [Single Family Traffic Mit. Fee] X [Peak-Hour Trips Generated By the Development] X [Reduction Factor for Pass-By Trips (If Applicable)]

- The calculation of peak-hour trips generated by non-residential development will be determined as follows, in order of precedence:
-
    - Via the City's current schedule of peak hour trips and reduction factors (Attach. A); or
    - Via the SANDAG current "Traffic Generators' Manual's (Not So) Brief Guide of Vehicular Traffic Generation rates for San Diego Region"; or
    - Via applicant's traffic study or other relevant factual data which demonstrates the traffic impacts of the development to the satisfaction of the City Engineer.

The Following Facilities are Exempt:

- Construction for public or governmental purposes;
- Replacements or remodels of existing residential structures which do not add new units; and
- Residential accessory units as defined in Municipal Code Section 30.34.040V.

How are Traffic Mitigation Fees Calculated and Collected?

Fees determined by the Public Works Department and collected by the Finance Office.

Fees are payable prior to:

- Final Inspection and/or Issuance of a Certificate of Occupancy for Building permits; and
- Commencement of the use necessitating the fee for projects not requiring a Building permit.

ATTACHMENT A

PEAK-HOUR TRIPS FOR SPECIFIC RESIDENTIAL AND NON-RESIDENTIAL USES, AND APPLICABLE PASS-BY TRIP REDUCTION FACTORS

1 Peak hour trip =$2,741.97

Land Use Categories	Highest AM/ PM Peak hour trips	Pass-By Trips Reduction Factor	Traffic Fees
RESIDENTIAL (per DU)			
Rural Residential	1.20	N/A	$3,290.36
Single Family	1.00	N/A	$2,741.97
Other Residential	N/A	N/A	$2,741.97
OFFICE (per 1,000 sf)			
Standard Commercial Office	2.80	N/A	$7,677.52
Single Tenant Office	2.10	N/A	$5,758.14
Medical-Dental Office	5.50	N/A	$15,080.84
SHOPPING CENTER (per 1,000 sf)			
Community (10-30 acres)	7.00	0.70	$13,435.65
Neighborhood (<10 acres)	12.00	0.60	$19,742.18
COMMERCIAL SHOPS (per 1,000 sf)			
Convenience Market	40.00	0.50	$54,839.40
Grocery Store	15.00	0.60	$24,677.73
Discount Store	4.80	0.70	$9,213.02
General Retail Shop	3.60	0.90	$8,883.98
Furniture Store	0.54	N/A	$1,480.66
RESTAURANTS (per 1,000 sf)			
Fast Food (with drive through)	45.50	0.60	$74,855.78
Fast Food (without drive through)	49.00	0.60	$80,613.92
Delicatessen (7 a.m. – 4 p.m.)	13.50	N/A	$37,016.60
Sit Down, High Turnover	12.80	0.80	$28,077.77
Sit Down, Low Turnover (quality)	8.00	0.90	$19,742.18
FINANCIAL SERVICES (per 1,000 sf)			
Bank (walk-in only)	12.00	0.75	$24,677.73
Bank (with drive-through)	20.00	0.75	$41,129.55
OTHER LAND USES (per 1,000 sf unless otherwise noted)			
Church	0.72	N/A	$1,974.22
Day Care Center (per child)	0.90	0.30	$ 740.33
Private School (per student)	0.90	0.30	$ 740.33
General Hospital (per bed)	1.70	N/A	$4,661.35
Convalescent/Nursing (per bed)	0.21	N/A	$ 575.81
Gas Station w/mart/car wash (per pump)	13.95	0.50	$19,125.24
Hotel (w/convention facilities/restaurant) (per room)	0.80	N/A	$2,193.58
Motel (per room)	0.81	N/A	$2,221.00
Resort Hotel (per room)	0.56	N/A	$1,535.50
Business Hotel (per room)	0.63	N/A	$1,727.44
RECREATIONAL (per 1,000 sf)			
Golf Course (per hole)	3.20	N/A	$8,774.30
Movie Theater (per seat)	0.144	N/A	$ 394.84
Health Club	2.70	N/A	$7,403.32

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CITY OF ENCINITAS
ENGINEERING DEPARTMENT
REFUND POLICY

The following criteria are applicable to refund requests for development service fees regarding Engineering Department planchecks, permits and/or inspections regarding grading plans/permits, improvement plans, Final Maps/Parcel Maps and other Engineering Department permits, such as, but not limited to, encroachment, utility, construction, dumpster, or beach encroachment permits.

In all cases, a request for a refund shall be filed with the City Engineer a maximum of 180 days following the last plan submittal to the Engineering Department, or a maximum of 180 days following the date of permit issuance, whichever is applicable. The request shall be accompanied by a completed refund request letter and a copy of the receipt for the payment of the fees for which a refund is requested.

A fee which was erroneously paid or collected may be refunded in full at any time in the process upon written request to the City Engineer.

Upon closure or withdrawal of any project application, a new application and the required processing fees, consistent with the fee schedule in effect at the time of re-submittal, shall be submitted to reactivate the project.

Grading, Improvement, and Map/ Parcel Map Plancheck: A percentage of the plancheck fees paid for Grading (G), Simplified Grading (SG), Improvement Plans (I), Final Maps (FM), and Parcel Map (PM) reviews may be refunded, according to the schedule below. The refund request shall be filed no later than 180 days from the most recent plancheck submittal of the plan to the Engineering Department.

- **75%** refund prior to completion of the first project plancheck
- **50%** refund after completion of the first project plancheck
- **25%** refund after completion of the second plancheck
- **0%** refund after completion of the third plancheck, or after plan approval, whichever comes first

Grading and Improvement Inspection Fees and Securities: The full amount of surety posted and the inspection fees paid may be refunded if, prior to the start of any construction, a refund request letter is submitted to the City Engineer together with a statement of understanding that the approved plan will be voided and that no permit for the plan may be issued in the future. Inspection fees are not refundable after the start of work. The refund request shall be filed no later than 180 days from permit issuance.

Third Party Fees: Any fees paid to the City Engineering Dept. for third-party work, such as review by a structural consultant, are non-refundable.

Other Engineering Department Permit/ Inspection Fees: Eighty percent (80%) of fees paid for any other type of Engineering Department permit, such as, but not limited to, an encroachment, utility, construction, dumpster, or beach encroachment permit, may be refunded prior to the start of any work covered by the permit. Fees are not refundable after the start of work. The refund request shall be filed no later than 180 days from permit issuance.

Refund Request Letter: Plancheck Fees

Date: _____

Applicant Name: _____

Applicant Address: _____

Applicant Telephone Number: _____

RE: Refund Request for Plancheck Fees

Site Address: _____

Application No.: _____ Review No.: ☐ 1 (75%) ☐ 2 (50%) ☐ 3 (25%)

Date of Last Plancheck Submittal to City: _____

Dear City Engineer,
I wish to withdraw my project from plancheck and understand that I may not reinstate the project review without the payment of new plancheck fees consistent with the then-current Engineering Department fee schedule. Please consider my request for a refund of plancheck fees paid consistent with the Engineering Department refund policy. I understand that refund requests will be considered on a case-by-case basis by the City Engineer and that any approved request will require 6-8 weeks to process.

Sincerely,

_____ _____
Signature(s)

_____ _____
Print Name(s)

_____ _____
Print Title(s) (only if applicable)

_____
Name of Company, Trust, or Other Form of Ownership (only if applicable)

ATTACH COPY OF PAYMENT RECEIPTS

Refund Request Letter: Permit/ Inspection Fees

Date: _____

Permittee Name: _____

Permittee Address: _____

Permittee Telephone Number: _____

RE: Refund Request for Permit/ Inspection Fees

Site Address: _____

Permit Number: _____

Date of Permit Issuance: _____

Dear City Engineer,
I wish to withdraw my project permit. I understand that any approved plans associated with the permit will be void, and a permit on those plans may not be issued in the future to myself or to any future owner. Please consider my request for a refund of permit/ inspection fees paid consistent with the Engineering Department refund policy. I understand that refund requests will be considered on a case-by-case basis by the City Engineer and that any approved request will require 6-8 weeks to process.

Sincerely,

_____ _____
Signature(s)

_____ _____
Print Name(s)

_____ _____
Print Title(s) (only if applicable)

_____
Name of Company, Trust, or Other Form of Ownership (only if applicable)

ATTACH COPY OF PAYMENT RECEIPTS

STORMWATER INSPECTION FORM

INSTRUCTIONS

APPROVED STORMWATER INSPECTIONS ARE REQUIRED BEFORE YOU CALL FOR FOUNDATION AND FINAL INSPECTION!

CALL (760) 943-2140 FOR STORMWATER INSPECTION WHEN THE BMP REQUIREMENTS ARE INSTALLED AS SHOWN ON YOUR PLANS.

THE STORMWATER INSPECTOR WILL TAKE THIS FORM FROM YOU ONCE PROPER INSTALLATION OF THE BMPS IS VERIFIED.

BMP APPROVAL

BMP Approval for:

☐ Foundation Inspection

☐ Final Inspection

Address: _____

Permit #: _____

Owner: _____

Contractor: _____

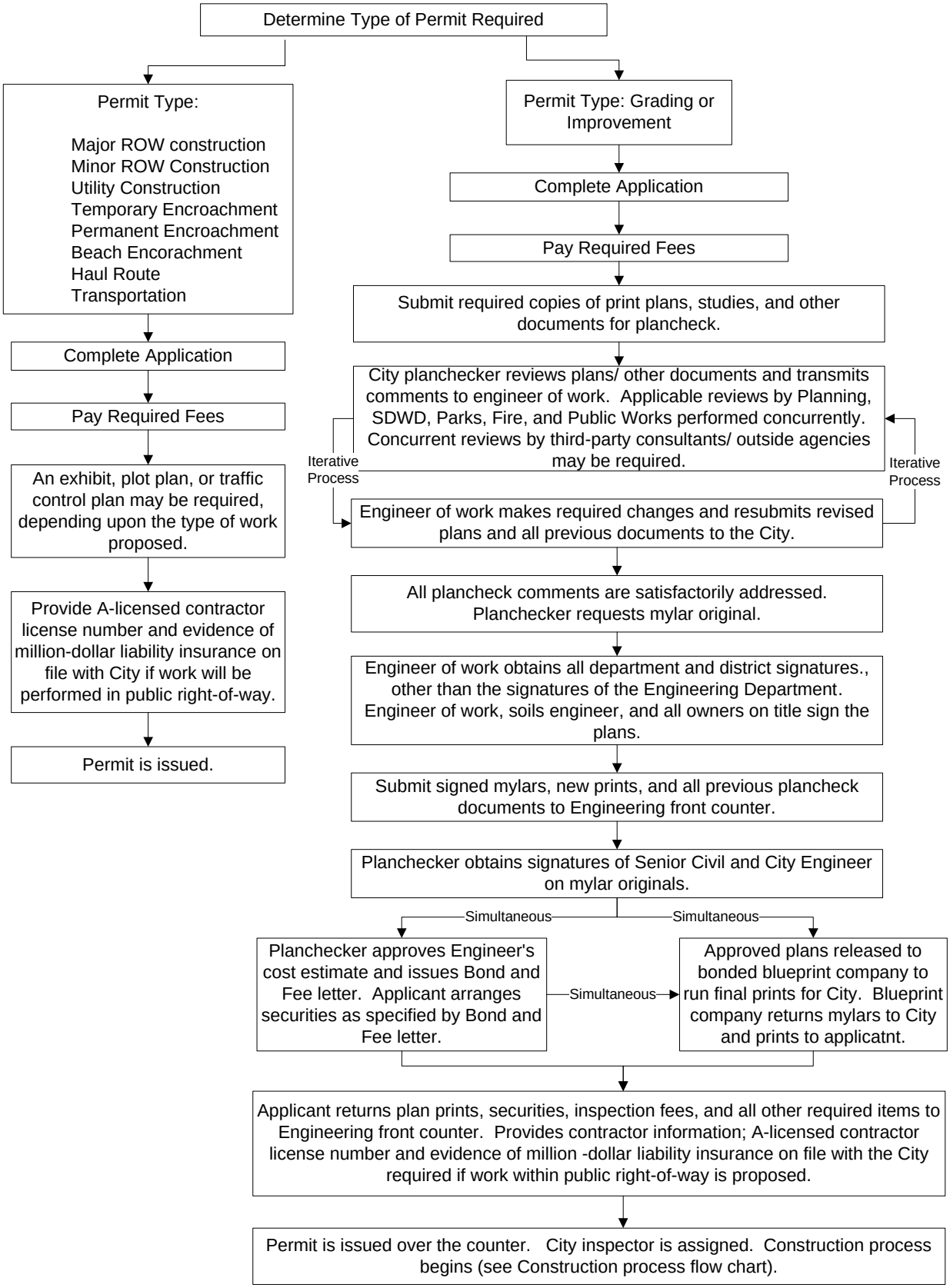
The BMP requirements are in substantial compliance, and this project is authorized to begin construction/ request a final inspection.

Inspector: _____ Date: _____

Comments: _____

_____

GRADING AND IMPROVEMENT PROCESS FLOWCHART50



GRADING PLAN INITIAL SUBMITTAL LIST

A first submittal for grading plan processing must contain the following items:

- ☐ Blueline prints of the Grading plan together with any associated Improvement Plan.
  - 6 copies- projects in Olivenhain Municipal Water District OMWD/ Leucadia Wastewater District LWD
  - 7 copies- projects in San Dieguito Water District (SDWD).
- ☐ Any associated Parcel Map or Final Map together with the approved Tentative Final Map (TM) or approved Tentative Parcel Map (TPM), as applicable.
  - 2 copies
- ☐ Resolution of Approval or Notice of Decision with project conditions.
  - 2 copies
- ☐ Cost estimate, itemizing all work proposed as a part of the project.
  - 2 copies
- ☐ Preliminary Title Report, less than 3 months old.
  - 2 copies
- ☐ Copies of all documents listed in the Preliminary Title Report, including Vesting Deed.
  - 2 copies
- ☐ Soils Report less than 3 years old and applicable to the current project, per Muni. Code 23.24.17 & 18.
  - 2 copies
- ☐ Corporate/Partnership papers, as appropriate.
  - 2 copies
- ☐ Structural Calculations for non-standard site walls.
  - 3 copies
- ☐ Hydrology Study with hydraulic and stormwater pollution control calculations.
  - 2 copies
- ☐ Notarized letter regarding permission to grade if work may disturb an adjacent private property.
  - 2 copies
- ☐ SWPPP, if applicable.
  - 2 copies on CD
- ☐ Completed Stormwater Intake Form- SWQMP
  - 2 copies
- ☐ Submittal Fee/Deposit.
- ☐ Completed and signed Engineering Development Application.

Please Note: If project is within the jurisdiction of OMWD and/or LWD, the applicant must process the application separately and directly with that agency. The project planchecker will require additional items to be submitted following the initial review of the project submittal. If third-party review is required, the cost is born by the applicant in addition to any City fees.

IMPROVEMENT PLAN INITIAL SUBMITTAL LIST

A first submittal for improvement plan processing must contain the following items:

- ☐ Blueline prints of the improvement plan together with any associated Grading Plan.
  - 6 copies- projects in Olivenhain Municipal Water District OMWD/ Leucadia Wastewater District LWD
  - 7 copies- projects in San Dieguito Water District (SDWD).
- ☐ Any associated Parcel Map or Final Map together with the approved Tentative Final Map (TM) or approved Tentative Parcel Map (TPM), as applicable.
  - 2 copies
- ☐ Resolution of Approval or Notice of Decision, with project conditions.
  - 2 copies
- ☐ Cost estimate, itemizing all work proposed as a part of the project. Private work shall be included in a separate estimate from public work.
  - 2 copies
- ☐ Preliminary Title Report, less than 3 months old, and copies of all documents listed in the Preliminary Title Report.
  - 2 copies
- ☐ Soils Report less than 3 years old and applicable to the current project, per Muni. Code 23.24.17 & 18.
  - 2 copies
- ☐ Corporate/Partnership papers, as appropriate.
  - 2 copies
- ☐ Structural Calculations for non-standard site walls.
  - 3 copies
- ☐ Hydrology Study with hydraulic and stormwater pollution control calculations.
  - 2 copies
- ☐ Legal descriptions/ plats/ closures if dedications are required.
  - 2 copies
- ☐ SWPPP, if applicable.
  - 2 copies on CD
- ☐ Completed Stormwater Intake Form- SWQMP
  - 2 copies
- ☐ Submittal Fee/Deposit.
- ☐ Completed and signed Engineering Development Application.

Please Note: If project is within the jurisdiction of OMWD and/or LWD, the applicant must process the application separately and directly with that agency. The project planchecker will require additional items to be submitted following the initial review of the project submittal. The requirement to submit the hydrology study and/ or soils report may in certain special cases be waived by the City Engineer. If third-party review is required, the cost is born by the applicant in addition to any City fees.

GRADING AND IMPROVEMENT PERMIT EXPIRATION NOTICE

Date: _____

City of Encinitas
Engineering Department
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Project Number: _____
Project Name: _____

Dear Applicant,

This letter is to inform you that the above-referenced Grading and/ or Improvement Permit number issued on _____ is set to expire on _____. Following the date of expiration, work performed at the project site will no longer be permitted and will be subject to removal, restoration, and/ or enforcement in accordance with City policies for unpermitted work.

The Engineering Design Manual, Chapter 2, advises that:
"Work covered by an Engineering permit shall commence within 90 days of permit issuance or the permit shall become invalid. Engineering permits expire following 90 days of inactivity on the work covered by the permit; refer to Municipal Code Section 23.24.240 for further information. Permits may expire earlier due to contractor insurance expirations or other City requirements".

Following expiration, a permit may be reinstated at the discretion of the City Engineer. The permit is subject to current policies, regulations, and additional fees at the time of permit reinstatement.

SAMPLE BOND AND FEE LETTER

Date

Owner
Address
Address

Re: Permit issuance requirements for:
Application ####
Case #
Site Address
APN

This letter summarizes the requirements for pulling your Engineering Permit for drawing ####. Your approved plan will remain valid for one year. If the permit is not issued within six months from the date of approval of the drawings, the plans will be subject to review by City staff for compliance with current codes and regulations before a permit can be issued, and changes to the approved plans as well as additional fees may be required.

Please read through this letter carefully and contact the City with any questions you may have. It contains information about many requirements that may apply to your project and can make the process clearer and easier for you.

In order to obtain the permits to construct the work shown on your approved plans, you will need to satisfy the requirements below. All of the items listed below must be submitted to the Engineering front counter in one complete package at the time the applicant comes in to pull the permit. Partial submittals of any kind will not be accepted. Your project planchecker will not accept any of the documents listed on behalf of the Engineering front counter staff; all items must be submitted to the front counter directly together and at one time. The correct number of each of the requested documents must be provided; copies of documents submitted to the City during plancheck do not reduce the necessary quantities listed below.

(1) Provide 4 print sets of the approved drawing ####.

Provide 2 copies of "Soils Report Title" prepared by Soils Engineering Firm and dated.

Provide a digital file (AutoCAD or similar) of the Map #### on CD to the City. The map must be tied to two City-approved control points.

Pay additional plancheck fees in the amount indicated in the fee table below.*******

Pay NPDES plancheck fees in the amount indicated in the fee table below. *****

Submit 2 copies of the approved, signed (not draft) Resolution of Approval or Notice of Decision for Planning Case #_____, to be routed by the City to inspector and file.

(2) Post Security Deposits to guarantee all of the work shown on your approved drawings. The amounts of security deposits are determined directly from the Approved Engineer's Cost Estimate generated by your engineer according to a set of predetermined unit prices for each kind of work shown on your plans. You will be required to post security deposit(s) as follows:

(a) **Security Deposit for Grading Permit ####:** in the amount $##,###.00 to guarantee both performance and labor/ materials for earthwork, drainage, private improvements, and erosion control.
(b) **Security Deposit for Improvement Permit ####:** in the amount $##,###.00 to guarantee both the performance and labor/ materials for the improvements shown on the approved improvement plan.
(c) **Security Deposit for Undergrounding of Overhead Utilities:** in the amount of $##,###.00 to guarantee the required undergrounding of overhead utilities for your project. The amount of this deposit is based upon a cost of $380.00 per linear foot of undergrounding required for your project. As an alternative, the applicant may provide a proposal for the required undergrounding supplied by SDG&E accompanied by receipts showing that the entirety of that required sum has been paid to the utility company.
(d) **Security Deposit for Deferred Monumentation:** in the amount of $##,###.00 to guarantee the setting of the monuments for your project. The amount of the security deposit is based directly upon the Monumentation Cost Estimate provided by your project engineer.

A minimum of 20% and up to 100% of the amount listed in item(s) 2(a) must be in the form of cash, certificate of deposit, letter of credit, or an assignment of account. Up to 80% of the amount listed in item 2(a) may be in the form of auto-renewing Performance and Labor and Materials Bonds issued by a State of California licensed surety company.

Up to 100% of the amount(s) listed in item(s) 2(b), 2(c), and/or 2(d) may be in the form of auto-renewing Labor and Materials bonds issued by a State of California licensed surety company. Cash, certificates of deposit, letters of credit, and assignments of account are also acceptable financial instruments.

If a certificate of deposit (CD) will be obtained to secure the entire amount(s) listed in item(s) 2(a) and/or 2(b), two separate CD's for 25% and 75% of the amount(s) listed in item(s) 2(a) and/or 2(b) should be obtained in order to facilitate any future partial release of those securities. CD's posted may be of any term but must be auto-renewing and must specify the City of Encinitas as a certificate holder and include a clause that until the City of Encinitas provides a written request for release of the CD, the balance shall be available to the City upon its sole request.

The format of any financial instrument is subject to City approval, may be in the owner's name only, and must list the City of Encinitas as a Certificate Holder.

For any questions regarding how to post securities, bonding, or the required format of securities, please contact Debra Geishart at 760-633-2779.

(3) Pay non-refundable fees as listed below:

Fee Type	Amount
Grading Inspection	
Improvement Inspection	
NPDES Inspection (Grading)	
NPDES Inspection (Improvement)	
Flood Control	
Additional Plancheck Fees Due	
NPDES Plancheck Fees Due	
GIS Mapping Fee (Maps/ PM's only)	**375.00**

The grading and improvement inspection fees are calculated based on 5% of first $100,000.00 of the approved Engineer's cost estimate dated DATE and 3% of the cost estimate over $100,000.00. The NPDES inspection fee is assessed as 1% of the first $100,000.00 of the approved Engineer's cost estimate and 0.6% of the cost estimate over $100,000.00. The flood control fee is assessed at a rate of $0.21 per square foot of net new impervious surface area for driveway and parking areas as created per the approved plan.

(4) Provide the name, address, telephone number, state license number, and license type of the construction contractor. The construction of any improvements within the public right-of-way or public easements is restricted to qualified contractors possessing the required state license as listed in the table below. The contractor must also have on file with the City current evidence of one million dollar liability insurance listing the City of Encinitas as co-insured. Additional requirements are described in the handout "Requirements for Proof of Insurance" available at the Engineering front counter.

Type	Description	Work to be Done
A	***General Engineering***	**any & all**
C-8	***Concrete***	**apron/curb/gutter/ramp/sidewalk**
C-10	***Electrical***	**lighting/signals**
C-12	***Grading & Paving***	**any surface, certain drain-basins/channels**
C-27	***Landscaping***	**planting/irrigation/fencing & other amenities**
C-29	***Masonry***	**retaining walls**
C-32	***Parking &Highway Improvement***	**signage/striping/safety**
C-34	***Pipeline***	**sanitary sewer/storm drain**

(5) Permits are valid for no more than one year from the date of issuance and may expire earlier due to expirations of letter of credit and/or insurance policies.

(6) This project does not propose land disturbance in excess of one acre and is exempt from the State Stormwater Pollution Prevention Plan (SWPPP) requirement. An erosion control plan shall be implemented per the approved grading plan.

Preconstruction Meeting: A preconstruction meeting at the project site is mandatory for all projects. The preconstruction meeting may not be scheduled until the Engineering permit(s) have been issued, and the applicant/contractor must give the assigned Engineering inspector a minimum of 48 hours advance notice prior to the scheduled meeting time.

Right-of-Way Construction Permit: A separate right-of-way construction permit will be required for any work in the public right-of-way or public easements. Typically, this work may include construction or reconstruction of a portion of the driveway within the public right-of-way, excavation, backfill, and resurfacing to install electric, gas, telephone, and cable television lines, or water and sewer connections. A permit fee of $300.00 per application and a site plan, preferably the work order issued by the public utility, will be required. Contractor license and insurance requirements apply. Permits must be issued at least 48 hours in advance of the start of work.

Haul Routes, Traffic Control Plans, and Transportation Permits: These separate permits may be required for your project and are handled by the Traffic Engineering Division. A fee of $250.00 is required for traffic control plans. For more details, contact Raymond Guarnes, Engineering Technician, at (760) 633-2704.

Release of Project Securities: The partial or complete release of project securities is initiated automatically by the City after submission of satisfactory as-built drawings to the City and approval by the project Engineering inspector. Applicant requests cannot be addressed without release approval from the project inspector. The processing and release of securities may take up to 4 weeks after the release process is initiated by the project Engineering inspector. Any cash releases will be mailed to the address on this letter unless the City is otherwise notified, and all letters mailed to a financial institution will be copied to the owner listed hereon. Satisfactory completion of Final Inspection certified by the project Engineering inspector is a prerequisite to full release of the Security Deposit assigned to any Grading Permit. A sum in the amount of 25% of the securities posted for improvement permits will be held for a one-year warranty period, and a release is automatically initiated at the end of that warranty period.

Construction Changes: Construction changes prepared by the Engineer of Work will be required for all changes to the approved plans. Requests for construction change approval should be submitted to the Engineering Services Department front counter as redlined mark-ups on 2 blueline prints of the approved Drawing. Changes are subject to approval prior to field implementation. Substantial increases in valuation due to the proposed changes may be cause for assessment and collection of additional inspection fees and security deposits. Construction change fees of $200.00 and $350.00 will be assessed for minor and major construction changes, respectively. Construction changes necessitating a new plan sheet will be assessed the per-sheet plancheck and NPDES plancheck fees in lieu of the construction change fee. Construction changes not previously approved and submitted as as-built drawings at the end of the construction process will be rejected and the securities release will be delayed.

Change of Ownership: If a change of ownership occurs following approval of the drawing(s), the new owner will be required to submit to the City a construction change revising the title sheet of the plan to reflect the new ownership. The construction change shall be submitted to the Engineering front counter as redline mark-ups on two blueline prints of the approved drawing together with two copies of the grant deed or title report reflecting the new ownership. Construction change fees apply. The current owner will be required to post new securities to replace those held by the City under the name of the former owner, and the securities posted by the former owner will be released when the replacement securities have been received and approved by the City.

Change of Engineer of Work: If a change in engineer of work occurs following the approval of the drawing(s), a construction change shall be submitted for review and approval by the Engineering Department. Two copies of the forms for the assumption of responsibility by the new engineer and the release of responsibility by the former engineer shall be completed and submitted to the City. Construction change fees apply.

As-builts: Project as-built drawings prepared by the Engineer of Work will be required prior to Final Grading acceptance by Engineering Services. Changes to the approved plans require a construction change to be submitted to the City prior to field implementation. Construction changes may not be submitted as as-builts at the end of the construction process.

This letter does not change owner or successor-in-interest obligations. If there should be a substantial delay in the start of your project or a change of ownership, please contact the City to request an update.

Should you have questions regarding the posting of securities, please contact Debra Geishart, who processes all Engineering securities, at (760) 633-2779.

Should you have any other questions, please contact me at (760) 633-**** or visit the Engineering Counter at the Civic Center to speak with an Engineering Technician.

ASSUMPTION OF RESPONSIBILITY LETTER FOR CHANGE OF ENGINEER OF WORK

Date: _____

To: City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Planning Case no.: (if applicable)
Engineering Project No.:
Project Name:
Owner Name:
Site Address:

In accordance with Section 23.24-360 of the City of Encinitas Municipal Code, please be advised that _____ (Engineering Firm), as new engineer of work, assumes all professional responsibility and liability for the above-referenced project and for the items outlined in the Declaration of Responsible Charge for this project. _____, the previous engineer of work, will no longer be responsible for the project.

Sincerely,

_____
Signature
Printed Name
Name of Engineering Firm

Affix Professional Seal

Please Note: The letter as given above shall be printed on company letterhead and signed and sealed by the New Engineer of Work.

RELEASE OF RESPONSIBILITY LETTER FOR CHANGE OF ENGINEER OF WORK

Date: _____

To: City of Encinitas
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Planning Case no.: (if applicable)
Engineering Project No.:
Project Name:
Owner Name:
Site Address:

In accordance with Section 23.24-360 of the City of Encinitas Municipal Code, please be advised that _____ (Engineering Firm) releases all professional responsibility and liability for the above-referenced project and for the items outlined in the Declaration of Responsible Charge as shown on the plans.

Sincerely,

_____
Signature
Printed Name
Name of Engineering Firm

Affix Professional Seal

Please Note: The letter as given above shall be printed on company letterhead and signed and sealed by the Engineer releasing professional responsibility to the New Engineer of Work..

ASSUMPTION OF RESPONSIBILITY LETTER FOR CHANGE OF SOILS ENGINEER OF WORK

Date: _____

City of Encinitas
Engineering Department
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Planning Case No.: (if applicable)
Engineering Project Number:
Project Name:
Owner Name:
Site Address:

References: List each geotechnical document for the project

In accordance with Section 23.24-360 of the City of Encinitas Municipal Code, please be advised that we have reviewed the project plans and all reports and/ or work as listed above. We hereby state that we concur with the findings, conclusions, and recommendations listed in the reports and are satisfied with the work performed. We hereby assume all professional responsibility and liability as the new soils engineer of work for the above-referenced project.

Sincerely,

_____
Signature
Printed Name
Name of Engineering Firm

Affix Professional Seal

Please Note: The letter as given above shall be printed on company letterhead and signed and sealed by the Engineer releasing professional responsibility to the New Engineer of Work.

OWNER'S FORM
FOR CHANGE OF ENGINEER OF WORK

Date: _____

City of Encinitas
Engineering Department
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Planning Case No.: (if applicable)
Engineering Project Number:
Project Name:
Owner Name:
Site Address:

In accordance with Section 23.24-360 of the City of Encinitas Municipal Code, please be advised that we, as property owners of the above-referenced property, hereby verify a chance of professional (engineer, soils engineer, or engineering geologist) from _____ (previous engineering firm) to _____ (new engineering firm).

Sincerely,

_____
Signature
Printed Name
Owner

Please Note: Each owner or a legally authorized representative of each owner listed on the property title report must sign the owner's form.

REQUIREMENTS FOR DEDICATION AND PUBLIC IMPROVEMENT

I. Residential Requirements for Dedication and Public Improvement

New Square Footage Proposed[1]	Right-of-way Dedication Required	Public Improvement Required[2]	Underground Service Required[3]
Less than 500 sf habitable space	No	No	No
Between 500 and 2000 sf habitable	Yes	No	Yes
Habitable/ nonhabitable combined > 750 sf	Yes	No	No, unless habitable > 500 sf
More than 2000 sf habitable	Yes	Yes	Yes
Habitable/ nonhabitable combined > 2500 sf	Yes	Yes	Yes, provided habitable > 500 sf
New Single Family Residence[4]	Yes	Yes	Yes
Electrical panel upgrade > 200 Amps	No	No	Yes

Notes:

1 Square footages are cumulative over the five years previous to the time of application (beginning 05/14/2007 onward). Remodeling counts if square footage is increased.

2 Single family homes are exempt from undergrounding of main utility lines but may be required to provide other public improvements

3 This requirement pertains to service lines only, not the main line along the property frontage carrying utilities to multiple properties

4 Zoning Code definition of New Residence does not apply; remodeling may trigger dedication and improvement requirements only if additional square footage is created.

II. Commercial Requirements for Dedication and Public Improvement

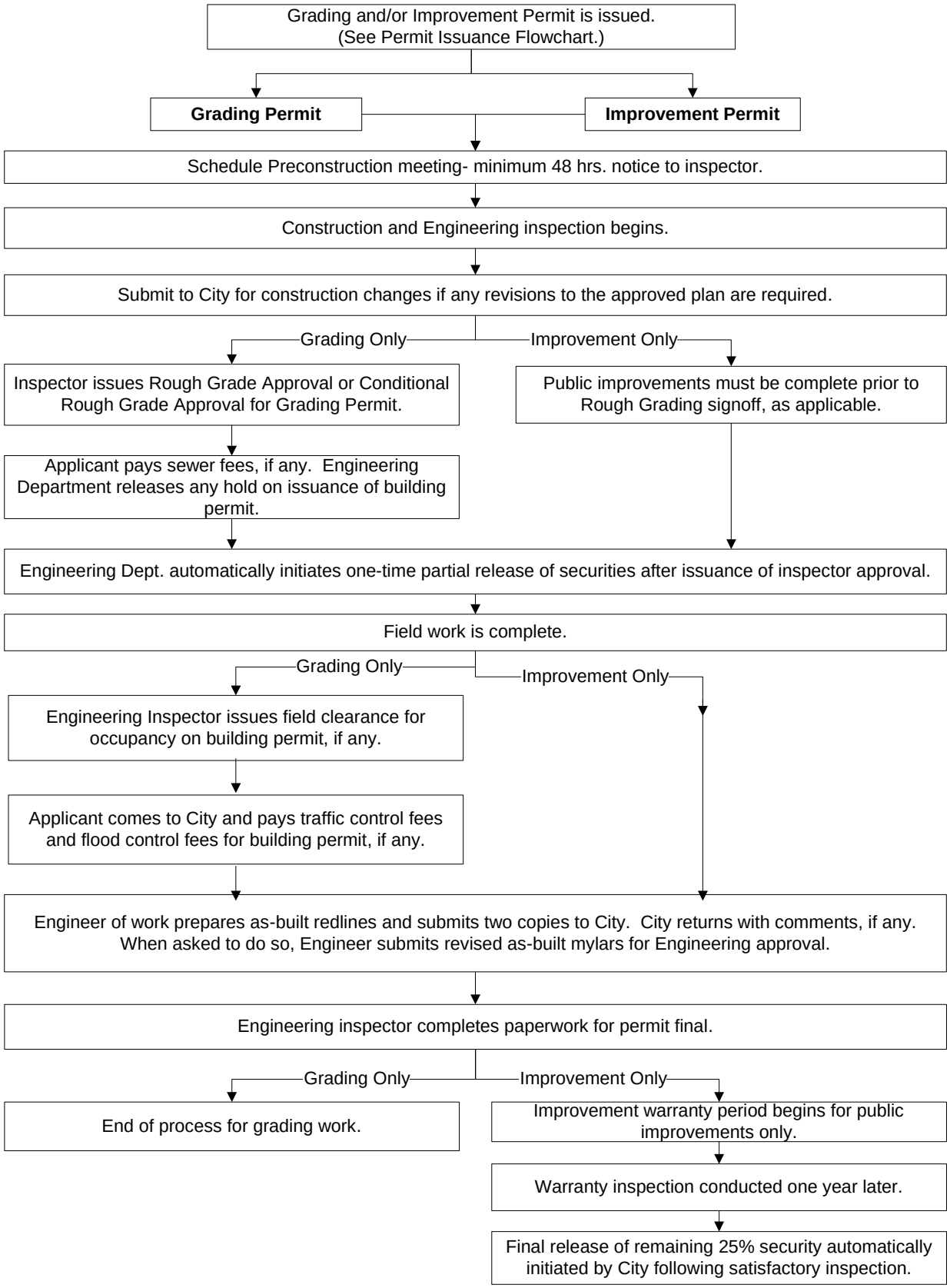
New Square Footage Proposed[5]	Right-of-way Dedication Required	Public Improvement Required[6]	Underground Service Required
New commercial construction < 500 sf	No	No	No
New commercial construction > 500 sf	Yes	Yes	Yes

Notes:

5 Square footages are cumulative over the five years previous to the time of application (beginning 05/14/2007 onward), and interior remodeling does not count towards the requirement unless square footage is added. However, if a discretionary permit is required, then commercial projects below the threshold may still be required to provide public improvement as a part of the conditions of approval.

6 Public improvements for commercial construction may include utility undergrounding along the property frontage.

CONSTRUCTION PHASE FLOWCHART



ENGINEERING SERVICES
AFTER-HOURS INSPECTION REQUEST FORM

The application must be submitted 48 hours in advance of the inspection date requested. A fee of $500.00 is required for inspection outside normal hours.

Developer: _____
Billing Address: _____
_____
Project Name: _____
Project Number: _____ **Phone Number:** _____
Date of Work: _____
Hours of Operation: _____ __.m. to _____ __.m.
Work to be Done: _____
_____

Conditions are Agreed to as Follows:

1. All current requirements of the Grading Ordinance 88-16 remain valid with this permit.
2. An Engineering Inspector must monitor all work on site as per the permit/ drawings.
3. Requestor will pay for all costs associated with the inspection.
4. The job superintendent is required to be on site full time during the entire inspection requested time period.
5. A soils technician is required to be on site full time during all fill or backfill operations.
6. Penalties for violation are stated in the Grading Ordinance 88-16.
7. An approved Traffic Control Plan must be obtained 48 hours prior to the execution of the work.
8. The Noise Ordinance shall be enforced and limits the hours of operation to between 7 am and 7 pm, with a maximum noise level of 75 decibels for more than 8 hours in a 24 hour period (Except night work).
9. The Engineering Inspector's approval is required prior to the start of work.
10. Night work hours are 9 pm - 6 am.

SPECIAL CONDITIONS: _____

_____

_____ _____
Developer Printed Name Developer Signature

Request for Overtime Inspection Approval:

_____ _____
Field Operations

ENGINEERING SERVICES
ROUGH GRADING APPROVAL REQUEST FORM

Developer: _____
Address: _____
_____
Grading Permit Number: _____
Engineer of Record: _____
Geotechnical Engineer: _____
Contractor: _____
Project Manager: _____
Rough Grading Approval is requested for the following lots:

_____

_____

The following attachments are included as required for Rough Grading Approval:

☐ Inspector's Rough Grading Approval Checklist

☐ Geotechnical reports for each of the above-referenced lots

☐ Engineer's Pad Certification report for each of the above-referenced lots

☐ Wall certification reports

Inspector: _____

Engineering Rough Grading Approval Requirements

Project: _____ Grading Permit: _____

The following requirements are the minimum allowable prior to rough grading approval.

1. All grading operations required to obtain the elevations shown on the grading plan are complete and pad elevations are within 0.1 foot.

   Approved: _____ Date: _____

   Provide geotechnical report certifying the grading has been performed in accordance with the soils report and the compaction test results shall be submitted to the City.

   Approved: _____ Date: _____

   Each retaining wall shown on the approved grading plans requires a Letter of Certification from the geotechnical engineer certifying that it was inspected and constructed in accordance with the geotechnical recommendations and that it conforms to the approved plan.

   Approved: _____ Date: _____

2. All drainage systems, public and private, surface and subsurface, have been installed and completed as per the grading plan, and have been inspected and approved by the inspector. Yard drain inlets need not be installed prior to rough grading approval.

   Approved: _____ Date: _____

3. All sewer systems shall be installed and accepted by the City Engineering Inspector and by the applicable sewer district.

   Approved: _____ Date: _____

4. All water systems, including fire protection systems, are to be installed and accepted by the appropriate water district and by the City as compete, including pressure testing, bacteria testing, and chlorinating.

   Approved: _____ Date: _____

Engineering Rough Grading Approval Requirements
Project: _____ Grading Permit: _____

5. Curb and gutter, sidewalk grades are completed and R-value tests have been taken. Letter of Certification from the Engineer certifying line and grade as required. Compaction report from the geotechnical engineer is also required.

   Approved: _____ Date: _____

6. All fire hydrants are to be installed, tested, inspected, and accepted by the Fire Department.

   Approved: _____ Date: _____

7. All roads are to be installed, except for the final lift of paving.

   Approved: _____ Date: _____

8. All dry utilities shall be installed, inspected, and approved by the appropriate agency.

   Approved: _____ Date: _____

9. All trails shall be installed, inspected, and approved by the Parks and Recreation Department.

   Approved: _____ Date: _____

10. All erosion control elements of the final erosion and sediment control plan are in place.

    Approved: _____ Date: _____

11. All other safety and health issues as required by the City to ensure a safe and hazard-free environment.

    Approved: _____ Date: _____

These items are to be submitted to the City Inspector along with a written request for rough grading approval. The inspector will approve or disapprove the request and forward to the Engineering Department.

ENGINEERING SERVICES
SAMPLE PAD CERTIFICATION LETTER

Date: _____

City of Encinitas
Engineering Services Permits
505 South Vulcan Ave.
Encinitas, CA 92024

RE: Engineer's Pad Certification
For Project No:_____ TM/TPM and Grading Permit No.: _____-G

Pursuant to Section 23.24.310 of the City of Encinitas Municipal Code, this letter is hereby submitted as a Pad Certification Letter for lots _____ through and including _____. As the Engineer of Record for the subject project, I hereby state all rough grading for these lots has been completed in conformance with the approved plans and the requirements of the City of Encinitas, Codes and Standards.

23.24.310 (B). The following list provides the pad elevations as field verified and shown on the approved grading plan:

	Lot No.	Pad Elevation per Plan	Pad Elevation per Field Measurement
Example:	*1*	*100.00*	*100.06*
	2	*103.00*	*102.96*

23.24.310 (B)1. Construction of line and grade for all engineered drainage devices and/ or retaining walls have been field verified and are in substantial conformance with the subject grading plan.

23.24.310 (B)5. The location and inclination of all manufactured slopes have been field verified and are in substantial conformance with the subject grading plan.

23.24.310 (B)6. The construction of earthen berms and positive building and pad drainage have been field verified and are in substantial conformance with the subject grading plan.

The above information shall be on the Engineer of Record's letterhead and shall be signed and sealed by the Engineer of Record.

ENGINEERING SERVICES
ROUGH GRADING CONDITIONAL APPROVAL

Date: _____

To: Subdivision Engineering
Public Service Counter

From: Field Operations
Private Contract Inspection

RE: Grading Permit No.: _____-G
Building Permit No.: _____

Project Name: _____

Developer: _____

Site Location: _____

The proposed grading of the subject site will require construction of retaining walls that are also building walls. The inspection of the site retaining walls is to be done by the Field Operations Division of the Engineering Services Department. However, the inspection of the building retaining walls is to be done by the Building Inspection Division of the Community Development department. Therefore, issuance of the necessary Building Permit is requested in order to facilitate the completion of rough grading.

No inspections beyond footings and foundation are to be provided by Building Inspection until a notice of rough grading approval, without conditions, is signed by the Engineering Inspector and transmitted. Framing is prohibited.

_____ _____
Signature of Engineering Inspector Date

_____ _____
Signature of Senior Civil Engineer, if required Date

Special Note: Submit a completed copy of this form to the Engineering counter technicians. A subsequent full rough grading approval is still required. Office staff will handle the appropriate reductions in security, if any, and will coordinate with Building Inspection. Thank you.

ENGINEERING SERVICES
FIELD CLEARANCE TO ALLOW BUILDING OCCUPANCY

This form is no longer in use. Please refer to Appendix 2.35.

SAMPLE BLUE CARD FORM

FINAL INSPECTION APPROVALS

CITY OF ENCINITAS BUILDING DIVISION
505 S. VULCAN AVENUE, ENCINITAS, CA 92024
(760) 633-2730 / (760) 633-2739 INSPECTION REQUESTS

PERMIT NO._____

Please note: This form must be completed and returned to the Building Department ***BEFORE YOU REQUEST A FINAL INSPECTION.***

Project address(es) _____

_____

Project description _____

_____

APPROVALS OF THE FOLLOWING ARE REQUIRED PRIOR TO REQUESTING A FINAL INSPECTION:

☐ ENGINEERING (760) _____
BY _____ DATE _____

☐ PLANNING (760) 633-2710
BY _____ DATE _____

☐ FIRE PREVENTION (760) 633-2820
BY _____ DATE _____

☐ SDWD WATER ENGINEERING (760) 633-2709
BY _____ DATE _____

☐ COUNTY HEALTH - HAZMAT (619) 338-2222
BY _____ DATE _____

☐ _____ _____
BY _____ DATE _____

c:\winword\formdocs\finals.doc2001/01

ENGINEERING SERVICES
ENGINEER'S FINAL GRADING CERTIFICATION

This form is no longer in use. Please refer to Appendix 2.35.

STANDARD NOTES FOR IMPROVEMENT PLAN TITLE SHEETS

1. A permit shall be obtained from the Encinitas Engineering Services Department for any work within the street right-of-way.

2A. The structural section shall be in accordance with City of Encinitas Public Road Standards. R value tests shall be required prior to construction. (To be used for public improvements)

2B. The structural section shall be in accordance with City of Encinitas Standards. R value tests shall be required prior to construction. (To be used for private improvements)

3. Approval of these improvement plans as shown does not constitute approval of any construction outside the project boundary.

4. All underground utilities within the street right-of-way shall be constructed, connected and tested prior to construction of berm, curb, cross gutter and paving.

5. The existence and location of existing underground facilities shown on these plans were obtained by a search of the available records. To the best of our knowledge, there are no other existing facilities except as shown on these plans. However, the contractor is required to take precautionary measures to protect any existing facility shown hereon and any other which is not of record or not shown on these plans.

6. Location and elevation of improvements to be met by work to be done shall be confirmed by field measurements prior to construction of new work. Contractor will make exploratory excavations and locate existing underground facilities sufficiently ahead of construction to permit revisions to plans if revisions are necessary because of actual location of existing facilities.

7. The contractor shall notify San Diego Gas and Electric Company prior to starting work near company facilities and shall coordinate his/her work with company representatives.

NOTICE: All electrical and gas services within this project are "Underground Installations". For location of electrical cables and gas

piping and appurtenances contact the San Diego Gas & Electric Company.

Telephone: (800) 422-4133

8. The contractor shall notify Pacific Bell prior to starting work near company facilities and shall coordinate his/her work with company representatives.

NOTICE: All telephone services within this project boundary are "Underground Installations". For location of cables and appurtenances contact Pacific Bell.

Telephone: (800) 422-4133

9. It shall be the responsibility of the developer to contact the utility agencies, advise them of the proposed improvements, and bear the cost of relocations, if needed.

10. All television services within this project are "Underground Installations". For location of cables and appurtenances contact (800) 422-4133.

11. Power sources and runs serving street lights shall be shown on the "As Built" improvement drawings. All sources shall be located within the dedicated right-of-way, or within easements dedicated to the City of Encinitas. (Used for public improvements)

12. No paving shall be done until existing power poles are relocated outside the areas to be paved.

13. Private road improvements shown hereon are for information only. City officials signature hereon does not constitute approval or responsibility of any kind for the design or construction of these private improvements. (Used for private improvements)

14. All luminaires shall provide true 90 degree cutoff, and allow no escape of light above the horizontal. (Used for public improvements)

15. The contractor shall request from the Engineering Services Department a pre-construction meeting and shall provide at least 48 hours of notice for such a meeting. Phone number for your inspector will be stamped on your permit.

16. The developer shall be responsible that any monument or bench mark which is disturbed or destroyed shall be re-established and replaced by a registered Civil Engineer or a licensed Land Surveyor.

17. The developer shall mark the location of each sewer lateral and water service by chiseling the letters "S" and "W", respectively, 2 inches high into the face of the curb.

18. The address of each lot shall be painted on the curb in a manner and location approved by the inspector.

19. All work shall be done in accordance with the Standard Specifications for Public Works Construction (latest edition), the San Diego Standard Special Provisions to the Standard Specifications for Public Works Construction (adopted by the San Diego Regional Standards Committee), and the San Diego Regional Standard Drawings (latest edition).

STANDARD NOTES FOR SEWER IMPROVEMENT PLANS

ENCINITAS SANITARY DISTRICT
CARDIFF SANITATION DISTRICT

ALL WORK SHALL BE DONE IF ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION "GREENBOOK", (LATEST EDITION), THE SAN DIEGO STANDARD SPECIAL PROVISIONS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, (LATEST EDITION ADOPTED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE), THE SAN DIEGO REGIONAL STANDARD DRAWINGS (LATEST EDITION) AND THE FOLLOWING SPECIAL PROVISIONS:

1. TRENCH WIDTH SHALL BE PER SDRSD NO. SP-02 UNLESS OTHERWISE NOTED. MINIMUM PIPE SEPARATION PER WAS WI-01, 02, & 03.

2. PIPE AND BEDDING CONDITIONS:

   (A) ALL PIPE SHALL HAVE 4" MINIMUM OF ¾" CRUSHED ROCK BENEATH THE PIPE.
   (B) V.C.P. PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE SAND, GRAVEL, CRUSHED AGGREGATE, NATIVE FREE-DRAINING GRANDULAR MATERIAL HAVING A SAND EQUIVALENT OR 30 OR BETTER.
   (C) P.V.C. AND A.B.S. SOLID WALL PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE ¾" CRUSHED ROCK. A.B.S. SOLID WALL PIPE MAY BE USED ONLY WHERE PIPE INVERT GRADES ARE 1% OR GREATER.

3. AFTER COMPLETION OF PIPE LAYING, ALL MAIN LINE SEWERS, SEWER SERVICE LATERALS AND STRUCTURES SHALL BE TESTED IN THE PRESENCE OF THE INSPECTOR. AN AIR PRESSURE TEST SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.

4. THE CONSTRUCTION OF P.C.C. SEWER MANHOLES SHALL BE PER SDRSD NO. SM-02. POURED IN PLACE MANHOLE BASES SHALL BE A MONOLITHIC POUR FINISHED COMPLETE AT TIME OF POUR. PRECAST MANHOLE BASES ARE ACCEPTABLE FOR USE WITH 8-INCH COLLECTOR SYSTEMS WITH CITY ENGINEER'S APPROVAL.

5. THE CONSTRUCTION OF 4-INCH SEWER LATERALS SHALL BE PER SDRSD NO'S SS-01 AND SS-02. LATERALS SHALL NOT DISCHARGE DIRECTLY INTO MANHOLES.

6. THE CONSTRUCTION OF CONCRETE CUT-OFF WALLS SHALL BE CONSTRUCTED AS PER SDRSD NO. SP-07.

7. ALL MAINS AND LATERALS SHALL BE A MINIMUM OF 42-INCHES BELOW THE FINISHED GRADE.

8. THE FINAL LOCATION AND ELEVATION OF SEWER AND WATER MAINS AND LATERALS SHALL BE SHOWN ON ORIGINAL AS-BUILT PLANS PRIOR TO ACCEPTANCE OF WORK.

9. FOR SEWER LATERAL TABLE, SEE SHEET ___.

10. "AS BUILT" DRAWINGS MUST BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.

11. ALL DESIGN CHANGES OF SEWER MAINS SHALL BE APPROVED BY A CONSTRUCTION CHANGE PRIOR TO ACCEPTANCE FOR PUBLIC USE.

12. FILL AREAS MUST BE COMPACTED TO 90% PRIOR TO PIPE INSTALLATION.

13. THE CONTRACTOR SHALL NOTIFY THE CITY'S FIELD OPERATIONS DIVISION 48 HOURS IN ADVANCE OF BEGINNING WORK TO ARRANGE FOR PRE-CON AND INSPECTION OF PROJECT. PHONE 760-633-2770.

14. CONTRACTOR SHALL OBTAIN A PERMIT FROM THE CITY'S ENGINEERING SERVICES DEPARTMENT FOR ANY EXCAVATION WITHIN CITY RIGHTS-OF-WAY.

15. THE APPLICANT SHALL WARRANTY THE PUBLIC SEWER FOR ONE YEAR FOLLOWING THE APPROVAL OF THE AS-BUILTS.

16. CONTRACTOR SHALL FURNISH AND INSTALL, PER SDRSD SP-01, THE APPROPRIATE BURIED UTILITY WARNING AND IDENTIFICATION TAPE ABOVE ALL PUBLIC SEWER LINES AND PORTIONS OF SEWER LATERALS LOCATED WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS.

17. THE DEVELOPER SHALL PROVIDE EASEMENTS AND ACCESS ROADS OVER PUBLIC SEWERS TO THE SATISFACTION OF THE CITY ENGINEER. THESE ARE TO BE SHOWN ON THIS PLAN.

18. WASTEWATER DISCHARGE AND PLUMBING PERMITS ARE REQUIRED PRIOR TO CONNECTION TO THE SANITARY SEWER SYSTEM.

19. ALL NEW SEWER MAINS SHALL BE INSPECTED BY CLOSED CIRCUIT TELEVISION AFTER COMPLETION OF TRENCHING BACKFILL AND FINISHED GRADING BUT PRIOR TO PLACEMENT OF PAVEMENT OR PERMANENT TRENCH RESURFACING. CONTRACTOR SHALL PROVIDE FOR TELEVISION INSPECTION. (SEE 500-1.1.5)

20. SEWER MANHOLE LINING:

    (A) NEW MANHOLES WITH 8-10" DIAMETER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.
    (B) NEW MANHOLES WITH 12" DIAMETER AND GREATER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE PROVIDED WITH INTEGRALLY LOCKING PVC LINING PER SECTION 500-2.5 OF THE GREENBOOK.
    (C) EXISTING MANHOLES: ALL EXISTING MANHOLES WITH NEW CONNECTIONS SHALL BE INSPECTED AND REPAIRED, AS NEEDED, WITH THE LINING SYSTEM THAT MATCHES THE EXISTING LINING FOR THAT MANHOLE; FOR MANHOLES WITHOUT ANY EXISTING LINING, THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.

EXCEPTIONS OR VARIATIONS TO THESE LINING REQUIREMENTS MAY BE CONSIDERED ON A CASE-BY-CASE BASIS BY THE CITY ENGINEER.

21. NO ADDITIONAL LATERALS SHALL BE PERMITTED WITHOUT PAYING SEWER CAPACITY FEES, PROCESSING A CONSTRUCTION CHANGE, AND JOINING ANY APPLICABLE SEWER REIMBURSEMENT DISTRICT.

22. MANHOLE FRAMES AND COVERS SHALL BE MADE IN THE USA OF HEAVY DUTY CAST-IRON TYPE WITH A 36-INCH OPENING. MANHOLE COVER INSERTS SHALL BE 24-INCH DIAMETER WITH LETTERING STATING "CITY OF ENCINITAS" AND "SEWER" SIMILAR TO WHAT IS INDICATED ON SDRSD M-1.

CITY OF ENCINITAS- DEPARTMENT OF ENGINEERING
IMPROVEMENT PLAN CHECKLIST

Owner's Name: _____ **Permit #:** _____

Site Address: _____ **Set#:** _____

Project Description: _____ **APN:** _____

Contact Person: _____ **Phone:** _____

Planning Case: _____ **Date:** _____

Plan Checker:_____

Satisfactory? **P C Phone:** _____

☐ 1. Key Map with Legend (See Section E) for large projects spanning multiple sheets. Scale 1" = 200'.

☐ 2. North arrow on all sheets.

☐ 3. Written and graphic scales on all sheets. An engineering (ex, 1" = 20') scale is required.

☐ 4. Vicinity Map on title sheet.

☐ 5. List of work to be done together with applicable standard drawing numbers to be shown on sheet 1 or 2.

☐ 6. Complete information for a City-approved benchmark, NAVD 88 datum. Assumed benchmarks are not allowed.

☐ 7. Location of easements and floodplain.

☐ 8. Show existing and proposed rights-of-way and easements.

☐ 9. Existing and proposed improvements within Right-of-Way. Work in R-O-W requires separate Eng. permit(s).

☐ 10. Location and dimensions of existing/ proposed buildings, structures, utilities, parking, and landscape areas.

☐ 11. Plan and profile of all proposed drainage facilities.

☐ 12. Existing/proposed drainage facilities (pipes, inlets/outlets, swales, etc.) No increase in cross lot drainage allowed.

☐ 13. Direction of water flow onto and off the property, with flow line elevations.

☐ 14. Contour lines of existing/proposed topography to continue at least 15 feet beyond property lines.

☐ 15. Map showing all drainage areas affecting the proposed improvements.

☐ 16. Quantities of grading including cut, fill, import/export, and over-excavation & re-compaction.

☐ 17. Finished grades; contours and/or spot elevations including finished pad elevation.

☐ 18. Check for non-erosive velocities at point of discharge or install adequate dissipater.

- ☐ 19. Label all objects on plan as either existing or proposed.
- ☐ 20. Reference other plans that are a part of this project (Planning Case and/or Grading/Improvement Plan).
- ☐ 21. Street horizontal curves to conform with City standards and sight distance requirements.
- ☐ 22. Plan and profile of all proposed sewer and/ or water lines including existing natural and proposed grade.
- ☐ 23. Undergrounding of overhead utilities and/ or utility service as required; each utility pole shown.
- ☐ 24. Stationing on plan and profiles consistent with City requirements.
- ☐ 23. Street names shown.
- ☐ 23. Curb return data and profiles provided.
- ☐ 24. Proposed lighting shown.
- ☐ 23. Stormwater quality features shown with construction details.

Please Note: Some of the most basic plancheck items are listed here. The project planchecker will require additional information based upon the specifics of the work proposed.

ENGINEERING SERVICES
ROUGH GRADING APPROVAL

Date: _____

To: Subdivision Engineering- Public Service Counter

From: Field Operations- Private Contract Inspection

RE: Grading Permit No.: _____-G
Building Permit No.: _____

Project Name: _____

Developer: _____

Site Location: _____

I have inspected the grading at the subject site and have verified certification of the pad by the Engineer of Work, _____ dated _____. I am hereby satisfied that the rough grading has been completed in accordance with the approved plans and specifications, Chapter 23.24 of the Municipal Code, and any other applicable engineering standards and specific project requirements.

Based on my observation and the certifications, I take no exception to the issuance of a building permit for the lots(s) as noted or Phase _____, if any, but only so far as grading is concerned. However, this release is not intended to certify the project with respect to other engineering concerns, including public road, drainage, water, sewer, park, and trail improvements, and their availability, any other public improvements deferred monumentation, or final grading.

Prior to final inspection of the Building Permit(s) and legal occupancy, I need to be further advised so that I can verify that final grading (i.e., finished precise grading, planting, and irrigation) has been completed in accordance with the approved plans and specifications.

_____ _____
Signature of Engineering Inspector Date

_____ _____
Signature of Senior Civil Engineer, only if required Date

Special Note: Submit this completed form to counter staff by placing a copy of it in the designated folder at the front counter. Please remember to do a final inspection of the grading permit and submit that paperwork when it is complete. Office staff will handle the appropriate reduction in security, if any.

ENGINEER'S CERTIFICATION OF FINAL GRADING AND REQUEST FOR FIELD CLEARANCE FOR OCCUPANCY

Instructions:

1. Engineer of Record completes Part 1 of this form
2. Engineer of Record provides a wet-signed and sealed original of this complete form to the Engineering Inspector. As-built processing begins (see last page of App. 2.35).
3. Engineering Inspector verifies issuance of occupancy is merited and signs Part 2 of this form. *The Inspector will not sign the "Blue Card" issued by the Building Dept.*
4. Development Review Engineer verifies and signs Part 3 of this form
5. Engineering Inspector copies the form and distributes as follows:
    a. Copy 1: Engineering Front Counter "Final Inspection" folder
    b. Copy 2: Stormwater Division "Construction" folder
6. Final security release occurs when As-Builts are approved for the entire project

PART 1: For Completion by Engineer of Record

Engineer's Certification for: ☐ Final Grading/Occupancy
☐ Partial Grading/Occupancy Lot # _____

1A: Project Information

Grading/Improvement Permit #:		Final/Parcel Map #:	
Developer Name:		Lot #:	
Address:		Planning Case #:	
APN(s):		Building Permit #:	
Stormwater Project Type:	☐ Priority ☐ Standard ☐ Basic		

1B: Engineer of Record Information

Engineer of Record Name:			
Business or Company Name:			
Address:			
Phone:		Email:	

Part 1C: Engineer of Record Certification Statements

Grading/Improvement Permit #:		Developer Name:	

Certification for Grading/Occupancy Stage: ☐ Final ☐ Partial

I, Engineer of Record, or an authorized representative under my responsible charge, have inspected the project site. Based upon my field verification and survey, I hereby certify:

Engineer Initials	Engineer's Certification Statement
	Pad certifications have been provided indicating that the grading under the above- referenced grading permit has been performed in substantial conformance with the approved grading plan or as per the approved plan. All building pads and finished elevations are within 0.1 foot of the approved plan elevations.
	All improvements have been constructed per the approved plans.
	All Source Control, Site Design (Low Impact Development), Pollutant Control, and Hydromodification Structural Best Management Practices (BMPs) as shown on the drawings have been field-verified and photo-documented to be consistent with the approved plans in size, design, cross-section, orifice size, subdrain design, overflow drain, vegetation cover, and side slopes. All BMPs were field-verified to be operational. Maintenance covenants are in place, as required, and parties responsible for BMP maintenance have been notified.
	As-builts conforming to the requirements of this Appendix have been provided to the Engineering Inspector for Grading/Occupancy stage: ☐ Final ☐ Partial, Lot#_____
	BMP Photographs have been: ☐ Attached to this Certification ☐ Provided Electronically
	Engineer has attached Special Inspection Report, as required per Plan: ☐ Required and Attached ☐ Not Applicable

Hereby Certified:

_____
Engineer Signature

_____
Date

_____
Printed Name

Seal

PART 2: For Completion by Engineering Inspector

The verifications below by the Engineering Inspector and Development Review Engineer do not relieve the Engineer of Record of the ultimate responsibility for the project. *The Engineering Inspector will not sign the Building Dept. "Blue Card".*

Grading/Improvement Permit #:		Developer Name:	

I, Engineering Inspector, have inspected the above-referenced site. Based upon my field verification and satisfactory documentation from the Engineer of Record, I hereby certify:

Inspector Initials	Inspector's Certification Statement
	All BMPs as shown on the drawings have been field-verified to be consistent with the approved plans and to be operational.
	BMP Photographs have been received: ☐ Attached to this Certification ☐ Provided Electronically
	Acceptable Soils Engineer certification has been received: ☐ Final ☐ Partial, Lot#_____
	Finish (precise) grading and any other site-related improvements are substantially complete for Grading/Occupancy Stage: ☐ Final ☐ Partial, Lot#_____
	As-Builts conforming to the requirements of this Appendix were received and field-verified accurate for Grading/Occupancy Stage: ☐ Final ☐ Partial, Lot#_____
	All required utility undergrounding for the entire project is complete.
	Issuance of building occupancy is merited.

Hereby Certified:

_____ _____

Inspector Signature Date

PART 3: For Completion by Development Review Engineer

Engineer Initials	Development Review Engineer's Certification Statement
	All BMPs shown on the drawings have been field-verified and/or photo-verified to be consistent with the plans and to be operational.
	See Special Inspection Report: ☐ Attached to this Certification ☐ Not Applicable

Hereby Certified:

_____ _____

Development Review Engineer Signature Date

As-Built Processing and Requirements

When the Engineering Inspector has deemed the Certification of Final Grading and Request for Issuance of Occupancy form to be complete, the inspector will approve the initiation of As-Built Processing.

At a minimum, As-Built Processing will include:

- Preparation of a Punch List by the Engineering Inspector/Development Review Engineer
- Completion by the developer/contractor of all Punch List items, to the satisfaction of the City Engineer
- Field verification and approval of all grading and improvements by the Development Review Engineer

Incremental (Partial) As-Built Processing for a Portion of a Project

Processing of As-Built Plans is typically done for an entire project or subdivision, meaning that the entire project is as-built at the same time. However, at the request of the developer, the City Engineer may allow As-Built Processing to be done incrementally for portions of a project, either for one phase or one subdivision lot at a time.

If the City Engineer authorizes As-Built Processing to be completed incrementally, the Engineer's Certification of Final Grading and Request for Issuance of Occupancy shall be provided prior to As-Built approval for each phase or lot.

The final security deposit release of funds back to the developer may be authorized only after As-Builts have been approved for the entire project (all lots or phases).

The drawings for a phase or lot-by-lot As-Built shall include:

- A cloud demarcating each lot or phase of the project. Each cloud will indicate an entire area, either a lot or a phase, that will be as-built together at one time.
- A table listing all phases or lots for the project, to be filled out with the as-built date for each, if required by the Development Review Engineer.
- Engineer of Record, Engineering Inspector, and Development Review Engineer approvals (initials and date) inside each cloud, indicating their respective approvals for the As-Built of that particular phase or lot. Prior to final security deposit release, the cloud for every lot must be marked with the Engineer of Record, Engineering Inspector, and Development Review Engineer approvals. Additionally, the Engineer of Record shall sign the As-Built block for the entire record drawing.

CHAPTER 3: GRADING PLAN PREPARATION AND SUBMITTAL REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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CHAPTER 3

GRADING PLAN PREPARATION AND SUBMITTAL REQUIREMENTS.

3.100 GENERAL INFORMATION FOR GRADING PLANS.

The purpose of this chapter is to assist the engineer in preparing a grading plan and submitting it to the City of Encinitas for plancheck.

Prior to issuance of a grading permit, the applicant shall submit for City review and approval a grading plancheck submittal. Information pertaining to the preparation of the grading plan is given in Sections 3.200- 3.500, and items to be included with the grading plancheck submittal are discussed in Section 3.600 below. The grading plancheck process, permit issuance, and the inspection process are discussed in Chapter Two of this manual, Permits and Processing Guidelines.

3.101 *APPLICABLE STATUTES, REQUIREMENTS, AND REFERENCES.*

Grading plans shall conform to requirements given in items A through F below. Standard reference documents are listed as items G through J below. The most current version of all documents shall be used.

A. City of Encinitas Municipal Code. The Grading Ordinance is Chapter 23 of the Municipal Code.

B. Requirements specified in the Conditions of Approval of any associated discretionary permits.

C. Requirements and guidelines specified in this manual.

D. City and staff policies.

E. Generally accepted standards for professional engineering and construction practice.

F. The City of Encinitas Best Management Practice Manual, Part II.

G. Standard Specifications for Public Works Construction, the "Greenbook".

H. San Diego Area Regional Standard Drawings.

I. County of San Diego Hydrology Manual.

J. County of San Diego Drainage Design Manual.

3.102 *TYPES OF GRADING PERMITS*.

The City of Encinitas issues several different types of grading permits for different kinds of work; each of these is discussed in turn below. The requirements for Precise, Emergency, and Simplified Grading Permits are generally the same as for standard Grading Permits, and exceptions are noted.

3.102.1 Grading Permits. Standard grading permits are referred to simply as "Grading Permits". Grading permits are required for any earth movement, clearing and grubbing, remedial earthwork, drainage modification, and for the creation of new impervious surface areas, unless the work is exempt as per Municipal Code Section 23.24. Requirements for the preparation of grading plans and plancheck submittal are discussed in Sections 3.200-3.500 and Section 3.600 below, respectively. Modifications to the standard requirements for, Simplified, Emergency, and Precise Grading Permits are noted in those sections and are described more fully in Chapter 2 of this manual, Permits and Processing Requirements.

3.102.2 Simplified Grading Permits. A Simplified Grading Permit may be authorized by the City Engineer instead of a standard Grading Permit if the requirements of Section 23.24.125 of the Municipal Code are met. The applicant is required to obtain permission from the City Engineer to submit a simplified grading plan instead of a standard

grading plan prior to making the initial plancheck submittal. If discovered during the plancheck or construction that the requirements for a simplified grading plan/ permit are not met, the applicant may be required to obtain from the City Engineer a standard Grading Permit.

3.102.3 Precise Grading Permits. In some situations, the grading plan initially approved for a project may not show sufficient detail with regards to existing and/ or proposed structures, building pad elevations, building footprints, existing and proposed drainage, and proposed stormwater treatment measures. In other cases, a building pad is graded long before a structure is proposed to be built upon it, necessitating remedial earthwork to ensure the pad is suitable to receive the structure. In such situations, a second grading permit called a Precise Grading Permit may be required; Precise Grading Permits are discussed in Section 23.24.126 of the Municipal Code. If the proposed work for the precise grading is consistent with the standards for a Simplified Grading Permit as discussed in Section 23.24.125 of the Municipal Code, the City Engineer may approve the proposed grading to be submitted as a part of a Simplified Grading Permit, described in Section 3.102.2 above.

3.102.4 Emergency Grading Permits. Emergency Grading Permits may be issued at the discretion of the City Engineer when immediate grading is necessary due to imminent health, safety, and stability issues. The Emergency Grading Permit is intended to allow emergency work to begin with a minimal processing delay; a Standard Grading Permit is then required to be processed in conjunction with the emergency grading permit. The Emergency Grading Permit process is discussed in Chapter 2 of this manual.

3.103 *OTHER PERMITS REQUIRED.*

The issuance of the grading permit does not relieve the applicant of the responsibility to secure other permits and/ or licenses required for work proposed.

3.103.1 Engineering Permits. A grading permit will be required for any borrow or fill sites within the City, unless exempt from a permit as per the Municipal Code. Additional permits may be required depending upon the nature of the proposed work, such as Traffic Control, Haul Route, Encroachment, Improvement, and Right-of-Way Construction Permits; these are discussed in Chapter 2: Permits and Processing.

3.103.2 Discretionary Permits. Certain projects will require both a discretionary permit, such as a Coastal Development Permit, as well as a Grading Permit. The initial submittal to the Engineering Department for grading plancheck may not be made until any required discretionary permits have been approved and issued, unless otherwise stipulated by both the Director of the Planning Department and the City Engineer In certain cases, the Director of the Planning Department and the City Engineer may agree to allow the grading plancheck submittal to be made prior to discretionary permit approval at the applicant's own risk, subject to the understanding that if the required discretionary permit is not issued, all plancheck fees that have been paid are refundable only according the approved refund policy, which can be found in Appendix 2.14. In no case, however, shall the Grading Permit be issued before any associated discretionary permits have been approved and issued.

3.103.3 Building Permits. The building plancheck shall not be submitted for review prior to the initial submittal of the grading plancheck, unless otherwise approved by the City Engineer. The Building Permit shall not be issued until issuance of rough grade approval by the Engineering Inspector for the Grading Permit, with the exception noted in the paragraph below.

In cases in which the work proposed with the Building Permit is integral to that proposed with the Grading Permit, such basement excavations, the City Engineer and the Director of the Building Department may allow a limited Building Permit to be issued prior to Rough Grade Approval. The limited Building Permit will allow for a

reduced scope of work to be completed prior to Rough Grade Approval and the issuance of the full Building Permit.

3.200 GENERAL GRADING PLAN FORMAT REQUIREMENTS.

The following items are among those that will be checked during the grading plancheck. Requirements pertaining specifically to the Title, Grading, and Erosion Control sheets are discussed in Sections 3.300, 3.400, and 3.500 of this manual, respectively.

3.201 *LEGIBILITY.*

The grading plan shall be legibly drawn, printed on paper during the plancheck process, and then printed on polyester base film at the time the final grading plan is requested by the City for approval. Lettering shall be no smaller than 0.10 inch. The ink used shall be black, opaque, and permanent in nature. Ink used on polyester base film shall be coated with a suitable substance to assure permanent legibility. Ammonia or electrostatic types of processes are not permitted. No shading or crosshatching will be permitted on map sheets. Sticky-backs are not acceptable. Backside printing is not allowed.

3.202 *SHEET SIZE.*

The size of each sheet shall be 24 x 36 inches. A one-inch margin line shall be drawn completely around each sheet. The margin shall be left blank except for certain information as directed below.

3.203 *ITEMS TO APPEAR IN MARGIN.*

The area outside of the one-inch margin line shall be left blank except for the name, address, and contact information of the engineering office preparing the grading plan. This information shall be included in the margin near the lower right-hand corner of the title sheet.

3.204 *TITLE BLOCK.*

The words "*GRADING PLAN FOR [Name of Project], [Address of Project]"* shall be printed in the title block at the lower right-hand corner of each sheet. In the lower

left-hand corner of the title block, the numbers of any associated discretionary permits and/or any associated grading or improvement plan numbers, including previously issued permits for the property, shall be included. A sample grading title sheet including the title block is included as Appendix 3.2 of this manual and is also available on the City website.

3.205 *SHEET NUMBERING.*

The sheet number and total number of sheets shall be printed on the grading plan as shown in Appendix 3.2.

3.206 *SCALE AND NORTH ARROW.*

The grading plan scale shall be selected in order to allow clarity while minimizing the need for details and tabular data; typical scales are 1" = 20' and 1" = 10'. An engineering scale as opposed to an architectural scale (e.g. ¼" = 1') shall be utilized. The scale and north arrow shall be shown on all sheets and on details, with the north arrow pointing to the top or right of the sheet. A graphic scale a minimum of four inches long is required. When a detail has no scale, indicate "Not to Scale".

3.207 *TITLE/ SIGNATURE BLOCK.*

The grading plan shall bear a title/ signature block including a box for every required approval signature and be placed on each sheet of the plan. Grading plans are required to be signed by all City departments, Planning, Fire Prevention, Parks and Recreation, Public Works, and Engineering. In addition, signatures from other agencies such as San Dieguito Water District (SDWD), Olivenhain Municipal Water District (OMWD), Leucadia Wastewater District, and the County Department of Environmental Health shall be included when the project falls under the jurisdiction of one of these agencies. The signature block shall also include the signature of the engineer of work. A construction change block shall be included on the far left side of the signature block. Signatures shall be obtained on the final mylar of the grading plan by the engineer of work or the applicant prior to submittal of the mylar to the Engineering Department for consideration of approval.

3.300 REQUIREMENTS FOR THE GRADING PLAN TITLE SHEET.

The title sheet is the first sheet of the grading plan and consists of standard notes, project address and APN, property legal description, owner information, approval signature block, and a legal description of the property being subdivided along with certain required certificates and statements. An example title sheet with the proper location of all certificates and statements is included in Appendix 3.2 and on the City website.

3.301 *STANDARD NOTES.*

The title sheet shall include all of the required notes, including standard grading notes, erosion control notes, and stormwater pollution control notes. These notes are available from the City website and are also included in Appendices 3.3, 3.4, and 3.5 of this manual. Other agencies, such as San Dieguito Water District, may require separate notes to be included on the title sheet. Typical notes for San Dieguito Water District are included in Appendix 3.6.

3.302 *PROJECT INFORMATION.*

The project address, assessor's parcel number(s), and legal description shall be printed on the title sheet. The project address and APN shall also be included in the title block as described in Section 3.204 above. The legal description and APN must match the property title report.

3.303 *PERMITTEE INFORMATION.*

Permittee information including name, company and title (if applicable), mailing address, and phone number shall be shown. The mailing address will be used for project correspondence and may be different than the site address.

3.304 *PROJECT STORMWATER TREATMENT STATUS.*

The project treatment status shall be shown in a box added to the signature block of the title sheet. The reference to the maintenance covenant may be omitted if the Engineering Department does not require a maintenance covenant to be recorded for the project. The block shall appear as follows:

STORMWATER TREATMENT STATUS:

[Priority Project] [Standard Project]
TYPE OF TREATMENT: [Fill in Type; For Example, Grass Swale]
LIMITED ACCESS: [No] [Yes: For Example, Rear Yard Location]
MAINTENANCE RESPONSIBILITY: [Ex, HOA or Owner]
MAINTENANCE COVENANT REC. [Date] AS DOC. NO. _____

3.305 *VICINITY MAP.*

The title sheet shall include a vicinity map showing the location of the project site and shall include, at a minimum, any major streets within the area as well as the name of and distance to the nearest cross street.

3.306 *BENCHMARK.*

Use of a City-approved benchmark is required; City benchmark networks are shown in Appendix 1.13. Other benchmarks may be used, at the discretion of the City Engineer; a benchmark data sheet shall be provided to the City reviewer during plancheck. Assumed benchmarks are not allowed.

The grading plan shall be prepared based on the NAVD 88 datum; the NGVD 29 datum may be provided only in addition to, not instead of, the NAVD 88 datum. All elevations shown on the plan shall be based on the NAVD 88 datum; the provision of an equation for the conversion of NGVD 29 elevations to NAVD 88 elevations is not allowed.

A description of the benchmark shall be included in the title block on each sheet. The benchmark name/ number,

description, location, datum used, and elevation shall be noted.

3.307 ***IMPERVIOUS AREAS.*** Only the impervious area for driveway and parking areas should be given on the plan, not the area for buildings or patios. Flood control fees required for the construction of building and patio areas will be assessed with the building permit for those facilities.

IMPERVIOUS AREA PRIOR TO CONSTRUCTION: _____ SF

IMPERVIOUS AREA AFTER CONSTRUCTION: _____ SF

NET INCREASE IN IMPERVIOUS AREA: _____ SF

3.308 ***ENVIRONMENTAL DATA***.
The environmental data statement is given below.

ENVIRONMENTAL DATA:

A) STEEPEST EXISTING NATURAL SLOPE ONSITE = _____%

B) MAXIMUM VERTICAL DEPTH OF CUT= _____ FEET

C) MAXIMUM VERTICAL DEPTH OF FILL= _____ FEET

D) AVERAGE DEPTH OF CUT =
[Total Cubic Yards Cut] x 27 = _____ FEET
[Total Square Footage of Cut Area]

E) AVERAGE DEPTH OF FILL =
[Total Cubic Yards Fill] x 27 = _____ FEET
[Total Square Footage of Fill Area]

3.309 ***EARTHWORK QUANITITIES***.
The quantities listed in the earthwork quantity statement shall include import, export, cut, fill, and remedial (remove and recompact) quantities. The plancheck engineer may

require earthwork calculations to be submitted with the grading plan.

EARTHWORK QUANTITIES:

A) CUT QUANTITY = _____ C.Y.

B) FILL QUANITITY = _____ C.Y.

C) REMOVE AND RECOMPACT QUANTITY = _____ C.Y.

D) IMPORT QUANTITY = _____ C.Y.

E) EXPORT QUANTITY = _____ C.Y.

3.310 *OWNER'S STATEMENT.*

The applicant must provide evidence that all the parties having any record title interest in the property sign the owner's statement on the grading plan title sheet. The owners, trustees, and beneficiaries listed in the owner's statement must match those listed in the title report. A separate signature line shall be provided for each signatory.

All corporation signatures shall be executed by two authorized officers of the corporation, unless a copy of the resolution passed by its board of directors authorizing a designated officer to sign on behalf of the corporation is furnished to the Engineering Department (refer to Corporations Code Section 313).

The language for the owner's certificate is given below.

I (WE) HEREBY CERTIFY THAT A REGISTERED SOILS ENGINEER OR GEOLOGIST HAS BEEN OR WILL BE RETAINED TO SUPERVISE OVER ALL GRADING ACTIVITY AND ADVISE ON THE COMPACTION AND STABILITY OF THE SITE.

SIGNATURE: _____ DATE: _____
[Printed Name as it Appears on Title]

3.311 *STATEMENT OF ENGINEER OF WORK.*

The engineer of work shall sign and stamp the engineer's statement given below. The grading plan is required to be prepared by a Civil Engineer registered in the State of California.

THE UNDERSIGNED ENGINEER AGREES THAT THE WORK PERFORMED BY THE ENGINEER SHALL COMPLY WITH THE GENERALLY ACCEPTED STANDARDS AND PRACTICES OF THE ENGINEER'S TRADE OR PROFESSION. THE ENGINEER FURTHER AGREES THAT THE WORK PERFORMED HEREIN SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE CITY OF ENCINITAS. THE ENGINEER AGREES THAT ANY PLANCHECK OR REVIEW PERFORMED BY THE CITY OF ENCINITAS IN ITS CAPACITY AS A PUBLIC ENTITY FOR THE PLANS PREPARED BY THE ENGINEER IS NOT A DETERMINATION BY THE CITY OF ENCINITAS OF THE TECHNICAL SUFFICIENCY OR ADEQUACY OF THE PLANS OR DESIGN, AND IT THEREFORE DOES NOT RELIEVE THE ENGINEER OF RESPONSIBILITY FOR THE PLANS OR DESIGN OF IMPROVEMENTS BASED THEREON. THE ENGINEER AGREES TO INDEMNIFY AND HOLD HARMLESS THE CITY OF ENCINITAS AND ITS OFFICERS, AGENTS, AND EMPLOYEES FROM PROPERTY DAMAGE OR BODILY INJURY ARISING SOLELY FROM THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER AND HIS/ HER AGENTS AND EMPLOYEES ACTING WITHIN THE COURSE AND SCOPE OF SUCH AGENCY AND EMPLOYMENT ARISING OUT OF THE WORK PERFORMED BY THE ENGINEER.

SIGNED: _____ *DATE:* _____

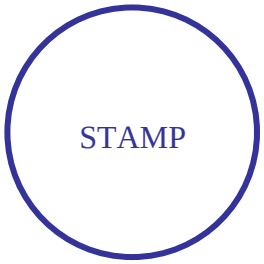
RCE NO.: _____ *EXP. DATE:*_____

[Company]

[Address]

[Phone]

[Engineer's Job No.]



3.312 *SOILS ENGINEER'S CERTIFICATION.*

The project soils engineer shall fill in the information to complete the statement below, sign it, and place his/ her seal beside the signature. The soil engineer's statement shall be signed by both a Registered Soils Engineer and a Certified Engineering Geologist, both licensed within the State of California.

I, [Name], A REGISTERED CIVIL ENGINEER IN THE STATE OF CALIFORNIA, PRINCIPALLY DOING BUSINESS IN THE FIELD OF APPLIED SOIL MECHANICS, HEREBY CERTIFY THAT A SMAPLING AND STUDY OF THE SOIL CONDITIONS PREVALENT WITHIN THIS SITE WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN THE DATES OF [Date] AND [Date]. ONE COMPLETE COPY OF THE SOILS REPORT COMPILED FROM THE STUDY, WITH MY RECOMMENDATIONS, HAS BEEN SUBMITTED TO THE OFFICE OF THE CITY ENGINEER. FURTHERMORE, I HAVE REVIEWED THESE GRADING PLANS AND CERTIFY THAT THE RECOMMENDATIONS INCLUDED IN THE SOILS REPORT FOR THIS PROJECT HAVE BEEN INCORPORATED IN THE GRADING PLANS AND SPECIFICTIONS.

SIGNED: _____ *DATE:* _____

RCE NO.: _____

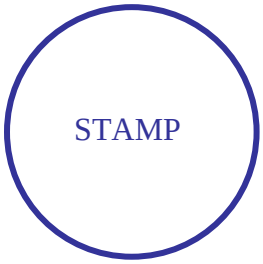
EXP. DATE: _____

[Company]

[Address]

[Phone]

[Engineer's Job No.]



3.313 *OWNER'S STATEMENT FOR SWPPP PROJECTS.*

In the case in which a project proposes land disturbance of one acre or more, an additional certification will be required. The owner/ developer shall execute the statement below.

DEVELOPMENT OF THIS PROJECT SHALL COMPLY WITH ALL THE REQUIREMENTS OF THE MOST RECENT STATE WATER RESOURCES CONTROL BOARD (SWRCB) ORDER, WASTE WATER DISCHARGE REQUIREMENTS FOR DISCHARGES OF STORMWATER RUNOFF ASSOCIATED

WITH CONSTRUCTION ACTIVITY. IN ACCORDANCE WITH SAID PERMIT, A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND A MONITORING PROGRAM PLAN SHALL BE DEVELOPED AND IMPLEMENTED CONCURRENT WITH THE COMMENCEMENT OF GRADING ACTIVITIES , AND A COMPLETE AND ACCURATE NOTICE OF INTENT (NOI) SHALL BE FILED WITH THE SWRCB. A COPY OF THIS PROJECT SWPPP SHALL BE FILED WITH THE CITY OF ENCINITAS; FURTHER, A COPY OF THE COMPLETED NOI FROM THE SWRCB SHOWING THE PERMIT NUMBER FOR THIS PROJECT SHALL BE FILED WITH THE CITY OF ENCINITAS WHEN RECEIVED.

IN ADDITION, THE UNDERSIGNED AND SUBSEQUENT OWNER(S) OF ANY PORTION OF THE PROPERTY COVERED BY THIS GRADING PLAN NO. _____-G AND BY SWRCB NO. R9-2009-0001 AND ANY SUBSEQUENT AMENDMENTS THERETO SHALL COMPLY WITH THE SPECIAL PROVISION AS SET FORTH IN SECTION C.7 OF SWRCB NO. R9-2009-0001.

NOI # _____

_____ _____
SIGNATURE DATE

_____
PRINTED NAME OF ABOVE PERSON TITLE

_____
COMPANY

3.400 REQUIREMENTS FOR THE GRADING SHEET.

3.401 *GENERAL INFORMATION TO BE INCLUDED ON THE GRADING SHEET.*

The following basic information shall be included on the grading sheet. Sections 3.402 through 3.418 below discuss additional information to be shown. In general, existing and proposed topography, drainage, pavement elevations, etcetera are required to be shown on one sheet with the existing screened back and the proposed shown dominantly. With prior approval from the City Engineer, components may be portrayed on separate sheets.

3.401.1 Legend. The grading plan shall include a complete legend showing all existing and proposed improvements. Typical symbology is given in the example legend included as Appendix 3.2.

3.401.2 Property Lines and Easements. Property lines for the property of concern as well as the adjacent properties and existing/ proposed easements/ rights-of-way shall be included on the grading plan with bearings and dimensions stated. All proposed easements/ rights-of-way shall be granted prior to issuance of the grading permit, and the source information map or document recording information for the easement or right-of-way shall be called out on the plan. Propertylines and existing/ proposed easements shall be shown in their true locations with respect to the most recent horizontal control monuments approved by the City Engineer. If easements or property lines are not correctly shown, the grading permit may be revoked by the City Engineer.

3.401.3 Setbacks. Applicable setbacks as per the Municipal Code shall be shown. These will include Fire Mitigation Area and Bluff Setbacks, as required.

3.401.4 Topography. Existing and proposed topographic information shall be shown on the grading plan with spot elevations and contour lines. Contour lines shall be one or two foot contours unless otherwise approved by the City Engineer. The elevation information shall be based upon a City-approved benchmark, as described in Section 3.306 above. Contours shall extend a minimum of 50' beyond the property boundaries on all sides, or as required to adequately show onsite and offsite drainage, or as required by the City Engineer.

3.401.5 Details, Profiles, and Cross Sections. Details, profiles, and cross-sections shall be provided as necessary to clearly show proposed improvements, or as requested by the plancheck engineer.

3.402 *EARTHWORK.*

3.402.1 Cut, Fill, and Slope Undulation. Top and toe of existing and proposed slopes shall be shown. In accordance with Chapter 23.24 of the Municipal Code, the maximum allowable cut and fill slope gradient is 2:1 horizontal to vertical.

Grading shall be planned to retain natural topography and vegetation and to cause the least amount of disturbance while allowing development. Excessive grading shall not be allowed. Uniform "stair-stepping" of building pads is prohibited. Diversity in design solutions, which add the characteristics of variety to hillside development, is encouraged. Whenever possible, existing building sites and pads shall be utilized. Proposed structures shall be designed to conform to the existing site conditions and terrain. Modification of existing sites to conform to proposed structures is discouraged.

In accordance with Section 23.24.490 of the Municipal Code, straight, uniform slopes shall not be allowed when it is feasible to create a more natural-appearing slope. Slopes shall be varied and the horizontal lines of the slope undulated such that the top/ toe of slope is not uniform

and straight, a manufactured appearance is avoided, and the slope mimics a natural appearance.

In certain exceptional cases, localized slope areas may be allowed to exceed the 2:1 maximum slope at the discretion of the City Engineer, provided that the average slope gradient is 2:1 or less. In consideration of allowing the steeper gradient, the City Engineer will require that the slope be reinforced with geotextile or other City-approved reinforcement, that the soils engineer of work provide a certification that the slope is not vulnerable to gross or local instability, and that the applicant provide any other materials deemed necessary to evaluate the potential risk of exceeding the 2:1 slope gradient.

3.402.2 Proposed Remedial Grading. The grading plan shall show the estimated bounds of any required remedial grading. At the discretion of the City Engineer, the applicant may be required to remediate beyond the proposed improvements, from propertyline to propertyline. The estimated depth of the remedial work shall agree with the soils report and be called out on the plan.

3.402.3 Building Pads. Building pads and proposed drainage for the pads shall also be shown on the plan, and the pad and finish floor elevations shall be labeled. Setbacks between structures and top and toe of slopes shall be dimensioned. In the case in which a basement is proposed, the footprint of the basement shall be outlined and labeled, "*Limits of Proposed Basement as per Building Permit ____. Finish Floor Elevation = _____*". In the case in which no building pad will be created and instead a raised foundation will be constructed, the limits of the raised foundation shall be shown and labeled "*Proposed Raised Foundation as per Building Permit ____*".

3.402.4 Boundaries of Undocumented Fill Material. If undocumented fill exists onsite, the boundaries of such material shall be shown on the grading plan. The material shall be removed and replaced or exported, in accordance

with the recommendations of the project soils engineer, unless determined otherwise by the City Engineer.

3.402.5 Contaminated Material. For the purpose of this Chapter, contaminated material/soil means materials having levels of contaminant(s) that reach or exceed certain thresholds established by the California Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board (RWQCB), and/or County of San Diego Department of Environmental Health (DEH). DTSC, RWQCB and DEH are the regulating agencies for handling, transport, disposal, treatment, and burial of contaminated materials/soils. The grading permit applicant/owner shall conform to all requirements established by DTSC, RWQCB or DEH. No grading permit will be issued by the City of Encinitas for a site that contains contaminated soils unless appropriate permits/approvals have been obtained from DTSC, RWQCB, or DEH. Nothing in this Chapter is intended to relieve the applicant/owner from any requirements established by DTSC, RWQCB and/or DEH relative to contaminated material/soil. However, in addition to DTSC, RWQCB and DEH requirements for contaminated soils, the City of Encinitas requires compliance with Sections 3.402.51 through 3.402.53 below.

A. Other Agencies' Permit Requirements. Any development activity in the City of Encinitas that proposes/causes disturbance of contaminated soils shall be reviewed and approved by DTSC, RWQCB, or DEH prior to issuance of any permits by the City of Encinitas. The applicant/owner is responsible for obtaining DTSC, RWQCB, or DEH approval and subsequent approvals due to any changes in the design or scope of the project while processing the project with the City.

B. Notification. The owner/applicant shall notify adjacent property owners of any grading activities that will cause disturbance, exposure, or displacement of contaminated soils. The notification shall be post marked three weeks before start of the grading that will disturb

contaminated material/soil. At a minimum, the notice shall:

- List the name and 24-hour telephone number of the site safety manager as well as the name(s) and 24-hour phone number(s) of the person(s) to contact regarding problems (i.e., odors, dust, runoff, and noise).
- Provide the Grading Permit number.
- Provide a brief description of the proposed activities.
- Provide a brief description of the contaminants found in soil or any other impacted media and the method of treatment, burial, transport, and/or disposal, as applicable. This description must include a California Proposition 65 Notice if applicable.
- If there is a potential for contaminated material to leave the property as dust, in surface waters, or in associated runoff, discuss what actions will be taken to monitor air quality, surface water quality, or other contaminant transport media at the perimeter of the property.
- Provide the dates and times that the work will be conducted, the duration of time for which the contaminated soils are to be disturbed, exposed, or displaced, and an estimate of when the work will be completed.
- Additional notification(s) in compliance with Section 3.402.5 (B) is required if the work extends beyond the period specified in the notification.

The notice shall be sent to all property owners and tenants up to and including the closest streets surrounding the property. In case there is no street within 500 of the property boundary the notification should be limited to 500 feet from the property.

C. Contaminated Soil Burial Restriction. Burial of contaminated soil is not allowed under any public easements or rights- of- way.

3.403 *DRAINAGE.*

The location of all existing and proposed natural and manmade drainage facilities, surface and subsurface, shall be shown on the grading plan.

3.403.1 Existing Facilities. Reference drawing numbers for existing drainage facilities shall be included whenever available. The size, slope, length, and material for all the existing facilities shall be called out unless records for the existing facilities are unavailable. Invert, flowline, and top of grate elevations, as applicable, shall be shown. The planchecker may request copies of the record drawings for the existing facilities to facilitate the plancheck.

3.403.2 Proposed Facilities. Proposed facilities shall be shown in plan view and in profile with the exception that the City Engineer may not require a profile for simple, private single family drainage systems. All drainage system components including brow ditches, swales, catch basins, inlet boxes, trench drains, pumps, and pump specifications. The size, length, slope, and material for each facility shall be called out; a table may be useful for presenting the data for various segments of the proposed drainage system. Invert, flowline, and top of grate elevations, as applicable, shall be shown.

Each proposed facility shall be labeled as public or private. Public facilities shall be shown with the existing or proposed easement together with the record map or recorded document information for the easement. In

cases in which a Private Maintenance Agreement is required, the agreement shall be called out on the plan with the recorded document number.

3.403.3 Cross-Lot Drainage. New cross-lot drainage situations shall not be allowed under any circumstances, and existing cross-lot drainage shall not be allowed if an alternate solution is feasible. If the historic drainage pattern is cross-lot, alternatives shall be examined that evaluate the impact on other downstream properties of re-routing the runoff. At the discretion of the City Engineer, Private Maintenance Agreements for the drainage facilities and/ or a Hold Harmless for Drainage covenant shall be recorded against the property. Examples of these documents are included in Appendices 1.18 and 1.19. Cross-lot drainage is discussed in greater detail in Chapter 6, Section 6.601 of this Manual.

3.403.4 Drainage of Bluff-top Properties. Discharge of runoff over the top of a bluff shall not be allowed. Infiltration areas are discouraged on bluff-top properties because of the potential of the runoff for disturbing the stability of the bluff. Bluff-top properties shall be graded to drain away from the bluff. Drainage from bluff-top properties is discussed in greater detail in Chapter 6, Section 6.602 of this Manual.

3.403.5 Private Landscape Drainage Systems. If landscaping with a private drainage system will be installed, the location of the proposed area drains and drainage facilities are required to be shown on the grading plan. Drainage systems not shown on the grading plan are subject to a grading permit requirement and potential removal/ redesign/ relocation, at the discretion of the City Engineer.

Any landscape/ landscape drainage system required within the public right-of-way requires prior approval from the City Engineer and an encroachment permit. The encroachment permit shall be issued prior to issuance of the grading permit, and the recording information for the encroachment permit shall be shown on the grading plan.

3.403.6 Floodplain and Floodway. The limit of the 100-year floodplain/ floodway as shown on the most recent Flood Insurance Rate Map (FIRM) shall be shown. Work within the floodplain/ floodway shall comply with FEMA requirements and the Chapter 23.40 of the Municipal Code.

A. Construction within the Floodplain. No grading is allowed in the floodplain unless a hydrological study is prepared and approved by both the City Engineer and FEMA and a Conditional Letter of Map Revision (CLOMR) and a Letter of Map Revision (LOMR) are processed with FEMA. Certifications by a registered civil engineer or land surveyor that the construction complies with the requirements of FEMA and the Municipal Code shall be required prior to final of the grading permit. Construction within the floodplain is discussed in greater detail in Chapter 6, Section 6.701 of this Manual.

B. Development within the Floodway. Encroachments including earthwork, new construction, improvements, and other development in the floodway are prohibited without a permit from the City. Any proposed improvements shall meet with the federal requirements for development within the floodway. More information on floodway encroachment can be found in Chapter 6, Section 6.602 of this Manual.

C. Leucadia Special Flood Area. A study of the flooded area along North Coast Highway 101 in Leucadia was performed by Rick Engineering and is on file with the City. The study specifies the area affected by the Leucadia flood and provides sections with water surface elevation profiles along the corridor. Copies of the study are available for review at City Hall. Requirements for development within the Leucadia special study area are discussed in Chapter 6, Section 6.603 of this Manual.

3.404 *DRIVEWAYS AND HARDSCAPE.*

The grading plan shall include all existing and proposed hardscape such as driveways, sidewalks, and proposed patios. In the interest of stormwater quality, the paved areas shall be minimized and directly connected impervious areas shall not be allowed. The driveway width shall be a minimum of 12 feet wide; other City departments may require wider driveways. A typical cross-section through the driveway showing the cross-slope and the pavement section shall be provided on the grading plan.

3.404.1 Grades. Finish surface elevations shall be shown in locations as necessary to show the drainage pattern and stormwater treatment design and also to allow for the construction/ inspection of the pavement.

3.404.2 Driveway Surfacing. Surface protection as provided by gravel, pavement, and pavers is required for all driveways. Gravel driveways will be allowed up to a maximum slope of 10%. Above 10% slope, the driveway shall be surfaced with asphalt or concrete over select base with a pavement section meeting Engineering Department requirements; refer to the CalTrans Gravel Equivalent method and Appendix 3.7 of this manual. A typical cross-section through the driveway showing the proposed pavement section and drainage pattern shall be provided.

If porous paving will be installed, a National Hot Mix Concrete Associate (NRMCA) porous concrete certified contractor must install the concrete. Notes shall be placed on the plan stating that the contractor is to provide proof of certification to the engineering field inspector prior to starting work, and that a core sample of the installed concrete may be required to verify that the void content is at least 20%; if the minimum void ratio is not achieved, the pavement is subject to removal and replacement to the satisfaction of the City Engineer.

3.404.3 Pavers. Pavers will be allowed in sloped areas up to 15% without mortar. At slopes exceeding 15%, the pavers shall be set in mortar and grouted.

Paver areas not meeting the Engineering Department requirements for pervious surfaces are considered hardscape areas. In order to be considered by the Engineering Department as a pervious surface, the pavers shall have a minimum of 20% void space to allow runoff to easily drain through without requiring excessive maintenance to prevent clogging. The pavers shall be underlain by one to two inches of leveling sand over a pervious base material, such as ¾" crushed rock. Paver sections not designed to be pervious shall be constructed on two inches of sand over six inches of Class II Base material. An example paver section is shown in Appendix 3.8.

3.404.4 Driveway Slope. The driveway slope shall not exceed 25%; a lesser slope may be required by other City Departments. The minimum allowable slope and cross-slope are 2% except in special cased approved by the City Engineer. Vertical curves shall be utilized for grade breaks exceeding 5%. Grade breaks in excess of 5% may be allowed only at the discretion of the City Engineer, and in no circumstances shall a grade break exceed 14%. A driveway profile showing existing grade and proposed finish surface may be required by the planchecker.

3.404.5 Driveway Location. Driveway locations shall meet sight distance requirements to the satisfaction of the City Engineer. Driveway locations shall be in conformance with the San Diego Area Regional Standard Drawings, unless approved in advance by the City Engineer.

3.404.6 Driveway Apron. Driveway aprons within the public right-of-way shall be concrete and shall be constructed in such a fashion as to prevent the entrance of runoff from the street into the private driveway. Where curb and gutter exist, the San Diego Regional Standard driveway apron shall be used. The driveway apron may occupy a

maximum of 40% of the property frontage, unless otherwise approved by the City Engineer.

3.404.7 Stormwater Treatment for Hardscape Areas. The stormwater runoff from all hardsurface areas including driveways, patios, pathways, pool hardscape, and any other hardscape areas shall be routed to landscape areas for stormwater treatment. The drainage from the proposed driveway areas shall drain to landscape areas, and these areas shall be identified on the plan and labeled "*Area for Stormwater Quality. To be Privately Maintained and Not to be Modified Without a Permit from the City*". The depiction of the treatment areas on the plans shall be of a precision necessary to locate the designated area onsite and shall be dimensioned. In order to allow proper stormwater treatment, drainage inlets shall not be installed within the hardscape area, unless otherwise approved by the City Engineer.

3.404.8 Hardscape Proposed without Earthwork. A permit will be required for the construction of hardscape areas in excess of 500 square feet even if no earthwork is associated with the proposed hardscape, at the discretion of the City Engineer. Refer to Municipal Code Section 23.24.105. Resurfacing or maintenance of existing paved surfaces are exempt from this requirement.

3.405 *RETAINING AND FREESTANDING SITE WALLS.*

The grading plan shall depict all existing and proposed retaining and site walls on the property. The plans shall also show walls on the adjacent properties within a distance equal to the maximum proposed excavation or 10' of the propertyline, whichever is greater. Elevations at the top of wall, top of footing, and at finish grade at the bottom of wall on either side of the wall shall be indicated.

3.405.1 Standard and Specially Designed Walls. Proposed retaining walls shall utilize the San Diego Area Regional Standard Drawings (SDRSD) designs. If an SDRSD design is not suitable for the proposed development, a specially designed wall may be proposed. The specially designed

wall shall be reviewed and approved by the City's third-party structural consultant, at an additional cost to the applicant, consistent with the approved fee schedule. A structural plan shall be attached and approved with the grading plan. The structural plan shall be prepared by a Structural Engineer licensed in the State of California and shall show a profile of the proposed wall, details, and cross-sections. The structural calculations shall be submitted for the consultant's review.

3.405.2 Retaining Wall Geogrid Soil Reinforcement. If the construction of the retaining walls will involve the use of geogrid or other reinforcement material, the extent of the reinforcement material shall be shown in the plan view. The reinforcement shall not extend into any public easements or beyond the private property without express written permission from the property owner concerned.

3.405.3 Wall Subdrain Systems. A subdrain system shall be provided for all retaining walls to eliminate the potential for hydrostatic pressure behind the wall. The proposed drainage system behind the retaining wall shall be shown on the plan. The face of the retaining wall shall be located a distance away from the property line that allows for construction of the drainage system, and the wall design and subdrain system shall be consistent with the soils report recommendations. A section through the propertyline and the wall including the subdrain system shall be shown on the plan. A detail of a typical wall drain is given in Appendix 3.9.

3.405.4 Encroachment into the Right-of-Way or Public Easements. Freestanding and retaining walls, footings, and associated wall drain systems shall not encroach into the public right-of-way or public easements unless an encroachment permit is issued by the City Engineer. The encroachment permit shall be issued, an Encroachment Maintenance and Removal Covenant recorded against the property, and the recording information entered onto the grading plan prior to issuance of the grading permit.

3.406 *STREETS, ALLEYS, AND STREET IMPROVEMENTS.*

3.406.1 Adjacent Street Easements and Rights-of-Way. The grading plan shall show adjacent public and private streets and alleys. Streets shall be labeled with the street name, and private streets shall be indicated as private on the plan. The width of the easement or right-of-way in its entirety and on each side from centerline shall be indicated in at least two places, or as necessary to show the relationship of the easement/ right-of-way sidelines to one another. The source of the right-of-way or easement shall be referenced on the grading plan by the type, recording date, and document number.

3.406.2 Right-of-Way Dedication Required. Any required right-of-way dedication shall be shown on the grading plan. The former propertyline shall be shown screened back and labeled "*Existing Property Line*" and the propertyline after the dedication shall be shown darkened and labeled "*Proposed Property Line*". The recording date and document number of the easement shall be shown on the grading plan. The grant of easement is required to record prior to issuance of the grading permit.

3.406.3 Existing and Proposed Street Improvements.
Existing and proposed street improvements shall be shown on the grading plan. An Improvement Permit is required for the construction of improvements within the public right-of-way. However, the City Engineer may allow minor public improvements to be shown on the grading plan. If a public improvement plan will be required, the drawing number for the public improvement plan shall be shown on the grading plan. Requirements for improvements are discussed in Chapter 8 of this manual.

3.406.4 Existing and Proposed Encroachments. An encroachment permit is required for the construction of private or non-standard improvements within the public right-of-way or public easements. The encroachment permit shall be issued, a Private Maintenance and Removal Covenant recorded against the property, and the recording

information placed on the grading plan prior to plan approval.

3.406.5 Trees Within Public Easements and Rights-of-Way. Trees within the vicinity of the proposed development shall be shown on the plans with the tree protection zone indicated, as applicable. Construction and/or grading in the vicinity of trees within public easements and rights-of-way shall comply with the City of Encinitas Urban Forest Management Program. Construction and/or grading in the vicinity of designated Heritage Trees, whether growing on private or public land, shall also comply with the City of Encinitas Urban Forest Management Program manual, which is contained in Appendix 3.16 of this manual.

3.407 *EXISTING AND PROPOSED UTILITIES.*

3.407.1 Water Service. Any existing water service to the property shall be shown. The proposed water lateral(s) and meter(s) shall be shown on the grading plan to the satisfaction of the water agency, either San Dieguito Water or Olivenhain Municipal Water District. The location of the water main shall be shown and labeled with the record drawing number, unless a record is unavailable. If the project falls within the jurisdiction of the Olivenhain Municipal Water District, the application must be processed separately with OMWD, and OMWD shall approve the plans prior to approval by the City. A signature box for OMWD shall be added to the title sheet signature/ title block.

3.407.2 Sewer Service. The location of the sewer main shall be shown and labeled with the record drawing number, unless a record is unavailable. At the discretion of the City Engineer, a property will be required to connect to the public sewer system and in some cases to extend the sewer main. The existing and/or proposed sewer service(s) shall be shown on the plan. A data table shall be provided indicating the depth of the lateral at the propertyline, the slope to the main, the length of the lateral from the main to the propertyline, and the drop at the main. Requirements for connection to the public sewer

system, sewer laterals, and pumped systems are discussed in Chapter Four of this manual.

The City of Encinitas is sewered by the Cardiff Sanitation and Encinitas Sanitary Districts, both of which are administered by the City, and by the Leucadia Wastewater District, which is an independent agency. Projects falling within the Leucadia Wastewater District (LWD) must be processed separately with LWD, and LWD shall approve the plans prior to approval by the City. A signature box for LWD shall be added to the title sheet signature/ title block.

Whenever possible, a gravity sewer lateral shall be installed. However, in some cases, it may not be possible to provide gravity flow to the main. In such situations, a pumped system may be approved, at the discretion of the City Engineer. Pumped sewer laterals are discussed in Section 4.303.3 of this manual. The grading plan shall show that the sewer lateral is being pumped to a private manhole from which it gravity flows to the sewer main; a detail of an approved design for the private manhole is included as Appendix 3.10. The pump specifications shall be included on the grading plan.

3.407.3 Septic Systems. In cases in which no sanitary sewer is available to service the subject property, a septic system may be installed in conformance with City sewer connection and septic requirements, and if approved in advance by the City Engineer (refer to Chapter 4 of this manual for additional information). Septic systems are regulated by the County of San Diego, and the Department of Environmental Health is the permitting agency. When a new septic system and/or improvements which could potentially require modification to an existing septic system are proposed, the County of San Diego Department of Environmental Health is required to sign the grading plan indicating approval prior to approval of the plan by the City Engineer. The location of the proposed septic tank, tight lines, and vertical pit, trenches, and/ or leach lines shall be shown on the grading plan. The applicant shall obtain approval of the septic layout from the County and shall provide a copy of the approval to the City during plancheck.

3.407.4 Overhead Utilities. Existing overhead utilities within the subject property or within any easement contiguous with the subject property shall be shown on the grading plan. Utility poles shall be shown with the pole number. A note shall be placed on the plan to indicate that all proposed utilities shall be installed underground. If the project is required to underground the overhead utilities, a note to that effect shall also be included on the plan, and each utility pole shall be labeled "*Protect in Place*" or "*To be Removed*", as appropriate. Utility undergrounding requirements are discussed in Chapter 23.36 of the Municipal Code.

3.408 *PERMANENT STORMWATER QUALITY FEATURES.*

Permanent stormwater quality features to the satisfaction of the City Engineer shall be shown on the grading plan prior to plan approval. Details and cross-sections shall be provided as necessary for plancheck, construction, and to the satisfaction of the City Engineer. A symbol shall clearly indicate the area designated for treatment such that inspections may be conducted during and after construction to determine whether the facilities are still in place and functioning properly. Schematic representations will not suffice. The facilities shall bear the following note:

"AREA FOR STORMWATER QUALITY. TO BE PRIVATELY MAINTAINED AND NOT TO BE MODIFIED WITHOUT A PERMIT FROM THE CITY."

At the discretion of the City Engineer, a Stormwater Treatment Facility Maintenance Agreement shall be recorded against the property to ensure the private maintenance of the treatment facilities in good working order. The maintenance covenant shall record prior to approval of the grading plan, and the recordation information shall be stated on the grading sheet and on the title sheet stormwater status box. The maintenance responsibility for the facilities shall be indicated on the plan including the name(s) of the responsible party, contact address, and phone number. A sample Stormwater Treatment Facility Maintenance Agreement is included as

Appendix 1.25, and design criteria and requirements are discussed in Chapter 7 of this manual. Stormwater quality requirements are discussed in Chapter 7 of this manual.

Removal and/ or modification of any stormwater quality features that were required on a grading plan will require a permit from the Engineering Department for corrective or other action. A requirement may be imposed to replace the stormwater quality facilities with equivalent facilities.

3.409 *BUILDING FOOTPRINTS.*

When structures are proposed, the building footprints shall be shown on the grading plan with basement or raised foundation areas noted. Distances from the face of wall to any proposed slope shall be labeled. The proposed discharge locations for the roof drains shall also be shown, and the following note shall be added to the plan:

"NOTE: ROOF DRAINS SHALL DISCHARGE TO LANDSCAPE AREAS DESIGNATED FOR STORMWATER TREATMENT PRIOR TO DISCHARGE FROM THE PROPERTY. DIRECT CONNECTION OF ROOF DRAINS TO THE PRIVATE STORM DRAIN SYSTEM IS NOT ALLOWED."

The location of any existing buildings or structures on the property where the work is to be performed and the location of any buildings or structures on land of adjacent owners which are within fifteen feet of the property, or which may be adversely affected by the proposed grading operations, shall be shown on the grading plan.

3.410 *SWIMMING POOLS AND POOL HARDSCAPE.*

Any proposed swimming pool shall be shown on the grading plan. The location of the swimming pool shall allow a minimum of seven feet from the bottom of the pool to daylight on any existing or proposed slope; alternate designs require additional review by the Engineering Department at the applicant's expense. The proposed pool hardscape shall also be shown, complete with the drainage and the stormwater treatment for the runoff from the pool area. In order to allow proper treatment of stormwater runoff, area drains shall not be located within the pool hardscape areas. An example of an acceptable design

which allows runoff from the pool hardscape to travel over designated landscape areas is included as Appendix 3.12.

If the swimming pool permit is obtained after the issuance of the grading permit and the swimming pool/ hardscape was not shown on the grading plan, a construction change will be required to add the proposed pool and any associated flatwork to the plan. The stormwater treatment measures for the runoff from the pool hardscape area shall be shown on the plan. In the case in which pool hardscape areas in excess of 500 square feet are to be constructed but were not shown on the pool permit, a construction permit will be required for the installation of the hardscape, unless determined otherwise by the City Engineer; refer to Municipal Code Section 23.24.105.

3.411 *UNDERGROUND FUEL STORAGE TANKS.*

A permit from the County Department of Environmental Health is required for the removal or abandonment of any existing underground storage tanks found during preliminary investigation or discovered during construction. The approximate location of any known underground storage tanks shall be shown on the grading plan and the requirement for the permit from the County Department of Environmental Health shall be indicated. The County shall sign the title sheet of the grading plan when permits under the County jurisdiction are required for work proposed on the grading plan.

3.412 *GEOLOGICAL HAZARD AREA.*

If the project site is located within a geological hazard area such as an area subject to landslide, faulting, or other hazard as shown on the maps from the California Geologic Survey, this shall be noted on the plans and adequately addressed in the project soils report. The City GIS digital database also maps these areas of concern, and inquiries about a particular property may be made to the Engineering Department. The City Engineer may require additional soils investigation and/ or the recordation of a covenant against the property acknowledging the

construction within the special hazard area prior to the approval of the grading plan.

3.413 *LANDSCAPE PLAN.*

Existing trees shall be shown on the grading plan and labeled either "*To Be Protected in Place*" or "*To Be Removed*". If a tree is to be protected in place, the tree protection zone may be required to be shown on the plan. In cases in which significant landscaping is required by a City department, a landscape plan may be required to be included as a part of the grading permit plan set. Landscape plans are discussed in below.

3.413.1 Landscape Plan Required. Landscape plans may be required at the discretion of the City Engineer and/ or the Director of the Building Department. Typical scenarios in which a landscape plan is required are when the Conditions of Approval specify landscaping requirements or when slopes in excess of 8' in vertical height are proposed and are required to be landscaped, or where a potential for erosion exists. All landscape and irrigation plans shall conform to all the requirements set forth in the City Landscape Guidelines Manual and may not propose plants included on the City List of Invasive Plants. The landscaping and irrigation shall be completed as early as feasible. At the discretion of the City Engineer, a separate bond will be required which will be held for a specified period of time in order to guarantee satisfactory establishment of the proposed landscaping.

3.413.2 Landscape and Irrigation for Bluff-top Properties. Bluff-top properties proposing landscaping with an irrigation system shall install a system designed to avoid excess watering. The system shall be designed to automatically shut off in the even of a pipe break. Automatic shut-off system, moisture sensors, and other advanced controls will be required for the installation of the irrigation system. The City Engineer may require the details of any irrigation system proposed with the development of a bluff-top property to be shown on a landscape and irrigation plan and to be permitted with the grading plan.

3.414 *SHORING PLAN.*

A shoring plan and structural calculations shall be submitted for any excavation meeting one or more of the following criteria:

A. Excavation exceeding 5' in height with sideslopes steeper than 1:1;
B. Excavation near an existing structure which, in the opinion of the engineer of work or the City Engineer could potentially threaten that structure;

C. Excavation at or below the groundwater table;

D. Shoring recommended by the project soils engineer.

A grading permit from the Engineering Department is required for the shoring; plancheck of the shoring plan and calculations may include review by a City third-party structural consultant at an additional cost to the applicant. Location, design, detail, and cross-section of the proposed shoring shall be included on the shoring plan. Grading and building permits shall be processed concurrently; no grading permit will be issued unless the building plancheck is complete and the project is ready for building permit issuance. The building permit number shall be referenced on the grading plan.

When shoring is utilized, the tie-backs could potentially encroach into the public right-of-way. If tie-backs within the public right-of-way are proposed, they shall be placed a minimum of 5 feet below the lowest public utility and a minimum of 10 feet below the finished surface elevation at the property line. The plans shall specify that all tension is to be released from the tie-backs prior to final of the grading permit. All the existing utilities within the public right-of-way shall be potholed by the applicant prior to grading permit issuance, and the actual location of each utility shall be shown on the proposed grading and improvement plans. Shoring sheet piles, soldier beams, and lagging shall be within the private property and shall not encroach into the public right-of-way.

The City Engineer may waive the shoring requirement for excavations into solid bedrock if the soils engineer provides a stability analysis indicating that the unsupported excavation is stable.

3.415 *PHASING PLAN.*

If phasing of the grading operations will be allowed by the Planning and Engineering Departments, then a phasing plan shall be attached to and approved with the grading plan. The phasing shall identify the work proposed with each phase of the project. Stockpiling of soil or other materials is not allowed.

3.416 *BLUFF STABILIZATION PLAN.*

If bluff stabilization work is proposed, the grading plan shall show the proposed bluff stabilization method, tie-back locations, details, and typical sections for the tie-backs. Information about the proposed appearance of the bluff stabilization shall be reviewed and approved by the City. The structural calculations shall be submitted for review. The plan shall be reviewed and approved by the City's third-party geotechnical and structural consultants, at an additional cost to the applicant.

3.417 *GROUNDWATER DISCHARGE AND TREATMENT PLAN.*

Projects proposing the construction of subterranean structures such as basements may encounter groundwater during excavation. If preliminary testing has indicated that groundwater could be a problem during construction, the City Engineer may require that a groundwater discharge and treatment plan be attached to and approved with the grading plan. The discharge and treatment plan shall detail the method of collection and pumping of groundwater to treatment tanks. A backup tank shall be included.

Due to long-term water quality concerns, permanent basement dewatering is not allowed. If the design of a building system capable of withstanding the anticipated hydrostatic pressure is economically infeasible, the City Engineer may consider a permanent dewatering system if

a permanent monitoring system is designed to monitor ground water quality for the life of the project and a groundwater discharge permit is obtained from the State Water Resources Control Board. The applicant shall also receive City approval for an emergency plan for the trucking and proper disposal of contaminated groundwater. The current and future property owners are responsible for hiring a consultant to conduct the permanent groundwater monitoring and shall deposit funds with the City as reimbursement for associated staff and review costs. A covenant shall be recorded against the property to memorialize the groundwater discharge requirements, and the document recording information shall be provided on the grading plan prior to approval.

3.418 *TRAFFIC CONTROL PLAN.*

At the discretion of the City Engineer, a traffic control plan shall be required to be attached to and permitted with the grading plan. The traffic control plan shall meet with the satisfaction of the City Traffic Engineer.

3.500 REQUIREMENTS FOR THE EROSION CONTROL PLAN.

3.501 *GENERAL REQUIREMENTS FOR THE EROSION CONTROL SHEET.*

The erosion control elements shall be shown graphically on the plan and described verbally as necessary to clarify the intended use. Details shall be provided to clearly show the installation of the erosion control measures. The erosion control plan shall be prepared in a manner consistent with the requirements in the City's Best Management Practice Manual, Part I, and the California Stormwater Quality Association (CSQA).

3.502 *EROSION CONTROL MEASURES.*

Erosion control measures to the satisfaction of the City Engineer shall be provided to protect, cover, and stabilize areas subject to erosion. Measures may include bonded fiber matrix, straw mat, geotextile fabric, hydroseed, and permanent landscaping and irrigation.

3.503 *DIVERSION OF RUNOFF FROM THE CONSTRUCTION SITE AND EROSIVE AREAS.*

The erosion control plan shall provide for the diversion of runoff and nuisance flows from the construction areas. Flows shall be directed away from slopes and erosive areas. Off-site flows shall be captured and routed safely via pipes and/ or ditches around the construction area.

3.504 *SEDIMENT CONTROL DEVICES.*

Sediment control devices shall be provided in order to reduce runoff velocity, reduce the erosion potential of runoff, to allow the sediment carried by stormwater to settle in designated collection areas. In order to prevent sediment from entering the storm drain system, gravel bags shall be placed surrounding inlets. Gravel check dams shall be provided on sloped areas in order to prevent the concentration of runoff. Silt fences, berms, fiber rolls, and desiltation basins may be required by the City

Engineer. A stabilized construction entrance to the satisfaction of the City Engineer shall be provided.

3.505 *HYDROSEED AND PERMANENT LANDSCAPING.*

Hydroseed shall be applied to slopes steeper that 6:1 horizontal to vertical that are greater than three feet high in fill areas and greater than five feet high in cut areas. The hydroseed mix used shall contain the ingredients in the quantities specified on the title sheet. If there is a potential that a pad may remain vacant for a period of time, a note shall be added to the grading sheet to specify that "*If Pads are Left to Remain Vacant for a Period of Three Months or More, or at the Discretion of the City Engineer, the Entire Pad Shall be Hydroseeded*". Straw mat may be required in order to stabilize erosive areas until the hydroseed establishes. Irrigation shall be provided to allow establishment of the hydroseed and shall be specified on the grading plan. Permanent landscaping and/ or surface protection shall be provided to ensure long-term erosion control to the satisfaction of the City Engineer.

3.506 *WASTE MANAGEMENT AND MATERIALS STORAGE.*

The methods of managing on-site waste and materials stoage shall be graphically and verbally described on the plan. The methods may include a 24-hour emergency contact plan, spoil prevention and control, concrete washout, and solid, hazardous, and liquid waste management.

3.507 *CONSTRUCTION SITE EROSION CONTROL PLAN.*

A construction site working erosion control plan is intended to be kept onsite and modified regularly by the contractor in order to address every stage of the construction operation. The City does not review/ approve the construction site working erosion control plan; the contractor bears the responsibility for assuring the plans at the site are adequate for preventing stormwater pollution in accordance with the requirements of the City, the Regional Water Quality Control Board, and any other applicable agencies.

3.600 ITEMS TO BE PROVIDED WITH GRADING PLAN SUBMITTAL.

The current submittal requirements can be found on the City website and in Appendix 2.17. The items below elaborate upon some of those submittal requirements.

3.601 *APPROVED COPY OF CONDITIONS OF APPROVAL.*

An approved copy of the Conditions of Approval for any associated discretionary permits is required; a draft or incomplete version is not acceptable. Conformance with all Conditions of Approval shall be evident from the plans and associated submittal items. Additional items as necessary to ensure that all Conditions of Approval are met may be required by the planchecker.

3.602 *DRAINAGE STUDY.*

A drainage study shall be provided with the grading plan submittal unless determined otherwise by the City Engineer. The drainage study shall address the existing drainage condition from the subject property and the impact of the proposed development. The study shall be prepared in accordance with the requirements discussed in Chapter 6.

3.603 *STORMWATER TREATMENT VERIFICATION FORM.*

A stormwater treatment verification form shall be completed and submitted to the Engineering Department at the discretion of the City Engineer. The verification shall be submitted on the City's standard form and shall be signed by the engineer of work certifying the treatment design meets City requirements and by the property owner acknowledging the private maintenance responsibility into perpetuity of the treatment facilities.

3.604 *ENGINEERING SOILS AND GEOLOGIC REPORTS.*

Requirements for soils and engineering geology reports are discussed below and in Chapter 23.24 of the Municipal Code.

3.604.1 Soil Engineering Report. Soil engineering reports shall be required for all residential, commercial, industrial, and institutional subdivisions and similar developments involving structures and/or earthwork for which a grading permit is required. Soil reports shall also be required for grading or building permits on single lot projects when specified by the City Engineer.

The report shall be signed and stamped by a registered Soils Engineer.

The soil engineering report shall contain the following items:

A. A copy of the grading plan or site plan showing elevation contours. Proposed structures and/ or pad elevations shall be included if the nature of those improvements is known at the time of investigation.

B. The nature of the proposed improvements shall be described in the introduction. In the event that the nature of the improvements shown on the grading plan does not match those described in the report, an update letter stating that the original conclusions and recommendations as given in the original report remain valid for the modified development shall be provided or the soil report shall amend those recommendations as necessary.

C. Scope of work and a recommendation as to the feasibility of the proposed development for the project site.

D. Information relative to the current and past use of the site.

E. Evaluation and description of onsite soils.

F. Evaluation of geological concerns including fill, undocumented fill, compressible material, groundwater seepage, slope stability, liquefaction, collapsible soils, landslide, and erosion.

G. Exploratory borings extending below the lowest depths of the proposed excavation and/ or developments.

H. Test/ boring location maps and the results of the tests performed or measurements made at each of those locations. Test methods used shall be referenced. Results of laboratory soil tests providing adequate information on soil type and strength shall be provided.

I. Gross and surficial stability shall be analyzed for all cut, fill, and natural slopes and a written statement and calculations provided approving the slope stability, as applicable. Proposed temporary construction slopes shall also be evaluated. A minimum factor of safety of 1.5 shall be used for the static slope stability analysis.

J. Retaining wall and crib wall soil design parameters.

K. Pavement recommendations.

L. Presence of any contamination in accordance with San Diego County Department of Environmental Health requirements.

M. Conclusions as to the adequacy of the site for the proposed grading with recommendations for necessary remedial/ corrective measures, grading procedures, soil stabilization during and after construction, and foundation design.

N. List of reference materials.

3.604.2 Engineering Geology Report. In addition to the soils report, an Engineering Geology Report shall be provided at the discretion of the City Engineer. The report shall be signed and stamped by a State of California certified engineering geologist and a registered civil engineer or geotechnical engineer. The report shall address the following items:

A. Geologic hazards such as landslides, faulting, or other hazards identified by the City Engineer. Geologic

hazards located offsite but affecting the proposed development shall be addressed.

B. Faulting and seismic evaluation of the site.

C. Evidence of expansive or free-draining soils.

D. Present and future groundwater conditions. The potential for changes in perched or permanent groundwater levels due to the proposed development shall be evaluated.

E. Large diameter boring accompanied by the boring log will be required to evaluate landslide and slope stability issues.

F. A geologic map identifying the materials and formations found onsite. The map shall show locations of proposed keyways, buttresses, stabilization fills, existing and proposed existing subdrains, and other mitigative areas.

G. Geologic cross sections which providing an interpretation of the geologic conditions in graphic form.

H. Classification and description of origin, mode of deposition, distribution thickness of bedrock and surficial materials, formation names, geologic age, physical and chemical properties.

3.604.3 Preliminary Soils Report Waiver for Simplified Grading Permits.

At the discretion of the City Engineer, a preliminary soils report may not be required by the Engineering Department in association with a simplified grading permit provided that an as-graded soils report will be issued at the completion of grading to certify the inspection, compaction test results, foundation recommendations, and slope stability. A waiver cannot be considered if there is potential for any of the following factors to be present on the site:

A. Undocumented fill material,

B. Evidence of slope instability onsite or in vicinity,

C. Unauthorized grading,

D. Collapsible and/ or compressible soils onsite or in vicinity,

E. Geohazards existing onsite or in vicinity.

If the preliminary soils report requirement is waived, the owner shall sign a statement on the grading plan stating the following:

I (WE) HEREBY CERTIFY THAT A REGSTERED SOILS ENGINEER HAS BEEN OR WILL BE RETAINED TO SUPERVISE AND INSPECT ALL GRADING ACTIVITY, PROVIDE COMPACTION TEST RESULTS, AND ADVISE OF THE STABILITY OF THE SITE. UPON CONCLUSION OF GRADING, THE SOILS ENGINEER SHALL PROVIDE A LETTER OF INSPECTION AND TESTING CERTIFYING THE COMPACTION, FOUNDATION RECOMMENDATIONS, SLOPE STABILITY, AND SATISFACTORY COMPLETION OF THE GRADING OPERATION AND MEETING THE REQUIREMENTS OF THE CITY OF ENCINITAS ENGINEERING DEPARTMENT.

BY: [Signatures of all owners on title] DATE:_____
[Printed name of signatory]

3.605 *GRADING PLAN.*

The number of copies of the grading plan and any associated improvement plan and/or map required on the submittal checklist shall be submitted to the Engineering Department. The grading plan shall include structural, landscape and irrigation, construction dewatering, and other specialty plans as required by the City Engineer or other City Departments. Specialty plans shall be attached to the back of the grading plan set, be in the standard City format with the City title block across the bottom, and be continuously numbered with the grading sheets; a separate numbering scheme for the specialty plan is not allowed. If a professional other than the civil engineer of work is responsible for the preparation of the specialty drawing and will accept professional responsibility for the work shown thereon, a separate Engineer's Statement of

Responsibility shall be included on the first sheet of the specialty plan and signed by the responsible professional.

3.606 *STORMWATER POLLUTION PREVENTION PLAN (SWPPP).*

A SWPPP shall be provided consistent with the requirements of the Regional Water Quality Control Board (RWQCB) and the California Stormwater Quality Association (CSQA) for the mitigation of impacts of land disturbance on stormwater quality. The SWPPP shall be prepared in accordance with the checklist given in Appendix 3.13 of this manual and shall be reviewed and approved by the City prior to approval of the grading permit. A Notice of Intent shall be filed with the RWQCB and a copy of the letter with the WDID number provided to the City prior to approval of the grading plan. The WDID number shall be referenced on the title sheet of the grading plan.

3.607 *WASTEWATER DISCHARGE PERMIT.*

Projects proposing groundwater dewatering shall obtain the required wastewater discharge permits from the Regional Water Quality Control Board (RWQCB) prior to approval of the grading plan. A copy of the discharge permits shall be provided to the City. Projects encountering unexpected groundwater during construction may be issued a stop-work notice at the discretion of the City Engineer in order to allow time for the appropriate discharge permits to be obtained. If a groundwater discharge and treatment plan was required by the City, groundwater testing reports shall be submitted to the City during construction at frequencies specified by the City Engineer and in conformance with the requirements of the Regional Water Quality Control Board.

3.608 *TITLE REPORT AND EVIDENCE OF AUTHORITY TO SIGN.*

The applicant must provide evidence that all the parties having any record title interest in the property sign the owner's statement on the grading plan title sheet. The owners, trustees, and beneficiaries listed in the owner's

statement must match those listed in the title report. The title report shall be a maximum of six months old unless otherwise approved by the City Engineer. Grant deeds alone cannot be accepted since they do not contain information about easements and encumbrances on the property that could affect the proposed development.

Evidence of the authority to sign on behalf of a company or corporation shall be provided for each signatory. A recorded copy of all partnership agreements and/or joint venture agreements together with the Articles of Incorporation are to be provided at the time of first submittal to the Engineering Department so that all title interest can be accounted for correctly. All corporation signatures shall be executed by two authorized officers of the corporation, unless a copy of the resolution passed by its board of directors authorizing a designated officer to sign on behalf of the corporation is furnished to the Engineering Department (refer to Corporations Code Section 313).

3.609 *RECORDED DOCUMENTS.*

Copies of all recorded documents shown in the title report shall be provided with the grading plan submittal. If these documents reference other recorded documents, copies of those items will be required as well, at the discretion of the City Engineer.

3.610 *ENGINEER'S COST ESTIMATES.*

The engineer of work shall prepare and provide signed, stamped cost estimates for the work shown on the grading plan. The unit costs shall be those from the City approved unit cost list, included as Appendix 3.14 of this manual. At the discretion of the City Engineer, the planchecker may request two separate cost estimates, one to be used for determining the amount of surety required for the project and the other to be used for determining the fees required as a part of the project. If so, the planchecker will indicate which items may be removed from the full cost estimate in order to produce the reduced cost estimate for purposes of surety determination.

3.611 *LETTER OF PERMISSION TO GRADE.*

Letters of permission to grade shall be required for the performance of work which may take place upon a neighboring private property or which may, in the opinion of the City Engineer, jeopardize existing structures and/or improvements on a neighboring private property. Such letter of permission to grade shall be a maximum of one year old at the time of plan approval; updated letters may be requested if the plan is not approved and the permit issued within one year from the date of the permission to grade letter. The language to be included with a permission to grade letter is included as Appendix 3.15. The signatures on the letter of permission to grade letter shall be notarized.

Letters of permission may also be required by the City Engineer for work proposed within an easement granted to a public utility company or to another private property. Such letters shall be provided prior to approval of the grading plan. If the easement holder is a public utility company, the letter of permission may be in the standard format of that utility company provided that it is on company letterhead and references the grading plan number, project address, and a general description of the work proposed within the easement.

3.612 *STRUCTURAL CALCULATIONS.*

The applicant shall supply structural calculations for any proposed non-standard structures such as shoring and specially designed walls. The structural calculations shall be prepared by a licensed structural engineer, signed, and stamped. The calculations and structural sheets of the grading plan shall be reviewed and approved by the City third-party structural consultant, at an additional cost to the applicant, prior to approval of the grading plan. If a computer program is utilized in the structural calculations, the program data including program name, version, required inputs, input values, and explanation of variables shall be provided to supplement the calculations.

3.613 *COVENANTS AND EXHIBITS.*

Any required covenants and/ or easements shall recorded against the property prior to approval of the grading plan. Most City-required documents will be provided by the City department concerned. If property legal descriptions, attachments, and exhibits are required, these shall be prepared by the engineer of work and provided to the City during the plancheck process. When the required documents and all attachments have been approved, the document shall be signed by the property owner(s) and returned to the City with the next plancheck submittal for recordation. An explanation of requirements for the recordation of documents is included in Appendix 3.1.

3.614 *APPROVED SEPTIC LAYOUT.*

If the property under development is being allowed to remain on a septic system for sewage disposal, then the approved septic layout signed and stamped by the County shall be provided prior to approval of the grading plan. The facilities as shown on the grading plan shall match those shown on the approved septic layout from the County, or a revised layout approval will be required by the City.

3.615 *OTHER MATERIALS AS REQUESTED BY CITY ENGINEER.*

The list of typically required materials presented in this manual is not intended to be a complete listing of all required documents. Other materials as requested by the City Engineer shall be provided prior to approval of the grading plan.

APPENDIX CHAPTER 3:
GRADING PLAN PREPARATION AND SUBMITTAL REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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INSTRUCTIONS FOR DOCUMENTS TO BE RECORDED WITH THE COUNTY RECORDER

Documents are required to be recorded prior to the final approval of this project. This sheet explains how to ensure the document is complete prior to returning it to the Engineering Department for recordation and how to make payment for the recording fees.

Please ensure that the covenants/ documents are complete, with:

1) A complete and correct attached property description;
2) A plat attachment if required;
3) Signatures of all owners on the document;
4) Notary documentation (ensure use of new 2008 forms);
5) A subordination agreement if included and required.

Please submit the completed covenants with a check payable to the San Diego County Recorder (one for each covenant, as this allows one covenant to record even if the County Recorder finds a problem with another covenant).

If possible, please make the check out to the SD County Recorder but leave the amount field blank. This allows Engineering staff to fill in the check at the County Recorder's office, eliminating the possibility of a document being rejected if the check amount is not exactly correct.

The recording fee charged by the County Recorder can be calculated as $16.00 for the first page and $3.00 for each additional, including notary sheets. For encroachment covenants, a notarization of the City Engineer's signature is required, so the check amount must include the $3.00 fee for that page as well.

No recording fee is necessary for covenants recorded "for the benefit of the City".

Please contact the Engineering Department at 760-633-2770 if you have any questions.

SAMPLE GRADING TITLE SHEET

GENERAL RIGHT-OF-WAY NOTES:

1. NO ACCESS OR WORK SHALL BE PERFORMED WITHIN THE CITY RIGHT-OF-WAY WITHOUT THE FULL KNOWLEDGE OF THE ASSIGNED CITY INSPECTOR WHO SHALL BE GIVEN NOT LESS THAN 48 HOURS ADVANCE NOTICE OF THE INITIATION OF PERMITTED USE AT (760) 633-2796 OR 633-2797, OR AS STATED ON THE PERMIT.
2. AT LEAST 48 HOURS PRIOR TO STARTING WORK, **UNDERGROUND SERVICE ALERT (USA)** SHALL BE NOTIFIED FOR LOCATION OF UNDERGROUND UTILITIES AT 1-800-422-4133. THE PROPOSED DIG AREA MUST BE MARKED IN WHITE PAINT PRIOR TO CONTACTING (USA).
3. ALL WORK COVERED BY THIS PERMIT SHALL BE PERFORMED BY A CONTRACTOR POSSESSING A VALID CALIFORNIA CONTRACTOR'S LICENSE OF THE APPROPRIATE CLASS.
4. ALL TRAFFIC CONTROL WITHIN THE CONSTRUCTION AREA SHALL BE SUBJECT TO AN APPROVED TRAFFIC CONTROL PLAN AND SHALL BE FLAGGED AND BARRICADED TO THE SATISFACTION OF THE CITY INSPECTOR IN COMPLIANCE WITH THE "WORK AREA TRAFFIC CONTROL HANDBOOK", LATEST EDITION PUBLISHED BY BUILDING NEWS, INC. IN THE EVENT THAT THE INSPECTOR DETERMINES PROPER TRAFFIC CONTROL IS NOT IN PLACE, ALL WORK SHALL CEASE AND PERMITTEE AUTHORIZES THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE TO ORDER, ON THE RENTAL BASIS, SUCH TRAFFIC CONTROL DEVICES AS SHALL BE NECESSARY AND PROPER TO PROTECT THE PUBLIC SAFETY AND FURTHER AGREES TO PAY ANY AND ALL COSTS AND CHARGES THAT THE CITY MAY INCUR IN PROVIDING SAID TRAFFIC CONTROL.
5. APPLICANT AGREES THAT IT SHALL BE HIS RESPONSIBILITY TO PROVIDE THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER AGENT RESPONSIBLE FOR CONSTRUCTION OF PERMITTED WORKS WITHIN THE CITY RIGHT-OF-WAY, WITH A COPY OF THE PERMIT INCLUDING THESE STANDARD CONDITIONS AND A COMPLETE SET OF APPROVED PLANS. THE PERMIT, PLANS AND WORK AREA TRAFFIC CONTROL HANDBOOK SHALL BE AVAILABLE AT THE PERMIT SITE WHENEVER WORK IS IN PROGRESS.
6. PERMITTED WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY SPECIFICATIONS AND APPROVED PLANS, SUBJECT TO INSPECTION AND APPROVAL BY THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE. CERTIFICATION FOR ALL MATERIALS AND WORK, INCLUDING COMPACTION TESTS, SHALL BE FURNISHED BY THE APPLICANT UPON REQUEST BY THE CITY INSPECTOR. PAYMENT FOR ANY COMPACTION TESTING SHALL BE BY THE PERMITTEE. CERTIFICATION SHALL BE MADE BY A CERTIFIED TESTING AGENCY OR FIRM ACCEPTABLE TO THE CITY.
7. NO WORK WITHIN THE PUBLIC RIGHT-OF-WAY IS PERMITTED ON SATURDAYS, SUNDAYS, OR HOLIDAYS. ANY DEVIATION FROM THE WORK SCHEDULE PRESENTED IN THESE CONDITIONS MUST RECEIVE PRIOR, WRITTEN APPROVAL OF THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE. ANY QUESTIONS REGARDING DAYS CITY HALL IS CLOSED, CALL (760) 633-2770.
8. NO WORK ON ANY PUBLIC ROADWAY, EXCLUDING PRIME ARTERIALS AND MAJOR ROADS, SHALL BE STARTED BEFORE 7:30 A.M. OR CONTINUE AFTER 5:00 P.M. ON WEEKDAYS.
9. NO WORK SHALL BEGIN BEFORE 9:00 A.M. OR CONTINUE AFTER 3:00 P.M. ON PRIME ARTERIALS AND OTHER MAJOR ROADS, UNLESS AUTHORIZED ON THE PERMIT BY THE CITY ENGINEER. ALL WORK ON PRIME ARTERIALS AND OTHER MAJOR ROADS, ALL AS SHOWN ON THE CIRCULATION ELEMENT OF THE CITY'S GENERAL PLAN, WILL REQUIRE A TRAFFIC CONTROL PLAN ACCEPTABLE TO THE CITY TRAFFIC ENGINEER WHOSE OFFICE CAN BE CONTACTED AT (760) 633-2704.
10. THE ROADWAY SHALL BE CLEAN AND FREE OF ALL OBSTRUCTIONS AND COMPLETELY OPEN TO TRAFFIC AT THE END OF EACH WORKING DAY. (NO LATER THAN 3:00 P.M. ON MAJOR ROADS, DEFINED HEREIN.)
11. TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. MINIMUM TRAVEL LANE WIDTH FOR MOTOR VEHICLES SHALL BE 12 FEET. IF STREET WIDTH PREVENTS MAINTAINING TWO-WAY TRAFFIC, PERMITTEE AND DIRECTOR OF ENGINEERING SERVICES SHALL AGREE ON AN ADEQUATE TRAFFIC CONTROL PLAN PRIOR TO STARTING WORK, WHICH SHALL INCLUDE THE USE OF A FULL-TIME FLAGMAN.
12. ALL EXCAVATIONS IN EXISTING PAVEMENT SHALL BE SAW CUT TO NEAT LINES AND AC REPLACEMENT SHALL BE MADE TO THE SATISFACTION OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
13. OPEN TRENCH MUST BE BACKFILLED AND CAPPED WITH AT LEAST 2" OF COLD MIX ASPHALT OR METAL PLATED ACCORDING TO CITY SPECIFICATIONS DURING NON-WORKING HOURS. METAL PLATES ARE REQUIRED TO HAVE COLD MIX ASPHALT RAMPS ON ALL (4) SIDES AND MUST BE MAINTAINED. REFER TO THE CITY'S STANDARD DRAWING DATED JULY 31, 1990.
14. NATIVE MATERIAL MAY BE USED UPON APPROVAL OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE. REFER TO THE CITY'S STANDARD DRAWING DATED SEPTEMBER 30, 1996.
15. NO TUNNELING UNDER CURB AND GUTTER OR OTHER IMPROVEMENTS SHALL BE PERMITTED. IMPROVEMENTS SHALL BE REMOVED AND REPLACED JOINT TO JOINT.
16. TWO SACK SAND-CEMENT SLURRY MIX SHALL BE REQUIRED AS BACKFILL ON ALL LATERAL EXCAVATIONS WITHIN PRIME ARTERIALS, MAJOR ROADS AND COLLECTORS AS WELL AS ALL LOCATIONS WHERE THE INSPECTOR DEEMS THE NATIVE MATERIAL TO BE UNACCEPTABLE FOR USE AS BACKFILL.
17. CARE SHALL BE EXERCISED TO PREVENT WATER, SOIL AND DEBRIS FROM DEPOSITING IN GUTTERS, STREETS AND STORM DRAINS. NO WASHING OUT OF MIXERS OR CONCRETE PUMPS WILL BE ALLOWED ON CITY STREETS. VIOLATIONS WILL BE REFERRED FOR NPDES ENFORCEMENT AND PENALTIES.
18. ANY ROADWAY STRIPING OR MARKINGS DAMAGED OR REMOVED DURING THE OPERATIONS OF THIS PERMIT SHALL BE MATCHED AND REPLACED BY THE APPLICANT USING THE LATEST EDITION OF STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR PAINT OR THERMOPLASTIC, ALL TO THE SATISFACTION OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
19. ALL CONCRETE WORK SHALL BE TRANSIT MIXED AND CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION, SECTION 201, AND BE APPROVED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
20. TRENCHING FOR INSTALLATIONS ACROSS ANY INTERSECTING ROADWAY OPEN TO TRAFFIC SHALL BE PROGRESSIVE. NOT MORE THAN HALF OF THE WIDTH OF A TRAVELED ROADWAY SHALL BE DISTURBED AT ONE TIME AND THE REMAINING WIDTH SHALL BE KEPT OPEN TO TRAFFIC BY BRIDGING OR BACKFILLING.
21. WHERE STREET DIMENSIONS AND STATE DEPARTMENT OF HEALTH SERVICES REGULATIONS ALLOW, ALL PIPES AND CONDUITS LAID PARALLEL TO THE ROADWAY SHALL BE PLACED AT LEAST FIVE (5) FEET FROM THE EDGE OF THE PAVEMENT OR GRADED TRAVELED ROADWAY, UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE CITY ENGINEER. THE SHALLOWEST PORTION OF ANY PIPELINE OR OTHER FACILITY SHALL BE INSTALLED NOT LESS THAN THIRTY (30) INCHES BELOW THE ROADWAY SURFACE.
    21(A). WHERE STREET DIMENSIONS AND STATE DEPARTMENT OF HEALTH SERVICES REGULATIONS ALLOW, ALL PIPES AND CONDUITS LAID PARALLEL TO EXISTING UTILITIES SHALL MAINTAIN A MINIMUM SEPARATION OF THREE (3) FEET MEASURED FROM THE NEAREST EDGE OF THE FACILITY. ANY DEVIATION FROM THIS REQUIREMENT IS NOT ALLOWED UNLESS APPROVED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
22. ALL EXCAVATED MATERIAL SHALL BE CAST AWAY FROM THE IMPROVED PORTION OF THE HIGHWAY. AFTER THE WORK HAS BEEN COMPLETED, ALL EXCESS MATERIAL, INCLUDING TRENCH SPOILS, SHALL BE REMOVED FROM THE RIGHT-OF-WAY. THE ROADWAY SHALL BE LEFT IN NEAT AND ORDERLY CONDITION.
23. ALL ROADSIDE DRAINAGE DITCHES SHALL BE RESTORED TO TRUE GRADES AND THE INTAKE AND OUTLET ENDS AT ALL CULVERTS SHALL BE LEFT FREE FROM ALL EXCESS MATERIALS AND DEBRIS.
24. ALL APPROACHES TO PRIVATE DRIVEWAYS AND INTERSECTING ROADS AND STREETS SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
25. CLAY AND EARTH WHICH ADHERE TO THE PAVED SURFACE OF THE ROADWAY SHALL BE REMOVED BY HAND SCRAPING, WASHING AND SWEEPING, OR BY ANY OTHER METHOD WHICH WILL LEAVE A CLEAN NON-SKID SURFACE WITHOUT IMPAIRING, DAMAGING OR LOOSENING THE SURFACE.
26. PERMITTEE SHALL COMPLY WITH ANY AND ALL DIRECTIVES ISSUED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE IN ORDER TO PREVENT DUST OR OTHER MATERIALS FROM BECOMING A NUISANCE OR ANNOYANCE.

GENERAL RIGHT-OF-WAY NOTES (CONTINUED):

27. TEMPORARY PATCHING OF TRENCH IS REQUIRED ON LATERAL CUTS IN SURFACED STREETS IMMEDIATELY AFTER BACKFILLING. AFTER COMPLETION OF THE REFILLING AND COMPACTING OF THE BACKFILL MATERIAL IN THE EXCAVATION, ALL AS SPECIFIED IN THE STANDARD DRAWING DATED SEPTEMBER 30, 1996, AND THE REMOVAL OF OBSTRUCTION(S), THE PERMITTEE SHALL PROMPTLY REPLACE WITH TEMPORARY OR PERMANENT PATCHING MATERIAL, OR REPAIR ANY PORTION OF THE HIGHWAY SURFACE REMOVED OR DAMAGED BY THE EXCAVATION, OBSTRUCTION, OR CONSTRUCTION OPERATIONS, ALL TO THE SATISFACTION OF THE CITY ENGINEER, AND AS SPECIFIED ELSEWHERE HEREIN. THE CITY ENGINEER MAY, AT HIS OPTION, ELECT TO DO THE SURFACING OR REPAIRING HIMSELF; IN SUCH CASE, THE PERMITTEE SHALL BEAR THE COST OF SUCH WORK. TEMPORARY PATCHING MATERIAL MAY BE LEFT IN PLACE FOR UP TO 30 DAYS, BUT MUST BE CONTINUALLY MAINTAINED.
28. WHERE THE PAVEMENT, EXCEPT PORTLAND CONCRETE CEMENT PAVEMENT, OR OTHER TYPE OF SURFACE HAS BEEN REMOVED BY OTHERS, THE PERMITTEE SHALL REPLACE IT WITH A STANDARD REPAIR OF FOUR (4) INCHES AC OVER APPROVED BACKFILL OR REPAIR SECTION SHALL BE ONE (1) INCH AC GREATER THAN EXISTING STRUCTURAL SECTION, WHICHEVER IS GREATER. REFER TO THE MOST CURRENT STANDARD DRAWING. REPAIRS TO PCC PAVEMENT SHALL BE MADE PURSUANT TO THE SPECIFICATIONS OF THE ASSIGNED ENGINEERING INSPECTOR.
29. IF, AFTER THE REFILLING OF AN EXCAVATION, THE PERMITTEE FAILS OR REFUSES TO RESURFACE OR REPAIR THAT PORTION OF THE SURFACE OF THE ROADWAY DAMAGED BY HIM, OR IF THE CITY ENGINEER HAS ELECTED TO DO SUCH RESURFACING OR REPAIRING, THE CITY ENGINEER SHALL CAUSE THE REPAIR TO OCCUR; AND THE PERMITTEE SHALL BE CHARGED WITH THE COST THEREOF COMPUTED BY THE DIRECTOR OF ENGINEERING SERVICES.
30. WHEN SHORING IS REQUIRED, AN ENGINEERED DETAIL DRAWING WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER. ALL OSHA REGULATIONS SHALL BE MET.
31. ALL DIRECTIONAL BORES SHALL BE SUBJECT TO APPROVAL OF THE METHOD IN THE FIELD BY THE ASSIGNED ENGINEERING INSPECTOR, ACTING AS THE DULY AUTHORIZED AGENT OF THE CITY ENGINEER. A THOROUGH EXAMINATION OF THE SUBSURFACE CONDITIONS IS A PREREQUISITE. THE APPLICANT SHALL IDENTIFY THE BORE METHOD ON THE PERMIT APPLICATION EITHER AS AUGER, HAMMER, HYDRAULIC, ETC., AND SHOW THE BORE PITS. GROUTING AND INTERMEDIATE BORE PITS MAY BE REQUIRED.
32. ALL SUBSURFACE UTILITIES SHALL BE ACCURATELY SHOWN ON THE APPLICANT'S SITE PLAN FOR THOSE EXCAVATIONS IN EXCESS OF 250 LINEAR FEET, TRAVERSING SIGNALIZED INTERSECTIONS, CROSSING INTERCONNECT WIRES, OR OTHERWISE WHERE THE CITY ENGINEER HAS A SPECIAL CONCERN.
33. PAVEMENT CUTS IN STREETS REHABILITATED OR NEWLY CONSTRUCTED WITHIN THE PAST TWO YEARS SHALL BE CATEGORICALLY DENIED.
34. THE DEVELOPER SHALL BE RESPONSIBLE THAT ANY MONUMENT OR BENCH MARK WHICH IS DISTURBED OR DESTROYED SHALL BE RE-ESTABLISHED AND REPLACED BY A REGISTERED CIVIL ENGINEER OR A LICENSED LAND SURVEYOR.
35. THE REMOVAL OF ANY AND ALL CITY TREES SHALL BE CONSISTENT WITH THE CITY'S URBAN FOREST MANAGEMENT PROGRAM. TREES LOCATED WITHIN CITY STREET RIGHT-OF-WAY, ON CITY PROPERTY, OR WITHIN CITY EASEMENTS ARE REFERRED TO AS CITY TREES AND SHALL BE PROTECTED IN PLACE DURING CONSTRUCTION UNLESS SPECIFICALLY APPROVED OTHERWISE. NO GRADING, EXCAVATION, OR DISTURBANCE OF CITY TREE ROOT SYSTEMS SHALL OCCUR WITHIN THE CITY TREE DRIP LINE AREA (THE AREA FROM THE TRUNK OF A TREE TO THE OUTERMOST EDGE OF THE TREE CANOPY PROJECTION ON THE GROUND). IF A CITY TREE IS NOT CLEARLY LABELED TO BE REMOVED, IT MUST BE PROTECTED IN PLACE. EVEN IF APPROVED IMPROVEMENTS ARE IN CONFLICT WITH A CITY TREE, IT MUST NOT BE DISTURBED UNLESS THE PLAN IS REVISED TO ADDRESS THE TREE REMOVAL.
36. THE TRAFFIC LOOPS SHALL BE REPLACED WITHIN 3 DAYS OF COMPLETING WORK IN THE AREA TO CURRENT CALTRANS STANDARD TO DETECT BICYCLES PER TRAFFIC OPERATIONS POLICY DIRECTIVE 09-06 AT NO COST TO THE CITY.

EROSION CONTROL

1. IN CASE EMERGENCY WORK IS REQUIRED, CONTACT _____ AT (_____) _____-_____, 24 HOURS A DAY.
2. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 1 TO APRIL 15). ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE ON OCTOBER 1 AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY EROSION CONTROL MEASURES WHEN RAIN IS IMMINENT.
3. DEVICES SHOWN ON PLANS SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE ENGINEERING INSPECTOR.
4. THE CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
5. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE CITY ENGINEER DUE TO AN INCOMPLETE GRADING OPERATION OR UNFORESEEN CIRCUMSTANCES WHICH MAY ARISE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS THAT ARE UNSAFE OR ARE POTENTIALLY UNSAFE.
7. ALL EROSION CONTROL MEASURES PROVIDED PER THE APPROVED IMPROVEMENT PLAN SHALL BE INCORPORATED HEREON.
8. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORK DAY.
9. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE FIVE (5) DAY RAIN PROBABILITY FORECAST EXCEEDS FORTY PERCENT (40%). SILT AND OTHER DEBRIS SHALL BE REMOVED AFTER EACH RAINFALL.

NOTIFICATIONS

1. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITY PIPES AND STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS, HOWEVER: THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ANY EXISTING UTILITIES OR STRUCTURES LOCATED AT THE WORK SITE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE FOLLOWING OWNERS OF SAID UTILITIES OR STRUCTURES PRIOR TO ANY EXCAVATION, FOR VERIFICATION AND LOCATION OF UTILITIES AND NOTIFICATION OF COMMENCEMENT OF WORK:
    A. SEWERS - CSD/ESD - (760)-633-2770
    B. GAS & ELECTRIC - SDGE - (760)-438-6200
    C. WATER - SAN DIEGUITO WATER DISTRICT-1-800-227-2600
    D. TELEPHONE - SBC BELL - (760)-489-3411
    E. CABLE TV - COX COMMUNICATIONS-(760)-806-9809 X-2233

2. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER'S OFFICE 48 HOURS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT. PHONE: (760)-633-2770.

3. THE CONTRACTOR SHALL GIVE 24 HOURS NOTICE ON CALLS FOR INSPECTION. PHONE: (760)633-2770.
ALL WORK PERFORMED WITHOUT BENEFIT OF INSPECTION WILL BE SUBJECT TO REJECTION AND REMOVAL.

STORMWATER POLLUTION CONTROL BMP NOTES RELATIVE TO CONSTRUCTION ACTIVITIES

CONCRETE WASHOUT
CONTRACTOR SHALL ESTABLISH AND USE AN ADEQUATELY SIZED CONCRETE WASHOUT AREA TO CONTAIN WASHOUT WASTES ON SITE. IT IS ILLEGAL TO WASH CONCRETE, SLURRY, MORTAR, STUCCO, PLASTER AND THE LIKE INTO THE STORMWATER CONVEYANCE SYSTEM OR ANY RECEIVING WATER. CONTRACTOR SHALL POST A SIGN DESIGNATING THE WASHOUT LOCATION.

CONSTRUCTION SITE ACCESS
A STABILIZED CONSTRUCTION SITE ACCESS SHALL BE PROVIDED FOR VEHICLES EGRESS AND INGRESS TO PREVENT TRACKING DIRT OFF SITE. THIS SHALL INCLUDE USING MATERIAL SUCH AS 3" CRUSHED ROCK AND/OR CORRUGATED STEEL PANELS/PLATES.

CONSTRUCTION VEHICLES
A SPECIFIC AREA AWAY FROM GUTTERS AND STORM DRAIN SHALL BE DESIGNATED FOR CONSTRUCTION VEHICLES PARKING, VEHICLE REFUELING, AND ROUTINE EQUIPMENT MAINTENANCE. ALL MAJOR REPAIRS SHALL BE MADE OFF-SITE.

EROSION CONTROL
EROSION CONTROL MUST BE PROVIDED FOR ALL EROSIVE SURFACES. SLOPED SURFACES ESPECIALLY SHALL BE PROTECTED AGAINST EROSION BY INSTALLING EROSION RESISTANT SURFACES SUCH AS EROSION CONTROL MATS, ADEQUATE GROUND COVER VEGETATION, AND BONDED FIBER MATRIX.

NO EXCAVATION AND GRADING ACTIVITIES ARE ALLOWED DURING WET WEATHER.

DIVERSION DIKES SHALL BE CONSTRUCTED TO CHANNEL RUNOFF AROUND THE CONSTRUCTION SITE. CONTRACTOR SHALL PROTECT CHANNELS AGAINST EROSION USING PERMANENT AND TEMPORARY EROSION CONTROL MEASURES.

REMOVE EXISTING VEGETATION ONLY WHEN ABSOLUTELY NECESSARY. LARGE PROJECTS SHALL BE CONDUCTED IN PHASES TO AVOID UNNECESSARY REMOVAL OF THE NATURAL GROUND COVER. DO NOT REMOVE TREES OR SHRUBS UNNECESSARILY; THEY HELP DECREASE EROSION.

TEMPORARY VEGETATION MUST BE PLANTED ON SLOPES OR WHERE CONSTRUCTION IS NOT IMMEDIATELY PLANNED FOR EROSION CONTROL PURPOSES. EROSION SHALL BE PREVENTED BY PLANTING FAST-GROWING ANNUAL AND PERENNIAL GRASSES TO SHIELD AND BIND THE SOIL.

PLANT PERMANENT VEGETATION AS SOON AS POSSIBLE, ONCE EXCAVATION AND GRADING ACTIVITIES ARE COMPLETE.

WATER USAGE FOR DUST CONTROL SHALL BE MINIMIZED.

ON-SITE CONSTRUCTION MATERIAL STORAGE
STORED MATERIALS SHALL BE CONTAINED IN A SECURE PLACE TO PREVENT SEEPAGE AND SPILLAGE. CONTRACTOR SHALL STORE THESE PRODUCTS WHERE THEY WILL STAY DRY OUT OF THE RAIN. CONTRACTOR SHALL PROVIDE SECONDARY CONTAINMENT FOR ALL FUEL STORED ON-SITE. ELIMINATE OR REDUCE POLLUTION OF STORMWATER FROM STOCKPILES KEPT ON-SITE. STOCKPILES MAY INCLUDE SOIL, PARING MATERIALS, ASPHALT CONCRETE, AGGREGATE BASE, ETC. STOCKPILES SHALL BE LOCATED AWAY FROM CONCENTRATED STORMWATER STORMWATER FLOWS AND STORM DRAIN INLETS. STOCKPILES SHALL BE COVERED OR PROTECTED WITH SOIL STABILIZATION MEASURES AND PROVIDED WITH A TEMPORARY SEDIMENT BARRIER AROUND THE PERIMETER AT ALL TIMES.

TRAINING
CONTRACTORS' EMPLOYEES WHO PERFORM CONSTRUCTION IN THE CITY OF ENCINITAS SHALL BE TRAINED TO BE FAMILIAR WITH THE CITY OF ENCINITAS STORMWATER POLLUTION CONTROL REQUIREMENTS. THESE BMP NOTES SHALL BE AVAILABLE TO EVERYONE WORKING ON SITE. THE PROPERTY OWNER(S) AND THE PRIME CONTRACTOR MUST INFORM SUBCONTRACTORS ABOUT STORMWATER REQUIREMENTS AND THEIR OWN RESPONSIBILITIES.

WASTE MANAGEMENT
CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY DISPOSING OF ALL WASTE AND UNUSED CONSTRUCTION MATERIALS. DUMPING OF UNUSED OR WASTE PRODUCTS ON THE GROUND, WHERE WATER CAN CARRY THEM INTO THE CONVEYANCE SYSTEM IS STRICTLY PROHIBITED.

NO SEEPAGE FROM ANY DUMPSTER SHALL BE DISCHARGED INTO STORMWATER. BERMS/DIKES SHALL BE PLACED AROUND ALL DUMPSTERS TO DIVERT THE NATURAL STORM RUNOFF. DUMPSITES SHALL BE CHECKED FREQUENTLY FOR LEAKS. DUMPSTER LIDS SHALL REMAIN CLOSED AT ALL TIMES. DUMPSTERS WITHOUT LIDS SHALL BE PLACED WITHIN STRUCTURES WITH IMPERVIOUS ROOFING OR COVERED WITH TARPS IN ORDER TO AVOID RAIN CONTACT WITH ANY TRASH MATERIAL.

MANY CONSTRUCTION MATERIALS, INCLUDING SOLVENTS, WATER-BASED PAINTS, VEHICLE FLUIDS, BROKEN ASPHALT AND CONCRETE, WOOD, AND CLEARED VEGETATION CAN BE RECYCLED. NON-RECYCLABLE MATERIALS MUST BE TAKEN TO AN APPROPRIATE LANDFILL OR DISPOSED OF AS HAZARDOUS WASTE. FOR INFORMATION ON DISPOSAL OF HAZARDOUS MATERIAL, CALL THE HAZARDOUS WASTE HOTLINE TOLL FREE AT (800) 714-1195. FOR INFORMATION ON LANDFILLS AND TO ORDER DUMPSTERS CALL EDCO AT (760) 436-4151.

POLLUTANTS SHALL BE KEPT OFF EXPOSED SURFACES. PLACE TRASH CANS AND RECYCLING RECEPTACLES AROUND THE SITE.

PORTABLE TOILETS MUST BE IN GOOD WORKING ORDER AND CHECKED FREQUENTLY FOR LEAKS. CONTRACTOR SHALL PROVIDE SECONDARY CONTAINMENT AND LOCATE PORTABLE TOILETS AWAY FROM STORMDRAIN INLETS ON PERVIOUS SURFACES.

ALL CONSTRUCTION DEBRIS SHALL BE KEPT AWAY FROM THE STREET, GUTTER, AND STORMDRAIN. CONTRACTOR MUST ROUTINELY CHECK AND CLEAN UP MATERIAL THAT MAY HAVE TRAVELED AWAY FROM CONSTRUCTION SITE

FOR MORE INFORMATION ON STORMWATER POLLUTION CONTROL MEASURES AND REQUIREMENTS PLEASE CONTACT THE ENGINEERING DIVISION, CITY OF ENCINITAS AT (760) 633-2770.

IMPERVIOUS AREA
IMPERVIOUS AREA PRIOR TO CONSTRUCTION: _____SQFT
IMPERVIOUS AREA AFTER CONSTRUCTION: _____SQFT
INCREASE IN IMPERVIOUS AREA: _____SQFT

IMPERVIOUS AREA REPLACED: _____SQFT

OWNER/APPLICANT
OWNER NAME
ADDRESS (CURRENT MAILING)
PHONE

SITE ADDRESS
PROJECT ADDRESS
APN

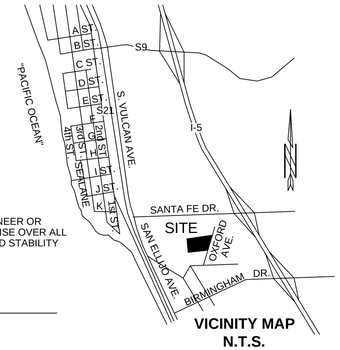
LEGAL DESCRIPTION

_____

OWNER'S CERTIFICATE

I (WE) HEREBY CERTIFY THAT A REGISTERED SOILS ENGINEER OR GEOLOGIST HAS BEEN OR WILL BE RETAINED TO SUPERVISE OVER ALL GRADING ACTIVITY AND ADVISE ON THE COMPACTION AND STABILITY OF THE SITE.

SIGNATURE:_____ DATE:_____
OWNER(S) NAME AS VESTED



VICINITY MAP
N.T.S.

SOILS ENGINEER'S CERTIFICATE

I,_____ A REGISTERED CIVIL ENGINEER IN THE STATE OF CALIFORNIA, PRINCIPALLY DOING BUSINESS IN THE FIELD OF APPLIED SOIL MECHANICS, HEREBY CERTIFY THAT A SAMPLING AND STUDY OF THE SOIL CONDITIONS PREVALENT WITHIN THIS SITE WAS MADE BY ME OR UNDER MY DIRECTION ON ___ AND FOR AN UPDATE ON _____ ONE COMPLETE COPY OF THE SOILS REPORT COMPILED FROM THIS STUDY, WITH MY RECOMMENDATIONS, HAS BEEN SUBMITTED TO THE OFFICE OF THE CITY ENGINEER. FURTHERMORE, I HAVE REVIEWED THESE GRADING PLANS AND CERTIFY THAT THE RECOMMENDATIONS INCLUDED IN THE SOILS REPORT FOR THIS PROJECT HAVE BEEN INCORPORATED IN THE GRADING PLANS AND SPECIFICATIONS.

SIGNED: _____

RCE NO.: _____

EXP. DATE: _____

JOB #: _____

COMPANY
ADDRESS
PHONE

STATEMENT OF ENGINEER OF WORK

THE UNDERSIGNED ENGINEER AGREES THAT THE WORK PERFORMED BY THE ENGINEER SHALL COMPLY WITH THE GENERALLY ACCEPTED STANDARDS AND PRACTICES OF THE ENGINEER'S TRADE OR PROFESSION. THE ENGINEER FURTHER AGREES THAT THE WORK PERFORMED HEREIN SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS REQUIRED BY THE CITY OF ENCINITAS, TO THE EXTENT THAT THE ENGINEER CONTROLS SUCH PERFORMANCE. THE ENGINEER AGREES THAT ANY PLANCHECK OR REVIEW PERFORMED BY THE CITY OF ENCINITAS IN ITS CAPACITY AS A PUBLIC ENTITY FOR THE PLANS PREPARED BY THE ENGINEER IS NOT A DETERMINATION BY THE CITY OF ENCINITAS OF THE TECHNICAL SUFFICIENCY OR ADEQUACY OF THE PLANS OR DESIGN AND IT THEREFORE DOES NOT RELIEVE THE ENGINEER OF RESPONSIBILITY FOR THE PLANS OR DESIGN OF IMPROVEMENTS BASED THEREON. THE ENGINEER AGREES TO INDEMNIFY AND HOLD HARMLESS THE CITY OF ENCINITAS AND ITS OFFICERS, AGENTS, AND EMPLOYEES FROM PROPERTY DAMAGE OR BODILY INJURY ARISING SOLELY FROM THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER AND HIS/HER AGENTS OR EMPLOYEES ACTING WITHIN THE COURSE AND SCOPE OF SUCH AGENCY AND EMPLOYMENT AND ARISING OUT OF THE WORK PERFORMED BY THE ENGINEER.

SIGNATURE: _____ DATE: _____
ENGINEER'S NAME

COMPANY
ADDRESS
PHONE NUMBER
RCE EXPIRES _____

SHEET INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	

BMP PROJECT STATUS

STANDARD
-or-
PRIORITY STORMWATER TREATMENT FACILITIES TO BE MAINTAINED BY HOA / HOMEOWNER / AGENT, etc. IN ACCORDANCE WITH "MAINTENANCE AGREEMENT FOR PRIVATE STORMWATER TREATMENT AND STORMWATER POLLUTION CONTROL FACILITIES"

RECORDED ON _____

AS DOC. #: _____

LEUCADIA WASTEWATER DISTRICT	FIELD OPERATIONS	PLANNING AND BUILDING	PARKS AND RECREATION	SAN DIEGUITO WATER DISTRICT OR OLIVENHAIN MUNICIPAL WATER DISTRICT	ENCINITAS FIRE DEPARTMENT
SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE

ENGINEERING COMPANY
ADDRESS
PHONE AND FAX

CHANGE NO.	DESCRIPTION	APPROVED	DATE

BENCHMARK
DESCRIPTION: _____
LOCATION: _____
RECORD FROM: ROS 18416
ELEVATION: _____
DATUM: NAVD88

SCALE
HORIZONTAL: 1" = X'
VERTICAL: 1" = X'

AS-BUILT
_____ _____
ENGINEER'S NAME DATE

DESIGNED BY: INITIALS	DRAWN BY: INITIALS	CHECKED BY: INITIALS

PLANS PREPARED UNDER SUPERVISION OF
DATE: _____
_____ R.C.E. NO.: _____
ENGINEER'S NAME EXP.: _____

ENGINEERING DIVISION APPROVALS
RECOMMENDED: _____ APPROVED: _____
MASIH MAHER GLENN PRUIM
_____ _____
DATE DATE

CITY OF ENCINITAS - PUBLIC WORKS DEPARTMENT
IMPROVEMENT PLAN FOR:
SITE ADDRESS
OWNER
APN
PLANNING CASE NO: _____ TPM/TM/CDP/DR/MUP/MIN/EIA, etc.

DRAWING NO.
XXXXX-I
SHEET 1 OF X

ENCINITAS SANITARY/CARDIFF SANITATION DISTRICT SEWER NOTES:

ALL WORK SHALL BE DONE IF ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION "GREENBOOK", (LATEST EDITION), THE SAN DIEGO STANDARD SPECIAL PROVISIONS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, (ADOPTED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE), THE SAN DIEGO REGIONAL STANDARD DRAWINGS (LATEST EDITION) AND THE FOLLOWING SPECIAL PROVISIONS:

1. TRENCH WIDTH SHALL BE PER SDRSD NO. SP-02 UNLESS OTHERWISE NOTED. MINIMUM PIPE SEPARATION PER WAS WI-01, 02, & 03.

2. PIPE AND BEDDING CONDITIONS:

   (A) ALL PIPE SHALL HAVE 4" MINIMUM OF ¾" CRUSHED ROCK BENEATH THE PIPE.
   (B) V.C.P. PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE SAND, GRAVEL, CRUSHED AGGREGATE, NATIVE FREE-DRAINING GRANDULAR MATERIAL HAVING A SAND EQUIVALENT OR 30 OR BETTER.
   (C) P.V.C. AND A.B.S. SOLID WALL PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE ¾" CRUSHED ROCK. A.B.S. SOLID WALL PIPE MAY BE USED ONLY WHERE PIPE INVERT GRADES ARE 1% OR GREATER.

3. AFTER COMPLETION OF PIPE LAYING, ALL MAIN LINE SEWERS, SEWER SERVICE LATERALS AND STRUCTURES SHALL BE TESTED IN THE PRESENCE OF THE INSPECTOR. AIR PRESSURE TEST SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.

4. THE CONSTRUCTION OF P.C.C. SEWER MANHOLE SHALL BE PER SDRSD NO. SM-02. POURED IN PLACE MANHOLE BASES SHALL BE A MONOLITHIC POUR FINISHED COMPLETE AT TIME OF POUR. PRECAST MANHOLE BASES ARE ACCEPTABLE FOR USE WITH 8-INCH COLLECTOR SYSTEMS WITH CITY ENGINEER'S APPROVAL.

5. THE CONSTRUCITON OF 4-INCH SEWER LATERAL PER SDRSD NO'S SS-01 AND SS-02. LATERALS SHALL NOT DISCHARGE DIRECTLY INTO MANHOLE.

6. THE CONSTRUCTION OF CONCRETE CUT-OFF WALLS SHALL BE CONSTRUCTED AS PER SDRSD NO. SP-07.

7. ALL MAINS AND LATERALS SHALL BE A MINIMUM OF 42-INCHES BELOW THE FINISHED GRADE.

8. THE FINAL LOCATION AND ELEVATION OF SEWER AND WATER MAINS AND LATERALS SHALL BE SHOWN ON ORIGINAL AS-BUILT PLANS PRIOR TO ACCEPTANCE OF WORK.

9. FOR SEWER LATERAL TABLE, SEE SHEET ___.

10. "AS BUILT" DRAWINGS MUST BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.

11. ALL DESIGN CHANGES OF SEWER MAINS SHALL BE APPROVED BY A CONSTRUCTION CHANGE PRIOR TO ACCEPTANCE FOR PUBLIC USE.

12. FILL AREAS MUST BE COMPACTED TO 90% PRIOR TO PIPE INSTALLATION.

13. THE CONTRACTOR SHALL NOTIFY THE CITY'S FIELD OPERATIONS DIVISION 48 HOURS IN ADVANCE OF BEGINNING WORK TO ARRANGE FOR PRE-CON AND INSPECTION OF PROJECT. PHONE NO. 760-633-2770.

14. CONTRACTOR SHALL OBTAIN A PERMIT FROM THE CITY'S ENGINEERING SERVICES DEPARTMENT FOR ANY EXCAVATION WITHIN EXISTING CITY RIGHTS-OF-WAY.

15. THE APPLICANT SHALL WARRANTY THE PUBLIC SEWER FOR ONE YEAR FOLLOWING THE APPROVAL OF THE AS-BUILTS.

16. CONTRACTOR SHALL FURNISH AND INSTALL, PER SDRSD SP-01, THE APPROPRIATE BURIED UTILITY WARNING AND IDENTIFICATIN TAPE ABOVE ALL PUBLIC SEWER LINES, AND PORTIONS OF SEWER LATERALS LOCATED WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENTS.

17. THE DEVELOPER SHALL PROVIDE EASEMENTS AND ACCESS ROADS OVER PUBLIC SEWERS TO THE SATISFACTION OF THE CITY ENGINEER. THESE ARE TO BE SHOWN ON THIS PLAN.

18. WASTEWATER DISCHARGE PERMITS AND PLUMBING PERMITS ARE REQUIRED PRIOR TO CONNECTION TO THE SANITARY SEWER SYSTEM.

19. ALL NEW SEWER MAINS SHALL BE INSPECTED BY CLOSED CIRCUIT TELEVISION AFTER COMPLETION OF TRENCHING BACKFILL AND FINISHED GRADING BUT PRIOR TO PLACEMENT OF PAVEMENT OR PERMANENT TRENCH RESURFACING. CONTRACTOR SHALL PROVIDE FOR TELEVISION INSPECTION. (SEE 500-1.1.5)

20. SEWER MANHOLE LINING:

   (A) NEW MANHOLES WITH 8-10" DIAMETER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.
   (B) NEW MANHOLES WITH 12" DIAMETER AND GREATER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE PROVIDED WITH INTEGRALLY LOCKING PVC LINING PER SECTION 500-2.5 OF THE GREENBOOK.
   (C) EXISTING MANHOLES: ALL EXISTING MANHOLES WITH NEW CONNECTIONS SHALL BE INSPECTED AND REPAIRED, AS NEEDED, WITH THE LINING SYSTEM THAT MATCHES THE EXISTING LINING FOR THAT MANHOLE; FOR MANHOLES WITHOUT ANY EXISTING LINING, THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.

   EXCEPTIONS OR VARIATIONS TO THESE MANHOLE LINING REQUIREMENTS MAY BE CONSIDERED ON A SPECIFIC CASE-BY-CASE BASIS BY THE CITY ENGINEER.

21. NO ADDITIONAL LATERALS SHALL BE PERMITTED WITHOUT PAYING SEWER CAPACITY FEES, PROCESSING A CONSTRUCTION CHANGE, AND JOINING THE SEWER REIMBURSEMENT DISTRICT, IF CREATED.
22. MANHOLE FRAMES AND COVERS SHALL BE MADE IN THE USA OF HEAVY DUTY CAST-IRON TYPE WITH A 36-INCH OPENING. MANHOLE COVER INSERTS SHALL BE 24-INCH DIAMETER WITH LETTERING "CITY OF ENCINITAS" AND "SEWER" SIMILAR TO WHAT IS INDICATED ON SDRSD M-1.

LWD SEWER NOTES

1. LWD APPROVAL OF THESE PLANS DOES NOT RELIEVE THE APPLICANT, PRIVATE ENGINEER OF WORK, OR CONTRACTOR FROM RESPONSIBILITY FOR THE CORRECTION OF ERRORS AND OMISSIONS DISCOVERED DURING OR AFTER CONSTRUCTION.

2. ALL DESIGN, MATERIALS, AND CONSTRUCTION WORK SHALL CONFORM TO THE LEUCADIA WASTEWATER DISTRICT LWD SEWER STANDARDS AND TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK) AND THE REGIONAL STANDARD DRAWINGS, MOST CURRENT EDITIONS. IN THE EVENT OF CONFLICT THE LWD SEWER STANDARDS GOVERN.

3. OSHA SAFETY ORDERS AND OSHA CONFINED SPACE ENTRY REQUIREMENTS SHALL BE FOLLOWED AT ALL TIMES WITHOUT EXCEPTION.

4. THE CONTRACTOR SHALL HAVE A COPY OF THE SEWER NOTES 2. & 3. DOCUMENTS ON THE JOB SITE AT ALL TIMES.

5. THE CONTRACTOR SHALL GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY LWD AND SHALL REPAIR OR REPLACE ANY WORK THAT MAY PROVE DEFECTIVE IN WORKMANSHIP AND/OR MATERIALS WITHIN THE ONE YEAR PERIOD WITHOUT EXPENSE WHATSOEVER TO LWD.

6. QUANTITIES SHOWN HEREON ARE FOR BOND ESTIMATE PURPOSES ONLY. NEITHER THE PRIVATE ENGINEER NOT LWD GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SEWER QUANTITIES.

7. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS REPRESENTING ALL MATERIALS AND SUPPLIES SATISFACTORY TO LWD. WORK SHALL NOT COMMENCE UNTIL SUCH MATERIALS ARE APPROVED BY LWD.

8. PRIOR TO BEGINNING SEWER WORK, THE LWD INSPECTOR SHALL BE FURNISHED THREE SETS OF CUT SHEETS AND SHALL COMPLY WITH LWD STANDARD SPEC SURVEY REQUIREMENTS.

9. PRIOR TO BEGINNING SEWER WORK, THE CONTRACTOR SHALL SECURE A LWD PERMIT FOR CONSTRUCTION AND SHALL PROVIDE A MINIMUM OF 72 HOURS NOTICE TO LWD PRIOR TO CONSTRUCTION.

10. NO WORK SHALL BE COMMENCED UNTIL ALL PERMITS HAVE BEEN OBTAINED FROM THE JURISDICTIONAL CITY, COUNTY, AND/OR OTHER APPROPRIATE AGENCIES.

11. THE CONTRACTOR SHALL CONFORM TO LABOR CODE SECTION 6705 BY SUBMITTING A DETAIL PLAN TO THE DISTRICT ENGINEER SHOWING THE DESIGN OF SHORING, BRACING, SLOPING, OR OTHER PROVISIONS TO BE MADE FOR PROTECTION OF WORKERS FROM THE HAZARD OF CAVING GROUND DURING TRENCH EXCAVATION AND PIPE INSTALLATION THEREIN. THIS PLAN MUST BE PREPARED FOR ALL TRENCHES FIVE FEET OR MORE IN DEPTH. IF THE PLAN VARIES FROM THE SHORING SYSTEM STANDARDS ESTABLISHED BY THE CONSTRUCTION SAFETY ORDERS, TITLE 8, CALIFORNIA ADMINISTRATIVE CODE, THE PLAN SHALL BE PREPARED BY A REGISTERED ENGINEER. A COPY OF THE OSHA EXCAVATION PERMIT MUST BE SUBMITTED TO THE LWD INSPECTOR PRIOR TO EXCAVATION.

12. ALL SEWER FACILITIES SHALL BE INSTALLED IN DRY EXCAVATIONS AND TRENCHES. CONTRACTOR SHALL DEWATER AND MAINTAIN DEWATERING CONTINUOUSLY UNTIL THE WORK IS COMPLETED INCLUDING PLACEMENT AND COMPACTION OF BACKFILL MATERIALS IN A DRY STATE. ALL PIPE ZONE MATERIAL LOCATED IN WET OR AREAS SUSPECTED TO BE WET IN THE FUTURE SHALL BE ENCASED IN GEOTEXTILE MATERIAL. SUITABLE GEOTEXTILE MATERIAL SHALL BE SUBMITTED TO THE DISTRICT ENGINEER FOR REVIEW AND APPROVAL. CONTRACTOR SHALL OBTAIN DEWATERING PERMITS AS NECESSARY AND RETURN OF GROUNDWATER TO THE SEWER SHALL NOT BE ALLOWED.

13. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES SHOWN ON THESE PLANS WAS OBTAINED BY AVAILABLE RECORDS SEARCH BY THE PRIVATE ENGINEER. TO THE BEST OF THE PRIVATE ENGINEER'S KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. ATTENTION IS CALLED TO THE POSSIBLE EXISTENCE OF OTHER UTILITIES OR STRUCTURES NOT SHOWN, OR IN A DIFFERENT LOCATION FROM THAT SHOWN ON THE PLANS. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN ON THE PLANS AND OTHER EXISTING FACILITIES OR STRUCTURES NOT SHOWN.

14. APPROVAL OF THIS PLAN BY LWD DOES NOT CONSTITUTE A REPRESENTATION OF THE ACCURACY OF THE LOCATION OF, OR THE EXISTENCE OR NONEXISTENCE OF, ANY UNDERGROUND UTILITY, PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.

15. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (800) 422-4133, AS REQUIRED BY STATE LAW. ALL UTILITY CROSSINGS SHALL BE POT HOLED PRIOR TO TRENCHING.

16. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS INCLUDING, BUT NOT LIMITED TO, TRENCH SAFETY AND CONFINED SPACE ENTRY.

17. SOILS REPORTS SHALL BE SUBMITTED TO LWD BY A QUALIFIED SOILS ENGINEER WHICH CERTIFIES THAT TRENCH BACKFILL WAS COMPACTED AS DIRECTED BY THE SOILS ENGINEER IN ACCORDANCE WITH ON SITE EARTHWORK SPECIFICATIONS AND THE LWD STANDARD SPEC.

18. SEWER ELEVATIONS SHOWN ARE INVERT ELEVATION (I.E.), INSIDE BOTTOM OF PIPE. SEWER LENGTHS SHOWN ARE FROM CENTER OF MANHOLE TO CENTER OF MANHOLE.

19. ALL REVISIONS TO DRAWINGS SHALL BE APPROVED BY THE LWD DISTRICT ENGINEER AS CONSTRUCTION CHANGES TO THE ORIGINAL MYLAR DWGS. WITH INITIALED APPROVAL ON THE MYLARS.

20. CONTRACTOR IS RESPONSIBLE FOR KEEPING COMPLETE RECORD OF CHANGES AND SHALL MAKE SUCH RECORD AVAILABLE TO THE PRIVATE ENGINEER. THE PRIVATE ENGINEER SHALL PROVIDE AS-BUILT DRAWINGS TO LWD FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

21. LENGTH OF OPEN TRENCH SHALL BE LIMITED TO 350 FEET, INCLUDING COLLECTORS AND LATERALS, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT. TRENCH SHALL BE BACKFILLED OR PLATED AT THE CONCLUSION OF EACH DAY OF WORK.

22. THE CONTRACTOR SHALL PROTECT ALL SURVEY MONUMENTATION. IF ANY SURVEY MONUMENTS ARE DISTURBED OR DESTROYED, THE CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO REESTABLISH AND RECORD THE MONUMENT CHANGE PER STATE LAW.

23. A MINIMUM OF 12 INCHES VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN THE SEWER PIPE AND ANY OTHER UTILITIES.

24. SEPARATION OF SEWER / WATER AND SEWER / RECLAIMED WATER SHALL COMPLY WITH LWD STD DWG S-2 AND WITH ALL COUNTY AND STATE HEALTH DEPT REGULATIONS

25. CONNECTIONS TO EXISTING SEWER PIPE OR MANHOLES SHALL ONLY BE DONE IN THE DIRECT PRESENCE OF THE LWD INSPECTOR. NEW SEWER SHALL NOT BE CONNECTED OR ALLOWED TO FLOW TO EXISTING SEWER UNTIL AFTER FINAL ACCEPTANCE OF ALL UPSTREAM WORK BY THE LWD INSPECTOR, OR AS APPROVED BY DISTRICT ENGINEER.

26. ALL SERVICE LATERALS SHALL BE LOCATED AT RIGHT ANGLES TO THE SEWER MAIN UNLESS OTHERWISE SHOWN AS APPROVED BY LWD ON THE PLANS.

27. A 2-INCH HIGH "S" SHALL BE INSCRIBED ON THE CURB FACE AT EACH LATERAL LOCATION BY THE CONTRACTOR.

28. A 10 GAGE SHIELDED COPPER WIRE SHALL BE BURIED OVER EACH LATERAL. THE WIRE SHALL EXTEND UP TO A 2" COPPER TAG TIED AND SOLDERED TO THE WIRE. THE TAG OVER THE SEWER MAIN SHALL TERMINATE 6" ABOVE PAVING SUBGRADE WITH FINAL LOCATION JUST BELOW PAVING. THE TAG OVER THE CUSTOMER END OF THE LATERAL SHALL EXTEND ABOVE GRADE UNTIL CONNECTED AND SHALL THEREAFTER BE BURIED AT THE POINT OF CONNECTION.

29. ALL PIPE SHALL BE HANDLED AND INSTALLED SO AS TO PROTECT PIPE, JOINTS, LINING, AND COATING. THE PIPE SHALL BE CAREFULLY BEDDED TO PROVIDE CONTINUOUS BEARING AND PREVENT UNEVEN SETTLEMENT. PIPE SHALL BE PROTECTED AGAINST FLOTATION AT ALL TIMES. OPEN ENDS OF PIPE SHALL BE SEALED AT ALL TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.

30. PIPE JOINTS SHALL NOT BE DEFLECTED UNLESS SO DESIGNED AND SHALL THEN BE LIMITED TO LESS THAN ONE-HALF OF THE ANGLE RECOMMENDED BY THE PIPE MANUFACTURER.

31. SEWER PIPE ZONE AND TRENCH BACKFILL SHALL BE PER THE LWD SEWER STANDARDS. WATER JETTING SHALL NOT BE ALLOWED.

32. ALL LATERALS SHALL BE CONSTRUCTED CLEAR OF DRIVEWAYS.

LWD SEWER NOTES

33. JOB MIXING OF CONCRETE IS NOT ALLOWED WITHOUT EXCEPTION. CONCRETE TESTING BY LWD WILL BE AT CONTRACTOR EXPENSE.

34. MANHOLE BASES SHALL BE MONOLITHICALLY PLACED, FINISHED, AND COMPLETED AT TIME OF PLACEMENT. GPK PRODUCTS, INC., OR APPROVED EQUAL, MANHOLE ADAPTERS SHALL BE SET IN THE BASE FOR EACH PIPE CONNECTION. SETTING OF MH RINGS SHALL NOT BE ALLOWED FOR 48 HOURS AFTER CONCRETE PLACEMENT. PRECAST MANHOLE BASES ARE ACCEPTABLE FOR USE WITH 8" SEWERS WITH DISTRICT ENGINEER APPROVAL.

35. JOINTS BETWEEN MH BASE, SHAFTING, CONE SECTIONS, AND RING SHALL HAVE A 2" BY 2" BUTYL RUBBER GASKET PLACED WITHIN THE FULL CIRCUMFERENCE. GASKET SHALL BE CPS-210 BY PRESS-SEAL GASKET CORP., OR APPROVED EQUAL.

36. ALL MANHOLES SHALL BE VACUUM TESTED 1) BEFORE BACKFILL, 2) AFTER BACKFILL, AND 3) SUBSEQUENT TO ANY SUSPECTED MOVEMENT OR DAMAGE AFTER BACKFILL.

37. ALL SEWERS AND LATERALS SHALL BE WAYNE BALLED OR JETTED, LOW PRESSURE AIR TESTED, AND TELEVISED AT THE APPLICANT /CONTRACTORS EXPENSE PRIOR TO CONSIDERATION FOR FINAL ACCEPTANCE BY LWD. AIR TEST SHALL BE DONE AFTER CONSTRUCTION OF ALL OTHER UTILITIES AND UTILITY LATERALS.

38. ALL SEWERS AND LATERALS SHALL BE IN PLACE AND SHALL HAVE FINAL APPROVAL BY THE LWD INSPECTOR PRIOR TO PAVING.

39. MANHOLES SHALL BE 4-FEET DIAMETER FOR PIPE UP TO 15-INCH DIAMETER PER LWD STD DWG S-3. MANHOLES SHALL BE 5-FEET DIAMETER FOR PIPE 18-INCHES AND LARGER PER LWD STD DWG S-4.

40. ALL NEW MH'S SHALL BE LINED WITH AN INTEGRALLY LOCKING PVC (T-LOCK) PROTECTIVE LINING SYSTEM. ALL EXISTING MH'S WITH MODIFICATIONS SHALL BE PROVIDED WITH URETHANE OR EPOXY LINING SYSTEM. LINING SYSTEM TO MATCH EXISTING LINING, IF ANY. T-LOCK, URETHANE, AND EPOXY LINING SYSTEMS SHALL BE PER SECT 500-2 OF THE GREENBOOK.

41. MAXIMUM DEPTH OF SEWER FOR SDR35 PVC PIPE IS 15'. C900 PIPE IS REQUIRED FOR DEPTH OF COVER OVER 15'.

42. FINAL APPROVAL OF PLANS BY DISTRICT ENGINEER IS VALID FOR A PERIOD OF TIME NOT TO EXCEED ONE YEAR FROM APPROVAL DATE TO START OF CONSTRUCTION. IF THE ONE YEAR TIME LIMIT IS EXPIRED PRIOR TO START OF CONSTRUCTION THE DEVELOPER SHALL RESUBMIT THE PLAN CHECK TO THE DISTRICT ENGINEER FOR AN UPDATED REVIEW AND APPROVAL. ANY CHANGES REQUIRED TO THE PLANS SHALL BE MADE AT THE DEVELOPERS EXPENSE AND APPROVED BY THE LWD DISTRICT ENGINEER PRIOR TO THE START OF CONSTRUCTION.

43. WHEN CONNECTION TO EXISTING MANHOLES IS NECESSARY AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL CONNECT TO EXISTING MANHOLE STRUCTURES AND CONSTRUCT THE NEW FLOW-THROUGH CHANNELS IN EACH MANHOLE BASE TO ACCOMMODATE THE NEW SEWER LINES AS REQUIRED. SMOOTH TRANSITIONS SHALL BE INSTALLED FROM THE INVERTS OF NEWLY INSTALLED PIPES TO THE EXISTING MANHOLE STRUCTURES. MANHOLES SHALL BE CORE DRILLED AND MANHOLE CONNECTION FITTINGS SHALL BE CONNECTED TO THE CORE DRILLED HOLE BY LINK-SEAL, OR APPROVED EQUAL. THE FIRST FLEXIBLE JOINT SHALL BE LOCATED WITHIN ONE-FOOT OF THE MANHOLE BASE. JACK HAMMERING SHALL NOT BE ALLOWED.

44. ALL NEW CONNECTIONS TO EXISTING SEWER SHALL BE MADE TO EXISTING WYES, MADE WITH GASKETED PVC SADDLE WYE, OR SHALL BE MADE BY INSTALLING NEW MANUFACTURED WYES. FOR INSTALLING NEW MANUFACTURED WYES, STANDARD BELL AND SPIGOT OR PLAIN END WYES AND PLAIN END PIPE SPOOLS MATCHING THE ADJACENT EXISTING PIPE MAY BE USED FOR INSERTING WYES INTO AN EXISTING SEWER. ALL CONNECTIONS NOT MADE TO EXISTING WYES MUST BE IN ACCORDANCE WITH LWD STANDARD DRAWING S-32.

45. IF NECESSARY DURING THE LATERAL CONNECTION WORK, UPSTREAM FLOW IN THE EXISTING SEWER SHALL BE TEMPORARILY PLUGGED AND BY-PASSED BY PUMPING OR PUMPER TRUCKS FOR DISPOSAL TO A DOWNSTREAM LWD SEWER. IN LOCATIONS WITH SIGNIFICANT UPSTREAM FLOW, LWD MAY REQUIRE TEMPORARY PROVISION OF DUTY AND BYPASS EQUIPMENT WITH FULL-TIME MANNED MONITORING. NO UNMANNED BYPASS SHALL BE ALLOWED.

46. FOR CONNECTION OF PLAIN END TO PLAIN END PVC SEWER, REPAIR COUPLINGS SHALL BE MADE OF PVC MATERIAL MEETING THE SAME MATERIAL REQUIREMENTS AS THE PIPE BEING REPAIRED. PVC SEWER REPAIR COUPLINGS SHALL BE RUBBER GASKETED WITH NO CENTER STOP. PIPE ENDS SHALL BE THOROUGHLY CLEANED PRIOR TO INSTALLATION OF THE REPAIR COUPLING(S). THE REPAIR COUPLING SHALL BE SLIPPED ALL THE WAY ON TO ONE PLAIN END PIPE, THEN THE PIPE AND ADJOINING PIPES SHALL BE ALIGNED TOGETHER AND THE REPAIR COUPLING SLIPPED BACK INTO A POSITION EQUALLY SPACED BETWEEN THE TWO PLAIN END PIPES. PVC SEWER REPAIR COUPLINGS SHALL BE AS MANUFACTURED BY PW PIPE OR EQUAL APPROVED BY THE LWD DISTRICT ENGINEER.

47. PVC OR VITRIFIED CLAY PIPE (VCP) SEWER PIPE AND WYES MAY BE USED TO TIE-IN TO EXISTING VCP. FOR CONNECTION OR REPAIR OF PLAIN END VCP TO VCP A ROMAC INDUSTRIES, INC. STYLE 501 COUPLING OR EQUAL SHALL BE USED. FOR CONNECTIONS OF VCP TO PVC, A ROMAC INDUSTRIES, INC. STYLE RC 501 REDUCING COUPLING WITH MATCHING INVERTS, OR APPROVED EQUAL, SHALL BE USED WITH A GASKET RANGE TO MATCH THE OUTSIDE DIAMETER OF THE PIPE ON THAT SIDE OF THE COUPLING BEING JOINED. THE CENTER RINGS SHALL BE DUCTILE IRON PER ASTM A536, GRADE 65-45-12 AND SHALL BE PROVIDED WITH 16 MILS FUSION BONDED EPOXY COLOR CODED TO THE TYPE OF CONNECTING PIPE. GASKETS SHALL BE SBR PER ASTM D2000 MBA710, COMPOUNDED FOR WATER AND SEWER SERVICE. ALL NUTS AND BOLTS SHALL BE TYPE 316 STAINLESS STEEL.

SAN DIEGUITO WATER DISTRICT NOTES:

1. WATER MAINS, LATERALS AND APPURTENANCES SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS OF THE CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC). THE CONTRACTOR SHALL AND HEREBY DOES GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR AFTER THE DATE OF ACCEPTANCE.
2. THE CONTRACTOR SHALL NOTIFY THE DISTRICT'S INSPECTION DEPARTMENT 48 HOURS IN ADVANCE OF BEGINNING WORK TO ARRANGE FOR INSPECTION OF PROJECT. THE CONTRACTOR SHALL GIVE 24 HOURS NOTICE ON CALLS FOR INSPECTION. PHONE: (760) 633-2709. ALL WORK PREFORMED WITHOUT BENEFIT OF INSPECTION WILL BE SUBJECT TO REJECTION AND REMOVAL.
3. THE CONTRACTOR WILL BE REQUIRED TO SCHEDULE A MANDATORY PRE-CONSTRUCTION CONFERENCE WITH THE SAN DIEGUITO WATER DISTRICT INSPECTOR PRIOR TO COMMENCEMENT OF WORK ON WATER IMPROVEMENTS. PHONE: (760) 633-2709.
4. UNLESS OTHERWISE NOTED, ALL CONNECTIONS TO EXISTING MAINS WILL BE MADE BY THE CONTRACTOR, UNDER THE SUPERVISION OF SAN DIEGUITO WATER DISTRICT, AFTER PAYMENT OF THE ESTIMATED COST BY THE DEVELOPER.
5. WHERE ELEVATIONS AND GRADES ARE NOT SHOWN ON THE WATER MAIN PROFILE, TOP OF PIPE PROFILE IS 48 INCHES BELOW CENTERLINE FINISH GRADE OF STREET.
6. ALL SERVICES TO BE CONSTRUCTED CLEAR OF DRIVEWAYS.
7. CONTRACTOR TO FURNISH ONE INCH COPPER WATER SERVICE AND METER BOX FOR EACH RESIDENTIAL LOT.
8. CONTRACTORS SHALL ACQUIRE A TRENCHING PERMIT FROM THE CALIFORNIA DIVISION OF SAFETY FOR ALL TRENCH WORK.
9. INSTALL FIRE HYDRANTS 2.5 FEET FROM FACE OF CURB, IF NO SIDEWALK EXISTS, OR 7 FEET FROM FACE OF CURB WHERE SIDEWALK EXISTS OR WILL BE CONSTRUCTED.
10. PROVIDE AIR RELEASE ASSEMBLIES AT ALL HIGH POINTS IN WATER MAIN.
11. CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF ENCINITAS FOR ANY EXCAVATION WITHIN EXISTING CITY RIGHTS-OF-WAY.
12. THE DISTRICT REQUIRES THAT COMPACTION TESTS BE TAKEN WHERE WATER LINES ARE INSTALLED WITHIN EXISTING COUNTY RIGHTS-OF-WAY, CITY OF ENCINITAS RIGHTS-OF-WAY, OR PRIVATE EASEMENTS, AND THE RESULTS APPROVED BY THE CITY OF ENCINITAS, BEFORE THE WATER LINES ARE ACCEPTED AND A COPY SENT TO THE SAN DIEGUITO WATER DISTRICT OFFICE.
13. PRIOR TO AWARDING WATER LINE CONTRACT, OWNER SHALL ADVISE PROSPECTIVE CONTRACTORS TO OBTAIN AND REVIEW CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC) SPECIFICATIONS.
14. FILL AREAS MUST BE COMPACTED TO 90%, PRIOR TO PIPE INSTALLATION.

SAN DIEGUITO WATER DISTRICT NOTES (CONTINUED):

15. APPROVAL OF THIS PLAN BY SAN DIEGUITO WATER DISTRICT DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF, THE LOCATION OF, OR THE EXISTENCE OR NON-EXISTENCE OF, ANY UNDERGROUND UTILITY, PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.

16. ALL EXISTING FACILITIES WHICH MAY EFFECT FINAL DESIGN, I.E., LINE CROSSINGS, LINE PARALLELING, OR PROPOSED CONNECTION SHALL BE FIELD VERIFIED. ALL EXISTING OR PROPOSED UTILITY CROSSINGS WITHIN 10 FEET OF PROPOSED WATER MAINS SHALL BE SHOWN ON IMPROVEMENT PLANS. ELECTRICAL AND SEWER TO CROSS UNDER WATER MAINS UNLESS GIVEN WRITTEN PERMISSION BY SAN DIEGUITO WATER DISTRICT.

17. WATER CONNECTIONS TO COMMERCIAL DEVELOPMENTS SHALL HAVE AN APPROVED BACKFLOW DEVICE INSTALLED TO THE DISTRICT'S SATISFACTION AND CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC) STANDARDS. BACKFLOW DEVICES ARE TO BE INSTALLED DIRECTLY OUTSIDE CITY OR COUNTY RIGHT-OF-WAY OR OUTSIDE WATER DISTRICT EASEMENT. REPAIR, MAINTENANCE AND ANNUAL TESTING OF BACKFLOW DEVICE ARE RESPONSIBILITY OF OWNER.

18. MINIMUM HORIZONTAL SEPARATION OF 10 FEET REQUIRED BETWEEN FIRE HYDRANTS AND SAN DIEGO GAS AND ELECTRIC VAULTS.

19. UTILITIES TO MAINTAIN MINIMUM 5-FOOT SEPARATION WHEN PARALLELING WATER SERVICES.

20. CONTRACTOR AND DEVELOPER ARE RESPONSIBLE TO RELOCATE ANY EXISTING WATER FACILITY (FIRE HYDRANT, METERS, VALVES, VALVE BOXES, ETC.) THAT ARE EFFECTED BY THEIR PROJECT.

21. CONTRACTOR TO SUPPLY DOCUMENTATION SHOWING THAT ANY ASBESTOS WATER PIPES REMOVED FROM THE GROUND WERE DISPOSED OF IN A MANNER ACCEPTABLE TO THE SAN DIEGO COUNTY WASTE DIVISION.

22. USE THE FOLLOWING VARIOUS COMBINATIONS OF PLAIN END PIPE LENGTHS WITH HIGH DEFLECTION COUPLINGS AND INTEGRAL BELL END PIPE FOR CURVED ALIGNMENTS IN BOTH HORIZONTAL AND VERTICAL DIRECTIONS. DO NOT BEND PIPE BETWEEN COUPLINGS. SAW CUT INTEGRAL BELL END OF STANDARD PIPE AND BEVEL END FOR USE WITH DEFLECTION COUPLINGS. USE 9.5-FOOT PLAIN END PIPE LENGTHS WITH DEFLECTION COUPLINGS FOR ALL RADII BETWEEN 140 FEET TO 270 FEET. USE 19-FOOT PIPE LENGTHS WITH DEFLECTION COUPLINGS FOR ALL RADII BETWEEN 270 FEET TO 560 FEET. USE AND INTEGRAL BELL END PIPE LENGTH JOINED TOGETHER WITH A 19-FOOT PLAIN END PIPE LENGTH TO FORM A CHORD. USE DEFLECTION COUPLINGS ON EACH END OF THE CHORD AND CONTINUE THIS COMBINATION THROUGH THE CURVED ALIGNMENT FOR ALL RADII BETWEEN 560 FEET TO 1,150 FEET. PIPE LENGTHS SHORTER THAN 9 FEET WILL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED THE BY THE DISTRICT'S REPRESENTATIVE.

1. CALIFORNIA STATE LAW ASSEMBLY BILL AB-1953 IS REQUIRING THAT NO-LEAD BRASS BE USED IN THE CONSTRUCTION OR REPAIR OF ALL POTABLE WATER SYSTEM EFFECT JANUARY 1, 2010. IN COMPLIANCE WITH THIS LAW, THE DISTRICT SHALL REQUIRE ALL MATERIALS TO BE NO-LEAD BRASS PARTS.
2. ALL COPPER TUBING USED FOR AIR RELEASES, BLOW OFFS, AND SERVICES SHALL BE PROVIDED WITH CATHODIC PROTECTION IN ACCORDANCE WITH WC-17 OR WC-18.
3. WATER SERVICES TO BE ABANDONED THAT ARE CONNECTED TO PIPELINES THAT WILL REMAIN IN SERVICE SHALL BE DISCONNECTED AT THE CORPORATION STOP, SHALL HAVE THE CORPORATION STOP REMOVED AND SHALL HAVE A BRASS PLUG INSTALLED; OR BE ABANDONED AS DIRECTED BY THE SDWD INSPECTOR.

OLIVENHAIN MUNICIPAL WATER DISTRICT
GENERAL POTABLE WATER SYSTEM NOTES REQUIRED FOR SUBDIVISION IMPROVEMENT PLANS

1. POTABLE WATER WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND MATERIALS AS SPECIFIED IN THE MOST RECENT EDITION OF THE OLIVENHAIN MUNICIPAL WATER DISTRICT (DISTRICT) STANDARD SPECIFICATIONS AND DRAWINGS FOR THE CONSTRUCTION OF WATER MAINS AND FACILITIES, INCLUDING ALL AMENDMENTS ADOPTED PRIOR TO THE DISTRICT APPROVAL DATE ON THESE PLANS. CONTRACTOR SHALL HAVE A COPY OF THE STANDARD SPECIFICATIONS ON THE JOB SITE AT ALL TIMES.
2. THE SUBMISSION AND REVIEW OF ALL SUBMITTALS (SHOP DRAWINGS, SIX SETS) AS REQUIRED BY THE STANDARD SPECIFICATIONS ARE TO BE ACCOMPLISHED PRIOR TO THE PRE-CONSTRUCTION MEETING WITH THE DISTRICT'S INSPECTOR.
3. UNLESS OTHERWISE NOTED, CONNECTIONS TO EXISTING MAINS SHALL BE MADE

STANDARD GRADING NOTES

The following general notes and soils engineer's certificate shall appear on the first sheet of ALL GRADING PLANS submitted.

WORK TO BE DONE

A. GENERAL

1. All work shall be done in accordance with these plans, the standard specifications for public works construction, the design construction standards of the City of Encinitas and the San Diego Regional Standard Drawings. Any changes or revisions therefrom shall be approved in writing by the City Engineer prior to any request for inspection.

2. The soils report titled _____ prepared by _____ and dated together with the soils update letter prepared by _____ and dated _____shall be considered as a part of this grading plan. All grading shall be done in accordance with the recommendations and specifications contained in said report.

3. Approval of this plan does not constitute approval of sizes, location, and type of drainage facilities, nor of improvements within street right-of-ways. Separate approvals and permits for these shall be required in conjunction with improvement plans.

4. Written permission shall be obtained for any off-site grading.

5. Contractor shall take any necessary precautions required to protect adjacent properties during grading operations. Anything damaged or destroyed shall be replaced or repaired to the condition existing prior to grading and to the satisfaction of the City Engineer.

6. The developer shall be responsible that any monument or bench mark which is disturbed or destroyed shall be re-established and replaced by a qualified registered civil engineer or a licensed land surveyor.

7. The contractor shall design, construct, and maintain all safety devices, including shoring, and shall be responsible for conforming to all local, state, and federal safety and health standards, laws, and regulations.

8. Grading and equipment operating within one-half (1/2) mile of a structure for human occupancy shall not be conducted between the hours of 5:30 p.m. and 7:30 a.m. nor on Saturdays, Sundays, nor City-recognized holidays.

9. No grading operations shall commence until a pre-grade meeting has been held onsite with the following people present: City Inspector, Civil Engineer, Soils Engineer, Grading Contractor, and the Permittee. The pre-grade meeting shall be scheduled with the City at least 48 hours in advance by calling (760) 633-2770.

10. Prior to hauling dirt or construction materials to any proposed construction site, the developer shall submit to and receive approval from the City Engineer for the proposed haul route. The developer shall comply with all conditions and requirements the City Engineer may impose with regards to the hauling operation.

11. Upon final completion of the work under the grading permit, but prior to final grading approval and/or final release of security, an as-graded certification shall be provided stating: "The grading under Permit No. _____ has been performed in substantial conformance with the approved grading plan or as shown on the attached as-graded plan". This statement shall be followed by the date and signature of the Civil Engineer who certifies such grading operation.

B. NOTIFICATIONS

1. The existence and location of underground utility pipes and structures shown on these plans were obtained by a search of available records. To the best of our knowledge, there are no existing utilities except as shown on these plans, however:

   The contractor is required to take due precautionary measures to protect any existing utilities or structures located at the work site. It is the contractor's responsibility to contact the following owners of said utilities or structures prior to any excavation, for verification and location of utilities and notification of commencement of work:

   a. Sewers - (Agency) (Phone)

   b. Gas & Electric - (Agency) (Phone)

   c. Water - (Agency) (Phone)

   d. Telephone - (Agency) (Phone)

   e. Cable TV - (Agency) (Phone)

2. Contractor shall notify the City Engineer's office 48 hours prior to beginning any work on this project. Phone: (760) 633-2770.

3. The contractor shall give 24 hours notice on calls for inspection. Phone: (760) 633-2770. All work performed

without benefit of inspection will be subject to rejection and removal.

C. GRADING

1. All grading shall be observed and tested by a qualified soils engineer or under the engineer's direction. He/She shall observe and test the excavation, placement, and compaction of fills and backfills and the compaction of trenches. He/She shall submit soils reports as required and will determine the suitability of any fill material. Upon completion of grading operations, he/she shall state that observations and tests were made by him/her or under his/her supervision and that in his/her opinion, all embankments and excavations were constructed in accordance with the approved grading plans and that all embankments and excavations are acceptable for their intended use.

2. The contractor shall properly grade all excavated surfaces to provide positive drainage and to prevent ponding of water. He/she shall control surface water and avoid damage to adjoining properties or to finished work on the site and shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control measures have been installed.

3. All areas to be filled shall be prepared to be filled and fill shall be placed in accordance with standard specifications. All vegetable matter and objectionable material shall be removed by the contractor from the surface upon which the fill is to be placed. Loose fill and alluvial soils shall be removed to suitable firm natural ground. The exposed soils shall be scarified to a depth of 6" and then compacted to a minimum of 90 percent. It shall be the contractor's responsibility to place, spread, water, and compact the fill in strict accordance with specifications.

4. Cut and fill slopes shall be cut and trimmed to finish grade to produce smooth surfaces and uniform cross sections. The slopes of excavations and embankments shall be shaped, planted and trimmed as directed by the engineer of work and left in a neat and orderly condition. All stones, roots, and other waste matter exposed or excavation or embankment slopes which may become loosened shall be removed and disposed. The toe and top of all slopes shall be rounded in accordance with the Grading Ordinance.

5. All trees, brush, grass, and other objectionable material shall be collected, piled, or otherwise disposed off the site by the contractor so as to leave the areas that have been cleared with a neat and finished appearance, free from unsightly debris. Approval of location of debris fill shall be secured from the soils engineer and City Engineer prior to the disposal of any such material.

STANDARD EROSION CONTROL NOTES

EROSION CONTROL

1. In case emergency work is required, contact (responsible party) at _____ (phone number), 24 hours a day.

2. Equipment and workers for emergency work shall be made available at all times during the rainy season (October 1 to April 15). All necessary materials shall be stockpiled on site on October 1 at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.

3. Devices shown on plans shall not be moved or modified without the approval of the Engineering Inspector.

4. The contractor shall restore all erosion control devices to working order to the satisfaction of the City Engineer after each run-off producing rainfall.

5. The contractor shall install additional erosion control measures as may be required by the City Engineer due to an incomplete grading operation or unforeseen circumstances which may arise.

6. The contractor shall be responsible and shall take necessary precautions to prevent public trespass onto areas when impounded waters create a hazardous condition.

7. All erosion control measures provided per the approved grading plan shall be incorporated hereon.

8. Graded areas around the project perimeter must drain away from the face of slope at the conclusion of each work day.

9. All removable protective devices shown shall be in place at the end of each working day when the five (5) day rain probability forecast exceeds forty percent (40%).

Silt and other debris shall be removed after each rainfall.

10. Should germination of hydro-seeded slopes fail to provide effective coverage of graded slopes (90% coverage) prior to November 15, the slopes shall be stabilized with punched straw installed in accordance with Section 35.023 of the Erosion and Sediment Control Handbook of the State of California Department of Conservation.

E. HYDRO-SEED

1. Hydro-seeding shall be applied to all slopes that are graded 6:1 (Horizontal to Vertical) or steeper when they are:

   A. Three feet or more in height in fill areas.

   B. 5 feet or more in height in cut areas, unless slope is not subject to erosion due to the erosion resistant character of the material and approved by the City Engineer.

2. Irrigation shall be provided to maintain the moisture level of the soil at the optimum level for the growth of the hydro-seeded growth.

3. Hydro-seeding mix shall consist of all the following:

   A. Seed mix shall consist of no less than:

Lbs / acre	Botanical Name	Min. % Purity/ Germination
2	Artemisia Californica	05/60
2	Cassimonia Cheiranthifolia	90/80
4	Encelia California	40/60
4	Erigonum Fasciculatum	
3	Eschscholzia Californica	98/80
12	Festuca Rubra 'Molate'	95/80
1	Layia Platyglossa	60/60
6	Lotus Scoparius	90/80
4	Melica Imperfecta	80/60
3	Mimulis Auriantiacus	02/60

	Puniceus	
3	Phacelia Campanularia	98/75
3	Rhus Intergrifolia	
2	Salvia Mellifera	70/50
8	Vulpia Microstachys	90/80

B. All seed materials shall be transported to the job-site in unopened containers with the California Department of Food and Agriculture certification tag attached to or printed on said containers.

C. Non-phyto-toxic wetting agents may be added to the hydro-seed slurry at the discretion of the contractor.

D. Type 1 mulch applied at the rate of no less than 2,000 lbs. per acre. Type 6 mulch (straw) may be substituted, all or part, for hydraulically applied fiber material. When straw is used it must be anchored to the slope by mechanically punching no less than 50% of the straw into the soil.

4. Areas to be hydro-seeded shall be prepared prior to hydro-seeding by:

A. Roughening the surface to be planted by any or a combination of:

a. Track walking slopes steeper than 6:1.

b. Ripping areas that will not break up using item "a" above.

B. Conditioning the soil so that it is suitable for planting by:

a. Adjusting the surface soil moisture to provide a damp, but not saturated, seed bed.

b. The addition of soil amendments, pH adjustment, leaching, or covering saline soils to provide viable conditions for growth.

5. Hydro-seeded areas shall be maintained to provide a vigorous growth until the project is permanently landscaped or, for areas where hydro-seeding is the permanent landscaping, until the project is completed and all security released.

STANDARD STORM WATER POLLUTION CONTROL NOTES

Concrete Washout

- Contractor shall establish and use an adequately sized concrete washout area to contain washout wastes on site. It is illegal to wash concrete, slurry, mortar, stucco, plaster and the like into the stormwater conveyance system or any receiving water. Contractor shall post a sign designating the washout location.

Construction Site Access

- A stabilized construction site access shall be provided for vehicles egress and ingress to prevent tracking dirt off site. This shall include using material such as gravel and/or corrugated steel panels/plates.

Construction Vehicles

- A specific area away from gutters and stormdrain shall be designated for construction vehicles parking, vehicle refueling, and routine equipment maintenance. All major repairs shall be made off-site.

Erosion Control

- Erosion control must be provided for all erosive surfaces. Sloped surfaces especially shall be protected against erosion by installing erosion resistant surfaces such as erosion control mats, adequate ground cover vegetation, and bonded fiber matrix.
- No excavation and grading activities are allowed during wet weather.
- Diversion dikes shall be constructed to channel runoff around the construction site. Contractor shall protect channels against erosion using permanent and temporary erosion control measures.
- Remove existing vegetation only when absolutely necessary. Large projects shall be conducted in phases to avoid unnecessary removal of the natural ground cover. Do not remove trees or shrubs unnecessarily; they help decrease erosion.
- Temporary vegetation must be planted on slopes or where construction is not immediately planned for erosion control purposes. Erosion shall be prevented by planting fast-growing annual and perennial grasses to shield and bind the soil.
- Plant permanent vegetation as soon as possible, once excavation and grading activities are complete.
- Water usage for dust control shall be minimized.

On-site Construction Material Storage

- Stored materials shall be contained in a secure place to prevent seepage and spillage. Contractor shall store these products where they will stay dry out of the rain. Contractor shall provide secondary containment for all fuel stored on-site.
- Eliminate or reduce pollution of stormwater from stockpiles kept on-site. Stockpiles may include soil, paring materials, asphalt concrete, aggregate base, etc. Stockpiles shall be located away from concentrated stormwater flows and stormdrain inlets. Stockpiles shall be covered or protected with soil stabilization measures and provided with a temporary sediment barrier around the perimeter at all times.

Training

- Contractors' employees who perform construction in the City of Encinitas shall be trained to be familiar with the City of Encinitas stormwater pollution control requirements. These BMP notes shall be available to everyone working on site. The property owner(s) and the prime contractor must inform subcontractors about stormwater requirements and their own responsibilities.

Waste Management

- Contractor shall be responsible for properly disposing of all waste and unused construction materials. Dumping of unused or waste products on the ground, where water can carry them into the conveyance system is strictly prohibited.
- No seepage from dumpsters shall be discharged into stormwater. Berms/dikes shall be placed around dumpsters
  to divert the natural storm runoff. Dumpsters shall be checked frequently for leaks. Dumpster lids shall remain closed at all times. Dumpsters without lids shall be placed within structures with impervious roofing or covered with tarps in order to avoid rain contact with any trash material.
- Many construction materials, including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Non-recyclable materials must be taken to an appropriate landfill or disposed of as hazardous waste. For information on disposal of hazardous material, call the **Hazardous Waste Hotline** toll free at (800) 714-1195. For information on landfills and to order dumpsters call **EDCO** at (760) 436-4151.
- Pollutants shall be kept off exposed surfaces. Place trash cans and recycling receptacles around the site.
- Portable toilets must be in good working order and checked frequently for leaks. Contractor shall provide secondary containment and locate portable toilets away from stormdrain inlets on pervious surfaces.

SAN DIEGUITO WATER DISTRICT
NOTES FOR GRADING AND IMPROVEMENT PLANS

The following notes shall be included on plans within the San Dieguito Water District. SDWD may be contacted at (760) 633-2709.

1. REVIEW OF THIS PLAN BY SAN DIEGUITO WATER DISTRICT DOES NOT CONSTITUTE REPRESENTATION AS TO THE ACCURACY OF, THE LOCATION OF, OR THE EXISTENCE OR NON-EXISTENCE OF, ANY UNDERGROUND UTILITY, PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.

2. ALL EXISTING FACILITIES, WHICH MAY AFFECT FINAL DESIGN, I.E., LINE CROSSING, LINE PARALLELING OR PROPOSED CONNECTION SHALL BE FIELD VERIFIED. ALL EXISTING OR PROPOSED UTILITY CROSSING WITHIN 10 FEET OF PROPOSED WATER MAINS SHALL BE SHOWN ON IMPROVEMENT PLANS. ELECTRICAL AND SEWER TO CROSS UNDER WATER MAINS UNLESS GIVEN WRITTEN PERMISSION BY SAN DIEGUITO WATER DISTRICT.

3. CONTRACTOR AND OWNER ARE RESPONSIBLE TO RELOCATE AND/OR ADJUST TO GRADE ANY EXISTING WATER FACILITY (FIRE HYDRANT, METERS, VALVES, VALVE BOXES, ETC.) WHICH IS AFFECTED BY THEIR PROJECT. ALL AFFECTED WATER FACILITIES MUST MEET CURRENT WATER AGENCIES' STANDARDS COMMITTE (WASC) STANDARDS. IF FACILITIES DO NOT MEET STANDARDS, THEN THEY SHALL BE UPGRADED TO CURRENT STANDARDS AT THE OWNER'S EXPENSE.

4. UTILITIES TO MAINTAIN MINIMUM 5-FOOT SEPARATION WHEN PARALLELING WATER SERVICES.

5. MINIMUM HORIZONTAL SEPARATION OF 10-FEET REQUIRED BETWEEN FIRE HYDRANTS AND SAN DIEGO GAS AND ELECTRIC VAULTS.

6. ALL WATER SERVICES TO BE CONSTRUCTED CLEAR OF DRIVEWAYS AND ALL OTHER TRAVELED WAYS. WATER METERS MUST BE IN FRONT OF THE PARCEL THEY ARE SERVING.

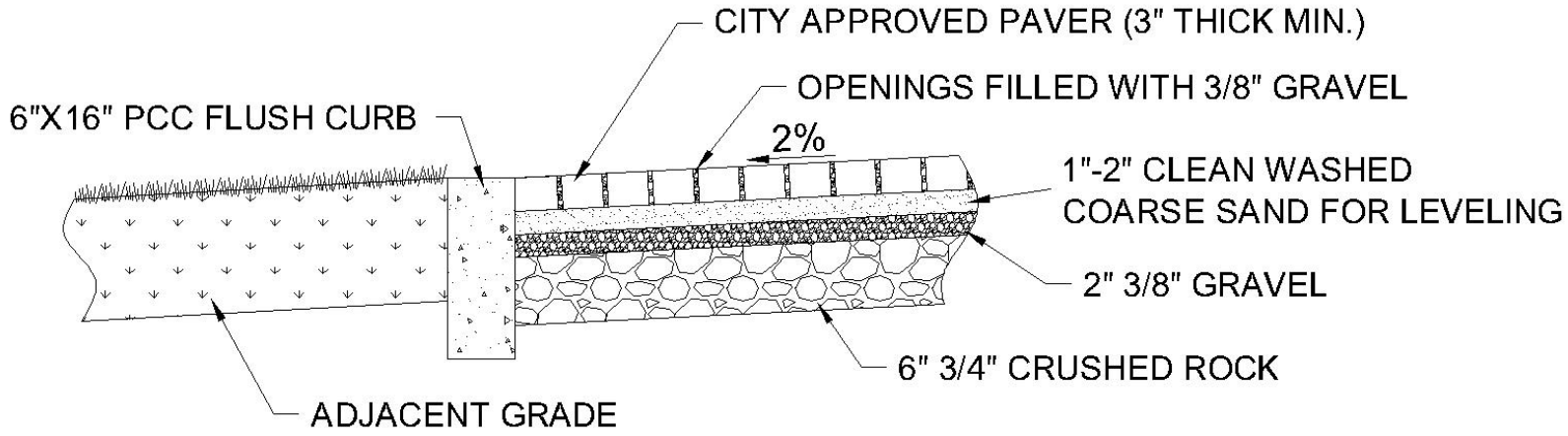
CALTRANS GRAVEL EQUIVALENT METHOD

Pavement structural sections shall be designed in accordance with the CaltTrans gravel equivalent method. CalTrans offers a program for this purpose called CalFP v1.1, which is available at the following web address:

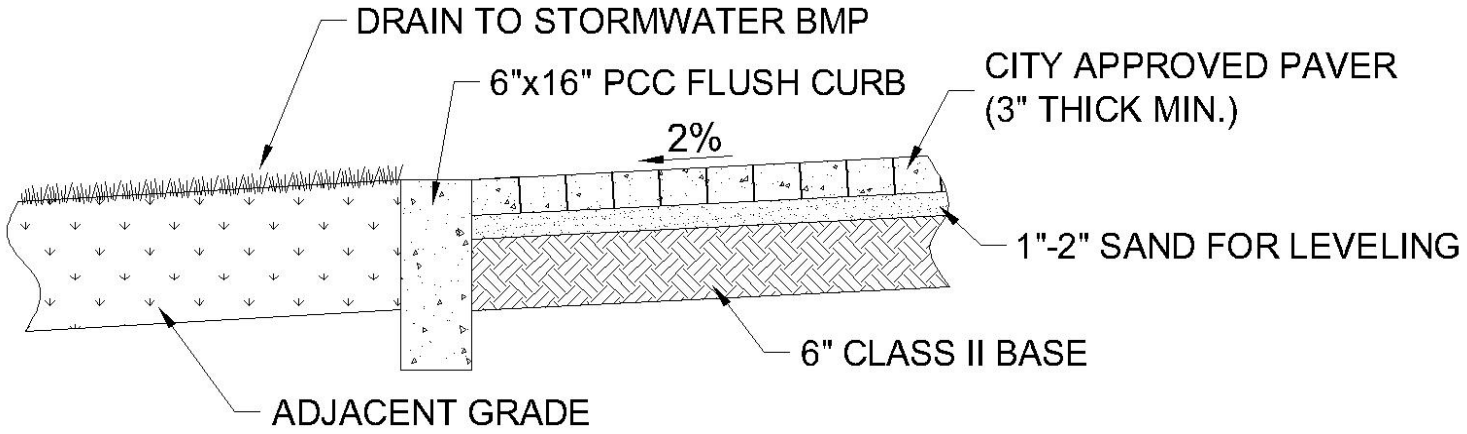
http://www.dot.ca.gov/hq/esc/Translab/ope/PavementSoftware.html

PAVER STRUCTURAL SECTION

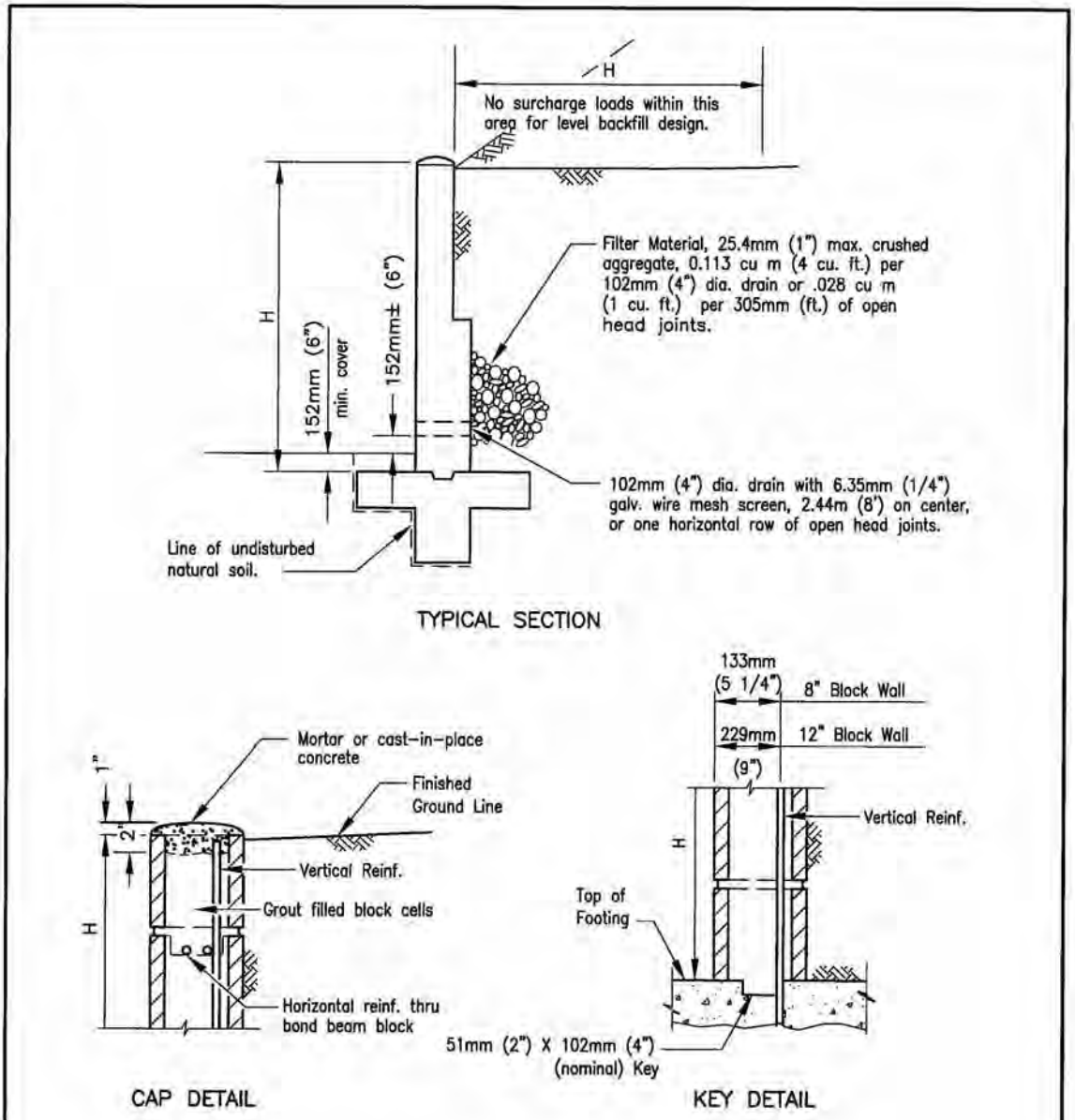
PERVIOUS PAVERS



NON-PERVIOUS PAVERS



SDRSD WALL DRAIN DETAIL



NOTES:

1. All masonry retaining walls shall be constructed with cap, key and drainage details as shown hereon.
2. 102mm (4") diameter drain may be formed by placing a block on it's side.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

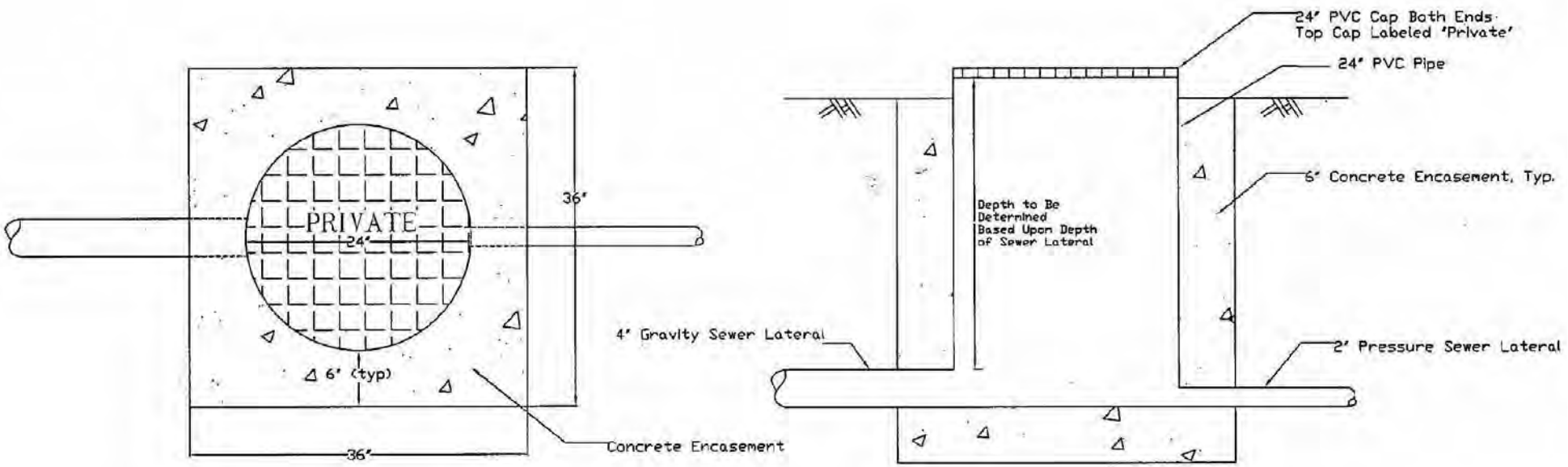
DETAILS FOR MASONRY RETAINING WALL

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Chairperson R.C.E. 19246 Date 3/01/2003

DRAWING NUMBER C-8

PRIVATE MANHOLE DETAIL



SAMPLE IMPROVEMENT TITLE SHEET

GENERAL RIGHT-OF-WAY NOTES:

1. NO ACCESS OR WORK SHALL BE PERFORMED WITHIN THE CITY RIGHT-OF-WAY WITHOUT THE FULL KNOWLEDGE OF THE ASSIGNED CITY INSPECTOR WHO SHALL BE GIVEN NOT LESS THAN 48 HOURS ADVANCE NOTICE OF THE INITIATION OF PERMITTED USE AT (760) 633-2796 OR 633-2797, OR AS STATED ON THE PERMIT.
2. AT LEAST 48 HOURS PRIOR TO STARTING WORK, **UNDERGROUND SERVICE ALERT (USA)** SHALL BE NOTIFIED FOR LOCATION OF UNDERGROUND UTILITIES AT 1-800-422-4133. THE PROPOSED DIG AREA MUST BE MARKED IN WHITE PAINT PRIOR TO CONTACTING (USA).
3. ALL WORK COVERED BY THIS PERMIT SHALL BE PERFORMED BY A CONTRACTOR POSSESSING A VALID CALIFORNIA CONTRACTOR'S LICENSE OF THE APPROPRIATE CLASS.
4. ALL TRAFFIC CONTROL WITHIN THE CONSTRUCTION AREA SHALL BE SUBJECT TO AN APPROVED TRAFFIC CONTROL PLAN AND SHALL BE FLAGGED AND BARRICADED TO THE SATISFACTION OF THE CITY INSPECTOR IN COMPLIANCE WITH THE "WORK AREA TRAFFIC CONTROL HANDBOOK", LATEST EDITION PUBLISHED BY BUILDING NEWS, INC. IN THE EVENT THAT THE INSPECTOR DETERMINES PROPER TRAFFIC CONTROL IS NOT IN PLACE, ALL WORK SHALL CEASE AND PERMITTEE AUTHORIZES THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE TO ORDER, ON THE RENTAL BASIS, SUCH TRAFFIC CONTROL DEVICES AS SHALL BE NECESSARY AND PROPER TO PROTECT THE PUBLIC SAFETY AND FURTHER AGREES TO PAY ANY AND ALL COSTS AND CHARGES THAT THE CITY MAY INCUR IN PROVIDING SAID TRAFFIC CONTROL.
5. APPLICANT AGREES THAT IT SHALL BE HIS RESPONSIBILITY TO PROVIDE THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER AGENT RESPONSIBLE FOR CONSTRUCTION OF PERMITTED WORKS WITHIN THE CITY RIGHT-OF-WAY, WITH A COPY OF THE PERMIT INCLUDING THESE STANDARD CONDITIONS AND A COMPLETE SET OF APPROVED PLANS. THE PERMIT, PLANS AND WORK AREA TRAFFIC CONTROL HANDBOOK SHALL BE AVAILABLE AT THE PERMIT SITE WHENEVER WORK IS IN PROGRESS.
6. PERMITTED WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY SPECIFICATIONS AND APPROVED PLANS, SUBJECT TO INSPECTION AND APPROVAL BY THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE. CERTIFICATION FOR ALL MATERIALS AND WORK, INCLUDING COMPACTION TESTS, SHALL BE FURNISHED BY THE APPLICANT UPON REQUEST BY THE CITY INSPECTOR. PAYMENT FOR ANY COMPACTION TESTING SHALL BE BY THE PERMITTEE. CERTIFICATION SHALL BE MADE BY A CERTIFIED TESTING AGENCY OR FIRM ACCEPTABLE TO THE CITY.
7. NO WORK WITHIN THE PUBLIC RIGHT-OF-WAY IS PERMITTED ON SATURDAYS, SUNDAYS, OR HOLIDAYS. ANY DEVIATION FROM THE WORK SCHEDULE PRESENTED IN THESE CONDITIONS MUST RECEIVE PRIOR, WRITTEN APPROVAL OF THE DIRECTOR OF ENGINEERING SERVICES OR HIS DULY AUTHORIZED REPRESENTATIVE. ANY QUESTIONS REGARDING DAYS CITY HALL IS CLOSED, CALL (760) 633-2770.
8. NO WORK ON ANY PUBLIC ROADWAY, EXCLUDING PRIME ARTERIALS AND MAJOR ROADS, SHALL BE STARTED BEFORE 7:30 A.M. OR CONTINUE AFTER 5:00 P.M. ON WEEKDAYS.
9. NO WORK SHALL BEGIN BEFORE 9:00 A.M. OR CONTINUE AFTER 3:00 P.M. ON PRIME ARTERIALS AND OTHER MAJOR ROADS, UNLESS AUTHORIZED ON THE PERMIT BY THE CITY ENGINEER. ALL WORK ON PRIME ARTERIALS AND OTHER MAJOR ROADS, ALL AS SHOWN ON THE CIRCULATION ELEMENT OF THE CITY'S GENERAL PLAN, WILL REQUIRE A TRAFFIC CONTROL PLAN ACCEPTABLE TO THE CITY TRAFFIC ENGINEER WHOSE OFFICE CAN BE CONTACTED AT (760) 633-2704.
10. THE ROADWAY SHALL BE CLEAN AND FREE OF ALL OBSTRUCTIONS AND COMPLETELY OPEN TO TRAFFIC AT THE END OF EACH WORKING DAY. (NO LATER THAN 3:00 P.M. ON MAJOR ROADS, DEFINED HEREIN.)
11. TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. MINIMUM TRAVEL LANE WIDTH FOR MOTOR VEHICLES SHALL BE 12 FEET. IF STREET WIDTH PREVENTS MAINTAINING TWO-WAY TRAFFIC, PERMITTEE AND DIRECTOR OF ENGINEERING SERVICES SHALL AGREE ON AN ADEQUATE TRAFFIC CONTROL PLAN PRIOR TO STARTING WORK, WHICH SHALL INCLUDE THE USE OF A FULL-TIME FLAGMAN.
12. ALL EXCAVATIONS IN EXISTING PAVEMENT SHALL BE SAW CUT TO NEAT LINES AND AC REPLACEMENT SHALL BE MADE TO THE SATISFACTION OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
13. OPEN TRENCH MUST BE BACKFILLED AND CAPPED WITH AT LEAST 2" OF COLD MIX ASPHALT OR METAL PLATED ACCORDING TO CITY SPECIFICATIONS DURING NON-WORKING HOURS. METAL PLATES ARE REQUIRED TO HAVE COLD MIX ASPHALT RAMPS ON ALL (4) SIDES AND MUST BE MAINTAINED. REFER TO THE CITY'S STANDARD DRAWING DATED JULY 31, 1990.
14. NATIVE MATERIAL MAY BE USED UPON APPROVAL OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE. REFER TO THE CITY'S STANDARD DRAWING DATED SEPTEMBER 30, 1996.
15. NO TUNNELING UNDER CURB AND GUTTER OR OTHER IMPROVEMENTS SHALL BE PERMITTED. IMPROVEMENTS SHALL BE REMOVED AND REPLACED JOINT TO JOINT.
16. TWO SACK SAND-CEMENT SLURRY MIX SHALL BE REQUIRED AS BACKFILL ON ALL LATERAL EXCAVATIONS WITHIN PRIME ARTERIALS, MAJOR ROADS AND COLLECTORS AS WELL AS ALL LOCATIONS WHERE THE INSPECTOR DEEMS THE NATIVE MATERIAL TO BE UNACCEPTABLE FOR USE AS BACKFILL.
17. CARE SHALL BE EXERCISED TO PREVENT WATER, SOIL AND DEBRIS FROM DEPOSITING IN GUTTERS, STREETS AND STORM DRAINS. NO WASHING OUT OF MIXERS OR CONCRETE PUMPS WILL BE ALLOWED ON CITY STREETS. VIOLATIONS WILL BE REFERRED FOR NPDES ENFORCEMENT AND PENALTIES.
18. ANY ROADWAY STRIPING OR MARKINGS DAMAGED OR REMOVED DURING THE OPERATIONS OF THIS PERMIT SHALL BE MATCHED AND REPLACED BY THE APPLICANT USING THE LATEST EDITION OF STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR PAINT OR THERMOPLASTIC, ALL TO THE SATISFACTION OF THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
19. ALL CONCRETE WORK SHALL BE TRANSIT MIXED AND CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION, SECTION 201, AND BE APPROVED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
20. TRENCHING FOR INSTALLATIONS ACROSS ANY INTERSECTING ROADWAY OPEN TO TRAFFIC SHALL BE PROGRESSIVE. NOT MORE THAN HALF OF THE WIDTH OF A TRAVELED ROADWAY SHALL BE DISTURBED AT ONE TIME AND THE REMAINING WIDTH SHALL BE KEPT OPEN TO TRAFFIC BY BRIDGING OR BACKFILLING.
21. WHERE STREET DIMENSIONS AND STATE DEPARTMENT OF HEALTH SERVICES REGULATIONS ALLOW, ALL PIPES AND CONDUITS LAID PARALLEL TO THE ROADWAY SHALL BE PLACED AT LEAST FIVE (5) FEET FROM THE EDGE OF THE PAVEMENT OR GRADED TRAVELED ROADWAY, UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE CITY ENGINEER. THE SHALLOWEST PORTION OF ANY PIPELINE OR OTHER FACILITY SHALL BE INSTALLED NOT LESS THAN THIRTY (30) INCHES BELOW THE ROADWAY SURFACE.
    21(A). WHERE STREET DIMENSIONS AND STATE DEPARTMENT OF HEALTH SERVICES REGULATIONS ALLOW, ALL PIPES AND CONDUITS LAID PARALLEL TO EXISTING UTILITIES SHALL MAINTAIN A MINIMUM SEPARATION OF THREE (3) FEET MEASURED FROM THE NEAREST EDGE OF THE FACILITY. ANY DEVIATION FROM THIS REQUIREMENT IS NOT ALLOWED UNLESS APPROVED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE.
22. ALL EXCAVATED MATERIAL SHALL BE CAST AWAY FROM THE IMPROVED PORTION OF THE HIGHWAY. AFTER THE WORK HAS BEEN COMPLETED, ALL EXCESS MATERIAL, INCLUDING TRENCH SPOILS, SHALL BE REMOVED FROM THE RIGHT-OF-WAY. THE ROADWAY SHALL BE LEFT IN NEAT AND ORDERLY CONDITION.
23. ALL ROADSIDE DRAINAGE DITCHES SHALL BE RESTORED TO TRUE GRADES AND THE INTAKE AND OUTLET ENDS AT ALL CULVERTS SHALL BE LEFT FREE FROM ALL EXCESS MATERIALS AND DEBRIS.
24. ALL APPROACHES TO PRIVATE DRIVEWAYS AND INTERSECTING ROADS AND STREETS SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
25. CLAY AND EARTH WHICH ADHERE TO THE PAVED SURFACE OF THE ROADWAY SHALL BE REMOVED BY HAND SCRAPING, WASHING AND SWEEPING, OR BY ANY OTHER METHOD WHICH WILL LEAVE A CLEAN NON-SKID SURFACE WITHOUT IMPAIRING, DAMAGING OR LOOSENING THE SURFACE.
26. PERMITTEE SHALL COMPLY WITH ANY AND ALL DIRECTIVES ISSUED BY THE CITY ENGINEER OR HIS DULY AUTHORIZED REPRESENTATIVE IN ORDER TO PREVENT DUST OR OTHER MATERIALS FROM BECOMING A NUISANCE OR ANNOYANCE.

GENERAL RIGHT-OF-WAY NOTES (CONTINUED):

27. TEMPORARY PATCHING OF TRENCH IS REQUIRED ON LATERAL CUTS IN SURFACED STREETS IMMEDIATELY AFTER BACKFILLING. AFTER COMPLETION OF THE REFILLING AND COMPACTING OF THE BACKFILL MATERIAL IN THE EXCAVATION, ALL AS SPECIFIED IN THE STANDARD DRAWING DATED SEPTEMBER 30, 1996, AND THE REMOVAL OF OBSTRUCTION(S), THE PERMITTEE SHALL PROMPTLY REPLACE WITH TEMPORARY OR PERMANENT PATCHING MATERIAL, OR REPAIR ANY PORTION OF THE HIGHWAY SURFACE REMOVED OR DAMAGED BY THE EXCAVATION, OBSTRUCTION, OR CONSTRUCTION OPERATIONS, ALL TO THE SATISFACTION OF THE CITY ENGINEER, AND AS SPECIFIED ELSEWHERE HEREIN. THE CITY ENGINEER MAY, AT HIS OPTION, ELECT TO DO THE SURFACING OR REPAIRING HIMSELF; IN SUCH CASE, THE PERMITTEE SHALL BEAR THE COST OF SUCH WORK. TEMPORARY PATCHING MATERIAL MAY BE LEFT IN PLACE FOR UP TO 30 DAYS, BUT MUST BE CONTINUALLY MAINTAINED.
28. WHERE THE PAVEMENT, EXCEPT PORTLAND CONCRETE CEMENT PAVEMENT, OR OTHER TYPE OF SURFACE HAS BEEN REMOVED BY OTHERS, THE PERMITTEE SHALL REPLACE IT WITH A STANDARD REPAIR OF FOUR (4) INCHES AC OVER APPROVED BACKFILL OR REPAIR SECTION SHALL BE ONE (1) INCH AC GREATER THAN EXISTING STRUCTURAL SECTION, WHICHEVER IS GREATER. REFER TO THE MOST CURRENT STANDARD DRAWING. REPAIRS TO PCC PAVEMENT SHALL BE MADE PURSUANT TO THE SPECIFICATIONS OF THE ASSIGNED ENGINEERING INSPECTOR.
29. IF, AFTER THE REFILLING OF AN EXCAVATION, THE PERMITTEE FAILS OR REFUSES TO RESURFACE OR REPAIR THAT PORTION OF THE SURFACE OF THE ROADWAY DAMAGED BY HIM, OR IF THE CITY ENGINEER HAS ELECTED TO DO SUCH RESURFACING OR REPAIRING, THE CITY ENGINEER SHALL CAUSE THE REPAIR TO OCCUR; AND THE PERMITTEE SHALL BE CHARGED WITH THE COST THEREOF COMPUTED BY THE DIRECTOR OF ENGINEERING SERVICES.
30. WHEN SHORING IS REQUIRED, AN ENGINEERED DETAIL DRAWING WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER. ALL OSHA REGULATIONS SHALL BE MET.
31. ALL DIRECTIONAL BORES SHALL BE SUBJECT TO APPROVAL OF THE METHOD IN THE FIELD BY THE ASSIGNED ENGINEERING INSPECTOR, ACTING AS THE DULY AUTHORIZED AGENT OF THE CITY ENGINEER. A THOROUGH EXAMINATION OF THE SUBSURFACE CONDITIONS IS A PREREQUISITE. THE APPLICANT SHALL IDENTIFY THE BORE METHOD ON THE PERMIT APPLICATION EITHER AS AUGER, HAMMER, HYDRAULIC, ETC., AND SHOW THE BORE PITS. GROUTING AND INTERMEDIATE BORE PITS MAY BE REQUIRED.
32. ALL SUBSURFACE UTILITIES SHALL BE ACCURATELY SHOWN ON THE APPLICANT'S SITE PLAN FOR THOSE EXCAVATIONS IN EXCESS OF 250 LINEAR FEET, TRAVERSING SIGNALIZED INTERSECTIONS, CROSSING INTERCONNECT WIRES, OR OTHERWISE WHERE THE CITY ENGINEER HAS A SPECIAL CONCERN.
33. PAVEMENT CUTS IN STREETS REHABILITATED OR NEWLY CONSTRUCTED WITHIN THE PAST TWO YEARS SHALL BE CATEGORICALLY DENIED.
34. THE DEVELOPER SHALL BE RESPONSIBLE THAT ANY MONUMENT OR BENCH MARK WHICH IS DISTURBED OR DESTROYED SHALL BE RE-ESTABLISHED AND REPLACED BY A REGISTERED CIVIL ENGINEER OR A LICENSED LAND SURVEYOR.
35. THE REMOVAL OF ANY AND ALL CITY TREES SHALL BE CONSISTENT WITH THE CITY'S URBAN FOREST MANAGEMENT PROGRAM. TREES LOCATED WITHIN CITY STREET RIGHT-OF-WAY, ON CITY PROPERTY, OR WITHIN CITY EASEMENTS ARE REFERRED TO AS CITY TREES AND SHALL BE PROTECTED IN PLACE DURING CONSTRUCTION UNLESS SPECIFICALLY APPROVED OTHERWISE. NO GRADING, EXCAVATION, OR DISTURBANCE OF CITY TREE ROOT SYSTEMS SHALL OCCUR WITHIN THE CITY TREE DRIP LINE AREA (THE AREA FROM THE TRUNK OF A TREE TO THE OUTERMOST EDGE OF THE TREE CANOPY PROJECTION ON THE GROUND). IF A CITY TREE IS NOT CLEARLY LABELED TO BE REMOVED, IT MUST BE PROTECTED IN PLACE. EVEN IF APPROVED IMPROVEMENTS ARE IN CONFLICT WITH A CITY TREE, IT MUST NOT BE DISTURBED UNLESS THE PLAN IS REVISED TO ADDRESS THE TREE REMOVAL.
36. THE TRAFFIC LOOPS SHALL BE REPLACED WITHIN 3 DAYS OF COMPLETING WORK IN THE AREA TO CURRENT CALTRANS STANDARD TO DETECT BICYCLES PER TRAFFIC OPERATIONS POLICY DIRECTIVE 09-06 AT NO COST TO THE CITY.

EROSION CONTROL

1. IN CASE EMERGENCY WORK IS REQUIRED, CONTACT _____ AT (_____) _____-_____, 24 HOURS A DAY.
2. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 1 TO APRIL 15). ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE ON OCTOBER 1 AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY EROSION CONTROL MEASURES WHEN RAIN IS IMMINENT.
3. DEVICES SHOWN ON PLANS SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE ENGINEERING INSPECTOR.
4. THE CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
5. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE CITY ENGINEER DUE TO AN INCOMPLETE GRADING OPERATION OR UNFORESEEN CIRCUMSTANCES WHICH MAY ARISE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS THAT ARE UNSAFE OR ARE POTENTIALLY UNSAFE.
7. ALL EROSION CONTROL MEASURES PROVIDED PER THE APPROVED IMPROVEMENT PLAN SHALL BE INCORPORATED HEREON.
8. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORK DAY.
9. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE FIVE (5) DAY RAIN PROBABILITY FORECAST EXCEEDS FORTY PERCENT (40%). SILT AND OTHER DEBRIS SHALL BE REMOVED AFTER EACH RAINFALL.

NOTIFICATIONS

1. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITY PIPES AND STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS, HOWEVER: THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ANY EXISTING UTILITIES OR STRUCTURES LOCATED AT THE WORK SITE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE FOLLOWING OWNERS OF SAID UTILITIES OR STRUCTURES PRIOR TO ANY EXCAVATION, FOR VERIFICATION AND LOCATION OF UTILITIES AND NOTIFICATION OF COMMENCEMENT OF WORK:
    A. SEWERS - CSD/ESD - (760)-633-2770
    B. GAS & ELECTRIC - SDGE - (760)-438-6200
    C. WATER - SAN DIEGUITO WATER DISTRICT-1-800-227-2600
    D. TELEPHONE - SBC BELL - (760)-489-3411
    E. CABLE TV - COX COMMUNICATIONS-(760)-806-9809 X-2233

2. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER'S OFFICE 48 HOURS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT. PHONE: (760)-633-2770.

3. THE CONTRACTOR SHALL GIVE 24 HOURS NOTICE ON CALLS FOR INSPECTION. PHONE: (760)633-2770.
ALL WORK PERFORMED WITHOUT BENEFIT OF INSPECTION WILL BE SUBJECT TO REJECTION AND REMOVAL.

STORMWATER POLLUTION CONTROL BMP NOTES RELATIVE TO CONSTRUCTION ACTIVITIES

CONCRETE WASHOUT
CONTRACTOR SHALL ESTABLISH AND USE AN ADEQUATELY SIZED CONCRETE WASHOUT AREA TO CONTAIN WASHOUT WASTES ON SITE. IT IS ILLEGAL TO WASH CONCRETE, SLURRY, MORTAR, STUCCO, PLASTER AND THE LIKE INTO THE STORMWATER CONVEYANCE SYSTEM OR ANY RECEIVING WATER. CONTRACTOR SHALL POST A SIGN DESIGNATING THE WASHOUT LOCATION.

CONSTRUCTION SITE ACCESS
A STABILIZED CONSTRUCTION SITE ACCESS SHALL BE PROVIDED FOR VEHICLES EGRESS AND INGRESS TO PREVENT TRACKING DIRT OFF SITE. THIS SHALL INCLUDE USING MATERIAL SUCH AS 3" CRUSHED ROCK AND/OR CORRUGATED STEEL PANELS/PLATES.

CONSTRUCTION VEHICLES
A SPECIFIC AREA AWAY FROM GUTTERS AND STORM DRAIN SHALL BE DESIGNATED FOR CONSTRUCTION VEHICLES PARKING, VEHICLE REFUELING, AND ROUTINE EQUIPMENT MAINTENANCE. ALL MAJOR REPAIRS SHALL BE MADE OFF-SITE.

EROSION CONTROL
EROSION CONTROL MUST BE PROVIDED FOR ALL EROSIVE SURFACES. SLOPED SURFACES ESPECIALLY SHALL BE PROTECTED AGAINST EROSION BY INSTALLING EROSION RESISTANT SURFACES SUCH AS EROSION CONTROL MATS, ADEQUATE GROUND COVER VEGETATION, AND BONDED FIBER MATRIX.

NO EXCAVATION AND GRADING ACTIVITIES ARE ALLOWED DURING WET WEATHER.

DIVERSION DIKES SHALL BE CONSTRUCTED TO CHANNEL RUNOFF AROUND THE CONSTRUCTION SITE. CONTRACTOR SHALL PROTECT CHANNELS AGAINST EROSION USING PERMANENT AND TEMPORARY EROSION CONTROL MEASURES.

REMOVE EXISTING VEGETATION ONLY WHEN ABSOLUTELY NECESSARY. LARGE PROJECTS SHALL BE CONDUCTED IN PHASES TO AVOID UNNECESSARY REMOVAL OF THE NATURAL GROUND COVER. DO NOT REMOVE TREES OR SHRUBS UNNECESSARILY; THEY HELP DECREASE EROSION.

TEMPORARY VEGETATION MUST BE PLANTED ON SLOPES OR WHERE CONSTRUCTION IS NOT IMMEDIATELY PLANNED FOR EROSION CONTROL PURPOSES. EROSION SHALL BE PREVENTED BY PLANTING FAST-GROWING ANNUAL AND PERENNIAL GRASSES TO SHIELD AND BIND THE SOIL.

PLANT PERMANENT VEGETATION AS SOON AS POSSIBLE, ONCE EXCAVATION AND GRADING ACTIVITIES ARE COMPLETE.

WATER USAGE FOR DUST CONTROL SHALL BE MINIMIZED.

ON-SITE CONSTRUCTION MATERIAL STORAGE
STORED MATERIALS SHALL BE CONTAINED IN A SECURE PLACE TO PREVENT SEEPAGE AND SPILLAGE. CONTRACTOR SHALL STORE THESE PRODUCTS WHERE THEY WILL STAY DRY OUT OF THE RAIN. CONTRACTOR SHALL PROVIDE SECONDARY CONTAINMENT FOR ALL FUEL STORED ON-SITE. ELIMINATE OR REDUCE POLLUTION OF STORMWATER FROM STOCKPILES KEPT ON-SITE. STOCKPILES MAY INCLUDE SOIL, PARING MATERIALS, ASPHALT CONCRETE, AGGREGATE BASE, ETC. STOCKPILES SHALL BE LOCATED AWAY FROM CONCENTRATED STORMWATER STORMWATER FLOWS AND STORM DRAIN INLETS. STOCKPILES SHALL BE COVERED OR PROTECTED WITH SOIL STABILIZATION MEASURES AND PROVIDED WITH A TEMPORARY SEDIMENT BARRIER AROUND THE PERIMETER AT ALL TIMES.

TRAINING
CONTRACTORS' EMPLOYEES WHO PERFORM CONSTRUCTION IN THE CITY OF ENCINITAS SHALL BE TRAINED TO BE FAMILIAR WITH THE CITY OF ENCINITAS STORMWATER POLLUTION CONTROL REQUIREMENTS. THESE BMP NOTES SHALL BE AVAILABLE TO EVERYONE WORKING ON SITE. THE PROPERTY OWNER(S) AND THE PRIME CONTRACTOR MUST INFORM SUBCONTRACTORS ABOUT STORMWATER REQUIREMENTS AND THEIR OWN RESPONSIBILITIES.

WASTE MANAGEMENT
CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY DISPOSING OF ALL WASTE AND UNUSED CONSTRUCTION MATERIALS. DUMPING OF UNUSED OR WASTE PRODUCTS ON THE GROUND, WHERE WATER CAN CARRY THEM INTO THE CONVEYANCE SYSTEM IS STRICTLY PROHIBITED.

NO SEEPAGE FROM ANY DUMPSTER SHALL BE DISCHARGED INTO STORMWATER. BERMS/DIKES SHALL BE PLACED AROUND ALL DUMPSTERS TO DIVERT THE NATURAL STORM RUNOFF. DUMPSITES SHALL BE CHECKED FREQUENTLY FOR LEAKS. DUMPSTER LIDS SHALL REMAIN CLOSED AT ALL TIMES. DUMPSTERS WITHOUT LIDS SHALL BE PLACED WITHIN STRUCTURES WITH IMPERVIOUS ROOFING OR COVERED WITH TARPS IN ORDER TO AVOID RAIN CONTACT WITH ANY TRASH MATERIAL.

MANY CONSTRUCTION MATERIALS, INCLUDING SOLVENTS, WATER-BASED PAINTS, VEHICLE FLUIDS, BROKEN ASPHALT AND CONCRETE, WOOD, AND CLEARED VEGETATION CAN BE RECYCLED. NON-RECYCLABLE MATERIALS MUST BE TAKEN TO AN APPROPRIATE LANDFILL OR DISPOSED OF AS HAZARDOUS WASTE. FOR INFORMATION ON DISPOSAL OF HAZARDOUS MATERIAL, CALL THE HAZARDOUS WASTE HOTLINE TOLL FREE AT (800) 714-1195. FOR INFORMATION ON LANDFILLS AND TO ORDER DUMPSTERS CALL EDCO AT (760) 436-4151.

POLLUTANTS SHALL BE KEPT OFF EXPOSED SURFACES. PLACE TRASH CANS AND RECYCLING RECEPTACLES AROUND THE SITE.

PORTABLE TOILETS MUST BE IN GOOD WORKING ORDER AND CHECKED FREQUENTLY FOR LEAKS. CONTRACTOR SHALL PROVIDE SECONDARY CONTAINMENT AND LOCATE PORTABLE TOILETS AWAY FROM STORMDRAIN INLETS ON PERVIOUS SURFACES.

ALL CONSTRUCTION DEBRIS SHALL BE KEPT AWAY FROM THE STREET, GUTTER, AND STORMDRAIN. CONTRACTOR MUST ROUTINELY CHECK AND CLEAN UP MATERIAL THAT MAY HAVE TRAVELED AWAY FROM CONSTRUCTION SITE

FOR MORE INFORMATION ON STORMWATER POLLUTION CONTROL MEASURES AND REQUIREMENTS PLEASE CONTACT THE ENGINEERING DIVISION, CITY OF ENCINITAS AT (760) 633-2770.

IMPERVIOUS AREA
IMPERVIOUS AREA PRIOR TO CONSTRUCTION: _____SQFT
IMPERVIOUS AREA AFTER CONSTRUCTION: _____SQFT
INCREASE IN IMPERVIOUS AREA: _____SQFT

IMPERVIOUS AREA REPLACED: _____SQFT

OWNER/APPLICANT
OWNER NAME
ADDRESS (CURRENT MAILING)
PHONE

SITE ADDRESS
PROJECT ADDRESS
APN

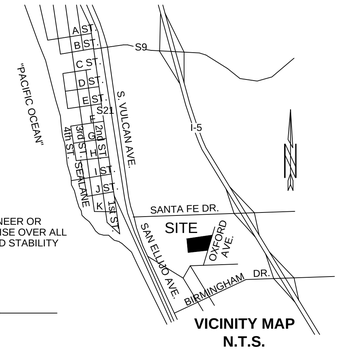
LEGAL DESCRIPTION

_____

OWNER'S CERTIFICATE

I (WE) HEREBY CERTIFY THAT A REGISTERED SOILS ENGINEER OR GEOLOGIST HAS BEEN OR WILL BE RETAINED TO SUPERVISE OVER ALL GRADING ACTIVITY AND ADVISE ON THE COMPACTION AND STABILITY OF THE SITE.

SIGNATURE:_____ DATE:_____
OWNER(S) NAME AS VESTED



VICINITY MAP
N.T.S.

SOILS ENGINEER'S CERTIFICATE

I,_____ A REGISTERED CIVIL ENGINEER IN THE STATE OF CALIFORNIA, PRINCIPALLY DOING BUSINESS IN THE FIELD OF APPLIED SOIL MECHANICS, HEREBY CERTIFY THAT A SAMPLING AND STUDY OF THE SOIL CONDITIONS PREVALENT WITHIN THIS SITE WAS MADE BY ME OR UNDER MY DIRECTION ON ___ AND FOR AN UPDATE ON _____ ONE COMPLETE COPY OF THE SOILS REPORT COMPILED FROM THIS STUDY, WITH MY RECOMMENDATIONS, HAS BEEN SUBMITTED TO THE OFFICE OF THE CITY ENGINEER. FURTHERMORE, I HAVE REVIEWED THESE GRADING PLANS AND CERTIFY THAT THE RECOMMENDATIONS INCLUDED IN THE SOILS REPORT FOR THIS PROJECT HAVE BEEN INCORPORATED IN THE GRADING PLANS AND SPECIFICATIONS.

SIGNED: _____

RCE NO.: _____

EXP. DATE: _____

JOB #: _____

COMPANY
ADDRESS
PHONE

STATEMENT OF ENGINEER OF WORK

THE UNDERSIGNED ENGINEER AGREES THAT THE WORK PERFORMED BY THE ENGINEER SHALL COMPLY WITH THE GENERALLY ACCEPTED STANDARDS AND PRACTICES OF THE ENGINEER'S TRADE OR PROFESSION. THE ENGINEER FURTHER AGREES THAT THE WORK PERFORMED HEREIN SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS REQUIRED BY THE CITY OF ENCINITAS, TO THE EXTENT THAT THE ENGINEER CONTROLS SUCH PERFORMANCE. THE ENGINEER AGREES THAT ANY PLANCHECK OR REVIEW PERFORMED BY THE CITY OF ENCINITAS IN ITS CAPACITY AS A PUBLIC ENTITY FOR THE PLANS PREPARED BY THE ENGINEER IS NOT A DETERMINATION BY THE CITY OF ENCINITAS OF THE TECHNICAL SUFFICIENCY OR ADEQUACY OF THE PLANS OR DESIGN AND IT THEREFORE DOES NOT RELIEVE THE ENGINEER OF RESPONSIBILITY FOR THE PLANS OR DESIGN OF IMPROVEMENTS BASED THEREON. THE ENGINEER AGREES TO INDEMNIFY AND HOLD HARMLESS THE CITY OF ENCINITAS AND ITS OFFICERS, AGENTS, AND EMPLOYEES FROM PROPERTY DAMAGE OR BODILY INJURY ARISING SOLELY FROM THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER AND HIS/HER AGENTS OR EMPLOYEES ACTING WITHIN THE COURSE AND SCOPE OF SUCH AGENCY AND EMPLOYMENT AND ARISING OUT OF THE WORK PERFORMED BY THE ENGINEER.

SIGNATURE: _____ DATE: _____
ENGINEER'S NAME

COMPANY
ADDRESS
PHONE NUMBER
RCE EXPIRES _____

SHEET INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	

BMP PROJECT STATUS

STANDARD
-or-
PRIORITY STORMWATER TREATMENT FACILITIES TO BE MAINTAINED BY HOA / HOMEOWNER / AGENT, etc. IN ACCORDANCE WITH "MAINTENANCE AGREEMENT FOR PRIVATE STORMWATER TREATMENT AND STORMWATER POLLUTION CONTROL FACILITIES"

RECORDED ON _____

AS DOC. #: _____

LEUCADIA WASTEWATER DISTRICT	FIELD OPERATIONS	PLANNING AND BUILDING	PARKS AND RECREATION	SAN DIEGUITO WATER DISTRICT OR OLIVENHAIN MUNICIPAL WATER DISTRICT	ENCINITAS FIRE DEPARTMENT
SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE	SIGN DATE

ENGINEERING COMPANY
ADDRESS
PHONE AND FAX

CHANGE NO.	DESCRIPTION	APPROVED	DATE

BENCHMARK
DESCRIPTION: _____
LOCATION: _____
RECORD FROM: ROS 18416
ELEVATION: _____
DATUM: NAVD88

SCALE
HORIZONTAL: 1" = X'
VERTICAL: 1" = X'

AS-BUILT
_____ _____
ENGINEER'S NAME DATE

DESIGNED BY: INITIALS	DRAWN BY: INITIALS	CHECKED BY: INITIALS

PLANS PREPARED UNDER SUPERVISION OF
DATE: _____
_____ R.C.E. NO.: _____
ENGINEER'S NAME EXP.: _____

ENGINEERING DIVISION APPROVALS
RECOMMENDED: _____ APPROVED: _____
MASIH MAHER GLENN PRUIM
_____ _____
DATE DATE

CITY OF ENCINITAS - PUBLIC WORKS DEPARTMENT
IMPROVEMENT PLAN FOR:
SITE ADDRESS
OWNER
APN
PLANNING CASE NO: _____ TPM/TM/CDP/DR/MUP/MIN/EIA, etc.

DRAWING NO.
XXXXX-I
SHEET 1 OF X

ENCINITAS SANITARY/CARDIFF SANITATION DISTRICT SEWER NOTES:

ALL WORK SHALL BE DONE IF ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION "GREENBOOK", (LATEST EDITION), THE SAN DIEGO STANDARD SPECIAL PROVISIONS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, (ADOPTED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE), THE SAN DIEGO REGIONAL STANDARD DRAWINGS (LATEST EDITION) AND THE FOLLOWING SPECIAL PROVISIONS:

1. TRENCH WIDTH SHALL BE PER SDRSD NO. SP-02 UNLESS OTHERWISE NOTED. MINIMUM PIPE SEPARATION PER WAS WI-01, 02, & 03.

2. PIPE AND BEDDING CONDITIONS:

   (A) ALL PIPE SHALL HAVE 4" MINIMUM OF ¾" CRUSHED ROCK BENEATH THE PIPE.
   (B) V.C.P. PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE SAND, GRAVEL, CRUSHED AGGREGATE, NATIVE FREE-DRAINING GRANDULAR MATERIAL HAVING A SAND EQUIVALENT OR 30 OR BETTER.
   (C) P.V.C. AND A.B.S. SOLID WALL PIPE BEDDING FROM BOTTOM OF PIPE TO 12" MINIMUM ABOVE THE PIPE SHALL BE ¾" CRUSHED ROCK. A.B.S. SOLID WALL PIPE MAY BE USED ONLY WHERE PIPE INVERT GRADES ARE 1% OR GREATER.

3. AFTER COMPLETION OF PIPE LAYING, ALL MAIN LINE SEWERS, SEWER SERVICE LATERALS AND STRUCTURES SHALL BE TESTED IN THE PRESENCE OF THE INSPECTOR. AIR PRESSURE TEST SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.

4. THE CONSTRUCTION OF P.C.C. SEWER MANHOLE SHALL BE PER SDRSD NO. SM-02. POURED IN PLACE MANHOLE BASES SHALL BE A MONOLITHIC POUR FINISHED COMPLETE AT TIME OF POUR. PRECAST MANHOLE BASES ARE ACCEPTABLE FOR USE WITH 8-INCH COLLECTOR SYSTEMS WITH CITY ENGINEER'S APPROVAL.

5. THE CONSTRUCITON OF 4-INCH SEWER LATERAL PER SDRSD NO'S SS-01 AND SS-02. LATERALS SHALL NOT DISCHARGE DIRECTLY INTO MANHOLE.

6. THE CONSTRUCTION OF CONCRETE CUT-OFF WALLS SHALL BE CONSTRUCTED AS PER SDRSD NO. SP-07.

7. ALL MAINS AND LATERALS SHALL BE A MINIMUM OF 42-INCHES BELOW THE FINISHED GRADE.

8. THE FINAL LOCATION AND ELEVATION OF SEWER AND WATER MAINS AND LATERALS SHALL BE SHOWN ON ORIGINAL AS-BUILT PLANS PRIOR TO ACCEPTANCE OF WORK.

9. FOR SEWER LATERAL TABLE, SEE SHEET ___.

10. "AS BUILT" DRAWINGS MUST BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.

11. ALL DESIGN CHANGES OF SEWER MAINS SHALL BE APPROVED BY A CONSTRUCTION CHANGE PRIOR TO ACCEPTANCE FOR PUBLIC USE.

12. FILL AREAS MUST BE COMPACTED TO 90% PRIOR TO PIPE INSTALLATION.

13. THE CONTRACTOR SHALL NOTIFY THE CITY'S FIELD OPERATIONS DIVISION 48 HOURS IN ADVANCE OF BEGINNING WORK TO ARRANGE FOR PRE-CON AND INSPECTION OF PROJECT. PHONE NO. 760-633-2770.

14. CONTRACTOR SHALL OBTAIN A PERMIT FROM THE CITY'S ENGINEERING SERVICES DEPARTMENT FOR ANY EXCAVATION WITHIN EXISTING CITY RIGHTS-OF-WAY.

15. THE APPLICANT SHALL WARRANTY THE PUBLIC SEWER FOR ONE YEAR FOLLOWING THE APPROVAL OF THE AS-BUILTS.

16. CONTRACTOR SHALL FURNISH AND INSTALL, PER SDRSD SP-01, THE APPROPRIATE BURIED UTILITY WARNING AND IDENTIFICATIN TAPE ABOVE ALL PUBLIC SEWER LINES, AND PORTIONS OF SEWER LATERALS LOCATED WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENTS.

17. THE DEVELOPER SHALL PROVIDE EASEMENTS AND ACCESS ROADS OVER PUBLIC SEWERS TO THE SATISFACTION OF THE CITY ENGINEER. THESE ARE TO BE SHOWN ON THIS PLAN.

18. WASTEWATER DISCHARGE PERMITS AND PLUMBING PERMITS ARE REQUIRED PRIOR TO CONNECTION TO THE SANITARY SEWER SYSTEM.

19. ALL NEW SEWER MAINS SHALL BE INSPECTED BY CLOSED CIRCUIT TELEVISION AFTER COMPLETION OF TRENCHING BACKFILL AND FINISHED GRADING BUT PRIOR TO PLACEMENT OF PAVEMENT OR PERMANENT TRENCH RESURFACING. CONTRACTOR SHALL PROVIDE FOR TELEVISION INSPECTION. (SEE 500-1.1.5)

20. SEWER MANHOLE LINING:

   (A) NEW MANHOLES WITH 8-10" DIAMETER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.
   (B) NEW MANHOLES WITH 12" DIAMETER AND GREATER SEWER MAINS: THE INSIDE OF THE SEWER MANHOLES SHALL BE PROVIDED WITH INTEGRALLY LOCKING PVC LINING PER SECTION 500-2.5 OF THE GREENBOOK.
   (C) EXISTING MANHOLES: ALL EXISTING MANHOLES WITH NEW CONNECTIONS SHALL BE INSPECTED AND REPAIRED, AS NEEDED, WITH THE LINING SYSTEM THAT MATCHES THE EXISTING LINING FOR THAT MANHOLE; FOR MANHOLES WITHOUT ANY EXISTING LINING, THE INSIDE OF THE SEWER MANHOLES SHALL BE COATED WITH AN EPOXY PROTECTIVE LINING SYSTEM PER SECTION 500-2.7 OF THE GREENBOOK.

   EXCEPTIONS OR VARIATIONS TO THESE MANHOLE LINING REQUIREMENTS MAY BE CONSIDERED ON A SPECIFIC CASE-BY-CASE BASIS BY THE CITY ENGINEER.

21. NO ADDITIONAL LATERALS SHALL BE PERMITTED WITHOUT PAYING SEWER CAPACITY FEES, PROCESSING A CONSTRUCTION CHANGE, AND JOINING THE SEWER REIMBURSEMENT DISTRICT, IF CREATED.
22. MANHOLE FRAMES AND COVERS SHALL BE MADE IN THE USA OF HEAVY DUTY CAST-IRON TYPE WITH A 36-INCH OPENING. MANHOLE COVER INSERTS SHALL BE 24-INCH DIAMETER WITH LETTERING "CITY OF ENCINITAS" AND "SEWER" SIMILAR TO WHAT IS INDICATED ON SDRSD M-1.

LWD SEWER NOTES

1. LWD APPROVAL OF THESE PLANS DOES NOT RELIEVE THE APPLICANT, PRIVATE ENGINEER OF WORK, OR CONTRACTOR FROM RESPONSIBILITY FOR THE CORRECTION OF ERRORS AND OMISSIONS DISCOVERED DURING OR AFTER CONSTRUCTION.

2. ALL DESIGN, MATERIALS, AND CONSTRUCTION WORK SHALL CONFORM TO THE LEUCADIA WASTEWATER DISTRICT LWD SEWER STANDARDS AND TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK) AND THE REGIONAL STANDARD DRAWINGS, MOST CURRENT EDITIONS. IN THE EVENT OF CONFLICT THE LWD SEWER STANDARDS GOVERN.

3. OSHA SAFETY ORDERS AND OSHA CONFINED SPACE ENTRY REQUIREMENTS SHALL BE FOLLOWED AT ALL TIMES WITHOUT EXCEPTION.

4. THE CONTRACTOR SHALL HAVE A COPY OF THE SEWER NOTES 2. & 3. DOCUMENTS ON THE JOB SITE AT ALL TIMES.

5. THE CONTRACTOR SHALL GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY LWD AND SHALL REPAIR OR REPLACE ANY WORK THAT MAY PROVE DEFECTIVE IN WORKMANSHIP AND/OR MATERIALS WITHIN THE ONE YEAR PERIOD WITHOUT EXPENSE WHATSOEVER TO LWD.

6. QUANTITIES SHOWN HEREON ARE FOR BOND ESTIMATE PURPOSES ONLY. NEITHER THE PRIVATE ENGINEER NOT LWD GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SEWER QUANTITIES.

7. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS REPRESENTING ALL MATERIALS AND SUPPLIES SATISFACTORY TO LWD. WORK SHALL NOT COMMENCE UNTIL SUCH MATERIALS ARE APPROVED BY LWD.

8. PRIOR TO BEGINNING SEWER WORK, THE LWD INSPECTOR SHALL BE FURNISHED THREE SETS OF CUT SHEETS AND SHALL COMPLY WITH LWD STANDARD SPEC SURVEY REQUIREMENTS.

9. PRIOR TO BEGINNING SEWER WORK, THE CONTRACTOR SHALL SECURE A LWD PERMIT FOR CONSTRUCTION AND SHALL PROVIDE A MINIMUM OF 72 HOURS NOTICE TO LWD PRIOR TO CONSTRUCTION.

10. NO WORK SHALL BE COMMENCED UNTIL ALL PERMITS HAVE BEEN OBTAINED FROM THE JURISDICTIONAL CITY, COUNTY, AND/OR OTHER APPROPRIATE AGENCIES.

11. THE CONTRACTOR SHALL CONFORM TO LABOR CODE SECTION 6705 BY SUBMITTING A DETAIL PLAN TO THE DISTRICT ENGINEER SHOWING THE DESIGN OF SHORING, BRACING, SLOPING, OR OTHER PROVISIONS TO BE MADE FOR PROTECTION OF WORKERS FROM THE HAZARD OF CAVING GROUND DURING TRENCH EXCAVATION AND PIPE INSTALLATION THEREIN. THIS PLAN MUST BE PREPARED FOR ALL TRENCHES FIVE FEET OR MORE IN DEPTH. IF THE PLAN VARIES FROM THE SHORING SYSTEM STANDARDS ESTABLISHED BY THE CONSTRUCTION SAFETY ORDERS, TITLE 8, CALIFORNIA ADMINISTRATIVE CODE, THE PLAN SHALL BE PREPARED BY A REGISTERED ENGINEER. A COPY OF THE OSHA EXCAVATION PERMIT MUST BE SUBMITTED TO THE LWD INSPECTOR PRIOR TO EXCAVATION.

12. ALL SEWER FACILITIES SHALL BE INSTALLED IN DRY EXCAVATIONS AND TRENCHES. CONTRACTOR SHALL DEWATER AND MAINTAIN DEWATERING CONTINUOUSLY UNTIL THE WORK IS COMPLETED INCLUDING PLACEMENT AND COMPACTION OF BACKFILL MATERIALS IN A DRY STATE. ALL PIPE ZONE MATERIAL LOCATED IN WET OR AREAS SUSPECTED TO BE WET IN THE FUTURE SHALL BE ENCASED IN GEOTEXTILE MATERIAL. SUITABLE GEOTEXTILE MATERIAL SHALL BE SUBMITTED TO THE DISTRICT ENGINEER FOR REVIEW AND APPROVAL. CONTRACTOR SHALL OBTAIN DEWATERING PERMITS AS NECESSARY AND RETURN OF GROUNDWATER TO THE SEWER SHALL NOT BE ALLOWED.

13. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES SHOWN ON THESE PLANS WAS OBTAINED BY AVAILABLE RECORDS SEARCH BY THE PRIVATE ENGINEER. TO THE BEST OF THE PRIVATE ENGINEER'S KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. ATTENTION IS CALLED TO THE POSSIBLE EXISTENCE OF OTHER UTILITIES OR STRUCTURES NOT SHOWN, OR IN A DIFFERENT LOCATION FROM THAT SHOWN ON THE PLANS. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN ON THE PLANS AND OTHER EXISTING FACILITIES OR STRUCTURES NOT SHOWN.

14. APPROVAL OF THIS PLAN BY LWD DOES NOT CONSTITUTE A REPRESENTATION OF THE ACCURACY OF THE LOCATION OF, OR THE EXISTENCE OR NONEXISTENCE OF, ANY UNDERGROUND UTILITY, PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.

15. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (800) 422-4133, AS REQUIRED BY STATE LAW. ALL UTILITY CROSSINGS SHALL BE POT HOLED PRIOR TO TRENCHING.

16. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS INCLUDING, BUT NOT LIMITED TO, TRENCH SAFETY AND CONFINED SPACE ENTRY.

17. SOILS REPORTS SHALL BE SUBMITTED TO LWD BY A QUALIFIED SOILS ENGINEER WHICH CERTIFIES THAT TRENCH BACKFILL WAS COMPACTED AS DIRECTED BY THE SOILS ENGINEER IN ACCORDANCE WITH ON SITE EARTHWORK SPECIFICATIONS AND THE LWD STANDARD SPEC.

18. SEWER ELEVATIONS SHOWN ARE INVERT ELEVATION (I.E.), INSIDE BOTTOM OF PIPE. SEWER LENGTHS SHOWN ARE FROM CENTER OF MANHOLE TO CENTER OF MANHOLE.

19. ALL REVISIONS TO DRAWINGS SHALL BE APPROVED BY THE LWD DISTRICT ENGINEER AS CONSTRUCTION CHANGES TO THE ORIGINAL MYLAR DWGS. WITH INITIALED APPROVAL ON THE MYLARS.

20. CONTRACTOR IS RESPONSIBLE FOR KEEPING COMPLETE RECORD OF CHANGES AND SHALL MAKE SUCH RECORD AVAILABLE TO THE PRIVATE ENGINEER. THE PRIVATE ENGINEER SHALL PROVIDE AS-BUILT DRAWINGS TO LWD FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

21. LENGTH OF OPEN TRENCH SHALL BE LIMITED TO 350 FEET, INCLUDING COLLECTORS AND LATERALS, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT. TRENCH SHALL BE BACKFILLED OR PLATED AT THE CONCLUSION OF EACH DAY OF WORK.

22. THE CONTRACTOR SHALL PROTECT ALL SURVEY MONUMENTATION. IF ANY SURVEY MONUMENTS ARE DISTURBED OR DESTROYED, THE CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO REESTABLISH AND RECORD THE MONUMENT CHANGE PER STATE LAW.

23. A MINIMUM OF 12 INCHES VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN THE SEWER PIPE AND ANY OTHER UTILITIES.

24. SEPARATION OF SEWER / WATER AND SEWER / RECLAIMED WATER SHALL COMPLY WITH LWD STD DWG S-2 AND WITH ALL COUNTY AND STATE HEALTH DEPT REGULATIONS

25. CONNECTIONS TO EXISTING SEWER PIPE OR MANHOLES SHALL ONLY BE DONE IN THE DIRECT PRESENCE OF THE LWD INSPECTOR. NEW SEWER SHALL NOT BE CONNECTED OR ALLOWED TO FLOW TO EXISTING SEWER UNTIL AFTER FINAL ACCEPTANCE OF ALL UPSTREAM WORK BY THE LWD INSPECTOR, OR AS APPROVED BY DISTRICT ENGINEER.

26. ALL SERVICE LATERALS SHALL BE LOCATED AT RIGHT ANGLES TO THE SEWER MAIN UNLESS OTHERWISE SHOWN AS APPROVED BY LWD ON THE PLANS.

27. A 2-INCH HIGH "S" SHALL BE INSCRIBED ON THE CURB FACE AT EACH LATERAL LOCATION BY THE CONTRACTOR.

28. A 10 GAGE SHIELDED COPPER WIRE SHALL BE BURIED OVER EACH LATERAL. THE WIRE SHALL EXTEND UP TO A 2" COPPER TAG TIED AND SOLDERED TO THE WIRE. THE TAG OVER THE SEWER MAIN SHALL TERMINATE 6" ABOVE PAVING SUBGRADE WITH FINAL LOCATION JUST BELOW PAVING. THE TAG OVER THE CUSTOMER END OF THE LATERAL SHALL EXTEND ABOVE GRADE UNTIL CONNECTED AND SHALL THEREAFTER BE BURIED AT THE POINT OF CONNECTION.

29. ALL PIPE SHALL BE HANDLED AND INSTALLED SO AS TO PROTECT PIPE, JOINTS, LINING, AND COATING. THE PIPE SHALL BE CAREFULLY BEDDED TO PROVIDE CONTINUOUS BEARING AND PREVENT UNEVEN SETTLEMENT. PIPE SHALL BE PROTECTED AGAINST FLOTATION AT ALL TIMES. OPEN ENDS OF PIPE SHALL BE SEALED AT ALL TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.

30. PIPE JOINTS SHALL NOT BE DEFLECTED UNLESS SO DESIGNED AND SHALL THEN BE LIMITED TO LESS THAN ONE-HALF OF THE ANGLE RECOMMENDED BY THE PIPE MANUFACTURER.

31. SEWER PIPE ZONE AND TRENCH BACKFILL SHALL BE PER THE LWD SEWER STANDARDS. WATER JETTING SHALL NOT BE ALLOWED.

32. ALL LATERALS SHALL BE CONSTRUCTED CLEAR OF DRIVEWAYS.

LWD SEWER NOTES

33. JOB MIXING OF CONCRETE IS NOT ALLOWED WITHOUT EXCEPTION. CONCRETE TESTING BY LWD WILL BE AT CONTRACTOR EXPENSE.

34. MANHOLE BASES SHALL BE MONOLITHICALLY PLACED, FINISHED, AND COMPLETED AT TIME OF PLACEMENT. GPK PRODUCTS, INC., OR APPROVED EQUAL, MANHOLE ADAPTERS SHALL BE SET IN THE BASE FOR EACH PIPE CONNECTION. SETTING OF MH RINGS SHALL NOT BE ALLOWED FOR 48 HOURS AFTER CONCRETE PLACEMENT. PRECAST MANHOLE BASES ARE ACCEPTABLE FOR USE WITH 8" SEWERS WITH DISTRICT ENGINEER APPROVAL.

35. JOINTS BETWEEN MH BASE, SHAFTING, CONE SECTIONS, AND RING SHALL HAVE A 2" BY 2" BUTYL RUBBER GASKET PLACED WITHIN THE FULL CIRCUMFERENCE. GASKET SHALL BE CPS-210 BY PRESS-SEAL GASKET CORP., OR APPROVED EQUAL.

36. ALL MANHOLES SHALL BE VACUUM TESTED 1) BEFORE BACKFILL, 2) AFTER BACKFILL, AND 3) SUBSEQUENT TO ANY SUSPECTED MOVEMENT OR DAMAGE AFTER BACKFILL.

37. ALL SEWERS AND LATERALS SHALL BE WAYNE BALLED OR JETTED, LOW PRESSURE AIR TESTED, AND TELEVISED AT THE APPLICANT /CONTRACTORS EXPENSE PRIOR TO CONSIDERATION FOR FINAL ACCEPTANCE BY LWD. AIR TEST SHALL BE DONE AFTER CONSTRUCTION OF ALL OTHER UTILITIES AND UTILITY LATERALS.

38. ALL SEWERS AND LATERALS SHALL BE IN PLACE AND SHALL HAVE FINAL APPROVAL BY THE LWD INSPECTOR PRIOR TO PAVING.

39. MANHOLES SHALL BE 4-FEET DIAMETER FOR PIPE UP TO 15-INCH DIAMETER PER LWD STD DWG S-3. MANHOLES SHALL BE 5-FEET DIAMETER FOR PIPE 18-INCHES AND LARGER PER LWD STD DWG S-4.

40. ALL NEW MH'S SHALL BE LINED WITH AN INTEGRALLY LOCKING PVC (T-LOCK) PROTECTIVE LINING SYSTEM. ALL EXISTING MH'S WITH MODIFICATIONS SHALL BE PROVIDED WITH URETHANE OR EPOXY LINING SYSTEM. LINING SYSTEM TO MATCH EXISTING LINING, IF ANY. T-LOCK, URETHANE, AND EPOXY LINING SYSTEMS SHALL BE PER SECT 500-2 OF THE GREENBOOK.

41. MAXIMUM DEPTH OF SEWER FOR SDR35 PVC PIPE IS 15'. C900 PIPE IS REQUIRED FOR DEPTH OF COVER OVER 15'.

42. FINAL APPROVAL OF PLANS BY DISTRICT ENGINEER IS VALID FOR A PERIOD OF TIME NOT TO EXCEED ONE YEAR FROM APPROVAL DATE TO START OF CONSTRUCTION. IF THE ONE YEAR TIME LIMIT IS EXPIRED PRIOR TO START OF CONSTRUCTION THE DEVELOPER SHALL RESUBMIT THE PLAN CHECK TO THE DISTRICT ENGINEER FOR AN UPDATED REVIEW AND APPROVAL. ANY CHANGES REQUIRED TO THE PLANS SHALL BE MADE AT THE DEVELOPERS EXPENSE AND APPROVED BY THE LWD DISTRICT ENGINEER PRIOR TO THE START OF CONSTRUCTION.

43. WHEN CONNECTION TO EXISTING MANHOLES IS NECESSARY AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL CONNECT TO EXISTING MANHOLE STRUCTURES AND CONSTRUCT THE NEW FLOW-THROUGH CHANNELS IN EACH MANHOLE BASE TO ACCOMMODATE THE NEW SEWER LINES AS REQUIRED. SMOOTH TRANSITIONS SHALL BE INSTALLED FROM THE INVERTS OF NEWLY INSTALLED PIPES TO THE EXISTING MANHOLE STRUCTURES. MANHOLES SHALL BE CORE DRILLED AND MANHOLE CONNECTION FITTINGS SHALL BE CONNECTED TO THE CORE DRILLED HOLE BY LINK-SEAL, OR APPROVED EQUAL. THE FIRST FLEXIBLE JOINT SHALL BE LOCATED WITHIN ONE-FOOT OF THE MANHOLE BASE. JACK HAMMERING SHALL NOT BE ALLOWED.

44. ALL NEW CONNECTIONS TO EXISTING SEWER SHALL BE MADE TO EXISTING WYES, MADE WITH GASKETED PVC SADDLE WYE, OR SHALL BE MADE BY INSTALLING NEW MANUFACTURED WYES. FOR INSTALLING NEW MANUFACTURED WYES, STANDARD BELL AND SPIGOT OR PLAIN END WYES AND PLAIN END PIPE SPOOLS MATCHING THE ADJACENT EXISTING PIPE MAY BE USED FOR INSERTING WYES INTO AN EXISTING SEWER. ALL CONNECTIONS NOT MADE TO EXISTING WYES MUST BE IN ACCORDANCE WITH LWD STANDARD DRAWING S-32.

45. IF NECESSARY DURING THE LATERAL CONNECTION WORK, UPSTREAM FLOW IN THE EXISTING SEWER SHALL BE TEMPORARILY PLUGGED AND BY-PASSED BY PUMPING OR PUMPER TRUCKS FOR DISPOSAL TO A DOWNSTREAM LWD SEWER. IN LOCATIONS WITH SIGNIFICANT UPSTREAM FLOW, LWD MAY REQUIRE TEMPORARY PROVISION OF DUTY AND BYPASS EQUIPMENT WITH FULL-TIME MANNED MONITORING. NO UNMANNED BYPASS SHALL BE ALLOWED.

46. FOR CONNECTION OF PLAIN END TO PLAIN END PVC SEWER, REPAIR COUPLINGS SHALL BE MADE OF PVC MATERIAL MEETING THE SAME MATERIAL REQUIREMENTS AS THE PIPE BEING REPAIRED. PVC SEWER REPAIR COUPLINGS SHALL BE RUBBER GASKETED WITH NO CENTER STOP. PIPE ENDS SHALL BE THOROUGHLY CLEANED PRIOR TO INSTALLATION OF THE REPAIR COUPLING(S). THE REPAIR COUPLING SHALL BE SLIPPED ALL THE WAY ON TO ONE PLAIN END PIPE, THEN THE PIPE AND ADJOINING PIPES SHALL BE ALIGNED TOGETHER AND THE REPAIR COUPLING SLIPPED BACK INTO A POSITION EQUALLY SPACED BETWEEN THE TWO PLAIN END PIPES. PVC SEWER REPAIR COUPLINGS SHALL BE AS MANUFACTURED BY PW PIPE OR EQUAL APPROVED BY THE LWD DISTRICT ENGINEER.

47. PVC OR VITRIFIED CLAY PIPE (VCP) SEWER PIPE AND WYES MAY BE USED TO TIE-IN TO EXISTING VCP. FOR CONNECTION OR REPAIR OF PLAIN END VCP TO VCP A ROMAC INDUSTRIES, INC. STYLE 501 COUPLING OR EQUAL SHALL BE USED. FOR CONNECTIONS OF VCP TO PVC, A ROMAC INDUSTRIES, INC. STYLE RC 501 REDUCING COUPLING WITH MATCHING INVERTS, OR APPROVED EQUAL, SHALL BE USED WITH A GASKET RANGE TO MATCH THE OUTSIDE DIAMETER OF THE PIPE ON THAT SIDE OF THE COUPLING BEING JOINED. THE CENTER RINGS SHALL BE DUCTILE IRON PER ASTM A536, GRADE 65-45-12 AND SHALL BE PROVIDED WITH 16 MILS FUSION BONDED EPOXY COLOR CODED TO THE TYPE OF CONNECTING PIPE. GASKETS SHALL BE SBR PER ASTM D2000 MBA710, COMPOUNDED FOR WATER AND SEWER SERVICE. ALL NUTS AND BOLTS SHALL BE TYPE 316 STAINLESS STEEL.

SAN DIEGUITO WATER DISTRICT NOTES:

1. WATER MAINS, LATERALS AND APPURTENANCES SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS OF THE CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC). THE CONTRACTOR SHALL AND HEREBY DOES GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR AFTER THE DATE OF ACCEPTANCE.
2. THE CONTRACTOR SHALL NOTIFY THE DISTRICT'S INSPECTION DEPARTMENT 48 HOURS IN ADVANCE OF BEGINNING WORK TO ARRANGE FOR INSPECTION OF PROJECT. THE CONTRACTOR SHALL GIVE 24 HOURS NOTICE ON CALLS FOR INSPECTION. PHONE: (760) 633-2709. ALL WORK PREFORMED WITHOUT BENEFIT OF INSPECTION WILL BE SUBJECT TO REJECTION AND REMOVAL.
3. THE CONTRACTOR WILL BE REQUIRED TO SCHEDULE A MANDATORY PRE-CONSTRUCTION CONFERENCE WITH THE SAN DIEGUITO WATER DISTRICT INSPECTOR PRIOR TO COMMENCEMENT OF WORK ON WATER IMPROVEMENTS. PHONE: (760) 633-2709.
4. UNLESS OTHERWISE NOTED, ALL CONNECTIONS TO EXISTING MAINS WILL BE MADE BY THE CONTRACTOR, UNDER THE SUPERVISION OF SAN DIEGUITO WATER DISTRICT, AFTER PAYMENT OF THE ESTIMATED COST BY THE DEVELOPER.
5. WHERE ELEVATIONS AND GRADES ARE NOT SHOWN ON THE WATER MAIN PROFILE, TOP OF PIPE PROFILE IS 48 INCHES BELOW CENTERLINE FINISH GRADE OF STREET.
6. ALL SERVICES TO BE CONSTRUCTED CLEAR OF DRIVEWAYS.
7. CONTRACTOR TO FURNISH ONE INCH COPPER WATER SERVICE AND METER BOX FOR EACH RESIDENTIAL LOT.
8. CONTRACTORS SHALL ACQUIRE A TRENCHING PERMIT FROM THE CALIFORNIA DIVISION OF SAFETY FOR ALL TRENCH WORK.
9. INSTALL FIRE HYDRANTS 2.5 FEET FROM FACE OF CURB, IF NO SIDEWALK EXISTS, OR 7 FEET FROM FACE OF CURB WHERE SIDEWALK EXISTS OR WILL BE CONSTRUCTED.
10. PROVIDE AIR RELEASE ASSEMBLIES AT ALL HIGH POINTS IN WATER MAIN.
11. CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF ENCINITAS FOR ANY EXCAVATION WITHIN EXISTING CITY RIGHTS-OF-WAY.
12. THE DISTRICT REQUIRES THAT COMPACTION TESTS BE TAKEN WHERE WATER LINES ARE INSTALLED WITHIN EXISTING COUNTY RIGHTS-OF-WAY, CITY OF ENCINITAS RIGHTS-OF-WAY, OR PRIVATE EASEMENTS, AND THE RESULTS APPROVED BY THE CITY OF ENCINITAS, BEFORE THE WATER LINES ARE ACCEPTED AND A COPY SENT TO THE SAN DIEGUITO WATER DISTRICT OFFICE.
13. PRIOR TO AWARDING WATER LINE CONTRACT, OWNER SHALL ADVISE PROSPECTIVE CONTRACTORS TO OBTAIN AND REVIEW CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC) SPECIFICATIONS.
14. FILL AREAS MUST BE COMPACTED TO 90%, PRIOR TO PIPE INSTALLATION.

SAN DIEGUITO WATER DISTRICT NOTES (CONTINUED):

15. APPROVAL OF THIS PLAN BY SAN DIEGUITO WATER DISTRICT DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF, THE LOCATION OF, OR THE EXISTENCE OR NON-EXISTENCE OF, ANY UNDERGROUND UTILITY, PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.

16. ALL EXISTING FACILITIES WHICH MAY EFFECT FINAL DESIGN, I.E., LINE CROSSINGS, LINE PARALLELING, OR PROPOSED CONNECTION SHALL BE FIELD VERIFIED. ALL EXISTING OR PROPOSED UTILITY CROSSINGS WITHIN 10 FEET OF PROPOSED WATER MAINS SHALL BE SHOWN ON IMPROVEMENT PLANS. ELECTRICAL AND SEWER TO CROSS UNDER WATER MAINS UNLESS GIVEN WRITTEN PERMISSION BY SAN DIEGUITO WATER DISTRICT.

17. WATER CONNECTIONS TO COMMERCIAL DEVELOPMENTS SHALL HAVE AN APPROVED BACKFLOW DEVICE INSTALLED TO THE DISTRICT'S SATISFACTION AND CURRENT WATER AGENCIES' STANDARDS COMMITTEE (WASC) STANDARDS. BACKFLOW DEVICES ARE TO BE INSTALLED DIRECTLY OUTSIDE CITY OR COUNTY RIGHT-OF-WAY OR OUTSIDE WATER DISTRICT EASEMENT. REPAIR, MAINTENANCE AND ANNUAL TESTING OF BACKFLOW DEVICE ARE RESPONSIBILITY OF OWNER.

18. MINIMUM HORIZONTAL SEPARATION OF 10 FEET REQUIRED BETWEEN FIRE HYDRANTS AND SAN DIEGO GAS AND ELECTRIC VAULTS.

19. UTILITIES TO MAINTAIN MINIMUM 5-FOOT SEPARATION WHEN PARALLELING WATER SERVICES.

20. CONTRACTOR AND DEVELOPER ARE RESPONSIBLE TO RELOCATE ANY EXISTING WATER FACILITY (FIRE HYDRANT, METERS, VALVES, VALVE BOXES, ETC.) THAT ARE EFFECTED BY THEIR PROJECT.

21. CONTRACTOR TO SUPPLY DOCUMENTATION SHOWING THAT ANY ASBESTOS WATER PIPES REMOVED FROM THE GROUND WERE DISPOSED OF IN A MANNER ACCEPTABLE TO THE SAN DIEGO COUNTY WASTE DIVISION.

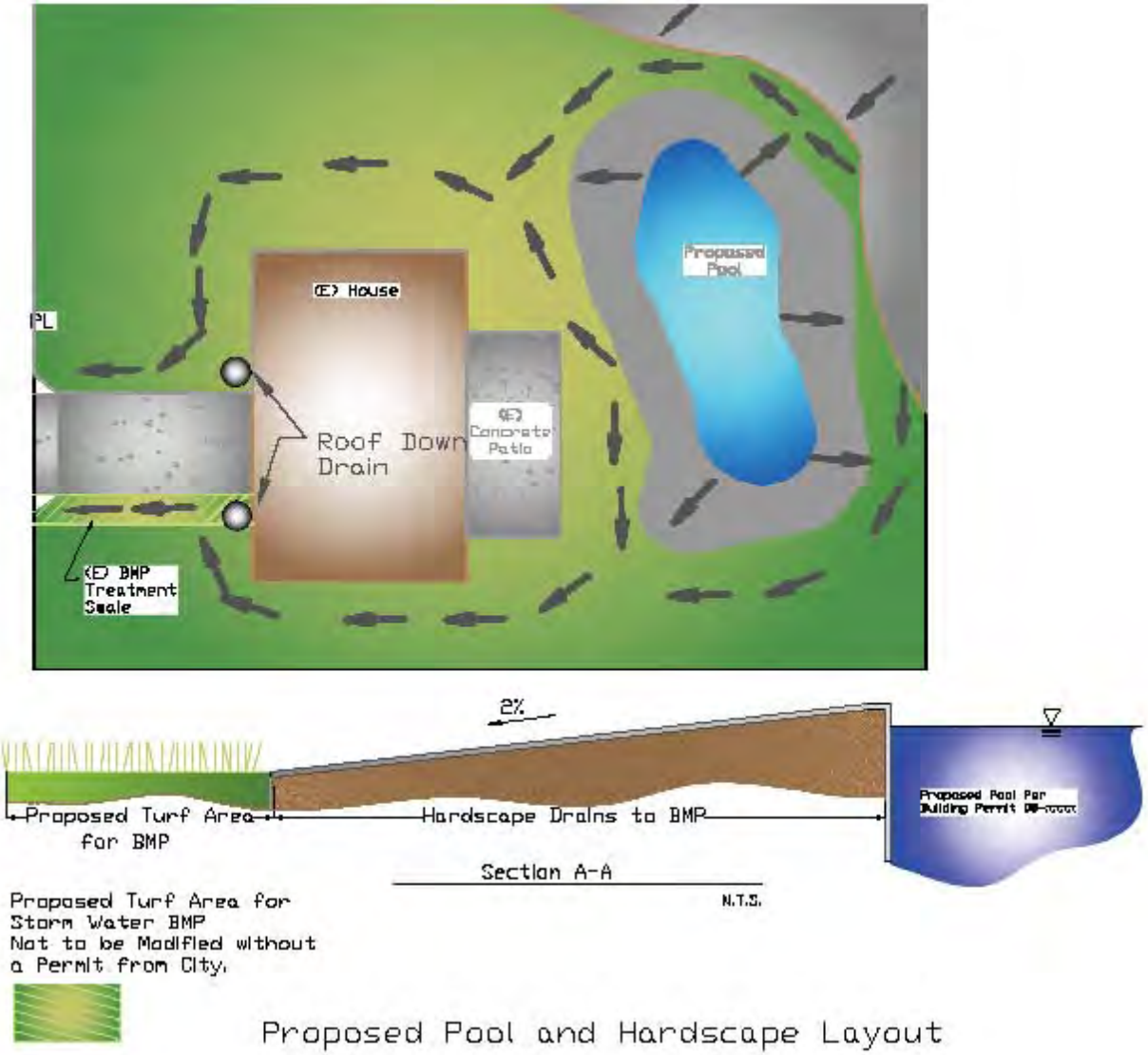
22. USE THE FOLLOWING VARIOUS COMBINATIONS OF PLAIN END PIPE LENGTHS WITH HIGH DEFLECTION COUPLINGS AND INTEGRAL BELL END PIPE FOR CURVED ALIGNMENTS IN BOTH HORIZONTAL AND VERTICAL DIRECTIONS. DO NOT BEND PIPE BETWEEN COUPLINGS. SAW CUT INTEGRAL BELL END OF STANDARD PIPE AND BEVEL END FOR USE WITH DEFLECTION COUPLINGS. USE 9.5-FOOT PLAIN END PIPE LENGTHS WITH DEFLECTION COUPLINGS FOR ALL RADII BETWEEN 140 FEET TO 270 FEET. USE 19-FOOT PIPE LENGTHS WITH DEFLECTION COUPLINGS FOR ALL RADII BETWEEN 270 FEET TO 560 FEET. USE AND INTEGRAL BELL END PIPE LENGTH JOINED TOGETHER WITH A 19-FOOT PLAIN END PIPE LENGTH TO FORM A CHORD. USE DEFLECTION COUPLINGS ON EACH END OF THE CHORD AND CONTINUE THIS COMBINATION THROUGH THE CURVED ALIGNMENT FOR ALL RADII BETWEEN 560 FEET TO 1,150 FEET. PIPE LENGTHS SHORTER THAN 9 FEET WILL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED THE BY THE DISTRICT'S REPRESENTATIVE.

1. CALIFORNIA STATE LAW ASSEMBLY BILL AB-1953 IS REQUIRING THAT NO-LEAD BRASS BE USED IN THE CONSTRUCTION OR REPAIR OF ALL POTABLE WATER SYSTEM EFFECT JANUARY 1, 2010. IN COMPLIANCE WITH THIS LAW, THE DISTRICT SHALL REQUIRE ALL MATERIALS TO BE NO-LEAD BRASS PARTS.
2. ALL COPPER TUBING USED FOR AIR RELEASES, BLOW OFFS, AND SERVICES SHALL BE PROVIDED WITH CATHODIC PROTECTION IN ACCORDANCE WITH WC-17 OR WC-18.
3. WATER SERVICES TO BE ABANDONED THAT ARE CONNECTED TO PIPELINES THAT WILL REMAIN IN SERVICE SHALL BE DISCONNECTED AT THE CORPORATION STOP, SHALL HAVE THE CORPORATION STOP REMOVED AND SHALL HAVE A BRASS PLUG INSTALLED; OR BE ABANDONED AS DIRECTED BY THE SDWD INSPECTOR.

OLIVENHAIN MUNICIPAL WATER DISTRICT
GENERAL POTABLE WATER SYSTEM NOTES REQUIRED FOR SUBDIVISION IMPROVEMENT PLANS

1. POTABLE WATER WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND MATERIALS AS SPECIFIED IN THE MOST RECENT EDITION OF THE OLIVENHAIN MUNICIPAL WATER DISTRICT (DISTRICT) STANDARD SPECIFICATIONS AND DRAWINGS FOR THE CONSTRUCTION OF WATER MAINS AND FACILITIES, INCLUDING ALL AMENDMENTS ADOPTED PRIOR TO THE DISTRICT APPROVAL DATE ON THESE PLANS. CONTRACTOR SHALL HAVE A COPY OF THE STANDARD SPECIFICATIONS ON THE JOB SITE AT ALL TIMES.
2. THE SUBMISSION AND REVIEW OF ALL SUBMITTALS (SHOP DRAWINGS, SIX SETS) AS REQUIRED BY THE STANDARD SPECIFICATIONS ARE TO BE ACCOMPLISHED PRIOR TO THE PRE-CONSTRUCTION MEETING WITH THE DISTRICT'S INSPECTOR.
3. UNLESS OTHERWISE NOTED, CONNECTIONS TO EXISTING MAINS SHALL BE MADE

POOL HARDSCAPE DESIGN SHEET



Proposed Pool and Hardscape Layout

SWPPP PREPARATION GUIDANCE

As per the Construction General Permit Oder 2009-0009-DWQ, the State requires a Storm Water Pollution Prevention Plan (SWPPP) to be prepared whenever a project proposes land disturbance exceeding one acre. The applicant must pay a fee and file with the State Water Resources Control Board to obtain a WDID number. A copy of the SWPPP must be submitted to the City during the plancheck process. A copy of the approved SWPPP must be kept on site during the grading process. This copy needs to be continuously updated as the project progresses and the storm water pollution control needs change.

Engineers can find a sample SWPPP prepared by the California Storm Water Quality Association online at: http://www.cabmphandbooks.com/Construction.asp#SWPPP.

Applicants wanting professional SWPPP preparation may select an Engineering firm specializing in storm water pollution control.

Engineers can contact our Stormwater Section at (760) 633-2787 with any questions about SWPPP preparation.

State Water Resources Control Board

Division of Water Quality
1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
FAX (916) 341-5543 • Internet Address: http://www.swrcb.ca.gov

To SWPPP Checklist users:

This checklist is being provided as an aid to those unfamiliar in the preparation of a SWPPP. It is a comprehensive list of issues a SWPPP preparer must consider during the development of the document. Many sites, especially small construction sites, will not need to address some of the listed items because they are not relevant to the site, the construction activities planned, or the construction materials used. This list allows the preparer to consider the applicability of the item to the specific circumstances of the site, and then determine to what extent the item should be addressed in the SWPPP. The items in the checklist are derived from Sections A, B, and C of the Construction General Permit, and the specific permit section is listed in the second column.

The use of this checklist does not guarantee compliance with the General Construction Storm Water Permit. Additionally, using the checklist to generate a SWPPP is not a substitute for knowledge of the permit requirements, the checklist serves as a **guidance** document only. A site specific SWPPP must be combined with proper and timely installation of the BMPs, thorough and frequent inspections, maintenance, and documentation.

STORM WATER POLLUTION PREVENTION PLAN AND MONITORING PROGRAM CHECKLIST

GENERAL CONSTRUCTION ACTIVITIES STORM WATER PERMIT

Construction site name: _____

Date Prepared:_____ WDID _____

Contact Information _____

Section A. Storm Water Pollution Prevention Plan (SWPPP)

	Permit Section	Page Number[1]	Not Applicable N/A	Implementation Date[2]
Vicinity Map (graphic)	***A.5.a.1***			
Major roadways, geographic features or landmarks	A.5.a.1			
Site perimeter	A.5.a.1			
Geographic features	A.5.a.1			
General topography	A.5.a.1			
Site Map (graphic) (can modify Parcel Map)	***A.5.a.2***			
Site perimeter	A.5.a.2			
Existing and proposed buildings, lots, and roadways	A.5.a.2			
Storm water collection and discharge points	A.5.a.2			
General topography before and after construction	A.5.a.2			
Anticipated discharge location(s)	A.5.a.2			
Drainage patterns	A.5.a.2			
Relevant drainage areas	A.5.a.2			
Temporary on-site drainage	A.5.a.2			
Drainage (graphic)	***A.5.b.1***			
Drainage patterns	A.5.b.1			
Slopes after major grading	A.5.b.1			
Calculations for storm water run-on	A.5.b.1			
BMPs that divert off-site drainage from going through site	A.5.b.1			
Storm Water Inlets (graphic)	***A.5.b.2***			
Drainage patterns to storm water inlets or receiving water	A.5.b.2			

[1] Indicate the page number where the information is located in your SWPPP. If the information is not applicable to your site, construction activities, or construction materials, check the N/A box. Your SWPPP does not have to address items which are not applicable to your situation.

[2] Date that the BMP will be installed on the site

BMPs that protect storm water inlets or receiving water	A.5.b.2			
	Permit Section	**Page Number[3]**	**Not Applicable N/A**	**Implementation Date[4]**
Site History/Past Site Usage (Real Estate Broker Disclosure may be sufficient)	***A.5.b.3***			
Description of toxic materials treated, stored, or spilled on site	A.5.b.3			
BMPs that minimize contact of contaminants with storm water	A.5.b.3			
Location of Areas Designated for: (graphic)	***A.5.b.4***			
Soil or waste storage	A.5.b.4			
Vehicle storage & service	A.5.b.4			
Construction material loading, unloading, and access	A.5.b.4			
Equipment storage, cleaning, maintenance	A.5.b.4			
BMP Descriptions for: (graphic or narrative)	***A.5.b.5***			
Waste handling and disposal areas	A.5.b.5			
On-site storage and disposal of construction materials and waste	A.5.b.5			
BMPs to minimize exposure of storm water to construction materials, equipment, vehicles, waste	A.5.b.5			
Post Construction BMPs	***A.5.b.6 See A. 10***			
Additional Information	***A.5. c***			
Description of other pollutant sources and BMPs that cannot be shown graphically	A.5.c.1			
Pre-construction control practices	A.5.c.1			
Inventory of materials and activities that may pollute storm water	A.5.c.2			
BMPs to reduce/eliminate potential pollutants listed in the inventory	A.5.c.2			
Runoff coefficient (before & after)	A.5.c.3			
Percent impervious (before & after)	A.5.c.3			
Copy of the NOI and WDID #	A.5.c.4			
Construction activity schedule	A.5.c.5			
Contact information	A.5.c.6			

[3] Indicate the page number where the information is located in your SWPPP. If the information is not applicable to your site, construction activities, or construction materials, check the N/A box. Your SWPPP does not have to address items which are not applicable to your situation.

[4] Date that the BMP will be installed on the site

EROSION CONTROL	**A.6**			
The SWPPP shall include: (graphic)	***A.6.a-c***			
Areas of vegetation on site	A.6.a.1			
Areas of soil disturbance that will be stabilized during rainy season	A.6.a.2			
Areas of soil disturbance which will be exposed during any part of the rainy season	A.6.a.3			
	Permit Section	**Page Number[5]**	**Not Applicable N/A**	**Implementation Date[6]**
Construction phase / BMP sequencing schedule including supplemental pre-rain action plan for erosion control measures	A.6.a.4			
BMPs for erosion control	A.6.b			
BMPs to control wind erosion	A.6.c			
SEDIMENT CONTROL	**A.8**			
Description/Illustration of BMPs to prevent increase of sediment load in discharge	A.8			
Construction phase / BMP sequencing schedule including supplemental pre-rain action plan for sediment control measures	A.8			
NON-STORM WATER	**A.9**			
Description of non-storm water discharges to receiving waters	A.9			
Locations of discharges	A.9			
Description of BMPs	A.9			
Name and phone number of qualified person responsible for non-storm water management	A.9			
POST-CONSTRUCTION	**A.10**			
Description and location of BMPs	A.10			
Operation/Maintenance of BMPs after project completion (including funding)	A.10			
MAINTENANCE, INSPECTIONS, AND REPAIR	**A.11**			
Name and phone number of qualified person responsible for inspections	A.11			

[5] Indicate the page number where the information is located in your SWPPP. If the information is not applicable to your site, construction activities, or construction materials, check the N/A box. Your SWPPP does not have to address items which are not applicable to your situation.

[6] Date that the BMP will be installed on the site

Inspection checklist: date, weather, inadequate BMPs, visual observations of BMPs, corrective action, inspector's name, title, signature	A.11.a-f			
OTHER REQUIREMENTS	**A.12-16**			
Documentation of all training	A.12			
List of Contractors/Subcontractors	A.13			

Section B. Monitoring and Reporting Requirements

Description of site inspection plans	B.3			
Compliance certification (annually 7/1) if project is under active construction	B.4			
Noncompliance reporting	B.5			
Records of all inspections; compliance certifications; noncompliance reports, etc. should be kept for at least three years	B.6			
	Permit Section	**Page Number[7]**	**Not Applicable N/A**	**Implementation Date[8]**
Monitoring program for sediment contribution from direct discharges to impaired water bodies	B.7			
Monitoring program for pollutants not visually detectable in storm water (non-visible pollutants)	B.8			

Section C. Standard Provisions for Construction Activities

Signed Certification for SWPPP, reports, amendments, etc. Who is authorized to sign and by what authority has the duly authorized representative been assigned?	C.9,10			
Location of General Permit and SWPPP on site during construction activities	C. 17			

Notes:

[7] Indicate the page number where the information is located in your SWPPP. If the information is not applicable to your site, construction activities, or construction materials, check the N/A box. Your SWPPP does not have to address items which are not applicable to your situation.

[8] Date that the BMP will be installed on the site

City of Encinitas

Engineering Department

Unit Price List

Effective May 1, 2005

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SECTION 1-EARTHWORK

GRADING

CLEAR AND GRUB	SF	$ 0.45
CONTAMINATED SOIL REMOVAL	CY	$ 105.00
EXCAVATE AND EXPORT	CY	GRADED
0-1,000	CY	$ 27.50
1,001-20,000	CY	$ 22.00
20,001-100,000	CY	$ 16.50
100,001-350,000	CY	$ 11.00
>350,000	CY	$ 7.15
EXCAVATE AND FILL	CY	GRADED
0-1,000	CY	$ 20.00
1,001-20,000	CY	$ 11.50
>20,000	CY	$ 6.5
IMPORT AND FILL	CY	GRADED
0-1,000	CY	$ 28.00
1,001-20,000	CY	$ 22.00
>20,000	CY	$ 12.00
SUB DRAIN (4" DIAMETER)	LF	$ 28.00
SUB DRAIN (6" DIAMETER)	LF	$ 30.00
SUB DRAIN (8" DIAMETER)	LF	$ 35.00
SUB DRAIN HEADWALL	EA	$ 2,500.00
SHORING (SUBSURFACE STRUCTURE)	SF	$ 25.00

BEST MANAGEMENT PRACTICES (BMP'S)

GRAVEL BAG	EA	$ 1.10
JUTE MAT	SF	$ 0.40
STRAW MAT	SF	$ 0.28
STRAW BALES	EA	$ 5.00
SILT FENCE	LF	$ 1.60
FIBER ROLLS	LF	$ 2.25
FIBER MATT	SF	$ 0.40
HYDRO-SEED	SF	$ 0.20
HYDRAULIC MULCH	SF	$ 0.30

STABLILIZED CONSTRUCTION ENTRANCE	SF	$ 5.25
CONCRETE WASHOUT	EA	$ 500.00
INLET PROTECTION (SEDIMENT)	EA	$ 150.00
MISCELLANEOUS SWPPP ITEMS	LS	

SECTION 2-PUBLIC DRAINAGE

PUBLIC RCP CULVERTS

18" RCP STORM DRAIN	LF	$ 95.00
24" RCP STORM DRAIN	LF	$ 110.00
30" RCP STORM DRAIN	LF	$ 120.00
36" RCP STORM DRAIN	LF	$ 145.00
42" RCP STORM DRAIN	LF	$ 165.00
48" RCP STORM DRAIN	LF	$ 175.00
54" RCP STORM DRAIN	LF	$ 200.00
60" RCP STORM DRAIN	LF	$ 255.00
72" RCP STORM DRAIN	LF	$ 285.00

PUBLIC RCP CULVERTS (WITH WATER TIGHT JOINTS)

18" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 99.75
24" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 115.50
30" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 126.00
36" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 152.25
42" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 173.25
48" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 183.75
54" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 210.00
60" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 267.75
72" RCP STORM DRAIN (WATER TIGHT JOINTS)	LF	$ 299.25

MISCELLANEOUS PUBLIC DRAINAGE

AC SPILLWAY (D-22)	EA	$ 320.00
PCC BOX CULVERT	CY	$ 1,100.00
CATCH BASIN, PER D-7 (TYPE F)	EA	$ 3,550.00
CATCH BASIN, PER D-8 (TYPE G)	EA	$ 3,900.00
CLEAN OUT, PER D-9 (TYPE A)	EA	$ 3,980.00
CLEAN OUT, PER D-10 (TYPE B)	EA	$ 4,500.00
CATCH BASIN, PER D-29 (TYPE I)	EA	$ 3,850.00
CONCRETE (STRUCTURAL)	CY	$ 550.00
CONCRETE ENERGY DISSIPATER, PER D-41	EA	$ 8,200.00
CONCRETE LUG, PER D-63	EA	$ 1,200.00
CONCRETE PIPE COLLAR, PER D-62	EA	$ 2,500.00

CURB INLET, PER D-1 (TYPE A)	EA	$ 3,850.00
CURB INLET, PER D-2 (TYPE B)	EA	$ 3,850.00
CURB INLET, PER D-3 (TYPE C)	EA	$ 4,500.00
CURB INLET, PER D-45 (TYPE J)	EA	$ 3,550.00
CURB OUTLET, PER D-25 (TYPE A)	EA	$ 2,500.00
CURB OUTLET-SIDEWALK UNDERRDRAIN, PER D-27	EA	$ 500.00
CURTAIN WALL, PER D-38	EA	$ 600.00
CUTOFF WALL WALL, PER D-72	EA	$ 475.00
PCC DRAINAGE CHANNEL, PER D-70 & 71	LF	$ 650.00
DRAINAGE DITCH, PER D-75	LF	$ 15.00
HEC-2 STUDY & FEMA REVISION	LS	$ 30,000.00
STRAIGHT HEAD WALL PER D-30&31 (TYPE A)	EA	$ 3,000.00
STRAIGHT HEAD WALL PER D-32&33 (TYPE A-GRAVITY)	EA	$ 2,700.00
WING/U TYPE HEAD WALL PER D-34/35A&B (18" TO 36"/36" TO 60")	EA	$ 4,300.00
WING/U TYPE HEAD WALL PER D-35A&B (60" TO 84")	EA	$ 4,600.00
L TYPE HEADAWALL PER D-36 & 37	EA	$ 4,100.00
INLET APRON, PER D-39	EA	$ 1,600.00
CONCRETET ENERGY DISSIPATOR, PER D-41	EA	$ 8,200.00
RIP RAP , PER D-40 (2 TON)	EA	$ 2,500.00
RIP RAP , PER D-40 (0.25 -1.0 TON)	EA	$ 2,100.00
RIP RAP , PER D-40 (NO. 2 BACKING)	EA	$ 1,750.00
CONNECT TO EXISTING S.D.	EA	$ 200.00

DESCRIPTION	UNIT	UNIT PRICE

SECTION 3-PUBLIC SURFACE IMPROVEMENTS

PUBLIC CURB AND GUTTER

CURB & GUTTER REMOVAL	LF	$ 3.00
MEDIAN CURB & GUTTER, PER G-6 (TYPE B-1)	LF	$ 12.00
MEDIAN CURB & GUTTER, PER G-6 (TYPE B-2)	LF	$ 20.00
6" CURB & GUTTER PER G-2 (TYPE G)	LF	$ 20.00
8" CURB & GUTTER PER G-2 (TYPE G)	LF	$ 24.00
6" CURB & GUTTER, PER G-2 (TYPE H)	LF	$ 25.00
8" CURB & GUTTER, PER G-2 (TYPE H)	LF	$ 30.00
ROLLED CURB, PER G-4	LF	$ 26.00
4" AC BERM, PER G-5	LF	$ 8.00
6" AC BERM, PER G-5	LF	$ 9.50
8" AC BERM, PER G-5	LF	$ 11.00

PUBLIC PAVEMENT

PAVEMENT DESIGN, PER SDG-113 (SCHEDULE J)	SF	$ 5.00
AC PAVING (1" SURFACE)	SF	$ 0.75
AC PAVING (2" SURFACE)	SF	$ 1.00
AC PAVING (3" SURFACE)	SF	$ 1.30
AC PAVING (4" SURFACE)	SF	$ 1.75
AC PAVING (5" SURFACE)	SF	$ 2.15
CTB PAVING (4" SURFACE)	SF	$ 1.00
CTB PAVING (6" SURFACE)	SF	$ 1.05
CTB PAVING (8" SURFACE)	SF	$ 1.25
CTB PAVING (12" SURFACE)	SF	$ 1.60
CTB PAVING (14" SURFACE)	SF	$ 1.65
CTB PAVING (16" SURFACE)	SF	$ 1.75
CTB PAVING (18+" SURFACE)	SF	$ 1.85
PCC PAVING (5" THICK)	SF	$ 5.00
PCC PAVING (5.5" THICK)	SF	$ 5.50
PCC PAVING (6" THICK)	SF	$ 6.00
PCC PAVING (8" THICK)	SF	$ 6.50
PCC PAVING (9" THICK)	SF	$ 7.50
PAVING SUBGRADE PREPARATION	SF	$ 0.50
AC PAVEMENT REMOVAL	SF	$ 2.00

PUBLIC PED RAMPS & SIDEWALK

'CURB RAMPS, PER SDG132 (TYPE A & B, NEW CONSTRUCTION)	EA	$ 1,400.00
CURB RAMPS, PER SDG133-134 (TYPE A1, A2 &C-EXIST SIDEWALK)	EA	$ 2,200.00
CURB RAMPS, ALLEY, PER SDG-136 (TYPE D)	EA	$ 1,600.00
SIDEWALK REMOVAL	SF	$ 1.50
4" PCC SIDEWALK, PER G-7	SF	GRADED
0-5000	SF	$ 5.00
>5000	SF	$ 4.00

MISCELLANEOUS PUBLIC SURFACE IMPROVEMENTS

CUT-OFF WALL @ END OF PAVEMENT, PER G-22 & 23	EA	$ 1,000.00
CROSS-GUTTER, PER G-12 & 13	SF	$ 8.00
DRIVEWAY, PER G-14A,B,C, & SDG-114	SF	$ 7.00
MEDIAN, PER SDG-112 (STAMPED CONCRETE)	SF	$ 5.00
MEDIAN, PER SDG-112 (DECORATIVE CONCRETE)	SF	$ 6.50
MEDIAN, PER SDG-112 (PAVERS)	SF	$ 10.50
TRENCH RESURFACING, PER SDG-107&108	LF	$ 25.00
NARROW TRENCHING, PER G-33-35	LF	$ 11.50
4" AC BERM, PER G-5	LF	$ 7.55
6" AC BERM, PER G-5	LF	$ 8.20
8" AC BERM, PER G-5	LF	$ 9.35
AC OVERLAY (1"-2")	SF	$ 0.45
AC SLURRY SEAL	SF	$ 0.60
ALLEY APRON, PER G-17	SF	$ 7.00
ADJUST TO GRADE	EA	$ 1,000.00
AGGREGATE BASE (AB)	SF	$ 1.00
MEDIAN PCC, PER SDG-112 (DECORATIVE)	SF	$ 11.00
MEDIAN PCC, PER SDG-112 (STAMPED CONCRETE)	SF	$ 8.00
MEDIAN PCC, PER SDG-112 (INTERLOCKING PAVERS)	SF	$ 12.00

DESCRIPTION	UNIT	UNIT PRICE

SECTION 4-PUBLIC TRAFFIC

TRAFFIC CONTROLS

DETECTOR LOOPS		EA	$ 450.00
PULL BOX, PER SDI-105 (ALL TYPES)		EA	$ 260.00
PULL BOX RELOCATION		EA	$ 400.00
REMOVE STRIPPING		LF	$ 3.00
STREET LIGHT, PER SDE-101, E-2 L.P. SODIUM		EA	$ 6,000.00
STREET LIGHT, PER SDE-101, E-2 L.P. SODIUM		EA	$ 6,000.00
STREET LIGHT, PER SDE-101, E-2 H.P. SODIUM		EA	$ 6,000.00
STREET NAME SIGN, PER SDM-102		EA	$ 400.00
STREET STRIPPING		LF	GRADED
	0-4000	LF	$ 0.65
	>4000	LF	$ 0.50
TRAFFIC SIGNAL (2X2 INTERSECTION)		LS	$ 105,000.00
TRAFFIC SIGNAL (4X2 INTERSECTION)		LS	$ 115,000.00
TRAFFIC SIGNAL (4X4 INTERSECTION)		LS	$ 120,000.00
TRAFFIC SIGNAL (4X6 INTERSECTION)		LS	$ 130,000.00
TRAFFIC SIGNAL (6X6 INTERSECTION)		LS	$ 140,000.00
TRAFFIC SIGNAL (8X6 INTERSECTION)		LS	$ 230,000.00
TRAFFIC SIGNAL INTERCONNECTION		LF	$ 15.00
BIKE LANE SIGNING AND STRIPING		MI	$ 2,000.00

SECTION 5-PUBLIC WATER/WASTEWATER UTILITIES

PUBLIC WASTEWATER

CONCRETE ANCHOR, PER S-9	LF	$ 1,262.00
CONCRETE CRADLE, PER S-6 (8" SWR MAIN)	LF	$ 13.95
CONCRETE CRADLE, PER S-6 (10" SWR MAIN)	LF	$ 15.40
CONCRETE CRADLE, PER S-6 (12" SWR MAIN)	LF	$ 17.60
CONCRETE CRADLE, PER S-6 (15" SWR MAIN)	LF	$ 20.35
CONCRETE CRADLE, PER S-6 (18" SWR MAIN)	LF	$ 24.85
CONCRETE CRADLE, PER S-6 (21" SWR MAIN)	LF	$ 29.00
CONCRETE CRADLE, PER S-6 (24" SWR MAIN)	LF	$ 20.00
CONCRETE CRADLE, PER S-6 (27" SWR MAIN)	LF	$ 34.40
CONCRETE CRADLE, PER S-6 (30" SWR MAIN)	LF	$ 41.20
CONCRETE CRADLE, PER S-6 (36" SWR MAIN)	LF	$ 52.95
CONCRETE CRADLE, PER S-6 (42" SWR MAIN)	LF	$ 68.70
CONCRETE CRADLE, PER S-6 (48" SWR MAIN)	LF	$ 78.25
CONCRETE ENCASEMENT, PER S-7 (8" SWR MAIN)	LF	$ 21.95
CONCRETE ENCASEMENT, PER S-7 (10" SWR MAIN)	LF	$ 25.60
CONCRETE ENCASEMENT, PER S-7 (12" SWR MAIN)	LF	$ 29.20
CONCRETE ENCASEMENT, PER S-7 (15" SWR MAIN)	LF	$ 34.35
CONCRETE ENCASEMENT, PER S-7 (18" SWR MAIN)	LF	$ 40.20
CONCRETE ENCASEMENT, PER S-7 (21" SWR MAIN)	LF	$ 45.10
CONCRETE ENCASEMENT, PER S-7 (24" SWR MAIN)	LF	$ 50.40
CONCRETE ENCASEMENT, PER S-7 (27" SWR MAIN)	LF	$ 59.60
CONCRETE ENCASEMENT, PER S-7 (30" SWR MAIN)	LF	$ 73.30
CONCRETE ENCASEMENT, PER S-7 (36" SWR MAIN)	LF	$ 84.20
CONCRETE ENCASEMENT, PER S-7 (42" SWR MAIN)	LF	$ 95.60
CONCRETE ENCASEMENT, PER S-7 (48" SWR MAIN)	LF	$ 116.45
CUTOFF WALL, PER S-10 (TYPE B)	EA	$ 1,474.00
SEWER MANHOLE, PER S-2 (3'x5')	EA	$ 3,585.00
SEWER MANHOLE, PER S-2 (3'x5' W/LOCKING COVER)	EA	$ 4,407.00
SEWER MANHOLE, PER S-2 (3'x5' PVC-LINER)	EA	$ 5,525.00
SEWER MANHOLE, PER S-2 (3'x5' W/PVC-LINER & LOCKING COVER)	EA	$ 6,347.00
SEWER MANHOLE, PER S-17 (3'x4')	EA	$ 3,175.00
SEWER MANHOLE, PER S-17 (3'x4' W/LOCKING COVER)	EA	$ 4,500.00
SEWER MANHOLE, PER S-17 (3'x4' PVC-LINER)	EA	$ 3,997.00
SEWER MANHOLE, PER S-17 (3'x4' W/PVC-LINER & LOCKING COVER)	EA	$ 5,322.00

DESCRIPTION	UNIT	UNIT PRICE
SEWER MANHOLE LOCKING COVER, PER M-4	EA	$ 822.15
4" PRESSURE PVC SEWER	LF	$ 52.70
6" PRESSURE PVC SEWER	LF	$ 71.75
SEWER ACCESS ROAD (4" DECOMPOSED GRANITE)	SF	$ 5.25
SEWER ACCESS ROAD, PER SDG-113 (AC)	SF	$ 11.30
SEWER ACCESS ROAD, PER SDG-113 (CONCRETE)	SF	$ 45.00
STREET SEWER LATERAL, PER S-13 (4", 40' LONG)	EA	$ 1,335.00
STREET SEWER LATERAL, PER S-13 (6" - 40' LONG)	EA	$ 2,510.00
STREET SEWER LATERAL, PER S-13 (8" - 40' LONG)	EA	$ 3,685.00
ALLEY SEWER LATERAL, PER S-13 (4" - 40' LONG)	EA	$ 1,117.00
ALLEY SEWER LATERAL, PER S-13 (6" - 40' LONG)	EA	$ 1,700.00
6" PVC SEWER MAIN, PER S-4	LF	$ 61.85
8" PVC SEWER MAIN, PER S-4	LF	$ 72.20
10" PVC SEWER MAIN, PER S-4	LF	$ 79.90
12" PVC SEWER MAIN, PER S-4	LF	$ 88.65
15" PVC SEWER MAIN, PER S-4	LF	$ 97.90
18" PVC SEWER MAIN, PER S-4	LF	$ 108.05
21" PVC SEWER MAIN, PER S-4	LF	$ 117.25
24" PVC SEWER MAIN, PER S-4	LF	$ 124.90
27" PVC SEWER MAIN, PER S-4	LF	$ 133.10
30" PVC SEWER MAIN, PER S-4	LF	$ 140.75
36" PVC SEWER MAIN, PER S-4	LF	$ 156.00
8" ESVC SEWER MAIN, PER S-4	LF	$ 75.00
10" ESVC SEWER MAIN, PER S-4	LF	$ 85.00
12" ESVC SEWER MAIN, PER S-4	LF	$ 90.00
15" ESVC SEWER MAIN, PER S-4	LF	$ 95.00
18" ESVC SEWER MAIN, PER S-4	LF	$ 110.00
21" ESVC SEWER MAIN, PER S-4	LF	$ 120.00
24" ESVC SEWER MAIN, PER S-4	LF	$ 130.00
27" ESVC SEWER MAIN, PER S-4	LF	$ 135.00
30" ESVC SEWER MAIN, PER S-4	LF	$ 140.00
42" ESVC SEWER MAIN, PER S-4	LF	$ 155.00
48" ESVC SEWER MAIN, PER S-4	LF	$ 190.00
16" STEEL CASING	LF	$ 97.50
19" STEEL CASING	LF	$ 125.00
21" STEEL CASING	LF	$ 142.00
24" STEEL CASING	LF	$ 161.00
30" STEEL CASING	LF	$ 187.00
33" STEEL CASING	LF	$ 198.00
36" STEEL CASING	LF	$ 212.00

39" STEEL CASING	LF	$ 225.00
42" STEEL CASING	LF	$ 259.00
48" STEEL CASING	LF	$ 286.00
52" STEEL CASING	LF	$ 313.00
60" STEEL CASING	LF	$ 360.00

PUBLIC WATER

AIR & VACUUM VALVE, PER W-4 (1")	EA	$ 1,550.00
AIR & VACUUM VALVE, PER W-4 (2")	EA	$ 2,200.00
BLOW-OFF ASSEMBLY, PER W-6 (2" TYPE A)	EA	$ 865.00
BLOW-OFF ASSEMBLY, PER SDW-106 (3" TYPE A)	EA	$ 1,600.00
BLOW-OFF ASSEMBLY PER W-7 (2" TYPE B, C & D)	EA	$ 1,875.00
RELOCATE FIRE HYDRANT	EA	$ 2,200.00
FIRE HYDRANT ASSY PER W-10 (2-WAY)	EA	$ 3,500.00
FIRE HYDRANT ASSY PER W-10 (3-WAY)	EA	$ 4,000.00
MULTIPLE SERVICE PER W-23	EA	$ 550.00
THUST BLOCK, PER W-17	SF	$ 175.00

PUBLIC WATER VALVES

4" GATE VALVE	EA	$ 550.00
6" GATE VALVE	EA	$ 1,000.00
8" GATE VALVE	EA	$ 1,800.00
10" GATE VALVE	EA	$ 2,850.00
12" GATE VALVE	EA	$ 3,700.00
16" GATE VALVE	EA	$ 4,650.00
20" GATE VALVE	EA	$ 5,900.00
8" PRESSURE REDUCER W/BOX	EA	$ 9,820.00

PUBLIC PVC WATER MAINS (ALL MATERIALS)

4" PVC WATER MAIN PER W-21	LF	$ 38.00
6" PVC WATER MAIN PER W-21	LF	$ 50.00
8" PVC WATER MAIN PER W-21	LF	$ 58.00
10" PVC WATER MAIN PER W-21	LF	$ 63.00
12" PVC WATER MAIN PER W-21	LF	$ 70.00
16" PVC WATER MAIN PER W-21	LF	$ 89.00
20" PVC WATER MAIN PER W-21	LF	$ 100.00

DESCRIPTION	UNIT	UNIT PRICE
PUBLIC WATER SERVICE		
WTR SERV. PER W-1 (1" W/1"X 0.75" METER)	EA	$ 2,389.00
WTR SERV. PER W-1 (1" W/1"X 1" METER)	EA	$ 2,478.00
WTR SERV. PER W-2 (2" W/1.5" METER)	EA	$ 2,782.00
WTR SERV. PER W-2 (2" W/2" METER)	EA	$ 2,866.00
WTR SERV. PER W-2 (2-2" W/2-2" METER, MANIFOLD)	EA	$ 4,561.00
WTR SERV. PER W-1 (1" W/O METER)	EA	$ 2,267.00
WTR SERV. PER W-2 (1" W/O METER)	EA	$ 2,453.00
WTR SERV. PER W-2 (2-2" W/O METER)	EA	$ 3,183.00

SECTION 6-MISCELLANEOUS PUBLIC IMPROVEMENTS

MISCELLANEOUS PUBLIC ITEMS

VEHICULAR BRIDGE	SF	$ 275.00
PEDESTRIAN BRIDGE	SF	$ 250.00
CRASH CUSHION (G.R.E.A.T.)	EA	$ 36,800.00
EXCAVATION (FOR STRUCTURES)	CY	$ 31.00
FENCE, PER M-6 (4' HIGH CHAIN LINK)	LF	$ 12.50
FENCE, PER M-6 (5' HIGH CHAIN LINK)	LF	$ 14.00
FENCE, PER M-6 (6' HIGH CHAIN LINK)	LF	$ 16.00
GUARD RAIL METAL BEAM, PER M-30-38	LF	$ 30.00
GUARD RAIL POST, PER M-9	EA	$ 240.00
GUARD BARRICADE, PER M-9	EA	$ 450.00
PCC MEDIAN BARRIER (TYPE 50)	EA	$ 55.00
SAW CUT EXISTING (AC/PCC)	LF	$ 4.00
TRENCH SHORING (5'-10' DEEP)	LF	$ 11.20
TRENCH SHORING (11'-15' DEEP)	LF	$ 17.40
TRENCH SHORING (16'-20' DEEP)	LF	$ 25.00
SURVEY MONUMENT, PER M-10	EA	$ 800.00
MASONRY RETAINING WALL	SF	$ 29.65
CAST IN PLACE RETAINING WALL	CY	$ 675.00
GRAVITY RETAINING WALL	SF	$ 22.00
CRIB-BLOCK RETAINING WALL	SF	$ 25.00
PEDESTRIAN BARRICADE, PER SDE 103	EA	$ 150.00

DESCRIPTION	UNIT	UNIT PRICE

SECTION 7-LANDSCAPE & IRRIGATION

LANDSCAPE PLANTING

SHRUBS (1 GALLON)	EA	$ 6.00
SHRUBS (5 GALLON)	EA	$ 20.00
SLOPE PLANTING (GROUND COVER)	SF	$ 0.48
SLOPE PLANTING (GROUND COVER + TREES)	SF	$ 0.79
SLOPE PLANTING (HYDRO-SEEDING)	SF	$ 0.13
TREE (5 GALLON)	EA	$ 15.00
TREE (15 GALLON)	EA	$ 85.00
TREE (24" BOX)	EA	$ 250.00
TREE (36" BOX)	EA	$ 350.00
TREE (48" BOX)	EA	$ 650.00
TREE GRATE (W/2FRAME)	EA	$ 480.00
TREE MAINTENANCE (TREES/YEAR)	TREE/ YR	$ 200.00

LANDSCAPE IRRIGATION

BACKFLOW PREVENTION ASSEMBLY (W/ENCLOSURE)	EA	$ 1,650.00
SLOPE IRRIGATION	SF	$ 0.59

SECTION 8-PRIVATE DRAINAGE

PRIVATE RCP CULVERTS

12" RCP STORM DRAIN	LF	$ 60.00
18" RCP STORM DRAIN	LF	$ 95.00
24" RCP STORM DRAIN	LF	$ 110.00
30" RCP STORM DRAIN	LF	$ 120.00
36" RCP STORM DRAIN	LF	$ 145.00
42" RCP STORM DRAIN	LF	$ 165.00
48" RCP STORM DRAIN	LF	$ 175.00
54" RCP STORM DRAIN	LF	$ 200.00
60" RCP STORM DRAIN	LF	$ 255.00
72" RCP STORM DRAIN	LF	$ 285.00

PRIVATE PVC/CMP/HDPE CULVERTS

4"-6" PVC STORM DRAIN	LF	$ 20.00
8"-12" PVC STORM DRAIN	LF	$ 30.00
18" PVC STORM DRAIN	LF	$ 71.00
24" PVC STORM DRAIN	LF	$ 80.00
30" PVC STORM DRAIN	LF	$ 91.00
36" PVC STORM DRAIN	LF	$ 105.00
42" PVC STORM DRAIN	LF	$ 120.00
48" PVC STORM DRAIN	LF	$ 135.00

MISCELLANEOUS PRIVATE DRAINAGE

AC SPILLWAY (D-22)	EA	$ 320.00
PCC BOX CULVERT	CY	$ 1,100.00
CATCH BASIN, PER D-7 (TYPE F)	EA	$ 3,550.00
'CATCH BASIN, PER D-8 (TYPE G)	EA	$ 3,900.00
'CLEAN OUT, PER D-9 (TYPE A)	EA	$ 3,980.00
'CLEAN OUT, PER D-10 (TYPE B)	EA	$ 4,500.00
CATCH BASIN, PER D-29 (TYPE I)	EA	$ 3,850.00
CONCRETE (STRUCTURAL)	CY	$ 550.00
CONCRETE ENERGY DISSIPATER, PER D-41	EA	$ 8,200.00
CONCRETE LUG, PER D-63	EA	$ 1,200.00
CONCRETE PIPE COLLAR, PER D-62	EA	$ 2,500.00
CURB INLET, PER D-1 (TYPE A)	EA	$ 3,850.00
CURB INLET, PER D-2 (TYPE B)	EA	$ 3,850.00

DESCRIPTION	UNIT	UNIT PRICE
CURB INLET, PER D-3 (TYPE C)	EA	$ 4,500.00
CURB INLET, PER D-4 (TYPE D)	EA	$ 3,550.00
CURB INLET, PER D-45 (TYPE J)	EA	$ 3,550.00
CURB OUTLET, PER D-25 (TYPE A)	EA	$ 2,500.00
CURB OUTLET-SIDEWALK UNDERRDRAIN, PER D-27	EA	$ 500.00
CURTAIN WALL, PER D-38	EA	$ 600.00
CUTOFF WALL WALL, PER D-72	EA	$ 475.00
PCC DRAINAGE CHANNEL, PER D-70 & 71	LF	$ 650.00
DRAINAGE DITCH, PER D-75	LF	$ 15.00
STRAIGHT HEAD WALL PER D-30&31 (TYPE A)	EA	$ 3,000.00
STRAIGHT HEAD WALL PER D-32&33 (TYPE A-GRAVITY)	EA	$ 2,700.00
WING/U TYPE HEAD WALL PER D-34/35A&B (18" TO 36"/36" TO 60")	EA	$ 4,300.00
WING/U TYPE HEAD WALL PER D-35A&B (60" TO 84")	EA	$ 4,600.00
L TYPE HEADAWALL PER D-36 & 37	EA	$ 4,100.00
INLET APRON, PER D-39	EA	$ 1,600.00
RIP RAP , PER D-40 (2 TON)	EA	$ 2,500.00
RIP RAP , PER D-40 (0.25 -1.0 TON)	EA	$ 2,100.00
RIP RAP , PER D-40 (NO. 2 BACKING)	EA	$ 1,750.00
RIP RAP , PER D-40 (2.0 TON)	CY	$ 180.00
RIP RAP , PER D-40 (4.0 TON)	CY	$ 200.00
CONNECT TO EXISTING S.D.	EA	$ 1,000.00
CDS UNIT (SMALL)	EA	$ 20,000.00
CDS UNIT (MEDIUM)	EA	$ 35,000.00
CDS UNIT (LARGE)	EA	$ 70,000.00
BIO-SWALE	LF	$ 5.50
12"x12" BOX INLET (PVT)	EA	$ 1,500.00
18"x18" BOX INLET (PVT)	EA	$ 2,500.00
24"x24" BOX INLET (PVT)	EA	$ 2,750.00

SETION 9-PRIVATE WATER & WASTEWATER

PUBLIC WASTEWATER

CONCRETE ANCHOR, PER S-9	LF	$ 1,262.00
CONCRETE CRADLE, PER S-6 (8" SWR MAIN)	LF	$ 13.95
CONCRETE CRADLE, PER S-6 (10" SWR MAIN)	LF	$ 15.40
CONCRETE CRADLE, PER S-6 (12" SWR MAIN)	LF	$ 17.60
CONCRETE CRADLE, PER S-6 (15" SWR MAIN)	LF	$ 20.35
CONCRETE CRADLE, PER S-6 (18" SWR MAIN)	LF	$ 24.85
CONCRETE CRADLE, PER S-6 (21" SWR MAIN)	LF	$ 29.00
CONCRETE CRADLE, PER S-6 (24" SWR MAIN)	LF	$ 20.00
CONCRETE CRADLE, PER S-6 (27" SWR MAIN)	LF	$ 34.40
CONCRETE CRADLE, PER S-6 (30" SWR MAIN)	LF	$ 41.20
CONCRETE CRADLE, PER S-6 (36" SWR MAIN)	LF	$ 52.95
CONCRETE CRADLE, PER S-6 (42" SWR MAIN)	LF	$ 68.70
CONCRETE CRADLE, PER S-6 (48" SWR MAIN)	LF	$ 78.25
CONCRETE ENCASEMENT, PER S-7 (8" SWR MAIN)	LF	$ 21.95
CONCRETE ENCASEMENT, PER S-7 (10" SWR MAIN)	LF	$ 25.60
CONCRETE ENCASEMENT, PER S-7 (12" SWR MAIN)	LF	$ 29.20
CONCRETE ENCASEMENT, PER S-7 (15" SWR MAIN)	LF	$ 34.35
CONCRETE ENCASEMENT, PER S-7 (18" SWR MAIN)	LF	$ 40.20
CONCRETE ENCASEMENT, PER S-7 (21" SWR MAIN)	LF	$ 45.10
CONCRETE ENCASEMENT, PER S-7 (24" SWR MAIN)	LF	$ 50.40
CONCRETE ENCASEMENT, PER S-7 (27" SWR MAIN)	LF	$ 59.60
CONCRETE ENCASEMENT, PER S-7 (30" SWR MAIN)	LF	$ 73.30
CONCRETE ENCASEMENT, PER S-7 (36" SWR MAIN)	LF	$ 84.20
CONCRETE ENCASEMENT, PER S-7 (42" SWR MAIN)	LF	$ 95.60
CONCRETE ENCASEMENT, PER S-7 (48" SWR MAIN)	LF	$ 116.45
CUTOFF WALL, PER S-10 (TYPE B)	EA	$ 1,474.00
SEWER MANHOLE, PER S-2 (3'x5')	EA	$ 3,585.00
SEWER MANHOLE, PER S-2 (3'x5' W/LOCKING COVER)	EA	$ 4,407.00
SEWER MANHOLE, PER S-2 (3'x5' PVC-LINER)	EA	$ 5,525.00
SEWER MANHOLE, PER S-2 (3'x5' W/PVC-LINER & LOCKING COVER)	EA	$ 6,347.00
SEWER MANHOLE, PER S-17 (3'x4')	EA	$ 3,175.00
SEWER MANHOLE, PER S-17 (3'x4' W/LOCKING COVER)	EA	$ 4,500.00
SEWER MANHOLE, PER S-17 (3'x4' PVC-LINER)	EA	$ 3,997.00
SEWER MANHOLE, PER S-17 (3'x4' W/PVC-LINER & LOCKING COVER)	EA	$ 5,322.00
SEWER MANHOLE LOCKING COVER, PER M-4	EA	$ 822.15

DESCRIPTION	UNIT	UNIT PRICE
4" PRESSURE PVC SEWER	LF	$ 52.70
6" PRESSURE PVC SEWER	LF	$ 71.75
SEWER ACCESS ROAD (4" DECOMPOSED GRANITE)	SF	$ 5.25
SEWER ACCESS ROAD, PER SDG-113 (AC)	SF	$ 11.30
SEWER ACCESS ROAD, PER SDG-113 (CONCRETE)	SF	$ 45.00
STREET SEWER LATERAL, PER S-13 (4", 40' LONG)	EA	$ 1,335.00
STREET SEWER LATERAL, PER S-13 (6" - 40' LONG)	EA	$ 2,510.00
STREET SEWER LATERAL, PER S-13 (8" - 40' LONG)	EA	$ 3,685.00
ALLEY SEWER LATERAL, PER S-13 (4" - 40' LONG)	EA	$ 1,117.00
ALLEY SEWER LATERAL, PER S-13 (6" - 40' LONG)	EA	$ 1,700.00
6" PVC SEWER MAIN, PER S-4	LF	$ 61.85
8" PVC SEWER MAIN, PER S-4	LF	$ 72.20
10" PVC SEWER MAIN, PER S-4	LF	$ 79.90
12" PVC SEWER MAIN, PER S-4	LF	$ 88.65
15" PVC SEWER MAIN, PER S-4	LF	$ 97.90
18" PVC SEWER MAIN, PER S-4	LF	$ 108.05
21" PVC SEWER MAIN, PER S-4	LF	$ 117.25
24" PVC SEWER MAIN, PER S-4	LF	$ 124.90
27" PVC SEWER MAIN, PER S-4	LF	$ 133.10
30" PVC SEWER MAIN, PER S-4	LF	$ 140.75
36" PVC SEWER MAIN, PER S-4	LF	$ 156.00
8" ESVC SEWER MAIN, PER S-4	LF	$ 75.00
10" ESVC SEWER MAIN, PER S-4	LF	$ 85.00
12" ESVC SEWER MAIN, PER S-4	LF	$ 90.00
15" ESVC SEWER MAIN, PER S-4	LF	$ 95.00
18" ESVC SEWER MAIN, PER S-4	LF	$ 110.00
21" ESVC SEWER MAIN, PER S-4	LF	$ 120.00
24" ESVC SEWER MAIN, PER S-4	LF	$ 130.00
27" ESVC SEWER MAIN, PER S-4	LF	$ 135.00
30" ESVC SEWER MAIN, PER S-4	LF	$ 140.00
42" ESVC SEWER MAIN, PER S-4	LF	$ 155.00
48" ESVC SEWER MAIN, PER S-4	LF	$ 190.00
16" STEEL CASING	LF	$ 97.50
19" STEEL CASING	LF	$ 125.00
21" STEEL CASING	LF	$ 142.00
24" STEEL CASING	LF	$ 161.00
30" STEEL CASING	LF	$ 187.00
33" STEEL CASING	LF	$ 198.00
36" STEEL CASING	LF	$ 212.00
39" STEEL CASING	LF	$ 225.00

42" STEEL CASING	LF	$ 259.00
48" STEEL CASING	LF	$ 286.00
52" STEEL CASING	LF	$ 313.00
60" STEEL CASING	LF	$ 360.00

PRIVATE WATER

AIR & VACUUM VALVE, PER W-4 (1")	EA	$ 1,550.00
AIR & VACUUM VALVE, PER W-4 (2")	EA	$ 2,200.00
BLOW-OFF ASSEMBLY, PER W-6 (2" TYPE A)	EA	$ 865.00
BLOW-OFF ASSEMBLY, PER SDW-106 (3" TYPE A)	EA	$ 1,600.00
BLOW-OFF ASSEMBLY PER W-7 (2" TYPE B, C & D)	EA	$ 1,875.00
RELOCATE FIRE HYDRANT	EA	$ 2,200.00
FIRE HYDRANT ASSY PER W-10 (2-WAY)	EA	$ 3,500.00
FIRE HYDRANT ASSY PER W-10 (3-WAY)	EA	$ 4,000.00
MULTIPLE SERVICE PER W-23	EA	$ 550.00
THUST BLOCK, PER W-17	SF	$ 175.00

PRIVATE WATER VALVES

4" GATE VALVE	EA	$ 550.00
6" GATE VALVE	EA	$ 1,000.00
8" GATE VALVE	EA	$ 1,800.00
10" GATE VALVE	EA	$ 2,850.00
12" GATE VALVE	EA	$ 3,700.00
16" GATE VALVE	EA	$ 4,650.00
20" GATE VALVE	EA	$ 5,900.00
8" PRESSURE REDUCER W/BOX	EA	$ 9,820.00

PRIVATE PVC WATER MAINS (ALL MATERIALS)

4" PVC WATER MAIN PER W-21	LF	$ 38.00
6" PVC WATER MAIN PER W-21	LF	$ 50.00
8" PVC WATER MAIN PER W-21	LF	$ 58.00
10" PVC WATER MAIN PER W-21	LF	$ 63.00
12" PVC WATER MAIN PER W-21	LF	$ 70.00
16" PVC WATER MAIN PER W-21	LF	$ 89.00
20" PVC WATER MAIN PER W-21	LF	$ 100.00

DESCRIPTION	UNIT	UNIT PRICE
PRIVATE WATER SERVICE		
WTR SERV. PER W-1 (1" W/1"X 0.75" METER)	EA	$ 2,389.00
WTR SERV. PER W-1 (1" W/1"X 1" METER)	EA	$ 2,478.00
WTR SERV. PER W-2 (2" W/1.5" METER)	EA	$ 2,782.00
WTR SERV. PER W-2 (2" W/2" METER)	EA	$ 2,866.00
WTR SERV. PER W-2 (2-2" W/2-2" METER, MANIFOLD)	EA	$ 4,561.00
WTR SERV. PER W-1 (1" W/O METER)	EA	$ 2,267.00
WTR SERV. PER W-2 (1" W/O METER)	EA	$ 2,453.00
WTR SERV. PER W-2 (2-2" W/O METER)	EA	$ 3,183.00

SECTION 10-PRIVATE SURFACE IMPROVEMENTS

PRIVATE CURB AND GUTTER

CURB & GUTTER REMOVAL	LF	$ 3.00
MEDIAN CURB & GUTTER, PER G-6 (TYPE B-1)	LF	$ 12.00
MEDIAN CURB & GUTTER, PER G-6 (TYPE B-2)	LF	$ 20.00
6" CURB & GUTTER PER G-2 (TYPE G)	LF	$ 20.00
8" CURB & GUTTER PER G-2 (TYPE G)	LF	$ 24.00
6" CURB & GUTTER, PER G-2 (TYPE H)	LF	$ 25.00
8" CURB & GUTTER, PER G-2 (TYPE H)	LF	$ 30.00
ROLLED CURB, PER G-4	LF	$ 26.00
4" AC BERM, PER G-5	LF	$ 8.00
6" AC BERM, PER G-5	LF	$ 9.50
8" AC BERM, PER G-5	LF	$ 11.00

PRIVATE PAVEMENT

PAVEMENT DESIGN, PER SDG-113 (SCHEDULE J)	SF	$ 5.00
AC PAVING (1" SURFACE)	SF	$ 0.75
AC PAVING (2" SURFACE)	SF	$ 1.00
AC PAVING (3" SURFACE)	SF	$ 1.30
AC PAVING (4" SURFACE)	SF	$ 1.75
AC PAVING (5" SURFACE)	SF	$ 2.15
CTB PAVING (4" SURFACE)	SF	$ 1.00
CTB PAVING (6" SURFACE)	SF	$ 1.05
CTB PAVING (8" SURFACE)	SF	$ 1.25
CTB PAVING (12" SURFACE)	SF	$ 1.60
CTB PAVING (14" SURFACE)	SF	$ 1.65
CTB PAVING (16" SURFACE)	SF	$ 1.75
CTB PAVING (18+" SURFACE)	SF	$ 1.85
PCC PAVING (5" THICK)	SF	$ 5.00
PCC PAVING (5.5" THICK)	SF	$ 5.50
PCC PAVING (6" THICK)	SF	$ 6.00
PCC PAVING (8" THICK)	SF	$ 6.50
PCC PAVING (9" THICK)	SF	$ 7.50
PAVING SUBGRADE PREPARATION	SF	$ 0.50
AC PAVEMENT REMOVAL	SF	$ 2.00

PRIVATE PED RAMPS & SIDEWALK

DESCRIPTION	UNIT	UNIT PRICE
'CURB RAMPS, PER SDG132 (TYPE A & B, NEW CONSTRUCTION)	EA	$ 1,400.00
CURB RAMPS, PER SDG133-134 (TYPE A1, A2 &C-EXIST SIDEWALK)	EA	$ 2,200.00
CURB RAMPS, ALLEY, PER SDG-136 (TYPE D)	EA	$ 1,600.00
SIDEWALK REMOVAL	SF	$ 1.50
4" PCC SIDEWALK, PER G-7	SF	GRADED
0-5000	SF	$ 5.00
>5000	SF	$ 4.00

MISCELLANEOUSPRIVATE SURFACE IMPROVEMENTS

CUT-OFF WALL @ END OF PAVEMENT, PER G-22 & 23	EA	$ 1,000.00
CROSS-GUTTER, PER G-12 & 13	SF	$ 8.00
DRIVEWAY, PER G-14A,B,C, & SDG-114	SF	$ 5.00
MEDIAN, PER SDG-112 (STAMPED CONCRETE)	SF	$ 5.00
MEDIAN, PER SDG-112 (DECORATIVE CONCRETE)	SF	$ 6.50
MEDIAN, PER SDG-112 (PAVERS)	SF	$ 10.50
TRENCH RESURFACING, PER SDG-107&108	LF	$ 25.00
NARROW TRENCHING, PER G-33-35	LF	$ 11.50
4" AC BERM, PER G-5	LF	$ 7.55
6" AC BERM, PER G-5	LF	$ 8.20
8" AC BERM, PER G-5	LF	$ 9.35
AC OVERLAY (1"-2")	SF	$ 0.45
AC SLURRY SEAL	SF	$ 0.60
ALLEY APRON, PER G-17	SF	$ 7.00
ADJUST TO GRADE	EA	$ 1,000.00
AGGREGATE BASE (AB)	SF	$ 1.00
MEDIAN PCC, PER SDG-112 (DECORATIVE)	SF	$ 11.00
MEDIAN PCC, PER SDG-112 (STAMPED CONCRETE)	SF	$ 8.00
MEDIAN PCC, PER SDG-112 (INTERLOCKING PAVERS)	SF	$ 12.00
FINISH SURFACING OF PRIVATE SEAWALLS	SF	$40.00
MOBILIZATION COST: FINISH SURFACING OF SEAWALLS	EA	$2,000.00
RESTORATION OF BEACH ACCESS AFTER CONSTRUCTION	EA	$5,000.00

SECTION 11-PRIVATE MISCELLANEOUS

MISCELLANEOUS PRIVATE ITEMS

VEHICULAR BRIDGE	SF	$ 275.00
PEDESTRIAN BRIDGE	SF	$ 250.00
CRASH CUSHION (G.R.E.A.T.)	EA	$ 36,800.00
EXCAVATION (FOR STRUCTURES)	CY	$ 31.00
FENCE, PER M-6 (4' HIGH CHAIN LINK)	LF	$ 12.50
FENCE, PER M-6 (5' HIGH CHAIN LINK)	LF	$ 14.00
FENCE, PER M-6 (6' HIGH CHAIN LINK)	LF	$ 16.00
GUARD RAIL METAL BEAM, PER M-30-38	LF	$ 30.00
GUARD RAIL POST, PER M-9	EA	$ 240.00
GUARD BARRICADE, PER M-9	EA	$ 450.00
PCC MEDIAN BARRIER (TYPE 50)	EA	$ 55.00
SAW CUT EXISTING (AC/PCC)	LF	$ 4.00
TRENCH SHORING (5'-10' DEEP)	LF	$ 11.20
TRENCH SHORING (11'-15' DEEP)	LF	$ 17.40
TRENCH SHORING (16'-20' DEEP)	LF	$ 25.00
SURVEY MONUMENT, PER M-10	EA	$ 800.00
MASONRY RETAINING WALL	SF	$ 29.65
CAST IN PLACE RETAINING WALL	CY	$ 675.00
GRAVITY RETAINING WALL	SF	$ 22.00
CRIB-BLOCK RETAINING WALL	SF	$ 25.00
PEDESTRIAN BARRICADE, PER SDE 103	EA	$ 150.00

EXAMPLE LETTER OF PERMISSION TO GRADE

City of Encinitas
Engineering Department
505 S. Vulcan Ave.
Encinitas, CA 92024

RE: Letter of Permission to Enter and to Import
Permit No.: _____
Export Project Address: _____
Import Project Address: _____

We, _____, are the owners of the property located at _____ in the City of Encinitas, also known as Assessor's Parcel Number (APN) _____.

This agreement is structured to allow for the import of clean fill to the above property in conjunction with the active grading permit for the above-referenced export property. A haul route shall be approved by the City prior to hauling of fill to our property.

We further hereby agree to hold the City of Encinitas free and clear of any and all liability for damages and/ or claims resulting or arising from work performed by the contractors pursuant to the aforementioned removal and placement of dirt.

Owners:

Signature: _____ Date: _____

Print Name: _____

Signature: _____ Date: _____

Print Name: _____

City of Encinitas

Urban Forest Management Program

Administrative Manual

First Edition

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INTRODUCTION

The City of Encinitas is fortunate to have such a beautiful population of trees, including magnificent individual trees, groupings of trees and native trees which give the City a unique character. Trees are a source of shade, air conditioning and other environmental benefits, and yield both a high quality of life and economic benefits to the community, including enhanced property values.

The City is dedicated to the planting and protection of its urban forest which is recognized as one of the City's greatest natural resources. Sustaining trees in Encinitas' developed environment presents a challenge, requiring careful planning and maintenance.

The Urban Forest Management Policy is the City's primary regulatory tool to provide for orderly protection of trees, to promote the health, safety, welfare, and quality of life for the residents of the City, to protect property values and to avoid significant negative impacts on adjacent properties. By assuring preservation and protection through regulations and standards of care, these resources will remain significant contributions to the landscape, streets and parks, and continue to help define Encinitas.

This Manual is issued by the City Manager, through the Departments of Building and Planning, Engineering Services, Parks and Recreation and Public Works to establish specific technical standards and specifications necessary to implement the policy. Terms defined in Section 1.00 Definitions appear *italicized* throughout this Manual.

SECTION 1.00 - DEFINITIONS

For the purpose of this Manual and interpretation of regulations, the following definitions shall apply:

Basal Flare means that portion of a tree where there is a rapid increase in diameter at the confluence of the trunk and rootcrown.

Building Area means the area of a parcel that (1) upon which, under applicable zoning regulations, a structure may be built without a variance or; (2) is necessary for the construction of primary access to structures located on the parcel, where there exists no feasible means of access which would avoid protected trees. On single-family residential parcels, the portion of the parcel deemed to be the *Building Area* access shall not exceed twelve (12) feet in width or sixteen (16) feet if required by the Fire Department.

Building Footprint means the two-dimensional configuration of a building's perimeter boundaries measured on a horizontal plane at grade level.

Certified Arborist is an individual who has a demonstrated knowledge and competency through obtainment of the current International Society of Arboriculture arborist certification, or who is a member of the American Society of Consulting Arborists. A *Certified Arborist* can be found in the yellow pages of the local telephone book or by contacting the Western Chapter of the ISA at (916) 641-2990 (www.wcisa.org).

City Arborist means the person(s) designated as such by the City of Encinitas.

City Tree any tree growing within the City street right-of-way, on City property or within City easements.

Compaction means compression of the soil structure or texture as described by the latest edition of the Standard Specifications for Public Works Construction (Greenbook). *Compaction* is injurious to roots and the health of a tree.

Dead Tree means a tree that is dead or that has been damaged beyond repair or is in an advanced state of decline (where an insufficient amount of live tissue, green leaves, limbs or branches, exists to sustain life) and has been determined to be such by a *Certified Arborist.*

Diameter at Breast Height (DBH) means the diameter of the perimeter tree trunk at four and one-half feet (or 54 inches) above natural grade level. The diameter may be calculated by using the following formula: DBH – circumference at 4.5-feet x 3.142 (D=C x P). To determine the DBH of multi-trunk trees or measuring trees on slopes, consult the current *Guide for Plant Appraisal*, published by the Council of Tree and Landscape Appraisers.

Discretionary Development Approval means an approval granted by the Planning and Building Director, Planning Commission, and/or City Council for applications including but not limited to coastal development permits, use permits, variances, subdivisions, and design reviews.

Disturbance refers to all of the various activities that may damage trees.

Dripline Area means the area from the trunk of a tree to the outermost edge of the tree canopy.

Excessive Pruning means removing in excess, one-fourth (25 percent) or greater, of the functioning leaf, stem or root area. Pruning in excess of 25 percent is injurious to the tree and is a prohibited act. *Excessive Pruning* typically results in the tree appearing as a "bonsai", "lion's-tailed", "lolly-popped", or overly thinned.

A. Unbalanced Crown - *Excessive Pruning* also includes *Removal* of the leaf or stem area predominantly on one side, *Topping*, or excessive tree canopy or crown raising. Exceptions are when clearance from overhead utilities or public improvements is required or to abate a *hazardous* condition or a *Public Nuisance.*

B. Roots - *Excessive Pruning* may include the cutting of any root two (2) inches or greater in diameter and/or severing in excess of 25 percent of the roots.

Hazardous Tree an imminent hazard or threat to the safety of persons or property. If a tree possesses a structural defect that may cause the tree or part of the tree to fall on someone or something of value (i.e. *'Target'*), and the condition is determined to be imminent, the tree is considered *hazardous*.

Heritage Tree is a tree designated by the process outline in Section 9.00 of this Manual that is one of the oldest or largest of its species located in the City and has historic significance due to an association with an historic building, site, street, person or event or it is a defining landmark or significant outstanding feature of a neighborhood.

Injury means a wound resulting from any activity, including but not limited to "*Excessive Pruning;"* cutting, *Trenching*, excavating, altering the grade, paving or *Compaction* within the *TPZ* of a tree. *Injury* shall include bruising, scarring, tearing, or breaking of roots, bark, trunk, branches or foliage, herbicide or poisoning, or any other action foreseeable leading to the death or permanent damage of the tree health.

Landscape Architect means a person licensed or registered in the planning, design and sometimes oversight of an exterior landscape or space.

Project Arborist means a *Certified Arborist* retained by a property owner or development applicant for the purpose of overseeing on-site activity involving the welfare of the trees to be retained or planted. The *Project Arborist* shall be responsible for all reports, tree preservation plans, or inspections as required.

Protective Tree Fencing means a temporary enclosure erected around a tree to protect the boundary of the tree protection zone (*TPZ).* The fence services three primary functions:

A. to keep the foliage crown, branch structure and trunk clear from direct contact and damage by equipment, materials or *Disturbances;*

B. to preserve roots and soil in and non-compacted state; and

C. to identify the *TPZ* in which no soil *Disturbance* is permitted and activities are restricted.

Public Nuisance means either an individual tree on any private property or on any street, public property, or a type or species apt to destroy, impair or otherwise interfere with any street improvements, sidewalks, curbs, gutters, sewers, or other public improvements, including above and below ground utilities.

Removal means the complete tree *Removal* such as cutting to the ground or extraction of the tree.

Root Buffer means a temporary layer of material to protect the soil, texture and roots. The buffer shall consist of a base course of tree chips spread over the root area to a minimum of 6-inch depth, capped by a base course of 3/4 –inch quarry gravel to stabilize ¾-inch plywood on top.

Site Plan means a set of drawings (e.g. preliminary drawings, *Site Plan*, grading, demolition, building, utilities, landscape, irrigation, tree survey, etc.) that show existing site conditions and proposed landscape improvements, including trees to be removed, relocated and/or retained. *Site Plan*s shall include the following minimum information that may impact trees:

- **A.** Surveyed tree locations, species, size (height, width, DBH). *Dripline Area* (including trees located on neighboring property that overhang or within 50 feet of the project site) and *City Tree*s adjacent to the project site;
- **B.** Paving, concrete, *Trenching*, or grade change (including the limits of over-excavation) located within the *Tree Protection Zone*;
- **C.** Existing and proposed utility easements;
- **D.** Surface and subsurface drainage and aeration systems to be used;
- **E.** Walls, tree wells, retaining walls and grade change barriers, both temporary and permanent;
- **F.** Landscaping, irrigation and lighting within dripline of trees, including all lines, valves, etc;

Soil Fracturing means the loosening of hard or compacted soil around a tree by means of a pneumatic soil probe (Gro-gun) that delivers sudden bursts of air to crack, loosen, or expand the soil to improve the root growing environment.

Structural Defect means any structural weakness or deformity of a tree or its parts.

Target is a term used to include people, vehicles, structures or something subject to damage if a tree or part of a tree fails.

Topping means the practice of cutting back large-diameter branches or truncating the main stem.

Tree Protection and Preservation Plan means a plan prepared by a *Certified Arborist* that outlines measures to protect and preserve trees on a project. This plan shall include requirements for preconstruction; treatments during demolition and/or construction; establishment of a *Tree Protection Zone;* tree monitoring and inspection schedule; and provide for continued maintenance of those trees after construction according to the requirements in this Manual

Tree Protection Zone (TPZ) means unless otherwise specified by a *Project Arborist* or *City Arborist*, the area of temporary fenced tree enclosure. Within the TPZ, roots that are critical for tree survival are typically found in the upper three foot soil horizon, and may extend beyond the *Dripline Area.* Protecting the roots in the TPZ is necessary to ensure the tree's survival. The TPZ is a restricted activity zone where no soil *Disturbance* is permitted, unless otherwise approved. TPZ must be identified for each tree and shown on all applicable improvement plans for a development project.

Tree Report means a report submitted to the City for review that is prepared by a *Certified Arborist* retained by the property owner or agent. In the case of a *discretionary development approval,* a tree survey report is required to provide information about all trees on the site including: inventory of all trees, location, species, size, condition, maintenance needs, potential impacts of *Disturbance*, recommended mitigation measures, tree appraisal value, etc.

Trenching means any excavation to provide irrigation, install foundations, utility lines, services, pipe, drainage or other improvements below grade. *Trenching* within the TPZ is injurious to roots and tree health and is prohibited, unless approved. If *Trenching* is approved within the TPZ, it must be in accordance with instructions and table outlines in this Manual

Verification of Tree Protection means the *Project Arborist* shall verify, in writing, that all pre-construction conditions have been met (tree fencing, erosion control, pruning, etc.) and are in place. An initial inspection of protective fencing and written verification must be submitted to the *City Arborist* prior to demolition, grading and/or building permit issuance.

Vertical Mulching means augering, hydraulic or air excavation of vertical holes within a tree's root zone to loosen and aerate the soil, typically to mitigate compacted soil. Holes are typically penetrated 4- to 6-feet on center, 2-to 3-feet deep, 2-to 6-inches in diameter and backfilled with either perlite, vermiculite, peat moss or a mixture thereof.

Wildland Urban Interface/Defensible Space means the geographical area where structures and other human development meets/or intermingles with wildland or vegetative fuels.

SECTION 2.00 - PROTECTION OF TREES DURING CONSTRUCTION

Introduction

The objective of this section is to reduce the negative affects of construction on trees to a less than significant level.

Land development and infrastructure construction is a complex process and is even more challenging when trees are involved.

One long-term goal of the City of Encinitas is urban forest sustainability. This describes the maintenance of social, recreational, ecological and economic functions of trees and their benefits over time. Stewardship of naturally occurring and planted trees is a central element in urban forest sustainability. Concerns about tree health and structure, preservation during development and other construction activities, species and site selection, quality of planting stock, standards of performance, maintenance practices in our parks, and recycling are integral to a sustainable urban forest.

Tree protection should begin before construction starts. If preservation measures are delayed or ignored until construction begins, the trees may be destined to fail. In many cases, construction affects to trees cannot be completely eliminated. Therefore, the City's goal is to keep *Injury* to trees to a minimum and allow construction projects to proceed at the same time.

Successful tree preservation occurs when designers, construction personnel, and project managers are committed to tree preservation. All members of the project team must be familiar with the rudimentary aspects of tree growth and development in order to understand the relationship between tree survival and construction practices. Myths abound how trees grow. Utilization of a *Certified Arborist* will facilitate everyone's understanding of the needs regarding trees.

For example, above ground parts of trees are not a "mirror" of what lies below ground. In actuality, typically four to eleven large roots radiate from the base of a tree's trunk. These "buttress" roots extend from the root crown and sometimes are visible when the trunk flares away from the root crown or collar. These large roots decrease in taper rapidly and branch repeatedly so that at distances of ten feet or more from the trunk, they are about ½ inch in diameter or smaller.

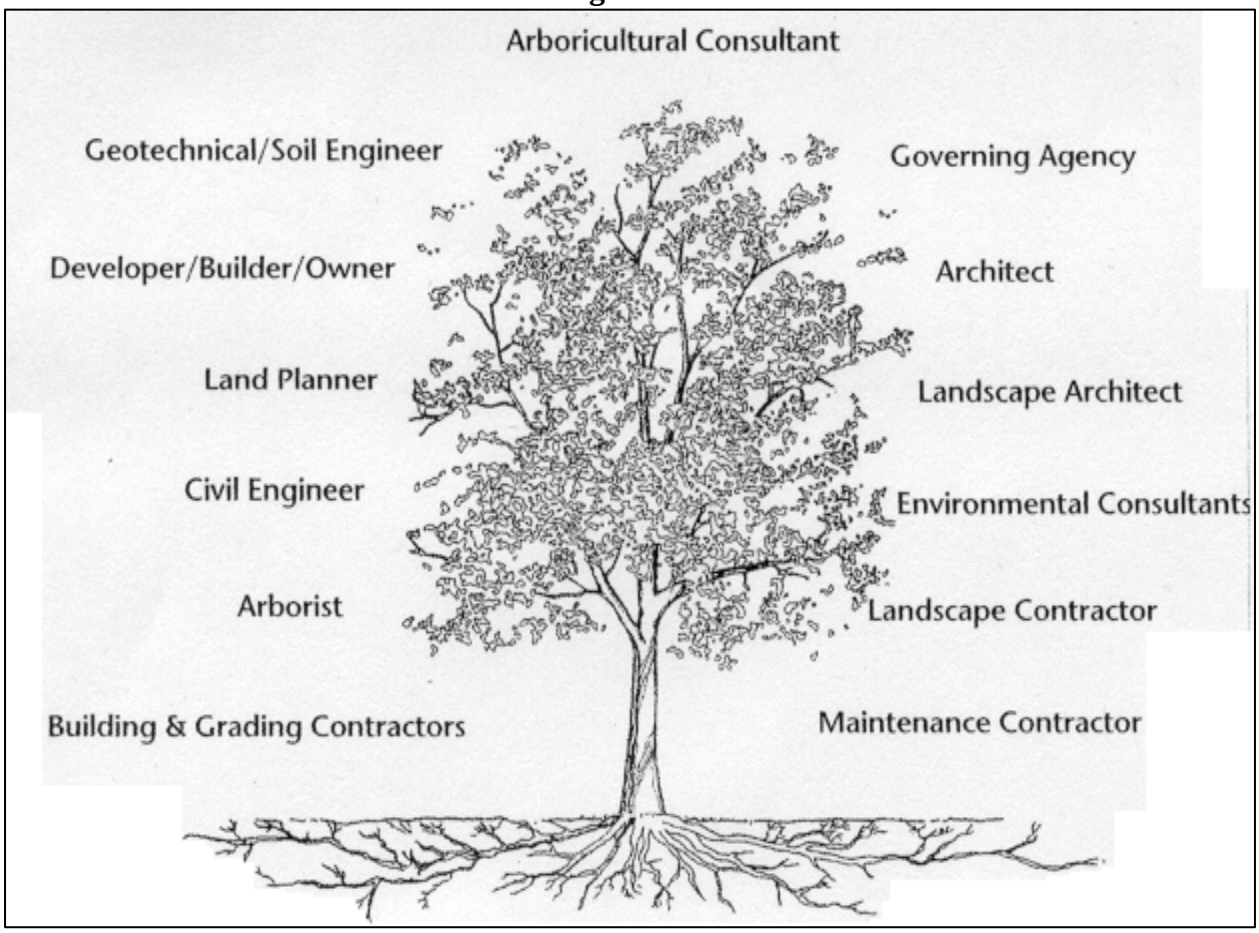
These roots grow horizontally through the soil and depending on the tree can extend 40 feet or more beyond the branch tips. These smaller roots are primarily responsible for water and mineral absorption. There can be hundreds of roots in a cubic inch of soil—thus any *Removal* of soil or root severance forces a tree to compromise its physiological processes to sustain the loss.

All trees cannot and should not be preserved.
Trees that are structurally unstable, dead, in poor health, or unable to survive effects of construction become a liability to the project and may have to be removed. A realistic tree preservation program acknowledges that conflicts between trees and development or other

construction projects will exist at times and may sometimes result in the *Removal* of some trees or *Removal* of some tree roots and recognizes the detrimental effect to the project and community when trees die after construction is completed.

Successful tree preservation occurs when construction impacts to trees are considered during the design process and can then be minimized. The challenge is to determine when impacts will be too severe for the tree to survive, not only in the short term, but also in the long term. There are no quantitative methods to calculate this critical level. Determining the optimum *TPZ* provides a guideline, although trees often survive and flourish with smaller protection areas.

Figure 2.0



Matheny, N.P. and Clark, J.R. 1998. *Trees and Development*

Tree Preservation during development requires the commitment of everyone involved in the project's planning, design, construction, and management as shown above (figure 2.0)

The following are the three guiding principles for tree preservation:

A. Tree preservation cannot be the responsibility of the City of Encinitas staff alone. Each development participant must understand that his or her activities and decisions influence the success of tree preservation efforts.

B. The ability to cure construction *Injury* is very limited, so the focus of preservation efforts is the *prevention* of damage to trees. This process starts during the planning and start of design of the project.

C. The acknowledgement that not all trees are in excellent health or have good structural stability.

Following the above principles will increase the chance for success and reduce the possibility that trees will be injured to the point that they will die during construction.

Efforts at preservation must include acknowledgement of the tree and its ecological support system.

2.10 Planning for All Projects

The City considers trees as important assets and requires plotting tree locations and TPZ on the plans for all projects whether they are private development, City capital improvement projects, or private utility company projects. All private development projects or private utility company projects shall have a *Project Arborist* which will work with the project manager on developing *TPZ*s and tree protection strategies. On all City capital improvement projects a *Certified Arborist* from the City's Department of Parks and Recreation (i.e. City Arborist) shall be assigned to each project and will work with the Project Manager on developing *TPZ*s and tree protection strategies.

2.10.1 Planning and Designing for Private Development and Capital Improvement Projects

Projects are designed by in-house design staff and by outside design firms. Either design team should be given set of guidelines defining the City's *Tree Preservation Policy* (Appendix A) and *Tree Protection Guidelines* (Appendix B and Appendix D), to assure that trees are accounted for from project initiation forward.

A. Survey before Planning
The survey must accurately plot the trunk locations within the project site. Include construction staging areas and delivery routes.

B. Plan and Design with Knowledge of Trees
The health and structural confirmation of the surveyed trees must be evaluated by the *Project Arborist* in order to anticipate how well they will respond to development. The evaluation must describe the character of trees and their suitability for preservation at a level of detail appropriate for the project and phase of planning. The *Project Arborist* must make this evaluation.

C. Plan with a Vision
Disruption of any tree by construction activities may negatively affect its physiological processes, and cause depletion of energy reserves and decline in vigor, often resulting in

tree death. Typically this does not manifest until many years after the tree is disrupted. Preservation of mature trees during construction has significant benefits to the success of a project.

When new trees are planted, consideration should be given to species diversity and appropriateness of location. To prevent destructive clearance pruning in future years, keep in mind the ultimate canopy and root spread.

D. Plan for all Aspects and Entire Duration of Project
Construction projects are multi-level and often require participation of various construction trades and subcontractors. It is important to plan for tree protection with an understanding of construction site dynamics. Trees must be protected in the staging area, construction employee parking area, adjacent properties, as well as on the actual construction site.

2.10.2 Managing In-House Construction Projects

The in-house construction team should be given a set of guidelines that define the City's *Tree Preservation Policy* (Appendix A) and *Tree Protection Guidelines* (Appendix B and Appendix D), and to assure that trees are accounted for from the project's initiation forward.

A. Survey before Planning
For all in-house projects, contact the *City Arborist* for an accurate evaluation of trees on the job site that is to be included in the survey.

B. Plan and Design with Knowledge of Trees
In order to better understand the condition of the affected trees, *City Arborist* will make available the results of the tree evaluation. This evaluation will provide you with knowledge of the resources and the anticipated construction tolerance of the affected trees.

C. Plan with a Vision
Obtain information about trees and minimize negative impacts on the urban forest. Conduct all projects with tree preservation in mind.

D. Plan for all Aspects and for the Entire Duration of the Project
Trees must be protected in the staging area, construction employee parking area, and during demolition and grading. Arrange with the Maintenance Supervisor from the City's Department of Parks and Recreation for trees to be watered and for the soil to be protected from *Compaction*.

2.20 Pre-Construction Requirements - *Tree Protection and Preservation Plan*

Prior to the commencement of a private development or City Capital Improvement project, the Project Manager (for either private development or City Capital Improvement project) and appropriate City staff from the Department of Parks and Recreation, Department of Planning and Building, Department of Public Works, and the Department of Engineering Services must be

assured that if any activity of the project is within the dripline of *City Tree or heritage tree(s)*, a site specific tree protection plan is prepared. The following six steps shall be incorporated as part of the *Tree Protection and Preservation Plan*:

2.20.1 *Site Plan*
For all projects, *Site Plan*s must indicate accurately plotted trunk locations and the TPZ of all trees or group of trees to be preserved within the development area. Additionally, for all *Protected Trees*, the plans shall accurately show the trunk diameter, dripline and clearly identify the TPZ. The type of protective fencing shall be specified and indicated with a bold dashed line.

2.20.2 *Protective Tree Fencing* for all categories of *Protected Trees*
Fenced enclosures shall be erected around trees to be protected. This will achieve three primary goals, (1) to keep crowns and branching structure clear from contact by equipment, materials, and activities; (2) to preserve roots and soil condition in an intact and non-compacted state and; (3) to identify the TPZ in which no soil *Disturbance* is permitted and activities are restricted unless otherwise approved by the *City Arborist* or either the Director of Public Works, Director of Engineering Services Services, Director of Parks and Recreation, or Director of Planning and Building.

All trees to be preserved shall be protected with five foot to six foot high chain link fences. Fences are to be mounted on two-inch galvanized iron posts, driven into the ground to a depth of at least two feet and at no more than ten-foot centers. A two-foot wide access gate for tree maintenance shall be installed. . Tree fences shall be erected before demolition, grading, or construction begins and remain until final inspection of the project. "Warning" sign shall be prominently displayed on each protective fence. The sign shall be a minimum of 8.5 inches x 11 inches and clearly state the following:

TREE PROTECTION ZONE
This Fence Shall Not be Removed

All work within the TPZ requires approval of either the *Certified Arborist*, the Director of Engineering Services Services, the Director of Public Works, the Director of Parks and Recreation, or Director of Planning and Building.

A Type I Tree Protection Fence is for trees to be preserved throughout the duration of the .project. The fences shall enclose the entire area under the canopy dripline or *TPZ*, if specified by the *Certified Arborist*. If fencing must be located on paving or concrete that will not be demolished, an appropriate grade level concrete base may support the posts.

B. Type II Tree Protection Fence is for trees situated in small planting areas, where only the planting area is enclosed with the required chain link protective fencing. The walkways and traffic areas are left open to the public.

C. Type III Tree Protection Fence is for trees in small tree wells, building site planters or sidewalk planters. Trees shall be wrapped with 2 inches of orange plastic fencing from the ground to the first branch and overlaid with 2-inch thick wooden slats that are bound securely (slats shall not be allowed to dig into the bark). During installation of the plastic fencing, caution shall be used to avoid damaging branches. Major scaffold limbs may also require plastic fencing as directed by the *Certified Arborist*.

No storage of material, topsoil, vehicles, or equipment shall be permitted within the fenced area throughout the entire duration of the construction project.

2.20.3 Pre-construction meeting

The *Certified Arborist* shall attend all pre-construction meetings to assure that everyone fully understands previously reviewed procedures and tree protective measures concerning the project site, staging areas, hauling routes, watering, contacts, etc.

2.20.4 *Tree Protection Zone*

During the design phase of the project the *Certified Arborist* and the Project Manager will work together on developing the TPZ for each tree impacted by the project. If an unresolved disagreement arises between the *Certified Arborist* and the project manager on the size of a TPZ for a particular tree, the dispute shall be brought to the Director of Engineering Services, the Director of Public Works or the Director of Parks and Recreation, who will render a final decision on the size of the TPZ.

Each tree to be retained shall have a designated TPZ identifying the area sufficiently large enough to protect it and its roots from *Disturbance*. The TPZ shall be shown on all *Site Plan*s including, Demolition, Grading, Irrigation, Electrical, Landscape, etc. Improvements or activities such as paving, utility and irrigation *Trenching* including other ancillary activities shall occur outside the TPZ, unless otherwise specified. The protection fence shall serve as the TPZ.

A. Activities prohibited within the *Tree Protection Zone* include:
   1. Parking vehicles or equipment, storage of building materials, refuse, or excavated soils, or dumping poisonous material on or around trees and roots. Poisonous materials include, but are not limited to paint, petroleum products, concrete, stucco mix, dirty water or any material that may be harmful to tree health
   2. The use of tree trunks as a backstop, winch support, anchorage, as a temporary power pole, signpost or other similar function
   3. Cutting of tree roots by utility *Trenching*, foundation digging, placement of curbs and trenches, or other miscellaneous excavations without prior approval of either the *Certified Arborist*, Director of Engineering Services, Director of Public Works, Director of Planning and Building, or Director of Parks and Recreation.
   4. Soil *Disturbance* or grade change
   5. Drainage changes

B. Activities permitted or required within the *Tree Protective Zone* include:

1. Mulch: During construction, wood chips may be spread within the TPZ to a four to six inch depth, leaving the trunk clear of mulch. This will aid in inadvertent soil *Compaction* and moisture loss. Mulch shall be 2-inch unpainted, untreated shredded wood or approved material.
2. *Root Buffer*: When areas under the tree canopy cannot be fenced, a temporary buffer is required and shall cover the root zone and remain in place at the specified thickness until the final grading stage. The protective buffer shall consist of shredded wood chips spread over the roots at a minimum of 6-inches in depth (keeping the trunk clear of chips), and layered by ¾-inch quarry gravel to stabilize the 3/4–inch plywood sheets laid on top. Steel plates can also be used.
3. Irrigation, Aeration, fertilization, Mycorrhizae treatments or other beneficial practices that have been specifically approved for use within the TPZ.

C Erosion Control:

If a tree is adjacent to or in the immediate proximity to a grade slope of 8% or more, approved erosion control or silt barriers shall be installed outside the TPZ to prevent siltation and/or erosion within the zone.

2.20.5 *Verification of Tree Protection*

The project contractor shall verify in writing that all pre-construction tree preservation conditions have been met as follows:

A. Tree fencing installed
B. Erosion control secured
C. Tree pruning completed
D. Soil *Compaction* preventive measures installed
E. Tree maintenance schedule established and the responsible party designated
F. Tree Protection Zone (TPZ)

The Project Manager, the *Certified Arborist*, City's construction inspector, and the contractor must sign this verification.

2.20.6 Tree Pruning and *Removal*

Prior to construction, various trees may need to be pruned away from structures or proposed construction activity. ***Construction or contractor personnel shall not attempt pruning.*** Only personnel approved by the *Certified Arborist* can perform pruning operations.

Removal of trees adjacent to trees that are to remain requires a great deal of care. Only personnel approved by the *Certified Arborist* shall engage in tree *Removal*. *Removal* of trees that extend into branches or roots of protected trees shall not be attempted by the demolition or construction crew, or by grading or other heavy equipment. Before removing tree stumps, the project manager shall determine if roots are entangled with trees that are to remain. If so, these stumps shall have their roots severed before extracting them.

2.30 Activities During Construction and Demolition Near Trees

Soil *Disturbance* or other damaging activities within the *TPZ* is prohibited unless approved by the *Certified Arborist* and mitigation for specific injuries is implemented. No encroachment within 5 feet of a trunk will be permitted under any circumstances.

2.30.1 Soil *Compaction*

Soil *Compaction* is the largest single factor responsible for the decline of trees on construction sites. The degree of *Compaction* depends on several factors: amount and type of pressure applied, presence and depth of surface organic litter, soil texture and structure, and soil moisture level.

The greatest increase in soil density occurs during the first few equipment passes over the soil, which underscores the importance of implementing protective measures before the project begins and equipment arrives at the site. To dispense traffic weight, mulch and temporarily *Root Buffer*s can be used.

The following techniques can lessen *Compaction*: *Vertical Mulching*, *Soil Fracturing*, core venting, and radial *Trenching*. Do not compact soil to higher density then needed: to 95% Proctor density (moisture – density) in improved areas for asphalt or concrete pavements, and not to exceed 85% in unimproved open landscape areas that use water jet *Compaction*.

2.30.2 Grading Limitations within the *TPZ*

Lowering the grade around trees can have an immediate and long-term effect on trees. Typically, most roots are within the top 3 feet of soil, and most of the fine roots active in water and nutrient absorption are in the top 12 inches.

A. Grade changes within the TPZ are not permitted.

B. Grade changes outside the TPZ shall not significantly alter drainage.

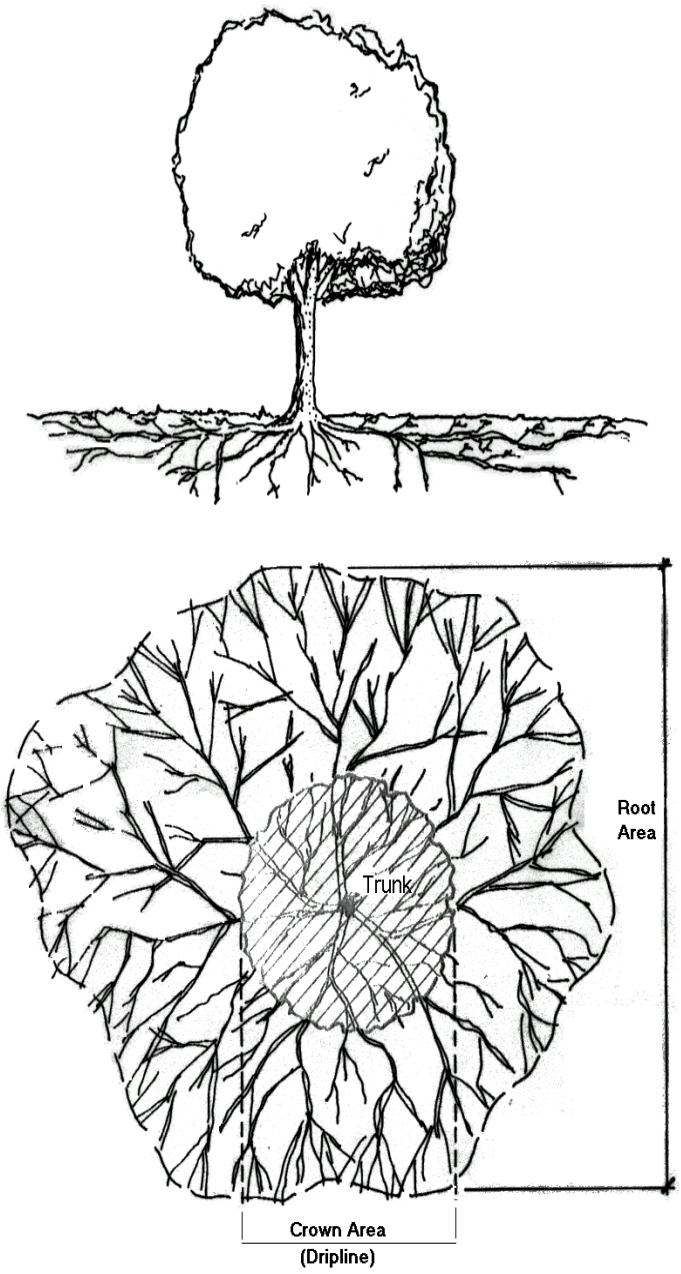
C. Grade changes under specifically approved circumstances shall not allow more than 6 inches of fill soil or allow more than 4 inches of existing soil to be removed from natural grade, unless mitigated.

D. Grade fills over 6 inches or impervious overlay shall incorporate an approved permanent aeration system, permeable material, or other approved mitigation.

E. Grade cuts exceeding 4 inches shall incorporate retaining walls or an appropriate transition equivalent.

The figures below illustrate the pattern of tree root development and areas where encroachments may have an adverse effect on tree health.

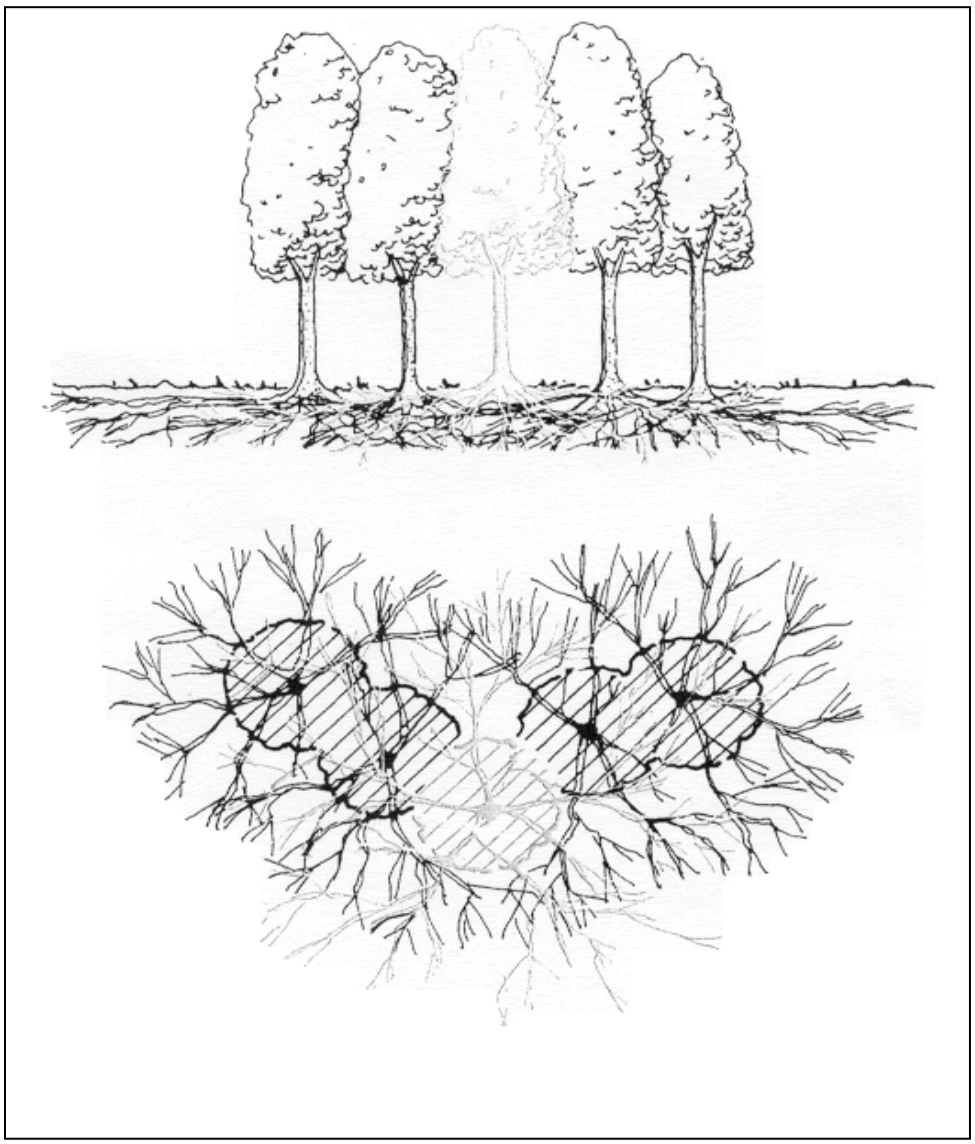
Figure 2.1



Matheny, N.P. and Clark, J.R. 1998. *Trees and Development*

Tree root system of a tree can be described as shallow and widespread, extending far beyond the edge of the canopy.

Figure 2.2



In many parks where trees grow closely together, root systems of individual trees overlap and intertwine, forming a dense mat of roots.

2.30.3 Trenching, Excavation and Equipment Use

Trenching, excavation or boring within the TPZ shall be limited to activities approved by the *Certified Arborist* or either the Director of Engineering Services, Director of Public Works, the

Director of Parks and Recreation, or Director of Planning and Building. Explore alternatives for *Trenching* outside the root zone. Avoid exposing roots during hot, dry weather. Backfill trenches as soon as possible with soil and soak with water the same day. Small roots can die in 10 to 15 minutes and large roots may not survive an hour of exposure. If the trench must be left open all roots must be kept moist by wrapping them in peat moss and burlap.

If *Trenching* is unavoidable, the following distances should be maintained:

TRUNK DIAMETER (measured at 4.5 feet above natural grade)	DISTANCE FROM BOTH SIDES OF THE TRUNK
Up to 6 inches	5 feet
6-9 inches	5 feet
10-14 inches	10 feet
15-19 inches	12 feet
over 19 inches	15 feet

A. Root Severance. No roots greater than 2 inches in diameter shall be cut without approval of either the *Certified Arborist*, Director of Engineering Services, Director of Public Works, Director of Planning and Building, or the Director of Parks and Recreation. Tunneling under roots is the approved alternative. Prior to excavation for foundation/footing/walls, or grading or *Trenching* within the TPZ, roots shall be severed cleanly one-foot outside the TPZ to the depth of the planned excavation. When roots must be cut, they shall be cut cleanly with a sharp saw to sound wood and flush with the trench site.

B. Excavation. Any approved excavation, demolition, or extraction of material shall be performed with equipment that is placed outside the TPZ. Hand digging, hydraulic, or pneumatic excavation are permitted methods for excavation within the TPZ.

C. Heavy Equipment. Use of backhoes, Ditch-Witches, steal tread tractors or other heavy vehicles within the TPZ is prohibited unless approved by the *Certified Arborist*, Director of Engineering Services, Director of Public Works, Director of Parks and Recreation, or Director of Planning and Building. If allowed, a protective *Root Buffer* is required.

2.30.4 Tunneling and Directional Drilling

Approved *Trenching* or pipe installation within the TPZ shall be either cut by hand, air-spade, or by mechanically boring a tunnel under the roots with a horizontal directional drill using hydraulic or pneumatic air excavation technology. In all cases, install the utility pipe immediately, backfill with soil and soak with water within the same day. Tunneling under the root system can greatly reduce both damage to the tree and the cost to repair landscape and other features destroyed in the *Trenching* process. There are times, such as when working in rocky soils and slopes, when tunneling is not a reasonable alternative.

The following recommendations for tunneling depths should be observed:

TRUNK DIAMETER (DBH)	MINIMUM TUNNEL DEPTH
Less than 12 inches	24 inches
12 inches or more	36 inches

2.30.5 Alternative Methods for Hardscape to Prevent Root Cutting
The following remedies should be considered as an alternative to severing tree roots:

- **A.** Grinding a raised walkway or concrete pad
- **B.** Ramping the walkway surface over the roots or lifted slab with pliable paving.
- **C.** Routing the walkway around tree roots
- **D.** Permeable paving materials (e.g., decomposed granite), interlocking pavers, or flagstone walkways on sand foundations

2.30.6 Using Alternative Base Course Materials
Engineered structural soil mix is an alternative material for hardscape areas near trees. More information can be found at www.amereq.com.

2.40 Tree Maintenance During Construction

Providing adequate maintenance can mitigate stressful changes that occur to a tree's environment during construction. To remain vigorous, the tree needs to maintain stored carbohydrates and preserve the effectiveness of its growth regulators. It is recommended that large projects provide:

2.40.1 Irrigation
Providing supplemental irrigation for trees under water stress may be the single most important treatment. Irrigation should be designed to wet the soil within the TPZ to the depth of the root zone and to replace that water once it is depleted. Light, frequent irrigation should be avoided. Create a six-inch berm around trees at the edge of the TPZ and fill with no more than six inches of mulch. Fill the basin with water. Irrigation should wet the top two to three feet of soil to replicate similar volumes and normal seasonal distribution.

2.40.2 Soil *Compaction* Mitigation
To prevent negligent encroachment into the TPZ, trees to be preserved during construction must have the specified type of protection fences in place at all times. *Removal* of fences, even temporarily, to allow deliveries or equipment access is not allowed unless approved by the *Certified Arborist* and a *Root Buffer* is installed. The *Root Buffer* components: mulch, gravel and plywood, must be maintained continually to assure its effectiveness against soil *Compaction*.

2.40.3 Dust Control
During periods of extended drought, wind or grading, trunks, limbs and foliage should be sprayed with water to remove accumulated construction dust.

2.50 Damage to Trees

2.50.1Reporting *Injury* to Trees
Any damage or *Injury* to trees shall be reported as soon as possible to the Project Manager or Construction Inspector, and always to the *City Arborist*. The *City Arborist* needs to be aware of an injured tree in order to monitor its recovery or progress. Injuries to roots and branches must be repaired immediately using ISA Best Management Practices.

2.50.2 Contractor Subject to Penalties.
If a tree designated to remain is removed or irreversibly damaged as determined by the *Certified Arborist*, a contractor may be required to install a replacement tree matching in size, quality and variety, using an contractor designated by the *City Arborist*. If an acceptable replacement tree is not available, the contractor may be required to pay damages to the City for the value of the damaged tree in accordance with the guidelines set forth in the Guide for Plant Appraisal, 9th Edition, using the Trunk Formula Method.

2.50.3 Employees Subject to Discipline
In the event of damage to above- or below-ground parts of park trees, the Construction Supervisor or Park Maintenance Supervisor shall conduct an investigation to determine the cause of the damage. If it is found that damage was caused due to the error, negligence, or willfulness of a City employee, then that employee may be subject to appropriate disciplinary action.

2.60 Documents to be Included in all Projects

2.60.1 Model Tree Protection Specifications for Designers and Project Managers (Appendix B). This document should be distributed to the Planning and Construction Designers, Project Managers, City Inspectors, bidding contractors, and contracted designing firms.

2.60.2 Tree Protection Summary and Instructions on How to Prevent Damage to Trees During Construction (Appendix D). This document should be distributed to the Construction and Maintenance staff for implementation during all in-house projects.

2.70 Right-of-Entry Permits and Documents to be included with every permit

In order to sustain a healthy urban forest, it is imperative that all Department staff understands the need to protect trees. Every individual, organization or agency issued a Right-of-Entry, permit or agreement to enter City property, should be in compliance with City policies concerning protecting trees and be given documentation the will help to ensure tree protection during the permitted activity. The document titled Instructions on How to Prevent Damage to Trees During Construction (Appendix D) shall be distributed to every permittee and the permittee shall comply with these instructions.

SECTION 3.00 – REMOVAL OF TREES

Introduction

A tree may not be removed without City review and approval, except in certain emergencies. The purpose of City review is to verify that the *Removal* is warranted and to prevent unnecessary tree *Removal*. In most cases, a removed tree must be replaced (although not necessarily in the same location).

3.10 Tree Removal

A. Allowable *Removal*

A written permit is required to remove a *City Tree*, except in emergency situations outlined in Section 6.00, Hazardous Tree. *Removal* of *Trees* is allowed if:

1. A tree is determined to be dead, dying, diseased, hazardous (*see Hazardous trees, Section 6.00*), a detriment to or crowding an adjacent tree or a *Public Nuisance* (*see Section 1.00*).

2. A tree trunk is touching or the *Basal Flare* is under the *Building Footprint* of an existing building (for example, uplifting foundation, contact or damage to eaves, gutters, etc.).

In the case of *City Tree*s, the Department responsible for managing the tree, either the Public Works Department or the Park and Recreation Department will issue a written permit approving the *Removal* of the tree.

In the case of a *Heritage Tree* shown on previously approved site or landscape plans, the Planning Commission must approve the *Removal* before the Director of Planning and Building will issue a written permit approving the *Removal* of the tree (*see Heritage Trees, Section 9.10.G*); unless deemed an emergency (see section 6.20).

B. Permit Application

Tree *Removal* Applications are available at the City of Encinitas, Engineering Sevrices Department Counter at 505 S. Vulcan Ave, Encinitas, CA. 92024. 760-633-2770.

The following is a checklist of items necessary for City review for tree *Removal*. Additional information may be required by the reviewing staff. Response will generally be mailed to the applicant within 10 days. The *Removal* permit must be on site during the *Removal*.

Tree *Removal* Checklist

1. Completed City of Encinitas Tree *Removal* Application (available at the City of Encinitas, Engineering Services Department Counter at 505 S. Vulcan Ave, Encinitas, CA. 92024. 760-633-2770.

2. Payment of $145.00 review process fee ($125 Schedule Fee and $20 Records Management)
3. Arborist report from a *Certified Arborist* on company letterhead to include the following information for each tree:
   a. A written narrative describing the tree species (common and scientific);
   b. Location (in relation to street, structures and property line);
   c. Size (DBH, height & crown spread);
   d. Condition (foliage, vigor, structural integrity, etc.);
   e. Life expectancy and prognosis (is the tree *hazardous*, in severe decline, causing property damage, etc.?)

C. Hazardous Trees

To remove a tree that is not subject to a permit and has been verified as *hazardous*, as defined by these procedures, written approval from the *City Arborist* is required and must be available on site when the tree is being removed, unless emergency conditions exit (*see Emergency Removal Conditions, Section 6.20*).

D. Notification Requirements

When the City has scheduled a tree for removal the following shall apply:

1. Notice shall be provided to residents in the immediate area 72 hours prior to the removal (notification may be such means as direct mail and/or door hangers);
2. Notice shall be provided to all interested community organizations, i.e. town councils, DEMA, etc., in the immediate area 72 hours prior to the removal.
3. The tree to be removed must be clearly marked 72 hours prior to scheduled removal.

In cases when a *Certified Arborist* has determined that a tree or trees are an imminent threat to public safety (Hazardous Trees), the City will attempt to notify the public as appropriate.

SECTION 4.00 - TREE REPLACEMENT

4.10 When Tree Replacement is Required

Certain conditions determine whether or not a tree must be replaced. In summary, they are:

A. *City Tree*s

1. If the City authorizes *Removal* of a *City Tree* in connection with a development project, it shall specify the replacement requirements in the permit authorizing *Removal*.
2. If a tree is determined to be dead, dying, diseased, hazardous *(see Hazardous trees, Section 6.00),* a detriment to or crowding an adjacent tree or a *Public Nuisance (see Section 1.00).*
3. A tree trunk is touching or the *Basal Flare* is under the *Building Footprint* of an existing building (for example, uplifting foundation, contact or damage to eaves, gutters, etc.) a replacement may be required.

B. *Heritage Tree*s

If the City authorizes *Removal* of a *Heritage Tree* because it is dead, dying, diseased, hazardous, or a nuisance, a tree replacement may be required. In all other cases, the tree must be replaced.

4.20 Tree Canopy Replacement Standards

When a tree is to be replaced, the following standards apply:

A. Species

The replacement trees shall be the same species unless the *City Arborist* determines that another species would be more suitable for the location. Factors to be considered include the long term health of the tree in the location and its compatibility with the adjacent uses as well as design considerations.

B. Location

The location of the replacement tree shall be approved by the *City Arborist*. If it is not possible or desirable to replace the tree on site, the *City Arborist* shall consider the distribution of trees so that diversity and age are considered. Section 5.00 *(Tree Planting)* will apply.

C. Size and Number

Each tree removed requires 2 x 24" box trees as replacement.

4.30 Tree Value Replacement Standard

When the value of a tree needs to be determined for establishing the amount of security required, or for any other purpose, the value shall be determined by using the most recent edition of the *Guide for Plant Appraisal* published by the Council of Tree and Landscape Appraisers.

4.40 Security Deposits

As a condition of a development approval, the City may require that the developer post security of between 25% and 100% of the value of the trees to be preserved, as determined by using the *Guide for Plant Appraisal* published by the Council of Tree and Landscape Appraisers. The security may be a cash deposit, letter of credit, or surety bond and shall be filed with the Finance Department. It shall be in a form satisfactory to the City Attorney. The security shall be posted before issuance of any grading or building permits. The guarantee period shall be specified; In general, it shall be at least two years after expected completion of construction. If the trees fail to survive, the developer shall replace them; if the developer fails to do so, the City may use the security to provide off site trees and/or landscaping.

SECTION 5.00 - TREE PLANTING

5.10 Introduction

Planting specifications apply for trees that are: 1) planted as a replacement, 2) to be planted as a *City Tree,* within the right-of-way or other public land; or 3) planted as part of a landscape plan subject to *Discretionary Development Approval.* Using the following specifications will result in consistent city-wide plantings and superior tree growth and vitality. To achieve this in development projects, the *Landscape Architect* shall incorporate these items into their specifications and the *City Arborist* will review and approve all plantings.

5.20 Planting Stock and Materials

A. Quality

It is the contractor's responsibility to supply stock that meets ANSI 760.1-1996.

1. All trees installed within the City of Encinitas shall conform to American Association of Standards, ANSI Z60.1, *Specifications for Acceptance of Nursery Trees at the Time of Delivery*, in all ways.
2. All trees shall be sound, healthy, vigorous, and free of plant disease and insect pests and their eggs.
3. Container stock shall be grown for at least 8-months in containers in which delivered and shall not be root bound or have girdling roots.
4. Trees shall not have been topped or headed.
5. *Landscape Architect* shall inspect and verify, in writing, that all tree material to be installed on a development site meets the above standards and is acceptable. The *City Arborist* will inspect all other plantings of *City Tree*s (e.g. right-of-way, public land, etc.)
6. The written verification shall be forwarded to the City Planning Department within one week of acceptance.
7. Inspection shall occur after delivery of stock to the project site.
8. Trees with broken tops, branches or injured trunks shall also be rejected.

B. Miscellaneous Materials

The following materials shall be used unless otherwise specified:

1. Tree stakes. Support stakes shall be treated 2-inch diameter Lodgepole Pine, two stakes per tree or approved equivalent. No cross brace shall be used. After installation, stakes shall be trimmed so that the branches clear the top of the stake.
2. Tree Ties. 'V.I.T' Tree Supports (recommended) or equivalent, twist brace, fabric-reinforced rubber (3/8-inch minimum), or equivalent approved by the City of Encinitas shall be used and installed in a figure eight fashion to support the tree to the stakes.
3. Mulch. Screened untreated wood chips 1/2- to 1- inches in size, spread to a 2-inch depth out to the edge of the root ball. The mulch should be kept at least two inches away from the trunk and shall be applied to each tree (*see Mulching, Section 3.45-G*).

4. Root Control Barriers. Use along all public sidewalks, and indicate on approved plans and drawings. 18-inch Linear Barrier LB18-2 root control barrier shall be used. Unless specified otherwise, a 10-foot length shall be placed on center with the tree and on the sidewalk side only. Root barrier boxes are not approved.
5. Tree Grates. Where sidewalk width is less than 8-feet and new trees will be installed in a tree well, metal tree grates shall be used and approved by the City. Minimum size grates shall be 4' x 4' unless specified otherwise. All tree grates shall be mounted in frames; frames inset into a concrete foundation within the sidewalk or surface material and shall be flush with the surrounding surface.

5.30 Planting Site Preparation

A. Soil Preparation and Conditioning

1. All debris, wood chips, pavement, concrete and rocks over 2-inches in diameter shall be removed from the planting pit to a minimum of 24-inch depth, unless specified otherwise *(see also Soil Improvement, Section 7.50*).

B. Planter Pit

1. Trees in a confined planter pit or sidewalk area: The planting hole shall be excavated to a minimum of 30-inches deep x the width of the exposed area. Scarify the sides of the pit *(see Planting the Tree, Section 5.40)*. Soil beneath the root ball shall be compacted to prevent settling.
2. Trees in all other areas: Excavate the hole's width a minimum of three times the diameter of the container, and deep enough to allow the root ball of the container to rest on firm soil. Scarify the sides and the bottom of the pit.
3. The height of the container root ball should be 1-2-inches higher than grade level *(see Planting the Tree, Section 5.40),* except when structural urban tree soil mix is used (*see Alternative Base Course Materials, Section 2.30.6*), in which case the tree may be planted at level grade.

C. Drainage

1. Poor drainage - A percolation test is required to ensure there is adequate drainage for planting new trees. A minimum of one test per site shall be reviewed with the *City Arborist* or *Landscape Architect* prior to plant installation. One or more of the following mitigations are required for locations with poor drainage.
   a. Mitigation for locations with poor drainage:
      i. Install french drain. The trench shall radiate away from the tree and be a minimum of 18-inches in depth filled with drain rock. The grade shall fall away from the tree trunk.
      ii. Install drain tiles or perforated pipe directing water away from the tree.
      iii. Install a drain chimney at the bottom of the planting pit, a minimum of 4-inches in diameter and filled with medium sand or fine gravel to ensure percolation of all water from the filled planter pit. Auger bore drain holes to penetrate hard pan or clay a minimum of 12-inches into undisturbed pervious soil. Angle the boring as close to vertical as possible.

2. Planting Percolation Test. A minimum of one test per development site is required. Additional tests may be needed as required by *Landscape Architect* or *City Arborist*. Fill planting hole with water and insure drainage that is greater than 2-inches per hour. If percolation is less, one or more of the mitigation measures outlined in *Section 7.50 Soil Improvement*, must be implemented.

5.40 Planting the Tree

A. Perform percolation test

If the soil is dry, add a few inches of water in the hole. Let it drain before planting the tree (*see Percolation Test, Section 5.30 C*).

B. Depth

To check the proper depth of the root ball, place the tree in the hole and lay a pole or shovel across the original grade - the top of the root ball should be 1 to 2-inches higher.

C. Placing the Tree

Locate the tree in the hole, and if the tree is located near a street right-of-way, rotate the tree to direct the main branches away from the street side.

D. Filling the Hole

Fill the hole halfway up with original soil or amended soil when approved, and gently tamp out air pockets with a pole or shovel handle. Add about 1-inch of water, and let drain. Fill the rest of the hole to grade, water the fill soil, and let drain.

E. Staking

Place the stakes at the edge of the root ball (drive them 2-feet into undisturbed ground), and avoid contact with the branches. If in a windy area, set the stakes in a plane at right angles to the wind. Remove the nursery stake. Loosely place two ties in a figure eight around the trunk, as low as needed to hold the tree upright and nail to the stake. Stakes shall be trimmed so that the branches clear the top of the stake. Do not install a cross-brace.

F. Berm, Mulch and Water

In non-turf areas, form a soil berm 3 to 4-inches high at the outermost edge of the root ball. Place 1 to 2-inches of mulch or bark over root ball and berm, keeping the mulch away from the trunk a minimum of 2-inches. Fill the berm with water to capacity (*see Watering Schedule, 7.45*).

5.50 Planting in Difficult Soil Conditions

A. Turf Areas

In turf areas that receive regular watering, the watering berm may be eliminated after a few weeks to ensure the tree is receiving adequate water. The turf shall be maintained a

minimum of one foot from the new tree stem, and mulch placed on top of the root ball. The mulch shall not be touching the tree stem.

B. Alternate Specifications

Occasionally, tree planting must occur in poor or difficult soil where standard planting techniques will result in poor-to-average performance or mortality (such as unique or unusual regional geology, slope, soil volume, restrictive physical or chemical properties, poor drainage, etc.). In this case, the responsible party must investigate alternative solutions to enable long term tree growth. Alternative planting specifications or plans that vary from the native or typical soil conditions shall be submitted to the *City Arborist* for approval prior to installation.

1. Alternative or specified soils, such as engineered, amended or structural urban tree soil mix, including written specifications and physical samples, shall be submitted for approval from the *City Arborist* and/or *Landscape Architect*. (*see Alternative Base Course Materials, Section 2.30.6*)

SECTION 6.00 - HAZARDOUS TREES

Introduction

The health and safety of a tree are two distinct and separate functional characteristics. A vigorous and healthy tree may not necessarily be of sound wood or structure. To remove a dangerous tree, it must first be evaluated and the tree determined to be "*hazardous"* as defined in this section. This must be verified in writing by the *City Arborist* before the tree can be *removed*.

6.10 Tree Hazards

A. Tree Hazard Responsibility

1. City owned trees on City property that may be a public safety hazard should be reported to the City of Encinitas, Public Works Department at (760) 633-2850.

2. On private property, it is the responsibility of the property owner to mitigate or abate a known hazardous condition of a *heritage tree* that may be of questionable structure or deemed as hazardous. Most tree hazards can be prevented with regular checkups by a tree care professional and timely maintenance action by the property owner. The City does not require advance permission for removal of *heritage trees* in emergencies. However, it does require documentation of the situation after the fact. This is to avoid the unlawful removal of sound trees on the grounds that they are hazardous. If there is no immediate danger, and the structural deficiency can be corrected, it should be. If the City determines that there was no reasonable basis for believing there was an emergency, the property owner may face penalties for violating City law (Ordinance).

B. Recognizing Tree Hazards

Determining whether or not a tree's defect/s constitutes a condition that presents an imminent hazard to an area requires a high degree of knowledge and experience. Hazard tree assessment should only be evaluated by an arborist who is familiar with tree physiology and can interpret the external signs of weaknesses; who can perform internal checks if necessary and recommend mitigation.

6.20 Emergency Removal Conditions

A. Abatement

When a *City Tree* or *Heritage Tree* has partially failed (or it is apparent it is about to fail), and persons or properties are threatened, the tree may be removed without City review or approval. The City does not require an arborist report before the *Removal* in this instance.

B. Authorization

Such cases must be substantiated after the fact by the property owner and tree professional with photographs, abatement information, insurance claim or other relevant information and completion of a Tree *Removal* Application. The information is to be submitted to the City's Planning Department within five days of emergency *Removal*. All

other authorizations are subject to the standard procedure outlined in *Removal of City Trees or Heritage Trees, Section 3.00.*

6.30 Criteria Used by the City to Determine if a Tree is Hazardous

A. Definition of Hazardous

City of Encinitas defines *'Hazardous'* as: an imminent hazard or threat to the safety of persons or property. If a tree possesses a structural defect that may cause the tree or part of the tree to fall on someone or something of value (i.e. *'Target'*), and the condition is determined to be imminent, the tree is considered *hazardous*.

B. Evaluation Form

The City uses the national standard, an ISA – Hazard Evaluation Form as a basis to determine the hazard rating of a tree (*see Hazard Rating, Section 6.40*). This form, or an approved equivalent, must be completed by a *Certified Arborist*. The *City Arborist* retains discretionary right to approve, request in writing a second opinion of a rating, in writing, or recommend action that may reduce the condition to a less-than significant level of hazard.

C. Authorization

If the *hazardous* condition or *Target* cannot be mitigated or reduced to a less than significant level (*see Hazard Reduction and Prevention, Section 6.60*) then removal of the tree shall be authorized by the City, with the exception of an emergency as outline in section 6.20.

6.40 Determining A Tree's Hazard Rating

For the purpose of *Removal*, if a tree is declared a hazard it must be rated for the level of hazard to persons or property by using the Hazard Rating Formula, or other professional methodology acceptable to the City of Encinitas.

International Society of Arboriculture (ISA) – Hazard Rating Formula.

TABLE 4-1 Hazard Rating Formula

ISA – Hazard Rating Formula			
Failure Potential	+ Target	+ Additional Factors/Size of Part	= Hazard Rating
1 = Low	1 = Low	1 = Low	3 = Low
4= Severe	4 = Severs	4 = Severe	4 = Severe
Note: the above factors are combined to quantify a hazard rating. For example, a minimum rating of 3 is the safest (a low predicable hazard), and the maximum rating of 12 is an imminent hazard (a high predictable hazard). Further details regarding this formula can be found in the ISA – Hazard Evaluation Form and the ISA publication *Evaluation of Hazard Trees in Urban Areas, most current edition.			

A. Failure Potential Rating

Failures do not occur at random, but are the result of a combination of defects and aggravating conditions. The scope of the professional evaluation will include structural defects in the tree (including branches, trunk and roots; and if necessary, shall employ the use of the most current methods of internal decay inspection available); soil/slope and/or creek bank stability; individual species susceptibility to failure; pruning; history; decay weaknesses and any other compromising or pertinent factors considered by the consultant.

B. *Target* Rating

Evaluation of potential *Target*s shall include people, vehicles, structures or something subject to damage if a tree or part of a tree fails. Property use shall consider what structures or activities are under or around the tree (e.g. building, parking, pedestrian, recreational, utility lines, hardscape, etc.). Occupancy shall consider frequency of the use (occasional, intermittent, frequent or constant), and whether the *Target* is likely to be present when failure occurs.

1. Consideration shall be given as to whether the *Target* can be reasonably removed or isolated to reduce the hazard rating to a less than significant level. A *Target* means people or property (public or private).

2. A tree may be a potential hazard if it is: (a) a tree with the potential to fail; (b) in an environment that increases the likelihood of failure and; (c) a tree that would strike a *Target*.

C. Additional Factors

Evaluation of other factors that contribute to aggravating conditions shall be considered, such as: size of the affected defect (i.e. a small branch vs. the entire tree uprooting); significant potential of fire, utility line contact or catastrophic effects, etc.

6.50 Tree Evaluation Checklist

This Section is intended to further help understand tree defects and how they may be interpreted by an arborist. Many tree defects are not readily apparent because decay or structural damage may be internal. Also, poor tree health may not reflect poor tree structure. *Hazardous* trees must be carefully evaluated. The following checklist of criteria that is typically used by professionals may indicate potential or current tree hazards. The checklist is not meant to be a comprehensive guide, however, it is an outline of indicators that may help to indentify potential hazards and suggest action to avert a tree failure and liability.

A. Hazard Evaluation Questionnaire

Target: If the tree fails and people, vehicles, structures or something subject to damage than immediate action may be necessary.

Dead Branches: Are there dead tops or branches? Is the tree dead?

Cracks: Are there deep, open cracks in the trunk or branches? These are major starting points for trunk and branch failure.

Crotch Cracks: Are there deep, open cracks below joining trunks or stems?
Tree Architecture: Has the tree grown beyond its species specific shape into a hazardous form? Is the tree leaning?
History: Has the tree recently lost large branches?

Edge Tree: Were neighboring trees recently removed, leaving tall trees exposed at the edge that may be subject to unexpected wind dynamics and blow-over?

Living Branches: Do live branches bend abruptly upward or downward where tips of large branches were cut off? These may pull out of trunks that are weakened by rot or cracks. Beware of large branches on rotten or cracked trunks.

Topping: Are large branches growing rapidly from *Topping* cuts? These sprouts have weak attachments and may weaken further as they grow. Is there decay below *Topping* cuts?

Storm *Injury:* Are there broken branches, split trunks, or injured roots? Are branches close to power lines?

Root Rot: Are there fungus fruit bodies (mushrooms) on roots or near the trunk? Were roots injured by construction?

Rots and Cankers: Are there hollows or cankers (dead spots) in the trunk or major branches, some with fungus fruit bodies?

Construction *Injury*: Have roots, trunk, or branches been injured?

New Lawn: Is there a new lawn or garden over injured roots? The added fertilizer may stimulate the growth of fungi that will rot the supporting roots while the top gets heavier. A moderate storm could cause the tree to fall.

Guying of Trees: Staking and guying of small to medium size trees may benefit from the additional support. Discretion must be exercised that the guying does not hide weaknesses, such as toppling over, that result from poor quality nursery stock or girdling roots.

6.60 Hazard Reduction and Prevention

City staff shall review the following list to reduce hazardous conditions.

1. Plant trees that are not problematic and that fit the site. The International Society of Arboriculture (ISA) has developed a list to assist you to avoid planting a tree that may become a problem.

2. A healthy, vigorous tree that receives regular care is less likely to become *hazardous* than one that is ignored. Prevention is the best solution to the tree hazard problem.

3. The risk of a hazard tree may be reduced by removing dead and broken branches, reducing branch end weights, by mechanically supporting weak branches from below, or by cabling and bracing. In some cases, *Targets* may be removed such as by moving picnic tables or other items beneath a precarious tree, fencing to prevent access to such trees, or rerouting pedestrian or vehicular traffic.

4. If there are no other options to abate the hazard, the tree may need to be removed entirely.

SECTION 7.00 - TREE MAINTENANCE GUIDELINES

Introduction

This section establishes the minimum standard of care and maintenance of trees for which the City of Encinitas is responsible. These standards apply to all persons who own or are engaged in the business of repairing, maintaining, or preserving these trees. The following standards of care are set forth for pruning (including utility, fire and traffic encroachment), planting, watering, soil and nutrient requirements, insect, disease, and fruit control.

7.10 Care of Trees

All owners of *City Tree*s and *Heritage Tree*s are to follow the required maintenance standards set forth in this Manual. If special pruning or situations require a variance from these standards, it is the responsibility of the *Project Arborist*, property owner or other City staff to clarify why the changes are needed and review them with the *City Arborist*.

In addition to following standards for care, the City will maintain an electronic inventory of all *City trees* and *Heritage trees*. The inventory will document, at a minimum, the tree species (both botanical and common name), location, and maintenance records.

7.15 Prohibited Acts

Improper maintenance of *City Trees* and *Heritage Trees* may constitute a prohibited act as defined by the City of Encinitas Municipal Code Chapters 15.04 and 15.08 and may constitute a violation which may be subject to penalty.

The following prohibited maintenance practices for *City Tree*s and *Heritage Tree*s apply.

A. *Excessive Pruning*
Except for clearance pruning of utility lines, or abating a *Public Nuisance, Excessive Pruning* shall be considered a prohibited act.

B. *Topping*
Topping shall be considered a prohibited act. Seek alternatives to *Topping.*

C. Other prohibited actions
Taking any action foreseeable leading to the death of a tree or permanent damage to its health, including but not limited to *Excessive Pruning*, cutting, girdling, poisoning, over watering, unauthorized relocation or transportation of a tree, posting signs or other objects on a tree, unless authorized through an approved construction permit that includes a *Tree Protection and Preservation Plan.* No t*renching*, excavating, altering the grade, or paving within the *Dripline Area* of a tree shall be permitted.

7.20 Standards for Pruning Trees

The most compelling reason to prune trees is to develop a strong, safe framework. All work to be performed on trees shall be in accordance with the following standards.

A. Specifications

All specifications for working on *City Tree*s and *Heritage Tree*s shall be written and shall be administered by a qualified arborist, and shall be designed to promote the preservation of tree structure and health.

B. Industry Standards

All work on trees shall be in accordance with the most current edition of the ANSI standards including: *ANSI A300-199; Safety Standards, ANSI Z133.1-1994, and Pruning Standards Appendix F*).

7.25 Pruning Mature Trees

There are six types of pruning that may be required for use on mature trees *(see ISA Pruning Guidelines, Appendix F).* Prior to entering the tree, the tree worker is required to be familiar with these types of pruning as stated in the Performance Standards, ANSI, A300-1995. 'Species-specific' pruning promotes the natural shape of the tree (i.e. excurrent, decurrent, vase-shaped, fast growing, etc.).

A. Types of Pruning

1. Crown Cleaning
2. Crown Thinning
3. Crown Raising
4. Crown Restoration
5. Crown Reduction
6. Utility Pruning

B. Tree *Injury*

Climbing and pruning practices shall not injure the tree except for the pruning cuts.

7.30 Recycle Green Waste

As a part of standard tree maintenance and care tree trimmings are generated. This material should be reused (chipped) or recycled whenever possible.

7.35 Pruning Distressed Trees

Distressed trees require as much leaf area as possible to overcome stressed conditions. To avoid additional *Injury*, the following measures shall be followed for these trees.

A. *Injury* or *Disturbance*

If a tree has been damaged by *Injury* or *Disturbance*, delay pruning until deadwood becomes evident (typically 1-3 years after *Injury*). Crown cleaning is then recommended.

B. Neglect

Trees that have received little or no care or maintenance may need moderate crown thinning, reduction of end weights or entire crown restoration.

7.40 Pruning Young Trees

The average life expectancy for trees growing in harsh urban conditions is 7-10 years. Pruning trees early will improve life expectancy and is a proven, cost-effective measure. Added benefits are also reflected in safer trees with fewer branch failures. Trees shall be pruned in the following way:

A. Young trees should be pruned during the second year after planting to improve their structure, and only minor crown cleaning every 3-7 years thereafter. Refer to *ISA Pruning Standards* (*see Appendix F*).

B. Do not top the main leader except to position the lowest main branch. Other main branches should be spaced at least 18-inches apart to alleviate a tight grouping branches.

C. Select permanent branching and allow temporary low branching on the lowest part of the trunk to remain.

7.45 Fertilizing Standards

This section outlines performance standards for fertilizing, and applies only if fertilizing is specified by the City Arborist. Fertilizing mature trees is generally not necessary. Fertilizing may be specified for trees that will be impacted by upcoming *Disturbance*, grade changes or a modified environment. Benefits gained from the increase stored resources may aid to the tree overcoming the stress caused by *Disturbance*.

A. Specifications

Fertilizing, if specified, shall be performed to the following standards:

1. Method of application: The method shall be subsurface injection, on approximate 3-foot centers (within the root ball on young trees; 2-feet out on older trees) and out to the approximate *Dripline* perimeter. Specific situations may justify other variations such as vertical mulch, soil-fracture or surface-broadcast methods.

2. Material and Rates: Unless specified otherwise, fertilizer formula shall be a slow-release, complete fertilizer with chelate trace elements (e.g. 22-14-14 or 20-20-20) and mixed at label rates not to exceed 4-pounds nitrogen per 100-gallons of water. Extraordinary cases may require soil and tissue sampling to correct *Target* deficiencies.

3. Amount: Unless specified otherwise, volume shall be determined by mixing 10-gallons of water per inch of trunk diameter when measured at 54-inches above natural grade.

4. Timing: Timing should not be detrimental to tree health. Best results are derived from applications made during the prior growing season. Apply fertilizer between May through September for best results.

7.50 Watering Schedule

Newly installed trees planted, including drought tolerant species, are dependent upon supplemental irrigation until established, typically for two years. Periods of extreme heat, wind or drought may require more or less water than recommended in these specifications. The method and amount that is applied may vary depending upon soil composition, heat, wind, planted in turf or ground cover, periods of abnormal rainfall or in poorly drained soils (*see Drainage, Section 5.30*). The watering of trees or their replacements shall follow these standards:

A. New trees

During the establishment period (1-2 years), trees should be watered thoroughly to their root depth as frequently as needed. A watering schedule is to be submitted at the preconstruction meeting for tress planted as part of a development project. The schedule is to include altering frequency and quantity. The minimum standards shall be as follows:

1. 1-3 months in the ground: 4 times per month or as necessary
2. 4-6 months in the ground: 2 times per month or as necessary
3. 7-12 months in the ground: 1 time per month or as necessary

B. Mature trees

1. Most species: 1 time per month during irrigation season (usually March through September)
2. Coast Live Oak, Valley Oak and Blue Oak: deep water in May and September — do not water during other months. For oaks already in the vicinity of irrigated conditions, automatic sprinklers or regular watering shall not be allowed to spray on or within three feet of the trunk. The water shall not be allowed to pool or drain towards the trunk.

C. Watering Methods

The following options shall fulfill the watering requirements. One or more of the following may be utilized dependent upon unique circumstances subject of the *City Arborist* determination. The options are as follows:

1. Automated Watering Systems. All new *City Trees* planted within the right-of-way shall be provided with one of the following automatic watering systems. Other city maintained systems shall be per the *City Arborist*'s approval.

2. Bubbler heads (Preferred). One or two bubbler heads mounted on notes: flexible tubing are to be placed adjacent to or on top of the root ball. The placement of bubbler within an aeration tube is not allowed.
3. Drip Loop system. A continuous loop of drip tubing circling around the trunk at a point two-thirds out from the trunk to the edge of the root ball (for new trees 36-inch box size and greater, a second loop of drip tubing is required at a point just beyond the root ball on native soil).
4. Hand watering systems. Recommended for trees that are part of a development project that must be watered to insure tree survival during the course of construction until automatic irrigation is installed.

4. Flood watering. Newly installed trees must be 'flood or basin watered' on top of the root ball to allow the water to infiltrate through the root zone.

5. Subsurface injections using a hydraulic spray pump (practical for use in hard, compacted soils or steep hillsides).

6. Soaker hose. Slow, deep watering using a garden type soaker hose.

7. Wetting agent. A root ball that has been allowed to dry out beyond the wilting point shall require the addition of a wetting agent to the water (such as Aqua-grow or equivalent).

D. Amount

Unless otherwise specified, the volume of water applied at each irrigation should be in the range of 10-gallons per inch of trunk diameter when measured at 54-inches above natural grade. The final decision of whether to water or not should be based on accurate soil probe samples that are taken from the root ball.

7.55 Soil Improvement

During development, *Compaction* of the soil is the largest single factor responsible for the decline of oaks and older trees. Ninety percent of the damage to the upper eighteen inches of soil occurs during the first pass of heavy equipment and cannot be reversed. Every effort to avoid *Compaction* of soil porosity within the *TPZ* shall be taken at all times. When required by the conditions of *Discretionary Development Approval* for a project or as mitigate on for *Injury* or a prohibited action, the following performance standards for improvement of compacted or damaged soil shall be implemented:

A. Aeration

Soil that is damaged or compacted within the *Dripline* of a tree shall be loosened or aerated to promote root growth and enhance tree vitality. One of the following aeration methods shall be specified an in effort to correct compacted soil conditions:

1. *Vertical Mulching:* auger holes 2 to 4-inch diameter, 2 to 3-feet deep, on 4-foot centers and backfilled with porous material such as perlite, vermiculite or volcanic rock.

2. Radial *Trenching* with an air excavator: excavate a soil trench 3 to 6-inches wide and a minimum of 12-inches deep from (approximately) 3-feet from the trunk out to the *Dripline* area. The trenches shall radiate out from one foot apart at the closest point.
3. *Soil-fracturing* with a pneumatic air-driven device
4. Subsurface injections under moderate hydraulic pressure using a three foot probe and applied on 3-foot centers under the *Dripline*.

B. Drainage

Adequate drainage must be provided to the surrounding soil for the planting of new trees. If the trees are to be planted in impermeable or infertile soil, and water infiltration rates are less than 2-inches an hour, then one of the following drainage systems or other approved measures must be implemented (*see Drainage, Section 3.40-C).*

1. French drain, a minimum of three feet in depth
2. Drain tiles or lines beneath the trees
3. Auger six drain holes at the bottom perimeter of the planting pit, a minimum of 4-inches in diameter, 24-inches deep and filled with medium sand or fine gravel

7.60 Insect and Disease Control

Generally, insect populations do not threaten tree health to the point of mortality. More often, when their populations become too great they create a nuisance. For example, scale on tulips or aphids feeding on purple leaf plums produce sticky honeydew that may be a nuisance if dripping on cars or at a storefront entry. Occasionally, pests such as Oak or Tussock Moth larvae can defoliate and severely damage a tree. If action is warranted, Integrated Pest Management (I.P.M.) suggests that the pest source be identified and *Target*ed with a specific and timely treatment. If insects or disease can lead to the death of a tree, then it is the responsibility of the owner to evaluate the condition according to the following guidelines and treat the problem in a timely fashion to prevent further deterioration of the tree.

A. Insects

For treatment, consult a pest control operator that is licensed by the California Department of Pesticide Regulation. Accurate timing is critical for success.

1. Nontoxic materials should be used whenever possible to control leaf-chewing insects

B. Disease and Decay - above ground

Disease such as heart-rot decay that erodes the health or weakens the structure of a tree may compromise the safety of people or property. It is the owner's responsibility to correct a known hazardous condition in a timely fashion. Consult with a *Certified Arborist* for remedy possibilities, for example, pruning out infected branches, thinning, or the spray application of a chemical treatment.

C. Disease - below ground

Soilborne diseases, such as Oak Root Fungus (*Armillaria mellea*) or Root Rot (*Phytophthora sp.*), can be present in soils. Often, a poor landscape design surrounding

old trees encourages harmful and often lethal diseases. The following conditions that favor a disease environment must be avoided:

1. Conditions to avoid:
   Compacting of the soil within the tree's *Dripline*, adding fill dirt, rototilling, *Trenching*, removing soil from the tree root area, and excessive or regular watering on or near the tree trunk area and planting incompatible water-loving plants within the tree's *Dripline*. Combined with poorly-drained soil, these factors often activate normally dormant fungi to become opportunistic and infect the tree to cause the decline and eventual death of the tree. This decline can be slow and may not be evident for many years.

2. Landscape Design:
   When planning landscaping around a tree, an evaluation of the tree and soil must be performed to determine if there is a disease present. If the tree is diseased and landscaping will contribute to decline, permanent damage or render it hazardous, it is the obligation of the property owner to take reasonable measures to reduce or eliminate the conditions that may cause the decline of the tree.
3. To identify cultural conditions that may lead to diseases such as Oak Root Fungus, Verticillium, Phytophthora or other soilborne fungi, review the *Sunset Western Garden Book* or consult with a *Certified Arborist.*

D. Foliar disease
Leaf spot or galls may be chronic or reoccur during specific seasons. Though many of these diseases destroy leaf tissue and become unsightly, they may not significantly reduce the trees health and therefore need not be treated.

7.65 Fruit Control

While all trees produce flowers or fruit of some kind, some trees can be considered a nuisance if the use area is not compatible with the litter generated by the tree. For example, the dropping fruit of the European Olive (*Olea europaea*), American Sweet Gum (*Liquidamber styraciflua*), or acorn drip of a Holly Oak (*Quercus ilex*) may be a safety hazard if it is in the proximity of a handicap ramp or other high pedestrian area and will thus justify control measures. Control can only be successful if materials are applied carefully at optimum timing. For treatment to control the situation, consult a pest control operator that is licensed by the California Department of Pesticide Regulation.

SECTION 8.00 - TREE REPORTS

Introduction

An arborist report is needed for; development projects, tree *Removal* permits requested by private property owners and when tree removals are recommended by the City staff. The report must be prepared by a *Certified Arborist* for the applicant and submitted to the City for the purpose of providing accurate information and opinions regarding the condition, welfare, maintenance, preservation or value of tree.

8.10 When a Written Report is Required

Generally, there are three circumstances in which *Tree Report*s are required: 1) When a tree *removal* permit is sought by a private property owner to remove a *City Tree* or a *heritage tree,* and 2) to complete and verify a *Site Plan*, assess tree impacts and establish tree protection for property development within the drip line of a *City Tree* or *heritage tree,* and 3) When the City has determined that a *City Tree* needs to be removed. The types of report formats are: *Letter Report, Tree Survey, Tree Protection and Preservation Plan* and *Tree Appraisal.*

8.20 Who May Prepare the Report

Reports are to be prepared by a *Certified Arborist* retained by the applicant, property owner or the City. This person shall possess a current ISA certification; be a member of the American Society of Consulting Arborists; or a member of good standing in another nationally recognized tree research, care, and preservation organization.

8.30 Reports for Individual Tree Removal Permit

A. Tree *Removal* Permit

The procedure involves three steps which must be completed and approved to *remove* a *City Tree* or a *heritage tree*. The information contained within the application will be reviewed by the *City Arborist* for written response.

B. Submittals

For this purpose, the following information is to be submitted to the City for review:

1. Application: A completed application for the *Tree Removal*.
2. Filling Fee: A filing fee of $145 (Application fee - $125, records management $20).
3. Arborist Report: An arborist report prepared by a *Certified Arborist.*

C. Written authorization

To *remove* a *City Tree* (on city land or in the street right-of-way), the property owner shall first have obtained written permission from Public Works Department or *City Arborist*. For a *Heritage Tree* on private property, the permit from the Planning Division must be on site when the tree is being removed. For a trees removed as part of a

development project, the approved plans serve as the approval and no separate written permit is needed.

8.40 Types of Reports

A. Letter Report

1. Letter Report Format

A brief format is acceptable for (1) and (2) below, and can generally be used for assessing multiple trees. The report is to be on letterhead stationery of the individual preparing the report, including their ISA Certification number.

i. *Removal*:

If for a tree *Removal* (i.e., an application request for *Removal* only, not in connection with a property development), the report shall provide information and determination whether the tree/s are dead, hazardous or constitutes a nuisance.

ii. Development:

If for development on a single family residential lot (not a subdivision), the report shall also clearly indicate whether or not any *Heritage Tree*/s or *City Tree* is so close to the '*Building Area* or *Building Footprint*' that it will be killed or permanently injured by *Disturbance*. The report must make specific recommendations to protect and preserve the tree during the course of construction that are consistent with the specifications within this *Manual*

B. Letter Report Submittals

1. Standard information

All letter reports shall contain the following information: Arborist name and certification number; purpose of the report and for whom; site address; date of the inspection(s); a to-scale diagram of the tree(s) location, accurate size of the trunk diameter (measurement taken at 54-inches above natural grade); perimeter of leaf canopy; proximity to structures; condition of the tree health (and/or decay presence), condition of the tree structure, imminent danger of failing; interface with utility services; conclusion and recommendation(s), photographs (encouraged) and Tree Protection Instructions (if needed).

2. Specific situations

Other conditions may require the following additional information on an as-needed basis if requested by the reviewing City staff: tree protection plans; appraised value and any other supporting information, photographs, diagrams, etc. that may be necessary.

C. Tree Survey Report

1. Tree Survey Report Format

A more extensive 'Tree Survey Report' is required for all development projects except those identified above. The report shall inventory all trees that are greater than 4-inches in diameter (measured at 12-inches above natural grade) on site, including trees to be removed, relocated and retained on the property (including trees on neighboring properties that overhang the project site) and all publicly owned trees in the right-of-way within 30-feet of the project site. In addition to information required in a letter report, the Tree Survey Report, shall include an inventory of the trees, *Site Plan*, appraised value of the trees and any other information pertinent to the project.

2. Tree Survey Report Submittals

i. Items to include

All Tree Survey Reports shall contain the following information: Arborist name and certification number; cover letter; title page; table of contents (if necessary); purpose of the report and for whom; site address; date of the inspection(s); *Site Plan* (showing each tree location by number that correlates with the tree inventory on plans; tree inventory data (include tree species, size, health, structure, etc. for all trees on the project site, including those to be removed (tables may be used); condition of the trees (include information with respect to health, structure, decay, imminent danger of falling, existing property lines, structures and utility services) conclusion, recommendation(s) and rated for suitability for preservation. The report shall include a separate list of all *Heritage Trees* with location numbers. If necessary, other supporting information, photographs, diagrams, etc. may be required or provided.

ii. Appraised Value

The monetary value that each tree contributes to the real estate value of the property shall be determined and listed separately within the Tree Survey Report. The formula used should be noted. *(Section 8.60 Tree Appraisals).*

8.50 Tree Protection and Preservation Report

All publicly owned or *Heritage Tree*s to be retained on a development site shall be shown on approved sets of civil, building and landscape plans and shall be protected during the construction process. *A Tree Protection and Preservation Plan* submitted for review by the Planning and Building Department is required when trees to be saved may be *injured* by *Disturbance*. The tree preservation plan shall assume compliance with standards in Section 2.00 of this Manual (*see Protection of Trees During Construction, Section 2.00*). In addition, the following submittal information must be included in the report:

A. Scope & Construction Phasing

The *Tree Protection and Preservation Plan* shall identify, but not be limited to, written recommendations for the health and long-term welfare of trees that are to be followed during the following distinct phases and conditions: preconstruction; during construction, post construction, demolition activities; methods of avoiding *Injury*, damage treatment and inspections. Schedules shall be included.

B. *Tree Protection Zone*

The *Tree Protection and Preservation Plan* shall establish a *TPZ* for each tree to be fenced and clearly outline site-specific measures for protection of the trees during construction and describe a plan for continued maintenance of those trees after construction. After project approval, any changes to the protection measures must be approved in writing, by the *City Arborist*. The tree protection plan shall include the following *Site Plan* elements:

8.60 Site Plan

A. Disclosure of all trees on and near the site

The property owner or designee shall provide accurate information to the *Project Arborist* to develop the tree protection measures and to enable accurate recommendations to insure their survival. This *Site Plan* shall accurately show the surveyed location, species, size of trunk and leaf canopy; show the drip line of any neighboring trees that may overhang the site and publicly owned trees that are within 30-feet on each side of the project. Failure to show a tree on the plans and later determined to be affected by construction may require the work to stop until mitigation can be agreed upon by the property owner and the City.

B. Plans submitted to the City

In addition to the above information, final improvement plans shall include and show the following information: show the *TPZ* of any tree to be retained and denote a 5-foot chain link type fencing around the protected zone of each tree or group of trees (to be clearly identified as such on all plans as a bold-dashed line); permeable paving located within the drip line area; approved utility pathways; grade changes; surface and subsurface drainage and aeration systems to be used; walls, tree wells, retaining walls and grade change barriers, both temporary and permanent; landscaping and irrigation within drip line of trees.

C. Plans must show tree protection

Protective Tree Fencing identified within the arborist report, both written and diagrammatic, shall be clearly shown as a bold, dashed line on the approved *Site Plan*s submitted for demolition, grading, construction, building permit or any other aspects that are relevant to the project.

8.70 Tree Appraisal

Landscape value typically contributes to the value of a property. An individual tree has an inherent value to the property that can be determined by an appraisal prepared by a *Certified Arborist*. An appraisal is a process for determining a monetary opinion of the value of a tree as it relates to the property, a group of trees and/or the immediate community. A qualified *Certified Arborist* is required to determine this value, and must exercise good and fair judgment by adjusting the basic value by the tree's condition and location. There are two methods to determine tree value; (1) the Replacement Method, based upon the size and availability of the

replacement tree or, (2) the Trunk Formula Method, if the tree cannot be replaced (e.g. not sufficient room on site or it is too large to replace). In all cases, the type of formula used must be identified.

8.80 Appraisal Methods

The *Certified Arborist* must prepare the appraisal by using the most current edition of (1) the *'Guide for Plant Appraisal'*, published by the Council of Tree and Landscape Appraisers, and (2) the most recent *'Form for Northern California'* established by the International Society of Arboriculture.

A. The Replacement Cost Method

This method applies to smaller trees with a trunk size up to 4-inches in diameter or, 48-inch box size trees (replaceable.) For this method, the appraised value shall be determined by combining: price quote + transportation + planting + other costs and applying the condition and location value to the tree. The sum

B. The Trunk Formula Method notes:

Applies to trees that are too large for practical replacement (transplanting) and shall be appraised by: determining the basic tree value and adjusting this value by a condition and location ratings. The appraised value shall be determined by using the most recent edition of the *'Guide for Plant Appraisal'*, published by the Council of Tree and Landscape Appraisers. The Trunk Formula or Replacement Method Forms for Northern California established by the International Society of Arboriculture must be used to compute the appraised value. All trees with a stem larger than 4-inches in diameter when measured at 12-inches above natural grade shall be calculated in this manner.

SECTION 9.00 - *HERITAGE TREES*

9.10 Designation of *Heritage Trees*

A. Upon nomination by any person or agency and with the written consent of the property owner(s), a tree or trees may be designated as a *Heritage Tree or trees*. *Heritage Tree*s may be located on City or private property.

B. Nominations for a *Heritage Tree* shall be reviewed by the Environmental Advisory Commission (EAC) and the EAC shall make a recommendation on *Heritage Tree* nominations to the Planning Commission.

C. The Planning Commission may designate a tree as a *Heritage Tree* upon a finding that it is unique and of importance to the community due to any of the following factors:

1. It is one of the oldest and largest of its species located in Encinitas;

2. It is a tree of unique form or species;

3. It has historic significance due to an association with an historic building, site, street, person or event; or

4. It is a defining landmark or significant outstanding feature of a neighborhood.

D. Upon Planning Commission approval, the tree(s) shall be designated as a *Heritage Tree*(s). Any work on or in the vicinity of a designated *Heritage Tree* shall be done in accordance with this Manual and under the provisions of a City-issued permit. The requirement for a permit may be waived in cases of hazardous trees or other cases where immediate action must be taken for public health or safety reasons.

E. After Planning Commission approval of a *Heritage Tree* designation, the City shall notify the property owner(s) in writing. A listing of trees so designated, including the specific locations thereof, shall be kept by the City.

F. It shall be the responsibility of any private property owner whose property contains a *Heritage Tree* to insure that any future owners, successors, heirs, personal representatives, transferees and/or assigns of said property owner knows of the designated *Heritage Tree*(s) and the requirements that come with this designation.

G. Once designated, a *Heritage Tree* shall be subject to the provisions of this Manual unless removed from the list of *Heritage Tree*s by action of the Planning Commission. The Planning Commission may remove a tree from the list upon its own motion or upon written request by the property owner. Request for such action must originate in the same manner and proceed through the same process as nomination for *Heritage Tree* designation.

H. Any person may appeal the designation of a tree or trees as a *Heritage Tree*(s), or the *Removal* of such designation, in accordance with the procedures set forth in Chapter 1.12 of the Municipal Code (Appeals).

SECTION 10.00 – DEVELOPMENT AND PERMIT APPLICATIONS

10.10 Disclosure of Information Regarding Existing Trees

A. Any application for discretionary development approval, or for a building or demolition permit where no discretionary development approval is required, shall be accompanied by a statement by the property owner or authorized agent which discloses whether any *City Tree or Heritage Tree* exist on the property which is the subject of the application, and describing each such tree, its species, size, *Dripline* area, and location. This requirement shall be met by including the information on plans submitted in connection with the application.

B. In addition, the location of all other trees on the site and in the adjacent public right of way which are within thirty feet of the area proposed for development, and trees located on adjacent property with canopies overhanging the project site, shall be shown on the plans, identified by species.

C. The Director of Planning and Building may require submittal of such other information as is necessary to further the purposes of this section including but not limited to photographs.

D. Disclosure of information pursuant to this section shall not be required when the development for which the approval or permit is sought does not involve any change in *Building Footprint* nor any grading or paving.

E. Knowingly or negligently providing false or misleading information in response to this disclosure requirement shall constitute a violation of this Manual.

10.20 Development Conditions of Approval

A. *Discretionary Development Approvals* for property containing *City Trees or Heritage Tree*s shall include appropriate conditions providing for the protection of such trees during construction and for maintenance of the trees thereafter.

B. *Discretionary Development Approvals* for projects for which a landscape plan is required shall include appropriate conditions providing for the protection of all existing trees to remain on the project site during construction and the protection and maintenance of all existing and newly planted trees thereafter.

C. All trees included in a required landscape plan for a project with a *Discretionary Development Approval* shall be protected and maintained in accordance with the standards and regulations contained within this Manual.

D. Any modifications to a landscape plan of a project with a *Discretionary Development Approval* shall require the submittal of an application for substantial conformance with the original permit for minor modifications to the landscape plan consistent with the original approval or the submittal of an application for modification of the original permit for major modifications to the landscape plan.

E. It shall be a violation of the Urban Forest Management Program policy for any property owner or agent of the owner to fail to comply with any development approval condition concerning preservation, protection, and maintenance of any tree, including but not limited to *City Trees or Heritage Tree*s.

SECTION 11.00 – ENFORCEMENT

11.10 Prohibited acts

It shall be a violation of the Urban Forest Management Program policy for anyone to remove or cause to be removed a *City Tree* or a *Heritage Tree*, except as allowed in this section:

A. In the absence of development, *City Trees* or *Heritage Tree*s shall not be removed unless determined by the Director of Public Works, on the basis of a *Tree Report* prepared by a *Certified Arborist* for the applicant and other relevant information, that the tree should be removed because it is dead, is hazardous, is a detriment to or crowding an adjacent *City Tree or Heritage Tree* or constitutes a *Public Nuisance* as defined in this Manual, except when an emergency removal is needed (Section 6.20).

B. In the case of development on a single-family residential lot, other than in connection with a subdivision:

1. *City Trees* or *Heritage Tree*s shall not be removed unless the trunk or *Basal Flare* of the tree is touching or within the *Building Footprint*, or the Director of Planning and Building has determined, on the basis of a *Tree Report* prepared by a *Certified Arborist* for the applicant and other relevant information, that the tree should be removed because it is dead, is hazardous, is a detriment to or crowding an adjacent trees, or constitutes a *Public Nuisance* as defined in this Manual.

2. If no *Building Footprint* exists, *City Trees or Heritage Trees* shall not be removed unless the trunk of the tree is located in the *Building Area*, or the Director of Engineering Services has determined, on the basis of a *Tree Report* prepared by a *Certified Arborist* for the applicant and other relevant information, that the tree should be removed because it is dead, is hazardous, is a detriment to or crowding an adjacent *City Trees or Heritage Trees*, or constitutes a *Public Nuisance* as defined in this Manual.

3. If *Removal* is allowed because the tree trunk is located in the *Building Footprint*, or the trunk or *Basal Flare* is in the *Building Area*, or because the Director of Engineering Services has determined that the tree is so close to the *Building Area* that construction would result in the death of the tree, the tree removed shall be replaced in accordance with the standards in the this Manual.

C. In connection with a proposed subdivision of land into two or more parcels, no *City Trees or Heritage Trees* shall be removed unless *Removal* is unavoidable due to restricted access to the property or deemed necessary to repair a geologic hazard (landslide, repairs, etc.). The tree removed shall be replaced in accordance with the standards in this Manual. Tree preservation and protection measures for any lot that is created by a proposed subdivision of land shall comply with the regulations of this Manual.

D. In all circumstances other than those described in paragraphs A, B and C of this section, *City Trees or Heritage Trees* shall not be removed unless one of the following applies:

1. The Director of Engineering Services, the Director of Parks and Recreation or the Director of Public Works has determined, on the basis of a *Tree Report* prepared by a *Certified Arborist* for the applicant and other relevant information, that the tree should be removed because it is dead, dangerous or constitutes a *Public Nuisance* as defined in this Manual. In such cases, the *Dripline* area of the removed tree, or an

equivalent area on the site, shall be preserved from development of any structure unless *Removal* would have been permitted under paragraph (2), and tree replacement in accordance with the standards in this Manual shall be required.

2. *Removal* is permitted as part of a discretionary development approval. In such a case, the approval shall be conditioned upon replacement in accordance with the standards in this Manual.

11.20 No Limitation of Authority Under Title 30

Nothing in this Manual limits or modifies the existing authority of the City under Title 30 (Zoning Ordinance) to require trees and other plants not covered by this Manual to be identified, retained, protected, and/or planted as conditions of the approval of development. In the event of conflict between provisions of this Manual and conditions of any permit or other approval granted pursuant to Title 30, the more protective requirements shall prevail.

11.30 Care Of *City Trees or Heritage Tree*s

A. All owners of property containing *City Trees or Heritage Tree*s shall follow the maintenance standards in this Manual.

B. The standards for protection of trees during construction contained in this Manual shall be followed during any development on property that contains, is adjacent to, or impacts in any way *City Trees or Heritage Tree*s.

11.40 Responsibility for Enforcement

The following designated employee positions may enforce the provisions of the Urban Forest Management Program policy by the issuance of citations: Building Official, Assistant Building Official and Code Enforcement Officer.

11.50 Enforcement - Remedies for Violation

In addition to all other remedies set forth in this code or otherwise provided by law, the following remedies shall be available to the city for violation of the Urban Forest Management Program policy:

A. Stop Work - Temporary Moratorium.

1. If a violation occurs during development, the city may issue a stop work order suspending and prohibiting further activity on the property pursuant to the grading, demolition, and/or building permit(s) (including construction, inspection, and issuance of certificates of occupancy) until a mitigation plan has been filed with and approved by the Director of Planning and Building, agreed to in writing by the property owner(s), and either implemented or guaranteed by the posting of adequate security. The mitigation plan shall include measures for protection of any remaining trees on the property, and shall provide for replacement of each tree removed on the property or at locations approved by the Director of Planning and Building or by the Director of Public Works, if replacement is to occur on public property. The replacement ratio

shall be in accordance with the standards set forth in this Manual and shall be at a greater ratio than that required where tree *Removal* is permitted pursuant to the provisions of this Manual.

2. If a violation occurs in the absence of development, or while an application for a building permit or discretionary development approval for the lot upon which the tree is located is pending, the Director of Planning and Building may issue a temporary moratorium on development of the subject property, not to exceed eighteen months from the date the violation occurred. The purpose of the moratorium is to provide the city an opportunity to study and determine appropriate mitigation measures for the tree *Removal*, and to ensure measures are incorporated into any future development approvals for the property. Mitigation measures as determined by the Director of Planning and Building shall be imposed as a condition of any subsequent permits for development on the subject property.

B. Civil Penalties.

1. As part of a civil action brought by the city, a court may assess against any person who commits, allows, or maintains a violation of any provision of this Manual a civil penalty in an amount not to exceed five thousand dollars ($5,000.00) per violation.

2. Where the violation has resulted in *Removal* of a tree, the civil penalty shall be in an amount not to exceed five thousand dollars ($5,000.00) per tree unlawfully removed, or the replacement value of each such tree, whichever amount is higher. Such amount shall be payable to the city. Replacement value for the purposes of this section shall be determined utilizing the most recent edition of the *Guide for Plant Appraisal*, published by the Council of Tree and Landscape Appraisers.

C. Injunctive Relief. A civil action may be commenced to abate, enjoin, or otherwise compel the cessation of such violation.

D. Costs. In any civil action brought pursuant to this Manual in which the city prevails, the court shall award to the city all costs of investigation and preparation for trial, the costs of trial, reasonable expenses including overhead and administrative costs incurred in prosecuting the action, and reasonable attorney fees.

11.60 Fees

*Tree Report*s required to be submitted to the city for review and evaluation pursuant to this Manual shall be accompanied by the fee prescribed therefor in the municipal fee schedule.

11.70 Severability

If any provision of this Manual or the application thereof to any person or circumstance is held to be invalid by a court of competent jurisdiction, such invalidity shall not affect any other provision of this Manual which can be given effect without the invalid provision or application, and to this end the provisions of this Manual are declared to be severable.

11.80 Appeals

Any person seeking the director's approval to remove a *City Trees or Heritage Tree*s pursuant to the regulations in this Manual who is aggrieved by a decision of the Director of Planning and Building or the Director of Public Works may appeal such decision in accordance with the procedures set forth in Municipal Code Chapter 1.12 (Appeals).

Appendix A

TREE PRESERVATION POLICY

Purpose
The purpose of the Tree Preservation Policy is to establish a regulatory tool to provide orderly protection of specified trees, protect their value, and avoid significant negative impacts to the ecosystem. The Policy regulates protection of trees in two categories: *City Trees* and *Heritage Tree.*

Heritage Trees:
Heritage trees are individual trees of any size or species that are specifically designated as heritage because of their historical, commemorative, or horticultural significance. The list of designated Heritage Trees remains open for new designations and provides useful information to the City of Encinitas staff regarding the importance of their actions while planning activities near heritage trees. Since Heritage Trees are protected trees, recommendations from the City Arborists must be obtained before any alterations to the protected trees is made that may cause the trees to become damaged, relocated, or removed. The City Arborist, Director of Engineering, Director of Parks and Recreation, Director of Public Works, or Director of Planning and Building must approve the recommendation before any action proceeds. Pruning also can cause irreversible damage to the tree and must be in compliance with the ISA Tree Pruning Guidelines. Pruning must be performed under supervision of an ISA certified staff only. If the tree poses an immediate threat to life or public safety, the City Arborist may compromise the process, if proper documentation, including digital photographs, is kept. Heritage trees identified as dead by the City Arborist will be removed and recorded into the designated Heritage Trees list. The Heritage Trees list can be obtained from the City of Encinitas Department of Parks and Recreation.

City Trees
Most City trees have great value beyond the shade they provide. They are a scenic resource to surrounding neighborhoods and their removal or disfigurement by extreme pruning for construction clearance or other reasons diminishes the value of the urban forest and often provokes public protest. Some trees have not been designated under a protected group of trees but still provide aesthetic, sentimental, economical, and environmental value. The large number of trees in our City has a significant cooling effect on the urban environment in Encinitas, where tree canopy represents only 25% the land. Every tree in our City is recognized as a valuable asset. This Manual provides guidelines for protecting trees during construction and offers suggestions and alternative technical solutions to avoid damages to trees. The City is responsible for seeing that the Maintenance, Park and Recreation, and Construction staff follows and implements tree preservation and protection practices outlined in this Manual.

Appendix B

TREE PROTECTION GUIDELINES FOR DESIGNERS AND PROJECT MANAGERS

Model Tree Preservation Specifications

These specifications shall be made a part of all construction documents. They were developed in order to protect all trees that have either direct or indirect encroachment into their driplines during construction within City parks. The City Arborist shall be invited to the Job Start Meeting and also notified 48-hours prior to start of construction. They may be contacted at (760) 633-2740.

General Requirements

1. No equipment is to be operated or parked under a tree, nor is any material to be stored within the dripline of a tree or leaned against a tree trunk. Do not pile or compact soil within a dripline.
2. In areas of construction, protect soil surface from traffic compaction with 3" of mulch or overlapping 3/4" plywood sheets.
3. No surface irrigation shall be installed within the dripline of a tree.
4. All work shall be in accordance with the City of Encinitas Tree Preservation Policy.
5. No chemical herbicides are to be used within 100 ft. of a tree's dripline.
6. Do not nail grade stakes or anything else to trees.
7. Encroachment from paving or structures within the dripline of a tree shall be permitted only with written authorization from the City Arborist.
8. Do not strip topsoil around trees. Any vegetation to be removed should be removed by cutting at ground level rather than pulling out by equipment.
9. Use a pneumatic drill to excavate under woody roots larger than 2" in diameter. Do not cut any root larger than 2" diameter. If roots must be severed, cuts are to be made by a Certified Arborist and soil backfilled immediately.

Typical Work Procedures

These procedures have been developed to minimize the impacts to each tree and protect them from unscheduled damage. All work around any existing tree to remain and to be protected shall follow these work procedures.

1. All work within a tree's root zone shall follow this Manual.
2. The extent of all work affecting any protected tree shall be staked by field survey and reviewed with the Parks and Recreation Arborist prior to construction.
3. A Parks and Recreation Arborist shall approve any pruning of protected trees prior to the start of construction.
4. Hand dig the vertical trench at the final cut line and to the final grade; cleanly cut roots behind torn ends. There is no need to apply any kind of pruning seal, since roots will form their own internal barriers to decay.

5. Type I, II, or III tree protection fencing shall be constructed at the limit of approved work to protect the trees from unauthorized damage. It shall remain in place until landscape work commences.
6. No further work within the root zone shall be done beyond that which was approved without obtaining written approval form the City Arborist, prior to proceeding.
7. The area within the chain link fence shall not be used for material or equipment storage, or parking during construction.
8. During construction, the impacted trees should be closely monitored for symptoms of shock. The contractor should be prepared to provide temporary water to irrigate and if needed, wash dust from foliage. Irrigation should wet the top 2-3 feet of soil to replicate similar volumes and normal seasonal distribution. Contact the City Arborist if a decline in tree condition is noted.
9. Contact (760)633-27470 for any general questions regarding trees in parks.

Damages

If a tree designated to remain is removed or irreversibly damaged as determined by the City Arborist, a contractor may be required to install a replacement tree matching in size, quality and variety, using an contractor designated by the City Arborist. If an acceptable replacement tree is not available, the contractor may be required to pay damages to the City for the value of the damaged tree in accordance with the guidelines set forth in the Guide for Plant Appraisal, 9th Edition, using the Trunk Formula Method.

Implementation

Please direct questions about construction adjacent to Heritage trees to the City Arborist.

Appendix C

MAJOR CONSTRUCTION IMPACTS AND METHODS TO MINIMIZE DAMAGE

The City of Encinitas recommends the following technical guide to help minimize construction impacts and damage to trees:

Matheny, N.P. and Clark, J.R. 1998. *Trees and Development. A Technical Guide to Preservation of Trees During Land Development.* International Society of Arboriculture. Champaign, IL. Exponent Publisher Inc. Hagerstown, IN.

The publication can be obtained from the:

International Society of Arboriculture (ISA),
P.O. BOX3129, Champaign, IL 61826-3129
Phone: (217)355-9411, Fax: (217)355-9516
Order toll-free 1-888-ISA-TREE
www.isa-arbor.com

Appendix D

HOW TO PREVENT DAMAGE TO TREES DURING CONSTRUCTION

Introduction

Land development and capital improvement projects are a complex process and even more challenging when trees are involved. Construction is one of the greatest causes of tree decline and death in urban areas. The long-term goal of the City of Encinitas is urban forest sustainability. The City seeks to maintain social, recreational, ecological and economic functions of trees and their benefits over time. Stewardship of naturally occurring and planted trees is a central element in forest sustainability. Concerns integral to a sustainable urban forest are tree health and structure, preservation during development and redevelopment, species and site selection, quality of planting stock, standards of performance, maintenance practices in our parks, and recycling.

Tree protection should not begin subsequent to construction. If preservation measures are delayed or ignored until construction begins, the trees may be destined to fail. Since in most cases construction affects to trees cannot be completely eliminated, the goal for planners and designers is to keep injury to trees to a minimum and allow building projects to proceed at the same time. Successful tree preservation occurs when designers, construction personnel, and project managers are committed to tree preservation. All members of the project team must be familiar with the rudimentary aspects of tree growth and development in order to understand the relationship between tree survival and construction practices.

There are many myths about how trees grow. For example, above ground parts of trees is not a "mirror" of what lies below ground. In actuality, typically four to eleven large roots radiate from the base of a tree's trunk. These "buttress" roots extend from the root crown and sometimes are visible when the trunk flares away from the root crown or collar. These large roots decrease in taper rapidly and branch repeatedly so that at distances of ten feet or more from the trunk they are about ½ inch in diameter or smaller. These roots grow horizontally through the soil and depending on the tree can extend 40 feet or more beyond the branch tips. These smaller roots are primarily responsible for water and mineral absorption. There can be hundreds of roots in a cubic inch of soil— thus any removal of soil or root severance forces a tree to compromise its physiological processes to sustain the loss. All trees cannot and should not be preserved. Trees that are structurally unstable, in poor health, or unable to survive effects of construction become a liability to the project and should be removed. A realistic tree preservation program acknowledges that conflicts between trees and development may sometimes result in the removal of some trees and recognizes the detrimental effect to the project and community when trees die after construction is completed.

Successful tree preservation occurs when construction impacts to trees are minimized or avoided altogether. The challenge is to determine when impacts will be too severe for the tree to survive, not only in the short term, but also in the long term. There are no quantitative methods to calculate this critical level. Determining the optimum tree protection zone provides a guideline,

although trees often survive and flourish with smaller protection areas. The following are the three guiding principles for tree preservation:

- The acknowledgement that not all trees are in excellent health or have good structural stability.
- Tree preservation cannot be the responsibility of the City of Encinitas staff alone. Each development participant must understand that his or her activities and decisions influence the success of tree preservation efforts.
- The ability of a Certified Arborist to cure construction injury is very limited, so the focus of preservation efforts is the *prevention* of damage.

Instructions
An arborist should be called in as a consultant to the construction site before any work is started. The arborist will recommend the removal of trees that are not likely to survive construction activities regardless of the scope of work. In general, the contractor is responsible for preventing trees from damage. The construction and maintenance staff must make the best effort to avoid unnecessary activities within the dripline of trees.

• **Fences -** Construction fences shall be erected around trees that are to remain. The fences should be placed as far from the trunk as possible in order to protect the above ground portion of the trees as well as the root system.

• **Storing and Piling -** Leaning objects against tree trunks and piling soil over the root zone is prohibited.

• **Pruning -** Pruning for vertical clearance of buildings, traffic, and construction equipment shall be performed by an arborist only, and not by construction or maintenance personnel.

• **Compaction -** Driving equipment and walking within the dripline causes soil compaction and is a serious cause of tree decline and death, and usually manifests long after construction is complete. Fences around trees reduce unnecessary traffic. If traffic cannot be avoided, it is recommended to spread a 6-12 inch thick layer of mulch to reduce compaction. As an added precaution, placing large plywood sheets over the mulch can disperse weight.

• **Excavation -** Excavation causes major damage to trees. Digging and trenching should be planned ahead to minimize the root loss. When roots must be severed, clean cuts shall be made and sealed by an arborist. The soil shall then be backfilled immediately to minimize drying of the roots.

• **Tree Maintenance -** Abruptly terminating regular tree maintenance is another cause for tree decline. Provide supplemental irrigation to replicate similar volumes and normal season distribution.

Appendix E

ANSI A300 PRUNING STANDARDS

ANSI A300 (Part 1)-2001 Pruning – American National Standard Institute Standard for Tree care Operations – Tree, Shrub, and Other Wood Plant Maintenance – Standard Practices.

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129
Phone: (217)355-9411, Fax: (217)355-9516
Order toll-free 1-888-ISA-TREE
www.isa-arbor.com

Best Management Practices, TREE PRUNING. Companion publication to the **ANSI A300 Part 1:** Tree, Shrub, and Other Wood Plant Maintenance – Standard Practices, Pruning.

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129
Phone: (217)355-9411, Fax: (217)355-9516
Order toll-free 1-888-ISA-TREE
www.isa-arbor.com

ANSI Z133.1-2000 – American National Standard Institute Standard for Arboricultural Operations – Pruning, Repairing, Maintaining, and Removing trees and Cutting Brush – Safety Requirements.

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129
Phone: (217) 355-9411, Fax: (217) 355-9516
Order toll-free 1-888-ISA-TREE
www.isa-arbor.com

STANDARD NOTE FOR POSSIBLE DISTURBANCE TO AN ADJACENT PRIVATE PROPERTY

All the work proposed on this plan is entirely within the applicant's property. If any disturbance to adjacent properties is anticipated as a result of any proposed work, a written letter of permission from the adjacent property owner must be obtained and submitted to the City prior to start of any such work. Any disturbance on the adjacent private property that has not been previously authorized in writing and submitted to the City is grounds for a stop-work to be issued for the project until the required permission is obtained.

SIMPLIFIED / MINOR GRADING PERMIT REQUIREMENTS

Which projects qualify?

A minor (simplified) grading permit may be authorized by the City Engineer if the following are met:

1. Proposed grading is between 50 and 250 cubic yards. (See exception in Item 8 below).
2. The grading does not propose to create slopes more than six feet high.
3. The grading is proposed on an existing slope less than six feet high.
4. The grading is not proposed within any environmentally sensitive areas, floodplain, floodway, within 100 feet of any coastal or inland bluffs, or area with geologic or slope stability problems, and does not divert or adversely impact any drainage flow.
5. The grading or other aspects of the development do not require any discretionary permit review by the Planning and Building Department other than a Coastal Development Permit.
6. The grading or other aspects of the development neither propose nor are required to provide public improvements.
7. The grading or other aspects of the development do not propose cross lot drainage or major drainage improvements.
8. If the proposed grading is for removal and recompaction of unsuitable soils under a building footprint, and the proposed depth of excavation is four feet or less, a simplified grading permit may be authorized for grading up to 750 cubic yards. **Additional inspection fees will be assessed for grading in excess of 250 cubic yards.**

What must be submitted?

1. Seven (7) copies of the grading plan. Use D-size (24" X 36") sheets with City standard title block, standard title sheet, and grading notes. The plan must be prepared, stamped and signed by a California Registered Civil Engineer. At a minimum, the grading plan shall include:
   a. Existing and proposed ground contours and spot elevations;
   b. Cross sections (to scale) showing existing and proposed grading, property lines, adjacent properties and improvements, and any adjacent public improvements;
   c. Existing and proposed drainage;
   d. Proposed Best Management Practice storm water pollution control measures for the post-construction phase of the project in conformance with the City standards;
   e. Existing and proposed impervious surface areas;
   f. Existing and proposed landscape materials; any trees or vegetation to be removed;
   g. Existing and proposed building footprints, including any buildings proposed for removal; and
   h. Interim erosion control measures on a separate Erosion Control Plan sheet.
2. A completed Engineering Development Application signed by the property owner or agent.
3. A completed Stormwater Intake Form (SWQMP) for all development projects.
4. **Payment of the plan review and permit fee**. Additional inspection fees may be required for grading in excess of 250cy. **A required $2000 security deposit will be held until approval of the final As-Built plans**.
5. Two copies each of the current title report and grant deed for the subject property.
6. Any additional items required in order to verify compliance with applicable City codes and regulations.

The final simplified grading plan shall be plotted on Mylar material. All owner, engineer, and required department signatures are required prior to final approval by the City Engineer.

If it is found prior to plan/permit approval or during construction that the project does not meet the above-mentioned requirements, the applicant may be required to obtain a full grading plan/permit at the discretion of the City Engineer.

If changes are proposed to an approved simplified/minor grading plan, a construction change shall be submitted to and approved by the Engineering Division in the normal manner and shall be charged the normal construction change fee.

Please feel free to contact the Engineering Division at 760-633-2770 with any questions.

GRADING GUIDELINES
PERMITS AND ENVIRONMENTAL REVIEW

Section I: When a Grading Permit is NOT Required:

Pursuant to Section 23.24.090 of the City's Grading Ordinance, an applicant is not required to obtain a grading permit if all of the following criteria are met:

A. The land area which is disturbed or filled is 10,000 square feet or less.

B. The effected natural and finished slopes are less than 25% gradient and the grading could not result in an adverse condition to existing or proposed structures, neighboring properties, public rights-of-way or storm water pollution control devices. (Ord. 2008-03)

C. The volume of soil or earth materials stored, graded, moved, replaced, imported, exported or otherwise disturbed is 50 cubic yards or less. (Ord. 2008-03)

D. Rainwater runoff is diverted, either during or after construction, from an area smaller than 5,000 square feet.

E. An impervious surface, if any, of less than 5,000 square feet is created.

F. No drainageway is blocked or has its stormwater carrying capacities or characteristics modified.

G. The activity does not take place on an inland or coastal bluff, within 100 feet by horizontal measurement from the top of an inland or coastal bluff, the bank of a watercourse, the mean high water-mark (line of vegetation) of a body of water or within the wetlands associated with a watercourse or water body, whichever distance is greater. (Ord. 2008-03)

H. Retaining wall constructed six feet or lower measured from the top of the wall to the lowest adjacent grade. (Ord. 2008-03)

I. Grading is proposed for a development that is not classified as a priority project for post construction storm water pollution control. (Ord. 2008-03)

J. No clearing and grubbing of vegetation and no disturbance of land within an environmentally sensitive area are proposed. (Ord. 2008-03)

A grading permit is not required for excavation which is strictly limited to that below the finished grade of a building (for basements or footings), below a retaining wall for footings, or excavation for a swimming pool, septic tank, or similar below-ground structure authorized by a valid building permit. The use of such excavated material as fill, however, may require a grading permit, as determined by criteria above.

Section II: Environmental Review of Grading Plan Applications

The Planning and Building Department shall determine if environmental review is required prior to submitting the grading plans to the Engineering Services Department for processing. Grading plans will not be accepted by Engineering Services unless environmental clearance has been obtained from Planning and Building.

Section 23.24.110 of the City's Grading Ordinance provides that all grading permit applications shall be reviewed by the Planning and Building Department, whereupon a determination will be made as to whether environmental review will be required. If such review is required, the developer must complete and submit an application for an Environmental Initial Study (EIS) to the Planning and Building Department along with the associated deposit amount. The Planning and Building Department shall than determine the appropriate form of environmental review given the project particulars, i.e., Negative Declaration or Environmental Impact Report. Whichever form environmental review takes, all documentation shall be prepared in accordance with the California Environmental Quality Act (CEQA) as well as the City's CEQA Implementation Guidelines and environmental processing procedures. The environmental review process shall be completed pursuant to CEQA prior to issuance of the grading permit.

Section III: California Coastal Commission Review

No grading permit shall be issued for a project or development within the California Coastal Zone without evidence of an approved Coastal Act permit or a certificate of exemption from Coastal Act requirements granted by the Coastal Commission. Regardless of City requirements for grading permits, any grading activity in the Coastal Zone is subject to review for conformance with the Coastal Act. Therefore, any person proposing to grade within the Coastal Zone should contact the California Coastal Commission as to permitting requirements.

Section IV: Grading Permit Application and Plans

A: Preparation of the Grading Plan

Grading plans are to be prepared on D-size (24" x 36") sheets with the City title block by a Registered Civil Engineer. The City standard title block is on the City website, www.CityofEncinitas.org . When approved by the City to do so, the grading plan shall be printed on mylar sheets and all signatures but the signature of the Engineering Department shall be obtained by the applicant. The complete mylar plan is submitted to the Engineering Department for the final approval signature.

The following information is to be included on the grading plan. Further information on formatting plan requirements can be found in the Engineering Design Manual, Chapter 3 on the City website.

1 *GENERAL INFORMATION.*

The grading plan must include the Standard Grading Notes, Standard Erosion Control Notes, and Storm Water Pollution Control Notes presented in Appendices 3.3, 3.4, and 3.5 of the Engineering Design Manual, available at www.CityofEncinitas.org . A sample grading title sheet is included as Appendix 3.2 and can be found in CAD format on the City website.

1.1 Complete Legend.

1.2 Property Lines and Easements for the existing and proposed condition for the subject property and the adjacent properties, shown in their true locations. Show bearings and dimensions as well as recording or other source information for easements.

1.3 Setbacks as per the Municipal Code shall be shown.

1.4 Topography, both existing and proposed, shown with spot elevations and contour lines. Areas sloped less than 2% shall be shown with 1' contours; other areas shall be 2' contours. The elevation information shall be based upon a City-approved benchmark, NAVD 88 datum. Contours shall extend a minimum of 50' beyond the property boundaries on all sides, or as required to adequately show onsite and offsite drainage.

Average slope shall be determined by using the following formula, in which S is the average slope (%), I is the contour interval (ft), L is the length of the contours (ft), and A is the total site area (acres):

$$S = \frac{(0.0023) \times (I) \times (L)}{A}$$ Where:

1.5 Details, Profiles, and Cross Sections as necessary to clearly show proposed improvements.

2 *EARTHWORK.*

2.1 Cut, Fill, and Slope Undulation. Top and toe of existing and proposed slopes shall be shown. In accordance with Chapter 23.24 of the Municipal Code, the maximum allowable cut and fill slope gradient is 2:1 horizontal to vertical.

2.2 Bounds of Any Proposed Remedial Grading.

2.3 Building Pads and proposed drainage for the pads.

2.4 Boundaries of Undocumented Fill Material, if any exists onsite.

2.5 Contaminated Material with contaminant levels in excess of the thresholds established by San Diego County shall be shown on the plan with the type of anticipated contaminant labeled.

3 *DRAINAGE.*

3.1 Existing Facilities with drawing numbers whenever available, shown with size, slope, length, material, invert, flowline, and top of grate elevations, as applicable. Label each facility "public" or "private".

3.2 Proposed Facilities shown in plan view and in profile with size, slope, length, material, invert, flowline, and top of grate elevations, as applicable. The City Engineer may not require a profile for simple, private single family drainage systems. Label each facility "public" or "private". Private landscape drainage systems are required to be shown.

3.3 100-Year Floodplain and Floodway as shown on the most recent Flood Insurance Rate Map (FIRM).

4 *DRIVEWAYS AND HARDSCAPE.*

The grading plan shall include all existing and proposed hardscape such as driveways, sidewalks, and proposed patios. A typical cross-section through the driveway showing the cross-slope and the pavement section shall be provided on the grading plan.

4.1 Grades. Finish surface elevations shall be shown.

4.2 Driveway Surfacing with surface protection as provided by gravel, pavement, and pavers is required for all driveways.

4.3 Stormwater Treatment for Hardscape Areas, with stormwater runoff from all hardsurface areas including driveways, patios, pathways, pool hardscape, and any other hardscape areas routed to landscape areas for stormwater treatment.

4.4 Hardscape Proposed without Earthwork. A permit will be required for the construction of hardscape areas in excess of 500 square feet even if no earthwork is associated with the proposed hardscape, at the discretion of the City Engineer. Refer to Municipal Code Section 23.24.105. Resurfacing or maintenance of existing paved surfaces are exempt from this requirement.

5 *RETAINING AND FREESTANDING SITE WALLS.*

The grading plan shall depict all existing and proposed retaining and site walls as well as walls on the adjacent properties within a distance equal to

the maximum proposed excavation or 10' of the property line, whichever is greater. Elevations at the top of wall, top of footing, and at finish grade at the bottom of wall on either side of the wall shall be indicated.

5.1 Standard and Specially Designed Walls. Proposed retaining walls shall utilize the San Diego Area Regional Standard Drawings (SDRSD) designs. If an SDRSD design is not suitable for the proposed development, a specially designed wall may be proposed. The specially designed wall shall be reviewed and approved by the City's third-party structural consultant, at an additional cost to the applicant, consistent with the approved fee schedule.

6 *STREETS, ALLEYS, AND STREET IMPROVEMENTS.*

6.1 Adjacent Street Easements and Rights-of-Way for adjacent public and private streets and alleys, labeled with the width on either side of centerline in at least two places, and marked "public" or "private".

6.2 Right-of-Way Dedication Required. Any required right-of-way dedication shall be shown on the grading plan with recording date and document number. The grant of easement is required to record prior to issuance of the grading permit.

6.3 Existing and Proposed Street Improvements.

6.4 Existing and Proposed Encroachments. An encroachment permit is required for the construction of private or non-standard improvements within the public right-of-way or public easements.

6.5 Trees Within Public Easements and Rights-of-Way to be shown and labeled as "to be removed" or "protect in place".

7 EXISTING AND PROPOSED UTILITIES.

7.1 Water Main and Service labeled as being within either San Dieguito Water or Olivenhain Municipal Water District. Projects within the jurisdiction of the Olivenhain Municipal Water District must be processed separately with OMWD.

7.2 Sewer Main and Service labeled with the record drawing number, unless a record is unavailable. At the discretion of the City Engineer, a property will be required to connect to the public sewer system and in some cases to extend the sewer main. Projects within the jurisdiction of Leucadia Wastewater District (LWD) must be processed separately with LWD.

7.3 Septic Systems shown with existing/ proposed septic tanks, tight lines, vertical pits, trenches, and/or leach lines. If the City Engineer allows a

septic system, the application must be processed separately with the County of San Diego Department of Environmental Health.

7.4 Overhead Utilities within the subject property or within any easement contiguous with the subject property shall be shown, with pole numbers given and facilities labeled as "protect in place" or "to be removed". Utility undergrounding requirements are discussed in Chapter 23.36 of the Municipal Code.

8 ***PERMANENT STORMWATER QUALITY FEATURES.***
Details and cross-sections shall be provided as necessary for plancheck, construction, and to the satisfaction of the City Engineer. Schematic representations will not suffice. The location of any roof drain system shall be shown.

9 ***BUILDING FOOTPRINTS.***
When structures are proposed, the building footprints shall be shown on the grading plan with basement or raised foundation areas noted. Distances from the face of wall to any proposed slope shall be labeled.

10 ***SWIMMING POOLS AND POOL HARDSCAPE.***
Any proposed swimming pool shall be shown on the grading plan. The proposed pool hardscape shall also be shown, complete with the drainage and the stormwater treatment for the runoff from the pool area.

Specialty plans such as landscape, shoring, phasing, bluff stabilization, groundwater discharge and treatment, or traffic control plans may be required prior to grading plan approval, at the discretion of the City Engineer. See the Engineering Design Manual, Chapter 3, on the City website for additional information.

B: Items to be Submitted with the Grading Plan Application

Please refer to the attached Grading Plan Initial Submittal List. Elaboration upon the items required can be found in Section 3.600 of the Engineering Design Manual, available on the City website. Incomplete applications may not be accepted by the City.

C: Requirements for the Erosion Control Plan

All grading plans must include an erosion and sediment control plan meeting the standards of the City of Encinitas consistent with the City of Encinitas Best Management Practice manual. A brief outline of requirements is presented in Section 3.500 of the Engineering Design Manual.

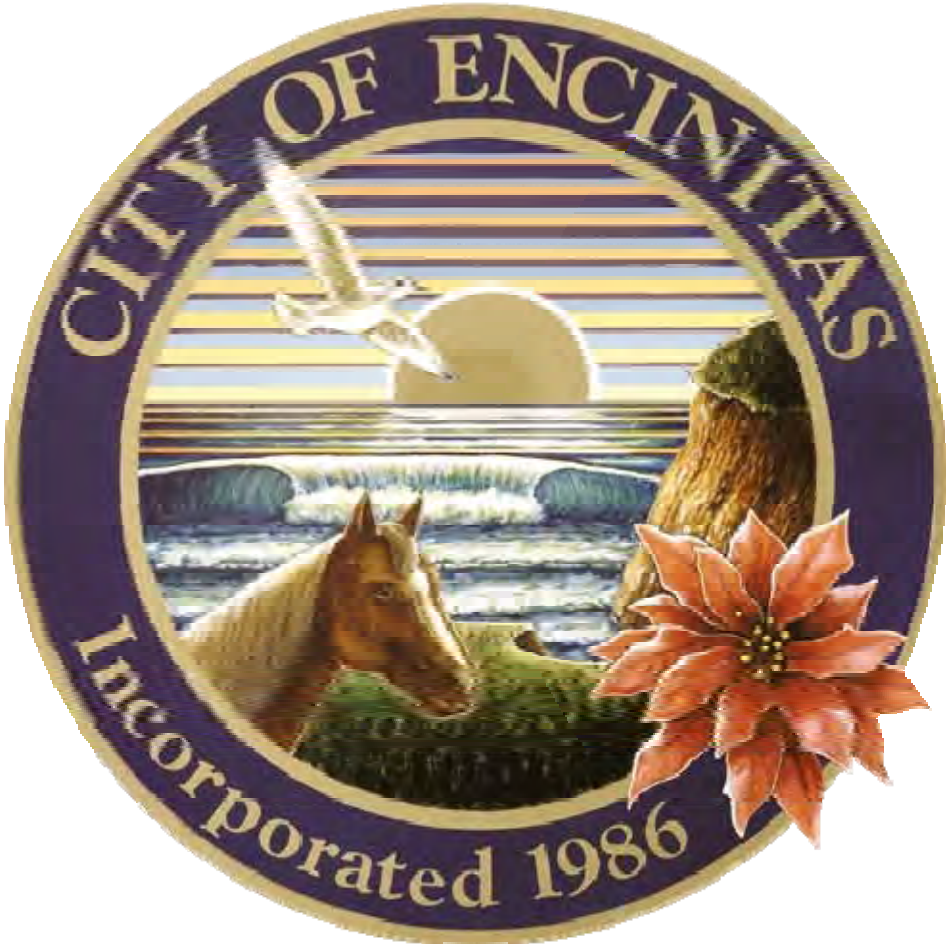
D: The Grading Plancheck and Permit Process

A flowchart of the plancheck and inspection processes is attached to this packet. The plancheck process commences with the initial submittal by the applicant. City staff review the applications in the order they are received; the review process is described in detail in Section 2.500 of the Engineering Design Manual, available at www.CityofEncinitas.org. Consult City staff for a current plancheck turnaround time.

Prior to permit issuance, the applicant will be required to post with the City security to guarantee the performance of the project and to pay inspection fees. Information can be found in Section 2.500 of the Engineering Design Manual.

Once a permit has been issued, changes to the work proposed are not allowed without prior authorization from the City Engineer. To request a change, redline prints of the proposed construction change are submitted to the City as described in Section 2.500 of the Engineering Design Manual.

Engineering Design Manual Section 2.600 provides information on the construction process, commencing with the preconstruction meeting and including rough grade approval, building permit clearance, partial and complete security releases, Engineering field clearance for building occupancy, and preparation of as-built drawings.



CHAPTER 4: SEWER DESIGN REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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RESOLUTION 2009-42

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING CHAPTER 4 OF THE ENGINEERING DESIGN MANUAL

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the first six chapters of the Engineering Design Manual have been made available for review by members of the public and the professional community in public workshops and on the City of Encinitas web page; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF CHAPTER 4 OF THE ENGINEERING DESIGN MANUAL

Chapter 4 of the Engineering Design Manual, Attachment 1 to this resolution, is hereby adopted by the City Council and is to be a comprehensive guide to the policies and processes for processing sewer designs.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of Chapter 4 of the Engineering Design Manual will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the Design Manual will not directly result in development; any development permit processed as a result of the policies and processes contained within the Engineering Design Manual may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

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CHAPTER 4

SEWER DESIGN REQUIREMENTS.

4.100 GENERAL INFORMATION.

The City Engineering Department reviews and approves designs for sewer improvements. The intent of this chapter is to describe City of Encinitas sanitary sewer design criteria and permitting. Sanitary sewer modeling and design requirements are discussed in Sections 4.200 and 4.300 below. Information on sewer easements, permits, and sewer reimbursement districts is presented in Sections 4.400, 4.500, and 4.600 respectively.

The City of Encinitas is served by three sewer agencies: Cardiff Sanitation District (CSD), Encinitas Sanitary District (ESD), and Leucadia Wastewater District (LWD). The Cardiff Sanitation and Encinitas Sanitary Districts are now administered by the City, but billing and fees remain different for the two districts. Leucadia Wastewater District is a separate agency from the City and must be contacted separately for that district's requirements. The requirements discussed herein pertain only to the districts administered by the City, CSD and ESD. A map of the areas included in each of the three sewer districts is included as Appendix 4.8 of this manual.

Because of the unique nature of each sewer project, the information presented here is intended as a guideline for the minimum requirements of the City of Encinitas; more stringent requirements may be applied. Deviations from the criteria herein will be allowed with advance written approval by the City Engineer.

4.101 *DEFINITIONS, ABBREVIATIONS, AND TERMINOLOGY.*

Certain words and phrases used in this manual are defined as set forth below. All definitions provided in the City of Encinitas Municipal Code shall also be applicable to this

manual, and said definitions are hereby incorporated by this reference.

A. ADWF: shall be used as an abbreviation for "Average Dry Weather Flows".

B. CFS: shall be used as an abbreviation for "Cubic Feet per Second".

C. CSD: shall be used as an abbreviation for "Cardiff Sanitation District".

D. EDU: is used as an abbreviation for "Equivalent Dwelling Unit". EDUs are used as a method for converting various kinds of sewer usages to an equivalent multiple of residential dwelling unit usage.

E. ESD: shall be used as an abbreviation for "Encinitas Sanitary District".

F. Infiltration: shall mean the total extraneous flow entering a sewer system, excluding sanitary sewage, because of poor construction, corrosion of the pipe, ground movement or structural failure through joints, porous walls or breaks.

G. Inflow: shall mean the extraneous flow which enters a sanitary sewer from sources other than infiltration, such as roof drains, basement drains, land drains or manhole covers.

H. Interceptor Sewer: shall be used to mean a publicly maintained sewer ranging from 10 to 30 inches in diameter and which collects the sewage from public sewer mains and conducts such sewage to a sewer trunk or point of treatment.

I. LWD: shall be used as an abbreviation for "Leucadia Wastewater District".

J. PDWF: shall be used as an abbreviation for "Peak Dry Weather Flows".

K. Private Sewer: shall mean any sewer serving more than one property, not lying within any public sewer easement or right-of-way, and not maintained by the City.

L. Public Sewer: shall be used to mean any sewer, other than a sewer lateral, which has been constructed in a public street, alley, or other public right-of-way, or in a public sewer easement, and is proposed to be a part of the sewer system publicly maintained by the City.

M. Outfall Sewer: shall mean a major sewer that receives treated wastewater from a treatment plant and carries flows to a point of disposal.

N. Sewer Lateral: shall mean a sewer pipe conveying wastewater from the private connection point to the public sewer main or private sewer. The private property owner is entirely responsible for the repair and maintenance of the entire sewer lateral serving his or her property. Permits are required for any work within public rights-of-way or easements.

O. Sewer Main: shall be used to mean a publicly maintained sewer pipe to which sewer laterals are joined. The term "sewer main" shall be used herein to describe requirements pertaining to sewers generally; the terms "interceptor sewer" and "trunk sewer" shall be used when the requirements for larger sewer pipes differ from those for the typical 8-inch sewer main.

P. SFR: shall be used as an abbreviation for "Single Family Residence".

Q. Trunk Sewer: shall be used to mean a publicly maintained sewer pipe 30 inches or more in diameter and having tributary sewer mains and interceptors.

4.102 *STATUTES AND REQUIREMENTS.*

Sewer designs and plans shall conform to all of the following:

A. City of Encinitas Municipal Code.

B. Requirements as specified in the associated Conditions of Approval, if any.

C. County of San Diego Regional Standard Drawings.

D. Standard Specifications for Public Works Construction ("Greenbook") specifications.

E. Requirements and guidelines as specified in this manual.

F. Staff Policies.

G. Generally accepted engineering principles and practices.

H. State of California Department of Health Services specifications.

4.200 SEWER STUDY AND SEWER FLOWS.

A sewer study may be required at the discretion of the City Engineer when a proposed development intensifies land use from the existing condition, when the project has the potential to generate additional sewer flow, when the existing sewer infrastructure is insufficient to support the project, or when the sewer infrastructure is prone to failure due to the inadequacy of a portion of the sewer system.

The sewer study shall address:

A. The existing condition, in order to identify existing deficiencies in the system;

B. The condition with the proposed development, in order to identify additional deficiencies created by the proposed development; and

C. The General Plan ultimate land use condition, in order to identify the ultimate pipe size required for the ultimate improvements and condition.

The sewer study shall be submitted to the Engineering Department for review and approval. Most often, projects required by the Engineering Department to perform a study shall satisfactorily complete the study prior to the issuance of any discretionary permits for the project. The sewer study shall follow the methodology outlined in this chapter. If computer models are utilized to prepare the sewer study, the program name together with a brief description of the methodology, organization of the output data, and input parameters used in the program shall be provided to the City Engineer.

4.201 *GENERAL SEWER FLOW CONSIDERATIONS.*

Each service area will have unique characteristics which may preclude the use of a uniform approach to sewer flow calculations. However, the information presented in this manual shall be used for the preparation of the sewer flow

calculations unless a more detailed analysis is authorized by the City Engineer.

The following criteria shall be evaluated to project wastewater flows; each is discussed in greater detail later in this section.

A. Tributary Areas.
B. Estimation of Ultimate Population.
C. Ultimate Land Use.
D. Flow Types.
   1. Per-capita Flows
   2. Residential Flows
   3. Commercial Flows
   4. Industrial flows
E. Major Point Source Discharges.
F. Inflow and Ground Water Infiltration.

4.201.1 Tributary Area. The tributary area of a sewer shall include all areas that will contribute to the flow in the sewer system, including flows from the ultimately developed service area and basin to basin flow routings. Tributary areas may be limited by topography as well as natural or human-made boundaries. Flows to the point of connection at the main line shall be estimated and included. The boundaries of the tributary area used in the sewer design shall be submitted to the City on a plat also showing the topography of the area, any existing sewer facilities, and existing or proposed sewer connections.

4.201.2 Estimation of Ultimate Population. The population of the tributary area is the basis for the sewer design flow calculations. The population estimate shall be based upon the proposed development and the ultimate land use for the service area. The population shall be estimated as accurately as possible using the most recent information.

4.201.3 Ultimate Land Use. The type of land use defines both the population densities and the type of contributors within the areas tributary to the sewer. Land use considerations shall be based upon the ultimate use and zoning maps. A field

review shall be utilized to verify the reasonableness of the projections.

4.201.4 Flow Types. The type of contributor, residential, commercial, or industrial, determines the level of flow that may be anticipated from each contributor. The flow rates may be determined from the ultimate land use according to the table presented in Appendix 4.1 of this manual.

Industrial flow may vary significantly with industry type, size, and method of wastewater discharge. The design engineer shall identify any industrial uses within the service area and shall determine the magnitude of the industries' wastewater contributions to the sewer. The determination shall be reviewed and approved by the City Engineer.

4.201.5 Major Point Source Discharges. Major point source discharges include flows from institutional, industrial, and commercial establishments. Existing major point source discharges within the tributary area shall be identified, and the engineer shall confirm the exact discharge location of the major point source. Potential major discharges from future point sources shall also be incorporated into the design flows.

4.201.6 Inflow and Ground Water Infiltration. The sewer design capacity shall include an allowance for extraneous flows which inevitably become a part of total flow. These flows include ground water infiltration through defective pipes, joints, manholes, and cleanouts as well as inflow from cross connections.

4.202 *SEWER FLOW CALCULATIONS.*

All new or replacement sanitary sewers shall be designed with size and flow capacity as needed to accommodate the ultimate conditions of the areas they serve. In certain cases in which the flow in an existing sewer main is increased by proposed developments or improvements, the project may be required to upgrade the existing system.

4.202.1 Peaking Factor. The sewer design flows may be calculated based upon peak dry weather flows. Use of the following equation shows the relationship between average dry weather flows (ADWF) and peak dry weather flows (PDWF) expressed in cubic feet per second (CFS):

$$Q_{PDWF} = 2.64 \, (Q_{ADWF})^{0.905}$$

4.202.2 Flow Contributions from Residential Populations. Flows from residential populations shall be based upon the ultimate density with the number of people per household determined as follows:

Residential Dwelling Unit = 3.5 people per unit

Accessory Unit = 70% of a dwelling unit =
(0 .70) x (3.5 people per unit) = 2.45 people per unit

Daily per capita residential sewer flow contributions shall be based upon 80 gallons per capita, per day (gpcd). The City of Encinitas bases sewer flow calculations on the concept of Equivalent Dwelling Units (EDUs) which converts various kinds of sewer usages to an equivalent multiple of residential dwelling unit usage.

1 EDU = (3.5 people/ residential dwelling unit) x 80 gpcd

Wastewater discharge fees are assessed as a predetermined sum per EDU multiplied by the number of EDUs of the proposed usage. Reference Municipal Code CHAPTER 18.08 for information on EDUs and Appendix 4.4 for information on the wastewater discharge fee.

4.202.3 Flow Contributions from Non-Residential Uses. Flow contributions from non-residential uses shall be determined consistent with the average daily sewer flow projections listed in Appendix 4.6.

4.202.4 Sewer Flow Table. The table included as 4.4 of this manual may be utilized for sewer flow calculations if, at the discretion of the City Engineer, the complexity and scope of the sewer study do not necessitate computer modeling.

4.300 SEWER SIZING AND MINIMUM REQUIREMENTS.

4.301 *SEWER DEPTH OF FLOW REQUIREMENTS.*

Sewer pipes shall not be designed to flow at full capacity in order to allow for the flowage of sewer gases. The gases flow in the space between the wastewater surface and the top of pipe. A sewer pipe full with wastewater inhibits the free flow of air and sewer gases, creating a pressure which pushes these gases through openings such as maintenance holes. The sewer gases may be combustible or toxic and have a strong undesirable odor. To avoid the odor problems associated with the sewer gases, sanitary sewers shall allow for the transport of the air and gases by designing the sewer to run less than full. Sewer mains and interceptors less than 16 inches in diameter shall be designed to flow a maximum of half (50%) full, and interceptor and trunk sewers of 16 inches or more in diameter shall be designed to flow a maximum of three-quarters (75%) full. At the discretion of the City Engineer, improvement to or upgrading of an existing sewer system may be required if the proposed development or improvements result in the sewer main flowing more than 50% full (75% for interceptor and trunk sewers 16 inches in diameter and larger).

4.302 *GENERAL SEWER DESIGN CRITERIA.*

The following general criteria apply to the design of sewer systems in the City.

A. Alignment. The preferred location of the sewer main is on the centerline. In cases in which a raised center median exists, the sewer shall be constructed outside of the median, unless otherwise approved by the City Engineer. Where the sewer is located along the street or alley centerline and the centerline is a curve, the sewer shall be constructed as a series of straight segments connected by manholes. Alternately, the sewer may be constructed along the centerline with a minimum radius of 200 feet and in accordance with the manufacturer's recommendations. Vertical curves and horizontal curves less than 200 feet are discouraged

and shall be approved in writing in advance by the City Engineer.

B. Depth. The sewer main shall be buried a minimum of 5 feet below grade to the top of the pipe and a maximum of 20 feet below grade. Deeper sewer mains may be constructed if allowed by the City Engineer in writing. An increase in depth will result in one or more of the following requirements: a stronger pipe material, special beddings, concrete encasement and/or additional easement width.

C. Structural Design Requirements. Structural design may be required by the City Engineer if the clearance between the sewer and another utility is 18 inches or less. When a sewer pipe crosses another pipe or utility trench, the sewer pipe section shall be designed to span the utility trench and must be continuous for a minimum of 10 feet on either side of the trench or pipe centerline. A detail to be used in the case in which pipes must cross is included in Appendix 4.3.

D. Location. Mainline sewers shall be located along street or alley centerline whenever possible. Sewers mains shall be located beneath the street pavement, not within the parkway. The sewer trench shall not be allowed to extend underneath the sidewalk or curb and gutter areas.

E. Manhole Construction. Manholes shall be designed and installed as per the current San Diego Regional Standard Drawing specification. The diameter of the base ring of manholes shall be 60 inches. The minimum diameter of the upper manhole rings shall be 36". The inside of the sewer manholes shall be coated with epoxy in order to prevent the deterioration caused by the sewer gases. In cases in which existing manholes must be raised, such as for a street pavement overlay, plastic riser rings shall not be allowed. Drop manholes shall not be allowed for public sewers; an alternative manhole design is included in Appendix 3.10 of this manual.

F. Manhole Locations. Manholes shall be provided at intersections of mains, at changes in slope, size, and horizontal or vertical alignment, and at a maximum of 350 feet on center. The use of horizontal and vertical curves is discouraged; the utilization of both a horizontal and a vertical curve or a reverse curve between manholes shall not be allowed. A manhole with a 5' stub or a cleanout, based on the City Engineer's discretion, shall be installed at the end of all sewers. Manholes shall be installed at the location of intersection of a proposed main with an existing one.

G. Material. Sewers shall be constructed of Polyvinyl Chloride (PVC) with a minimum rating of SDR 35. Alternate materials may be utilized with prior written approval from the City Engineer. All pipes shall be designed to withstand H-20 highway loading.

H. Private Sewer. Private sewer mains are not allowed unless approved in advance by the City Council. In the case in which a private sewer is accepted, the sewer shall be privately maintained and a private sewer easement shall be granted over the private sewer.

I. Radius. The minimum radius for a curved section of 8-inch pipe shall be 200 feet. Larger pipes may require a larger radius. The manufacturer's specifications showing that the sewer pipe joints can allow the deflection necessary to achieve the radius shall be provided to the City.

J. Separation From Water and Reclaimed Water Lines. For special designs and restrictions for locations in which a sewer must cross a water or reclaimed water main, please refer to Appendix 4.3.

K. Size. The sewer main shall be sized according to the provisions of this chapter. The minimum sewer main pipe size shall be an 8" inside diameter.

L. Slope. Sewer pipes shall be designed with a minimum slope of 1%, when possible. Where a 1% slope is not feasible, the City Engineer may allow a minimum of 0.4% slope.

M. Velocity. The minimum design velocity shall be 2 feet per second. The roughness coefficient used in calculations shall be n=0.013. Because PVC sewer mains suffer roughening of the inside pipe surface, the roughness coefficient used for PVC sewers shall also be n=0.013.

4.303 *SEWER MAIN EXTENSIONS AND CONNECTIONS TO THE SEWER.*

4.303.1 Requirement for Connection to Sanitary Sewer. Proposed development projects that trigger public improvement requirements per Municipal Code Section 23.36 shall be required to extend the sewer main and connect to the sanitary sewer unless the project qualifies for one or more of the exceptions described below:

A. Single family residence (SFR) additions of less than 500 SF of habitable and less than 750 SF of combined habitable and non-habitable additions are exempt from sanitary sewer connection provided that the proposed addition does not create a new residential or commercial unit and the septic system has adequate capacity to accommodate the additional flow.

B. SFR additions between 500 SF and 2000 SF of habitable area or 750 SF and 2500 SF of combined habitable and non habitable areas shall connect to sanitary sewer if a sewer main is available adjacent or within the property, at the discretion of the City Engineer. If the sewer main is not extended to the property the City Engineer may require extension of a private sewer lateral to the main.

C. New SFRs on existing legal lots (not in connection with a subdivision), SFR additions greater than 2000 SF of habitable area or greater than 2500 SF of combined habitable and non-habitable area, and commercial additions between 500 SF and 2000 SF which could create additional sewer flow shall extend the sewer main if required and connect to the sanitary sewer system. The main extension is normally equal to the

property frontage contiguous to the sewer main or the length necessary to bring the sanitary sewer to the nearest boundary of the subject property, whichever is greater. The City Engineer may allow other acceptable sewer disposal/ improvements if the sewer main extension required to service the property exceeds the length of the property frontage contiguous to the sewer main.

D. In addition to the requirement to extend the sewer main along the property frontage and/ or the length of the property frontage and to connect to the sanitary sewer, multifamily residential, commercial, and subdivision projects may be required to provide an offsite (beyond the property) sewer main extension. In cases in which the proposed residential parcels are one acre or greater in size, sewer is not available for a main extension, and the proposed lots meet all County Department of Environmental Health requirements, an alternate method of sewage disposal may be approved by the City Engineer.

E. The City Engineer may require a project with a failing septic system to connect to sanitary sewer regardless of the project scope. The County Department of Environmental Health shall review and approve projects proposing the expanded use of an existing septic system or the construction of a new septic system. The approval shall be obtained prior to issuance of a grading or building permit, whichever is issued first. As per General Plan Policy 1.12, development within unsewered areas shall only be allowed after testing proves that septic systems would not create potential pollution, and all development within unsewered areas shall be limited to parcels of at least one acre in size.

4.303.2 Requirement for Separate Sewer Laterals. Separate sewer laterals are required for each lot, but a separate sewer lateral is not required for an approved accessory unit to a single family dwelling located on the same property.

Projects proposing a condominium form of ownership for an existing or proposed development shall provide

separate lateral connections for each condominium. A shared lateral may be allowed by the City Engineer for commercial or multi-family residential projects when a homeowner's association or other acceptable legal entity is established to ensure the maintenance of the sewer lateral and assessment of costs into perpetuity.

4.303.3 Pumped Sewer Laterals. Private sewer pumps shall be allowed only when the City Engineer determines than no other alternatives exist or that an unnecessary hardship would be created by the requirement to provide a gravity sewer lateral.

In the case in which a sewer pump is proposed, the applicant shall provide a design submittal to the City for review and approval. The submittal shall be prepared by a registered Civil Engineer and shall include the proposed pump specifications and details. The City shall review and approve the application prior to issuance of a sewer discharge permit and/ or prior to issuance of a grading or building permit, if applicable.

The design for a pumped system shall include a private manhole located within the private property. The sewer lateral shall be pumped to the private manhole and allowed to gravity flow from the manhole to the sewer main. The connection of a pressure lateral directly to the sewer main will not be allowed. A detail for the design of the required private manhole is included in Appendix 3.10 of this manual.

4.303.4 Permits for Construction of a Sewer Lateral. A project proposing to connect to the sanitary sewer system is required to obtain permits and pay required fees. The permits required for a connection within the public right-of-way or a private street to an existing main include the wastewater discharge and sewer construction permits issued by the Engineering Department and the plumbing permit issued by the Building Department. A sewer construction permit is not required for a connection to a sewer lateral which has been stubbed out from the main to the property line, provided that no work within the public

right-of-way or a public easement is necessary. Projects with an existing connection to the sewer main proposing to augment usage may be required to obtain wastewater discharge and plumbing permits; the Engineering and Building departments should be consulted to determine which permits are required. The permits and fees associated with the sewer connection or augmentation of sewer usage are discussed below.

A wastewater discharge permit and the associated fees are required when a connection to the public sewer is being added, when a connection to a lateral stubbed out from the main to the property line is being made, and when additional sewer discharge is proposed. The sewer fees for Cardiff and Encinitas Sanitary districts are assessed as indicated in Appendix 4.4. In the case of sewer lateral installation in a new subdivision or connections to a public sewer main extension under construction, the issuance of wastewater discharge permits may be deferred until prior to issuance of any building permits. Properties serviced by Leucadia Wastewater District shall obtain a permit from LWD and shall pay the applicable fees assessed by that district.

A sewer construction permit shall be obtained for a connection to a public or private sewer. Connection to the sewer within the Leucadia Wastewater District requires a permit from LWD and a construction permit from the City if the work is proposed in the right-of-way, City easements, or City-owned properties.

In addition to the above fees, a sewer connection proposed within an area designated as a sewer reimbursement district, reimbursement fees in accordance with Section 4.600 below shall be paid.

4.303.5 Construction Requirements for Sewer Laterals. Sewer laterals shall be a minimum of five feet deep at the project property line in order to ensure adequate depth within the public right-of-way. Laterals shall comply with San Diego Regional Standard Drawing SS-01 through SS-04 and shall be a minimum of four inches in diameter for single family homes and units and six inches in diameter for other uses.

Laterals shall not discharge directly into a manhole and shall have a minimum slope of 2%. Deviation from these requirements shall be approved by the City Engineer in writing. The private property owner is responsible for the maintenance and repair of the lateral serving his or her property from its connection with the public sewer main to its termination on the private property. Permits are required for any work within public rights-of-way or easements.

Sanitary sewer laterals are intended for the purpose of providing a connection of sewer service from one private property to the sewer main. Sewer laterals generally extend across public rights-of-way or public sewer easements. The extension of sewer laterals longitudinally along the street or public easement in order to avoid the construction of a sewer main extension shall not be allowed.

4.303.6 Grease/ Oil/ Sand Interceptors. Fats, greases, and waxes can adhere to sewer structures and appurtenances, obstructing flows, causing system back-ups and potentially storm water pollution. Flows containing such materials shall be pre-treated prior to discharge into the public sewer system by a process or device to remove the materials from the flows. Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature and shall be watertight with easily removable covers that are both watertight and gastight when secured in place. All grease, oil, and sand interceptors are required to be maintained by the owner at owner's expense. Failure to provide or adequately maintain a grease, oil, and sand interceptor when required by the City may result in a citation and an order to comply with the applicable regulations in conformance with Section 18.04.120 of the Municipal Code. All new restaurants and food preparation facilities with the potential of releasing greases into the sewer shall provide grease traps to the satisfaction of the City Engineer. Existing restaurant and food preparation facilities without a grease trap and which propose an addition in excess of 500 square feet shall also provide grease traps.

4.303.7 Unauthorized Sewer Connection and Unauthorized Sewer Discharge. No connections shall be made to the public sewer system without prior submittal of an application for sewer connection/ capacity, payment of applicable fees and reimbursement district costs, if any, and approval of the City Engineer authorizing the connection. No materials, solid or liquid, may be disposed or discharged into the public sewer system without a permit issued by the City.

No discharge of storm water, surface water, groundwater, unpolluted industrial process water, roof runoff, subsurface drainage, or any waters from a cooling system, swimming pool, decorative fountain, or pond shall be allowed. Prior written permission from the City Engineer in conformance with adopted regulations is required for any variations from the prohibitions listed above.

Enforcement measures shall include any steps authorized by law to collect any fees or charges due and possible disconnection of the lateral from the public sewer system. Restrictions regarding the use of public sewers and enforcement measures are discussed in Sections 18.04.080 through 18.04.110 of the Municipal Code.

4.400 SEWER AND ACCESS EASEMENTS.

4.401 *SEWER EASEMENT REQUIRED.*

A minimum 20 foot wide sewer easement shall be granted to the City if the sewer is not proposed within the right-of-way. The sewer easement must be designed to allow truck access over the entire proposed sewer and shall be centered on the sewer main. In special circumstances where a 20 foot wide easement is infeasible, an easement of 15 feet in width may be allowed, at the discretion of the City Engineer.

No grading, trees, walls, fences, structures, or gates are allowed in the sewer easements. Landscape and irrigation that impair truck accessibility will also not be allowed within the sewer easements. Enhanced paving may be allowed within the sewer easement with an encroachment permit provided that the paving is designed to withstand truck loading.

In some cases, a sanitary sewer main may not be available to service a certain area. The City Engineer may require as a condition of sewer connection the dedication of a public sewer easement to facilitate future expansion of sewer infrastructure.

4.402 *SEWER ACCESS EASEMENT REQUIRED*.

If the entire sewer easement is not accessible by trucks due to natural topography, the City Engineer may require an access road to provide maintenance truck access to manholes and certain portions of the sewer system. A public sewer easement a minimum of 20 feet wide shall be granted over the entire access.

4.402.1 Requirements for Access Road. Minimally, sewer easements and access easements must be paved with granular base material to withstand truck loading, allow all-weather access, and provide erosion control. The minimum pavement section shall be six inches of class II base material topped with two inches of ¾" crushed rock for erosion control purposes.

Sewer easements and access easements shall be designed to include a 25' near-level area in front of access holes, and a hammerhead turnaround graded at no more than 5% shall be provided for easements exceeding 250 feet in length. Overhangs such as wires, tree branches, and building eaves shall allow a minimum 15-foot clearance from the road. The minimum centerline radius shall be 36 feet.

4.403 *CONSIDERATIONS FOR SEWER EASEMENT LOCATION AND WIDTH.*

The minimum easement width is 20 feet. In circumstances in which a 20 foot wide easement is infeasible, an easement 15 feet wide may be allowed at the discretion of the City Engineer. Additional width is necessary if a sewer is constructed at a depth greater than nine feet or if the ground longitudinal or cross-slope exceeds 10%, or based upon the special circumstances of the property or the proposed sewer.

Sewer easements should be as far as practical from buildings. Footings and roof overhangs shall not be allowed within an easement. The vertical distance between the sewer and the footing must be such that excavating for sewer construction or repair does not endanger the building; the City may require additional easement width if existing or proposed buildings or structures are located relatively close to the proposed sewer easement. Whenever possible, sewer easements parallel to lot lines shall not straddle the lot line but shall be located entirely on one parcel.

4.403.1 Shared Sewer Easements. Typically, a sewer easement is reserved for the exclusive purpose of a single utility pipe. Within a standard easement, a single sewer shall be constructed at easement centerline to provide room for access and future maintenance.

If multiple pipes will occupy an easement, the City may require additional easement width in order to allow adequate space for maintenance.

Public sewer easements are for the exclusive use of public sewers. The City Engineer shall approve in writing construction of any other utility or use with a public sewer easement. A conflicting use or placement of a utility which impedes maintenance access shall not be allowed.

4.403.2 Sewer Within Private Street. When a public sewer is proposed within a private street, a sewer easement at least 20 feet wide shall be granted over the sewer main in the street. If the private street is not accessible from the public right-of-way without crossing over private property, an access easement to allow City access to maintain the sewer facilities may be required. Sewer access easements are discussed in Section 4.402 above.

4.403.3 Granting of Sewer Easements. Sewer easements shall be dedicated to the public on a map/ parcel map or dedicated by a separate easement document. For information on easements granted on a map, refer to Map Manual Section 1.506.

When an easement is to be granted by a separate document, the City will prepare the easement document language for processing by the developer. The developer shall retain a qualified, licensed civil engineer or land surveyor to prepare the legal description and plat of the sewer easement. Title reports or grant deeds showing the current property ownership shall be provided to the City to assist in the preparation of the easement document. Lenders shall execute a City-approved subordination agreement subordinating their interest in the property to the public sewer easement. The proposed easement shall be surveyed and the traverse tapes submitted to the City for review and approval prior to recordation of the easement. The easement document shall be recorded with the County Recorder prior to issuance of any permit for the sewer construction.

4.500 SEWER IMPROVEMENT PLANS AND PERMITS.

Proposed sewer main improvements must be permitted by a City improvement permit. The applicant shall process with the City a sewer improvement plan. Standard notes for sewer improvement plans are included as Appendix 2.32 of this manual. When all City comments on the plans have been resolved through plancheck, the final drawings will be approved. At that time, a letter will be issued to the applicant detailing the final bond and fee requirements for issuing the permit. Following completion of those requirements, including payment of fees and posting of sureties, the permit will be issued. Information on the improvement permit application, plancheck, approval, bonding, and permitting process can be found in Chapter 2 of this manual.

4.600 SEWER REIMBURSEMENT DISTRICTS

4.601 *GENERAL INFORMATION.*

Pursuant to Health and Safety Code Section 4742.3 and Encinitas Municipal Code Chapter 18.12, when public sewers are installed, and the City Council determines that the sewer is necessary and can serve properties other than the property belonging to the person making the installation, the City Council may approve a sewer reimbursement district. The purpose of the sewer reimbursement district is to allow the developer to recoup a pro-rated portion of the sewer construction costs at such time as one or more of the properties identified in the reimbursement district connect to that sewer system. The option of a sewer reimbursement district is available only for public sewers within public sewer easements or street rights-of-way. Upon the City Council approval of a sewer reimbursement district, the City will collect a reimbursement fee from the property owners connecting to the sewer. The amount of the total reimbursement fee is established based on the original installation costs plus interest and is approved by the City Council.

4.602 *ADMINISTRATION OF REIMBURSEMENT AGREEMENTS.*

The decision to establish a sewer reimbursement district shall be agreed upon by both the City and the developer, and the developer shall agree to the stipulated terms of the reimbursement agreement. The establishment of a sewer reimbursement district may be denied by the City if the developer fails to agree to the terms and policies governing the establishment of a district.

The developer shall be responsible for all of the costs associated with the construction of the sewer main including, but not limited to, construction, easement acquisition, permitting, and administrative costs, and the owner shall pay a fee to the City as compensation for City's costs to administer the agreement. A deposit account shall be established with the City, and an initial deposit in compliance with City requirements shall be made in order to compensate the City for initial time and

expenses until such time as the reimbursement district agreement is finalized.

During construction of the sewer main, the developer shall retain invoices for all items to be included in the reimbursement agreement and evidence of payment of those invoices. The copies of invoices and proof of payment shall be submitted to the City for consideration not longer than 90 days following acceptance of the sewer by the City. Reimbursable costs shall ultimately be approved by the City Engineer and may include payments made by the developer for engineering, surveying, right-of-way or easement acquisition, permits, material testing, construction, inspection, and installation related to the sewer main.

The proposed sewer main shall be designed in accordance with public standards and City requirements and to the satisfaction of the City Engineer. Reimbursement payments for the sewer reimbursement district shall be collected by the City for connections to the sewer made within the term of the agreement.

There are no assurances that the developer will recoup the maximum reimbursement amount or any portion thereof. The number of possible connections used to determine the reimbursement fee is an estimate, and there is no guarantee that all or any of the connections will be made. Parcels will not be responsible for the reimbursement fee if a connection is made after the expiration of the reimbursement district. Likewise, parcels will only be responsible for the reimbursement fee if the parcel connects a lateral directly to the sewer main as identified in the reimbursement district or if the parcel connects to a future extension of that sewer main. If the City collects any reimbursement fees, payment shall be sent to the developer within ninety days of collection of the fee, until the developer has recouped the maximum reimbursement amount or until the agreement expires.

Information on sewer reimbursement districts can be found in Chapter 18.12 of the Municipal Code. Particulars on the establishment of a district and an overview of the process are included in the City administrative manual,

number G042, which is included in this manual as Appendix 4.5.

4.603 ***PROPERTIES INCLUDED IN THE REIMBURSEMENT DISTRICT.*** The developer shall engage the services of a registered civil engineer licensed to perform such work in order to prepare for the City information on which properties could potentially benefit from the construction of the sewer main, including the developer's property or properties. Those properties shall be determined based upon topography, availability of necessary easements, and other factors which would allow or impede the connection of a private sewer lateral to the sewer from each property. Properties which would be required to obtain an easement over private property that has not been guaranteed by the terms of the agreement shall not be included in the district. Properties which may connect only by use of a pumped sewer lateral are not eligible for inclusion in the district. The selection of parcels for inclusion into the reimbursement district is subject to review and approval by the City Engineer.

A preliminary sewer improvement plan shall be submitted to the Engineering Department for review and comment prior to submittal of the sewer improvement plans. The plan shall clearly delineate all properties that will be included in the proposed sewer reimbursement district upon adoption of a Code change by the City Council, the preliminary conceptual plan for the sewer reimbursement district shall be approved by the City Council prior to preparation of the sewer improvement plans and issuance of the improvement permit. Engineering approval of the preliminary or final sewer plans shall not be construed as the City Council approval of the sewer reimbursement district, nor shall it be interpreted as any guarantee whatsoever by City staff relative to the Council action on the proposed sewer reimbursement district.

The number of parcels to be included shall be determined based upon the existing zoning at the time the sewer main is constructed, and shall assume that vacant properties will be developed to the mid-range density allowed by the zoning. If a single lot is assessed for more than a

residential or a commercial unit, the fees will be collected at the time that each individual unit is developed.

In some situations, a parcel may have been included in an existing sewer reimbursement district, but an extension of the main constructed as a part of the reimbursement district may be necessary to facilitate the desired improvement of that parcel. In such cases, the parcel is not exempt from the terms of the reimbursement agreement as originally established and shall make payment of the reimbursement fee prior to establishing a connection to the sewer.

4.604 *CALCULATION OF THE REIMBURSEMENT FEE.*

Once the parcels to be included in the reimbursement district have been agreed upon by both the developer and the City, the per-parcel reimbursement fee may be calculated. The fee shall be calculated by dividing the total sum of costs determined by the City Engineer to be eligible for reimbursement by the total number of potential connections to service unconnected parcels. For example, if the reimbursable costs of the sewer main are $100,000.00 and there are ten potential connections, the reimbursement fee would be $10,000.00 per connection.

At the time that a new connection to the sewer main is sought, a property identified in the district shall make payment for the reimbursement fee together with any other applicable sewer or permit fees prior to issuance of a permit for the connection. The total amount due prior to connection shall be the original pro-rata share for the connection, plus 6% annual simple interest accumulated from the date the reimbursement district is approved by the City Council to the date the City receives payment for the reimbursement fee from each benefited party. The total reimbursement to the developer shall not exceed the maximum reimbursement amount.

The developer's property or properties will be included in the determination of the total number of possible connections. The developer's pro-rata share of the total reimbursement amount shall be deducted from the total reimbursable costs instead of collected at a later time.

APPENDIX CHAPTER 4:
SEWER DESIGN REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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CITY OF ENCINITAS SEWER USAGE TABLE

NOTE: For usage types labeled 'C' or 'W', the sewer discharge is calculated the same as the Commercial usage and the Warehouse usage, respectively. Commercial discharge given on page 4-1, Warehouse on page 4-3.

AUTO REPAIR GARAGE			
AUTOMOBILE SERVICE STATION, 4 OR FEWER PUMPS (GAS, DIESEL, NATURAL GAS)	2	EDU	
AUTOMOBILE SERVICE STATION, EACH DRAIN CONNECTED TO SEWER	0.5	EDU	/ DRAIN
AUTOMOBILE SERVICE STATION, MORE THAN 4 PUMPS (GAS, DIESEL, NATURAL GAS)	3	EDU	
BANK: BRANCH	C		
BANK: HEADQUARTERS	C		
BANQUET RMS/CONFERENCE	C		
BARBER SHOP	C		
BOWLING ALLEY	C		
CAR WASH AND/ OR MOTOR-VEHICLE WASH	C		
CHIROPRACTIC OFFICE	C		
CHURCH [4], PER 150 SEATS OR FRACTION THEREOF	1.5	EDU	/ 150 SEATS
CLINIC: OUTPATIENT	C		
COCKTAIL BAR, 1ST 1-18 SEATS	3	EDU [6]	
COCKTAIL BAR, EACH ADDITIONAL 6 SEATS	1	EDU	/6 SEATS
COLD STORAGE: RETAIL SALES	W		
COLD STORAGE:NO SALES	W		
COMMERCIAL USE [2]: 1st 1000 SF	1.2	EDU	
COMMERCIAL USE [2]: EACH ADDITIONAL 1000 SF OR FRACTION THEREOF	0.7	EDU	
COMMUNITY CARE FACILITY [1], LIC. BY COUNTY DEPT. OF SOCIAL SERVICES, 7-15 BEDS	0.5	EDU	/ BED
COMMUNITY CARE FACILITY [1], LIC. BY DEPT. OF HEALTH W/ MIN OF 16 BEDS	0.5	EDU	/ BED
COMMUNITY CARE HOME [1]: 6 OR FEWER RESIDENTS, INCLUDING RESIDENT STAFF AND HOUSEKEEPERS	1	EDU	

CONSTR. OFFICE	C		
DANCE HALL/ CLUB	C		
FILM PROCESSING	C		
FOOD SERVICE: BAKERY, ICE-CREAM SHOP, OR EQUIVALENT, SALES ON PREMISE ONLY	3	EDU	
FOOD SERVICE: RESTAURANT W/ REUSABLE UTENSILS, SEATING, MIN PUBLIC RESTROOMS (1-18 SEATS)	3	EDU [6]	
FOOD SERVICE: RESTAURANT W/ REUSABLE UTENSILS, SEATING, MIN PUBLIC RESTROOMS, EA. ADD'L 6 SEATS	1	EDU	
FOOD SERVICE: TAKE-OUT W/ DISPOSABLE UTENSILS, NO DISHWASHER, NO PUBLIC RESTROOMS	3	EDU	
FOOD SERVICE: TAKE-OUT/ EAT-IN W/ DISPOSABLE UTENSILS, MIN SEATING, AND PUBLIC RESTROOMS	3	EDU	
GYMNASIUM	C		
HANGAR (AIRCRAFT)	W		
HOSPITAL [1]: COMMUNITY CARE FACILITIES W/ >16 BEDS; LICENSED BY STATE DEPT. OF HEALTH	C		
HOSPITAL [1]: COMMUNITY CARE WITH <6 TOTAL RESIDENTS INCL RESIDENT STAFF AND HOUSEKEEPERS	0.1	EDU	
HOSPITAL [1]: CONVALESCENT, SKILLED NURSING CARE FACIL, PHYSCHOLOGICAL; LIC. BY DEPT. OF HEALTH	0.7	EDU	/ BED
HOSPITAL [1]: SMALL COMMUNITY CARE FACILITY WITH 7-15 BEDS; LIC. BY COUNTY DEPT. OF SOCIAL SERVICES	0.5	EDU	/ BED
HOTEL/ MOTEL [1], PER LIVING UNIT W/O KITCHEN	0.38	EDU	
HOTEL/ MOTEL [1], PER LIVING UNIT WITH KITCHEN	0.6	EDU	
INDUSTRIAL CONDOMINIUM [2], [3]	C		
INDUSTRIAL ESTABLISHMENT	C		
INDUSTRIAL PARK [2], [3]	C		
LAB: COMMERCIAL	C		
LAUNDRIES/ DRY CLEANERS	C		
LAUNDROMAT, SELF- SERVICE	1	EDU	/ WASHER
LIBRARY	C		
MARKET	C		
MASSAGE PARLOR	C		
MEDICAL OFFICE BUILDING	C		

MORTUARY	C		
MUSEUM	C		
POOL HALL, NO ALCOHOL SERVED	C		
POST OFFICE	C		
RECORDING STUDIO	C		
RECREATIONAL FACILITIES	C		
REHABILITATION CENTER (DRUG ABUSE REHAB OR SIMILAR)	C		
RES. ACCESSORY UNIT, PER EACH INDIVIDUAL LIVING UNIT ON SAME LOT	0.8	EDU	/ UNIT
RES. APARTMENT, PER EACH INDIVIDUAL LIVING UNIT ON SAME LOT	0.8	EDU	/ UNIT
RES. MANUFACTURED OR MOBILE HOME ON PRIVATE LOT	1	EDU	/ UNIT
RES. MOBILE HOME & TRAILER PARKS [1], PER EACH INDIVIDUAL SPACE	0.5	EDU	/ SPACE
RES. RECREATIONAL VEHICLE PARK [1], PER EACH INDIVIDUAL SPACE, OCCUPIED OR NOT	0.5	EDU	/ SPACE
RES. SFR, EACH INDIV. DWELLING UNIT	1	EDU	/ UNIT
RESTROOM: PUBLIC OR COMMERCIAL	0.5	EDU	/ FIXTURE
SCHOOL [7] : ELEMENTARY	1	EDU	/ 50 PUPILS [8]
SCHOOL [7]: HIGH SCHOOL	1	EDU	/ 24 PUPILS [8]
SCHOOL [7]: JUNIOR HIGH	1	EDU	/ 40 PUPILS [8]
SCHOOL [7]: TRADE, VOCATIONAL, UNIVERSITY, OR COLLEGE	1	EDU	/ 24 PUPILS [8]
SHOPPING CENTER [5], [3]	C		
STORE	C		
THEATRE [4], PER 150 SEATS OR FRACTION THEREOF	1.5	EDU	/ 150 SEATS
VETERINARY OFFICE	C		
VETERINARY HOSPITAL	C		
VETERINARY KENNEL, CAT AND/ OR DOG	C		
WAREHOUSE	1.0	EDU	/4 FIXTURE UNIT INCREMENT
WINE TASTING ROOM AND/OR KITCHEN	C		

Notes:

General Note: In the case of commercial, industrial, and other establishments not specifically included herein, or then the EDU's specified are not representative of actual flow due to the number of employees or type of operation, the number of EDU's shall be determined in each case by the City Engineer and shall be based upon the estimated volume and type of wastewater discharge.

1 Any accessory facilities such as laundry, dining, recreational areas, residences, etcetera shall be considered separately in addition to the primary use.

2 Commercial, professional, industrial buildings, industrial parks, shopping centers, and establishments not specified herein, and including cases in which occupancy types or usages are unknown at the time of application for service.

3 Portions less than 1000 square feet shall be prorated.

4 Does not include office spaces, school rooms, day care facilities, food preparation areas, etcetera. Additional EDU's will be assigned for these supplemental uses.

5 Shopping center EDU's are based upon square footage, not specific usages.

6 3.0 EDU minimum for the first 1-18 seats. Each additional 6-seat unit will be assigned 1.0 EDU. The number of seats will be equal to 80% of the maximum occupant load for the entire eating area as defined by the current Uniform Building Code.

7 Schools, to include daycare centers, boarding schools, or other combined youth educational, recreational, and residential facilities.

8 Minimum 1.0 EDU; additional EDU's shall be prorated. The number of pupils shall be based upon the average daily attendance during the preceding fiscal year, computed in accordance with the education code of the State of California. Where the school has no attendance during the preceding fiscal year, the City Engineer shall estimate the average daily attendance for the fiscal year for which the fee is to be paid.

9 **For usage types labeled 'C' or 'W', the sewer discharge is calculated the same as the Commercial usage and the Warehouse usage, respectively. Commercial discharge given on page 4-1, Warehouse discharge given on page 4-3.**

CITY OF ENCINITAS SEWER STUDY TEMPLATE

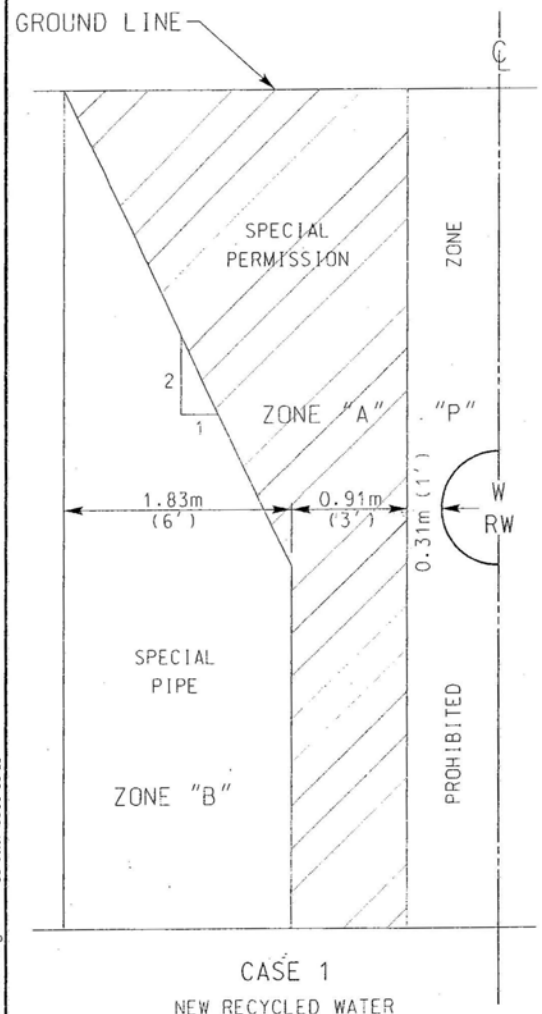
LINE	BASIN DESCRIPTION	POP PER D.U.	D.U.'S ADDED	NO. OF D.U.'S	POPULATION SERVED	TOTAL POP SRVD	PEAK/AVG RATIO	FLOW RES. MGD	FLOW RES. CFS	COM. FLOW	PEAK COM FLOW	TOTAL PEAK FLOW MGD

TOTAL PEAK FLOW CFS	DIA IN	DESIGN SLOPE %	DEPTH IN	DEPT/DIA RATIO	VELOCITY FPS

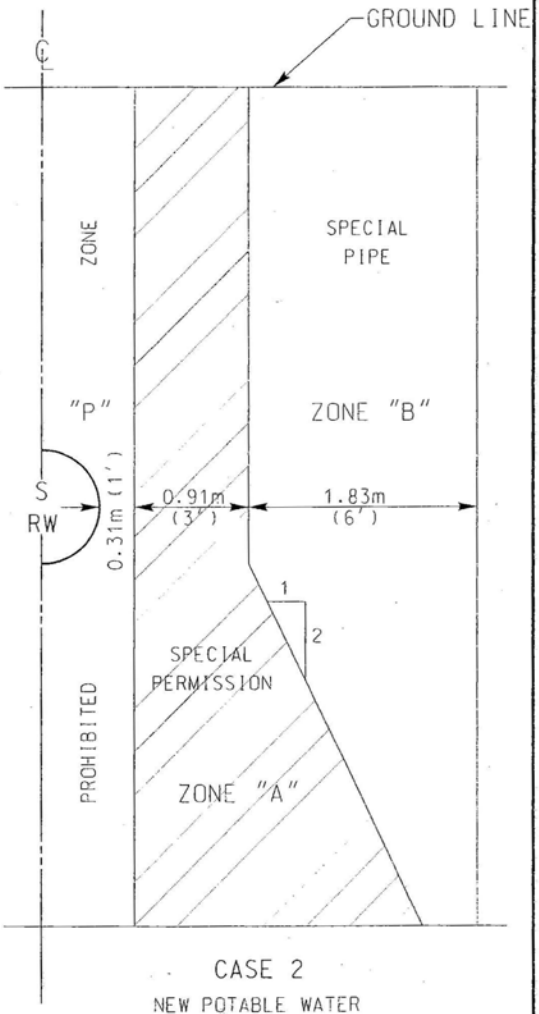
Please Note: A spreadsheet of the template that can be used for calculations is available from the Engineering Department upon request.

DETAIL FOR CONSTRUCTION OF CROSSING PIPES AND/OR UTILITY TRENCHES

NOTES:
1) ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE AS SHOWN BELOW
2) REQUIREMENTS OF THE STATE OF CALIFORNIA, HEALTH AND WELFARE AGENCY, DEPARTMENT OF HEALTH SERVICES
3) SEE WI-03 FOR NOTES ON WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATIONS
4) REFER TO THE WATER AGENCIES' STANDARDS DESIGN GUIDE FOR PIPE SEPARATION REQUIREMENTS



CASE 1
NEW RECYCLED WATER
OR
NEW SEWER



CASE 2
NEW POTABLE WATER
OR
NEW RECYCLED WATER

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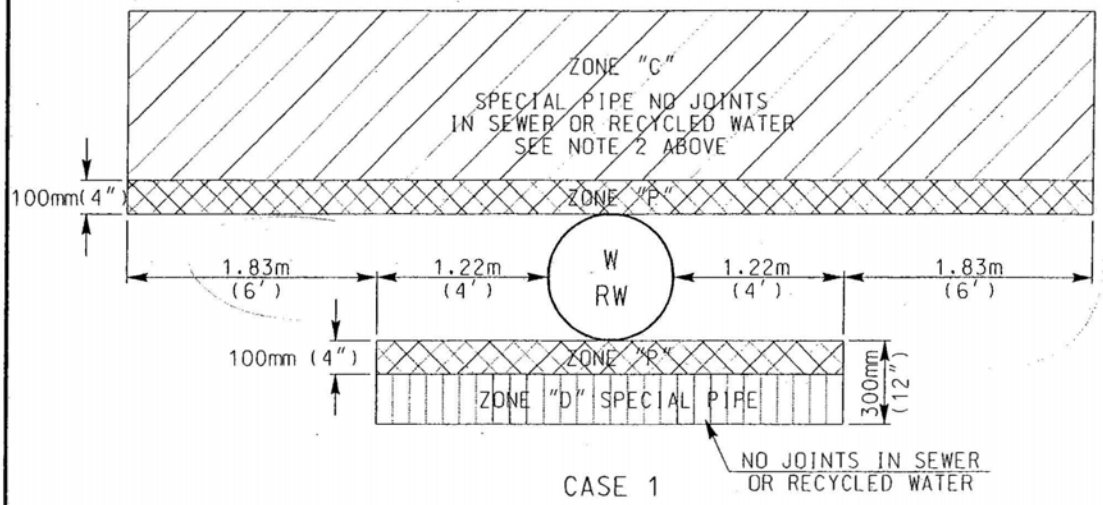
WATER, RECYCLED WATER AND SEWER MAIN PARALLEL SEPARATIONS

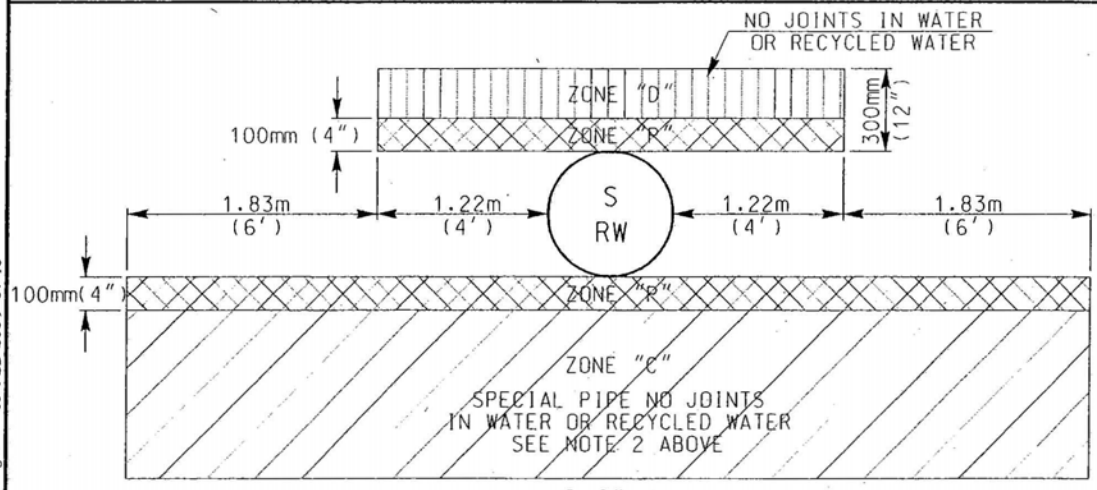
WATER AGENCIES STANDARDS	
COMMITTEE APPROVAL:	03/01/2001
DRAWING NUMBER:	WI-01

NOTES:
1) REQUIREMENTS OF THE STATE OF CALIFORNIA, HEALTH AND WELFARE AGENCY, DEPARTMENT OF HEALTH SERVICES
2) SEE WI-03 FOR NOTES ON WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATIONS
3) MAINS SHALL CROSS OTHER UTILITIES AT A PERPENDICULAR ANGLE, UNLESS OTHERWISE APPROVED. IN ANY CASE, UTILITIES CROSSING AT A SKEW ANGLE OF SEVENTY FIVE DEGREES (75°) OR LESS SHALL BE AVOIDED.
4) REFER TO THE WATER AGENCIES' STANDARDS DESIGN GUIDE FOR PIPE SEPARATION REQUIREMENTS



CASE 1

NEW RECYCLED WATER
OR
NEW SEWER



CASE 2

NEW POTABLE WATER
OR
NEW RECYCLED WATER

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WATER, RECYCLED WATER AND SEWER MAIN PERPENDICULAR SEPARATIONS	WATER AGENCIES STANDARDS
	COMMITTEE APPROVAL: 12/31/2003
	DRAWING NUMBER: WI-02

CONSTRUCTION REQUIREMENTS FOR WATER, RECYCLED WATER AND SEWER MAINS

CASE 1: NEW RECYCLED WATER OR SEWER MAINS

ZONE	
A	SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL SEWER OR RECYCLED WATER MAINS IN THIS AREA WITHOUT DISTRICT AND STATE HEALTH DEPARTMENT APPROVAL
B	PVC SEWER PIPE WITH PUSH-ON TYPE RUBBER RING JOINTS FOR SEWER MAINS C-900,CL200 OR C-905,PR235 PVC PIPE WITH PUSH ON TYPE RUBBER RING JOINTS FOR RECYCLED WATER MAINS
C	A 6.1m (20') SECTION OF PVC SEWER PIPE CENTERED AT THE MAIN BEING CROSSED, OR SEWER PIPE INSTALLED IN A CASING (FOR SEWER MAINS) A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS)
D	A 6.1m (20') SECTION OF PVC SEWER PIPE CENTERED AT THE MAIN BEING CROSSED, OR SEWER PIPE INSTALLED IN A CASING (FOR SEWER MAINS) A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS)
P	PROHIBITED ZONE: NO SEWER, WATER OR RECYCLED WATER MAINS; SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22

CONSTRUCTION REQUIREMENTS FOR WATER, RECYCLED WATER AND SEWER MAINS

CASE 2: NEW WATER OR RECYCLED WATER MAINS

ZONE	
A	SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL WATER OR RECYCLED WATER MAINS IN THIS AREA WITHOUT DISTRICT AND STATE HEALTH DEPARTMENT APPROVAL
B	C-900,CL200 OR C-905,PR235 PVC PIPE WITH PUSH ON TYPE RUBBER RING JOINTS FOR WATER MAINS C-900,CL200 OR C-905,PR235 PVC PIPE WITH PUSH ON TYPE RUBBER RING JOINTS FOR RECYCLED WATER MAINS
C	A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR WATER PIPE INSTALLED IN A CASING (FOR WATER MAINS) A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS)
D	A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC PIPE CENTERED AT THE MAIN BEING CROSSED, OR WATER PIPE INSTALLED IN A CASING (FOR WATER MAINS) A 6.1m (20') SECTION OF C-900,CL200 OR C-905,PR235 PVC, PIPE CENTERED AT THE MAIN BEING CROSSED, OR RECYCLED WATER PIPE INSTALLED IN A CASING (FOR RECYCLED WATER MAINS)
P	PROHIBITED ZONE: NO SEWER, WATER OR RECYCLED WATER MAINS; SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22

REFER TO THE WATER AGENCIES' STANDARDS DESIGN GUIDE FOR PIPE SEPARATION REQUIREMENTS

WATER, RECYCLED WATER AND SEWER MAIN PARALLEL AND PERPENDICULAR SEPARATION NOTES	WATER AGENCIES STANDARDS COMMITTEE APPROVAL: 03/01/2001 DRAWING NUMBER: WI-03

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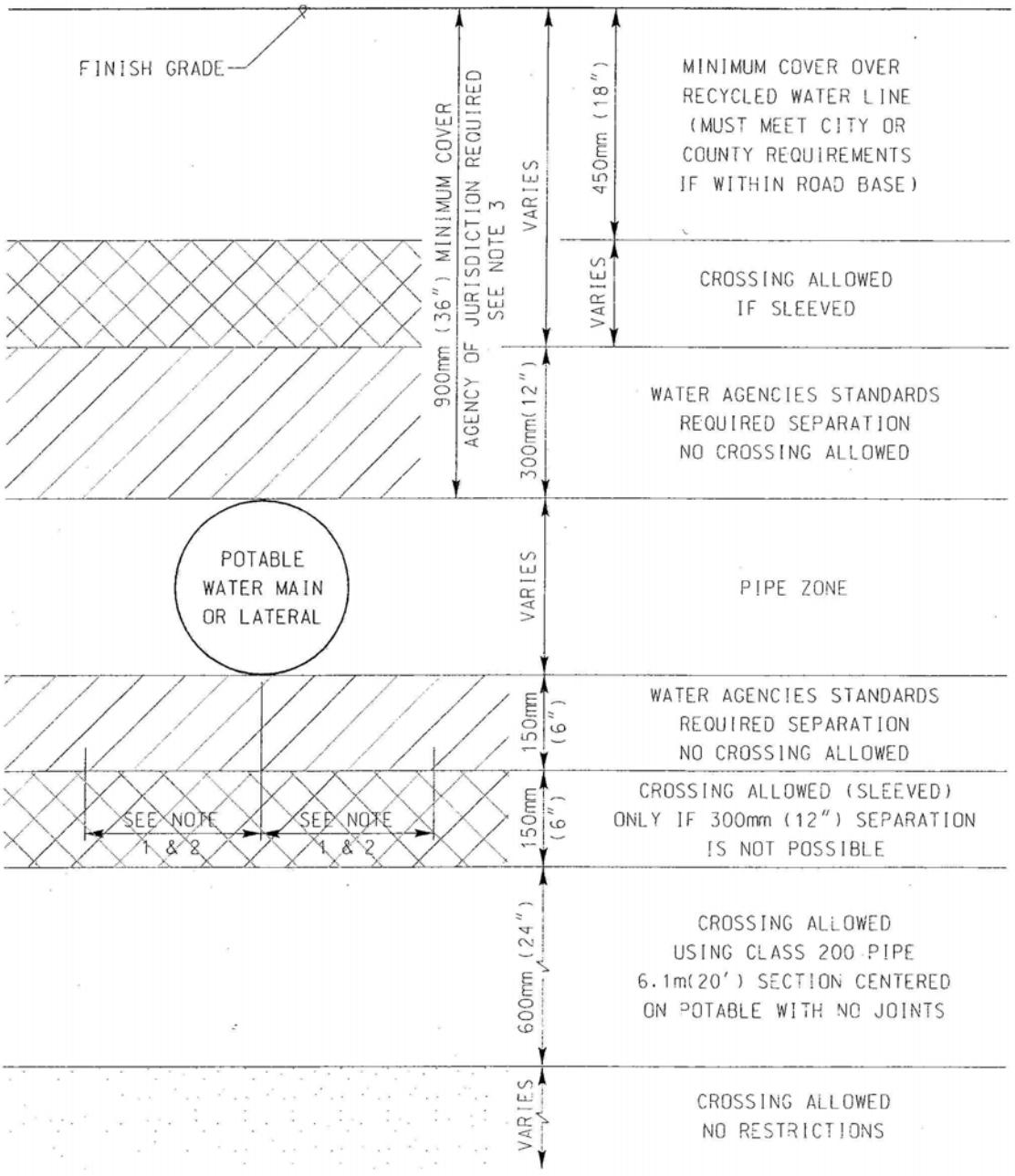
NOTES:
1) EXTEND SLEEVE 1.52m (5') ON EITHER SIDE OF POTABLE WATER LAT'S 75mm (3") DIA OR SMALLER
2) EXTEND SLEEVE 3.05m (10') ON EITHER SIDE OF POTABLE WATER LATERALS 100mm (4") DIAMETER OR LARGER (NO JOINTS IN SLEEVE OR PIPE)
3) IF POTABLE WATER LINE HAS LESS THAN 900mm (36") COVER, RECYCLED WATER LINE MUST CROSS BELOW POTABLE WATER LINE
4) REFER TO THE WATER AGENCIES' STANDARDS DESIGN GUIDE FOR PIPE SEPARATION REQUIREMENTS



POST METER CONSTANT PRESSURE RECYCLED WATER LINE
75mm (3") DIAMETER OR LESS CROSSING POTABLE WATER MAIN OR LATERAL WITHIN PUBLIC RIGHT OF WAY

WATER AGENCIES STANDARDS
COMMITTEE APPROVAL: 03/01/2001
DRAWING NUMBER: WI-04

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SCHEDULE OF FEES FOR CARDIFF AND ENCINITAS SANITARY DISTRICTS

The following schedule applies only to the Cardiff Sanitary Division (CSD) and Encinitas Sanitary Division (ESD) (Title 18, Encinitas Municipal Code). Please contact the Leucadia Wastewater District (LWWD) for fee information. CSD roughly covers the communities of Cardiff-by-the-Sea and Olivenhain. ESD provides service to Old Encinitas and portions of southeast Leucadia. LWWD collects wastewater from New Encinitas and the rest of Leucadia. The Sanitary Sewer Codes and Policies prevail over this Schedule of Fees, which should be used only for estimating, and should be consulted for details, limitations and conditions.

Wastewater Discharge fees are collected as part of the Wastewater Discharge Permit process. A Wastewater Discharge Permit authorizes discharge of legally allowed wastewater into the public system and provides funds to expand the public sewer system due to incremental increase in usage. A Wastewater Discharge Permit is not a **Sewer Construction Permit** or **Plumbing Permit**. It is illegal to connect and discharge without having first obtained the proper permits. A typical Wastewater Discharge fee is the product of the number of Equivalent Dwelling Units (EDU) assigned multiplied by the authorized dollar amount per EDU. A Wastewater Discharge fee can include one or more categories and rates, itemized per District (as shown in Table 1). The EDU count is assigned by evaluating the Sewer Usage Table given in Appendix 4.1 of the Engineering Design Manual, which is attached to this packet.

The Sewer Service Charge is collected annually, typically on the Property Tax Bill. Certain public facilities may have to be billed manually. Sewer Service Charges are based on water usage billed by the San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD) for those eligible properties lying within their boundaries and service areas (see Table 2). A prorated annual sewer service charge for new customers will be based on the median annual water usage for that group/sub-category (see Table 4).

TABLE 1

OUTLINE OF SEWER FEES

		CSD	***ESD***
1.	**Capacity Fee**	$3,417/EDU	$2,680/EDU
	[Provides funds to *expand* the public sewer system due to incremental increase in usage.]		
2.	**Processing Fee**	varies	varies
	[Assists in recovering government cost of administering reimbursement agreements. Dependent on terms of specific agreement.]		
3.	**Reimbursement Fee**	varies	varies
	[Assists private parties who have constructed public sewer facilities to recover equitable portions of the total cost. Dependent on terms of specific agreement and locale.]		
4.	**Sewer Service Charge**	$550.26/EDU	$543.17/EDU
	[Annual sewer service charges will be based on water meter usage as per records of the San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD). The charges will be collected through the property tax bill. See pages 3-8 of this handout for more detailed description of CSD and ESD Sewer Service Charges and sample calculations.]		

All rates are subject to increase. Please contact the Engineering Services Department for current fee verification.

Addresses and telephone numbers:

Cardiff Sanitary Division / Encinitas Sanitary Division
505 South Vulcan Avenue
Encinitas, CA 92024
(760) 633-2770

Leucadia Wastewater District (LWD)
1960 La Costa Avenue
Carlsbad, CA 92009
(760) 753-0155

TABLE 2

CARDIFF SANITARY DIVISION & ENCINITAS SANITARY DIVISION SEWER SERVICE CHARGES

Sewer Service Charges are comprised of two components: a fixed charge (based on water meter size) and a usage charge (based on water consumption). Single Family residential fixed charges are based on 5/8" meter.

***Residential Charges**

Water Consumption Periods to be used:

2 Lowest Bi-Monthly Periods of Water Consumption for Meter Readings Occurring Between Dec. – May for Most Recent Five-Year Period.

Formula For Determining Annual Sewer Service Charge:

Find the lowest meter readings (Dec.-May) for the most recent available 5-year period. Then find the second lowest meter readings (Dec.-May) for the same 5-year period. Take these two values and use them in the formula below.

Average Lowest Readings	+	Average 2nd Lowest Readings	x 3 =	Total Annual HCF	x RTS =	Billable Annual HCF	x	HCF Rate	+	Fixed Meter Charge	=	Annual Sewer Service Charge

Return to Sewer Percentages:

Single Family = 85%
Multi-Family = 85%
Mobile Homes = 85%

***Non-Residential (Commercial) Charges**

Water Consumption Periods to be Used:

Water Consumption for Meter Readings Occurring Between July-June of Preceding Year

Formula for Determining Annual Sewer Service Charge:

Total Meter Readings (July-June)	x	RTS	x	HCF Rate	+	Fixed Meter Charge	=	Annual Sewer Service Charge

Return to Sewer Percentages:

Non-Residential (Commercial) = 95%

See "Example Calculations" 1, 2, and 3 for a detailed explanation of the above formulas.

TABLE 3

CSD & ESD PRORATED
SEWER SERVICE CHARGES FOR NEW CUSTOMERS

Residential Charges

Service Charge For a New Customer:

Service Charge for a New Residential Customer	=	(# EDU	x	Median HCF	x	Unit Cost	+	Fixed Meter Charge)	x	Prorated % of Year

Non-Residential (Commercial) Charges

Service Charge For a New Customer =
{(Median HCF x RTS)(Unit Cost) + Fixed Meter Charge} (Prorated % of Year)

Service Charge for a New Commercial Customer	=	(Median HCF	x	RTS	x	Unit Cost	+	Fixed Meter Charge)	x	Prorated % of Year

See “Example Calculations” 4 and 5 for a detailed explanation of the above formulas.

TABLE 4

CSD & ESD RATE SCHEDULE FOR ANNUAL SEWER SERVICE CHARGE

Usage Charge

Users/Class	Sub Category	Unit Cost (per HCF)		Maximum Usage (HCF)		Median Annual HCF (No consumption history)	
		CSD	ESD	CSD	ESD	CSD	ESD
Group I Residential							
Single Family Residential	SF	$4.75	$4.73	300	300	$109.13	$98.13
Multi-Family Residential	MF	$4.75	$4.73	300/unit	300/unit	$109.13/unit	$98.13/unit
Trailer Park	TP	$4.75	$4.73	300/unit	300/unit	$109.13/unit	$98.13/unit
Group II Commercial							
Softwater Service	SW	$4.98	$4.81	N/A	N/A	----	----
Car Wash	CW	$4.98	$4.81	N/A	N/A	1,520	1,520
Office Building	OF	$4.98	$4.81	N/A	N/A	200	200
Fire Station	FS	$4.98	$4.81	N/A	N/A	110	110
Professional Building	PB	$4.98	$4.81	N/A	N/A	160	160
Veterinary Clinic	VC	$4.98	$4.81	N/A	N/A	----	----
Athletic Gymnasium	G	$4.98	$4.81	N/A	N/A	1,340	1,340
Laundromat	L	$4.98	$4.81	N/A	N/A	990	990
Retail Store/Shop	DRS	$4.98	$4.81	N/A	N/A	120	120
Warehouse	W	$4.98	$4.81	N/A	N/A	1,050	1,050
Hospital, Convalescent Home	HCH	$4.98	$4.81	N/A	N/A	3,240	3,240
Park	PB	$4.98	$4.81	N/A	N/A	510	510
Church	MO	$4.98	$4.81	N/A	N/A	440	440
Membership Organization	MO	$4.98	$4.81	N/A	N/A	240	240
Social Services	SS	$4.98	$4.81	N/A	N/A	160	160
Group III Commercial							
Hotels-Motels (without restaurant)	HM	$6.55	$5.49	N/A	N/A	890	890
Repair & Service Station	RSS	$6.55	$5.49	N/A	N/A	70	70
Shopping Center	SC	$6.55	$5.49	N/A	N/A	1,030	1,030
Kennel	K	$6.55	$5.49	N/A	N/A	900	900
Coffee Shop	CS	$6.55	$5.49	N/A	N/A	----	----
Amusement Park	AP	$6.55	$5.49	N/A	N/A	----	----
Nightclub/Bar	NC	$6.55	$5.49	N/A	N/A	320	320
Commercial Laundry	CL	$6.55	$5.49	N/A	N/A	----	----
Manufacturing	M	$6.55	$5.49	N/A	N/A	180	180
Lumber Yard	LY	$6.55	$5.49	N/A	N/A	----	----
Group IV Commercial							
Hotels-Motels (with restaurant)	HM	$9.86	$6.83	N/A	N/A	3,130	3,130
Bakery (wholesale) Food Processor	BW	$9.86	$6.83	N/A	N/A	----	----
Supermarket	SM	$9.86	$6.83	N/A	N/A	1,030	1,030
Mortuary	MT	$9.86	$6.83	N/A	N/A	300	300
Restaurant	R	$9.86	$6.83	N/A	N/A	600	600

Fixed Meter Charge

Meter Size	Annual Charge		Meter Size	Annual Charge	
	CSD	ESD		CSD	ESD
5/8"	$41.08	$32.07	1-1/2"	$205.38	$160.34
¾"	$61.61	$48.10	2"	$328.60	$256.54
1"	$102.69	$80.17	3"	$616.13	$481.01

* Multi-Family = Fixed Meter Charge x 2

SAMPLE CALCULATIONS

Example 1

The San Dieguito Water District (SDWD) is providing an existing customer in the Cardiff Sanitary Division (CSD) with water to a Single Family Residence (Group I Residential):

The customer is billed every two months by the SDWD. His or her water usage consists of the following:

	Dec/Jan	Feb/Mar	Apr/May	Lowest	2nd Lowest
Year 1	22	38	62	22	38
Year 2	24	25	54	24	25
Year 3	27	21	28	21	27
Year 4	16	28	41	16	28
Year 5	18	11	21	11	18
			Avg. Low/2nd Low	**18.8**	**27.2**

The average lowest two periods of water consumption for readings between December and May in Years 1 through 5 are 18.8 and 27.2 HCF. This accounts for four months of water usage. The total, 18.8 + 27.2 = 46.0 HCF, is multiplied by three, 46.0 x 3 = 138.00 HCF, to give an estimate for 12 months. This estimate is then multiplied by the "Return to Sewer %" (see Table 3). In this case, it is 85%. It is assumed that 85% represents projected inside (or indoor) usage and that the remaining 15% of the customer's water is not entering the sewer system. The result is 117.3 HCF. This value is then multiplied by the "CSD Unit Cost" (see Table 4) of $4.75. The fixed meter charge ($41.08) is then added to $557.18 for a total charge of $598.26. The annual sewer service charge for this customer is under the maximum annual HCF of 300 (see Table 4), so the fee charged is $598.26.

Sewer Service Charge = (18.8 + 25.2) (3) (0.85) ($4.75) + $41.08 = **$598.26**

Example 2

The Olivenhain Municipal Water District (OMWD) is providing an existing customer in the Cardiff Sanitary Division (CSD) with water to a Single Family Residence (Group I Residential):

The customer is billed every month by the OMWD. His or her water usage consists of the following:

	December	January	February	March	April	May
Year 1	36	32	21	34	29	26
Year 2	69	83	65	31	60	110
Year 3	60	79	30	20	55	91
Year 4	41	17	53	100	98	138
Year 5	69	37	94	33	64	138

These numbers are condensed into three water usage periods:

	Dec/Jan	Feb/Mar	Apr/May	Lowest	2nd Lowest
Year 1	68	55	55	55	55
Year 2	152	96	170	96	152
Year 3	139	50	146	50	139
Year 4	58	153	236	58	153
Year 5	106	127	202	106	127
			Avg. Low/2nd Low	**73**	**125.2**

The average lowest two periods of water consumption for readings between December and May in Years 1 through 5 are 73 and 125.2 HCF. This accounts for four months of water usage. The total, 73 + 125.2 = 198.2 HCF, is multiplied by three, 198.2 x 3 = 594.6 HCF, to give an estimate for 12 months. This estimate is then multiplied by the "Return to Sewer %" (see Table 3). In this case, it is 85%. It is assumed that 85% represents projected inside (or indoor) usage and that the remaining 15% of the customer's water is not entering the sewer system. The result is 505.4 HCF. This value is greater than the Single Family maximum usage of 300 HCF. In this case, the maximum usage of 300 HCF is multiplied by the "CSD Unit Cost" (see Table 4) of $4.75. The fixed meter charge ($41.08) is then added to $1,425.00 for a total charge of $1,466.08.

Sewer Service Charge = ((300) ($4.75)) + $41.08 = $**1,466.08**

Example 3

The San Dieguito Water District (SDWD) is providing an existing customer in the Encinitas Sanitary Division (ESD) with water to a restaurant (Group IV Commercial) with a 1" water meter:

The customer is billed every two months by the SDWD, with water usage consisting of the following:

May/Jun	Jul/Aug	Sep/Oct	Nov/Dec	Jan/Feb	Mar/Apr	Total
86	81	110	90	79	88	531

The total for the entire year is 86.00 + 81.00 + 110.00 + 90.00 + 79.00 + 88.00 = 534.00 HCF. This total is then multiplied by the "Return to Sewer %" (see Table 3). In this case, it is 95%. It is assumed that 95% represents projected inside (or indoor) usage and that the remaining 5% of the customer's water is not entering the sewer system. The result is 507.3 HCF. This value is then multiplied by the "ESD Unit Cost" (see Table 4) of $6.83 for a total of $3,464.86. The fixed meter charge for a 1" meter ($80.17) is then added to $3,464.38 for a total charge of $3,3545.03 (there is no maximum).

Sewer Service Charge= {(86 + 81 + 110 + 90 + 79 + 88) (0.95) ($6.83)} + $80.17 = **$3,545.03**

Example 4

Calculation of prorated annual sewer service charge for a new Single Family Residence with an accessory unit (Group I Residential) sanitary sewer customer in the Cardiff Sanitary Division (CSD) with a 5/8" water meter:

Taking into account that the fiscal year starts July 1, new customers to the CSD are given a four-month free proration grace period. For example, if a customer connects to the CSD in the month of September, the final four months of the fiscal year (June, May, April and March) are free. The customer is only charged for the remainder of the fiscal year. This includes the months of February, January, December, November, October and September (6 months).

A new single family residence with an accessory unit in the CSD is assigned 1.8 EDU's (Equivalent Dwelling Units) (see Table 2). The EDU count is then multiplied (see Table 3 for formula) by the "Median Annual HCF for New Connections" (see Table 4). In this case, the result is 1.8 x 109.13 HCF = 196.43 HCF. This HCF value is then multiplied by the "Unit Cost" (see Table 4), 196.43 HCF x $4.75 = $933.04. The fixed meter charge ($41.08 x 2) is then added to the usage charge for a total of $1,015.20. This result is then multiplied by the fraction of prorated months, $1,015.20 x 6/12 = $507.60.

Prorated Annual Sewer Service Charge for a New Customer =
[(1.8 EDU x 109.13 HCF x $4.75) + $82.16] x (6 months/12 months) = **$507.60**

Example 5

Calculation of prorated annual sewer service charge for a new restaurant (Group IV Commercial) sanitary sewer customer in the Encinitas Sanitary Division (ESD) with a 1-1/2" water meter:

Taking into account that the fiscal year starts July 1, new customers to the ESD are given a four-month free proration grace period. For example, if a customer connects to the ESD in the month of July, the final four months of the fiscal year (June, May, April and March) are free. The customer is only charged for the remainder of the fiscal year. This includes the months of February, January, December, November, October, September, August and July (8 months).

The "Median Annual HCF for New Connections" (see Table 5) of 600 HCF is multiplied by the "Return to Sewer %" (see Table 3). In this case, it is 95%. It is assumed that 95% represents projected inside (or indoor) usage and that the remaining 5% of the customer's water is not entering the sewer system. The result is 600 HCF x 0.95 = 570 HCF. The resulting value is then multiplied by the "Unit Cost" (see Table 4), 570 HCF x $6.83 = $3,893.10. The fixed meter charge ($160.34) is then added to the usage charge for a total of $4,053.44. This result is then multiplied by the fraction of prorated months, $4,053.44 x 8/12 = $2,702.29.

Prorated Annual Sewer Service Charge for a New Customer =
[(600 HCF x 0.95 x $6.83) + $160.34] (8 months/12 months) = **$2,702.29**

SEWER REIMBURSEMENT DISTRICT INFORMATION

I. STATEMENT OF PURPOSE

This policy provides specific regulations and procedures for establishing Sewer Construction Reimbursement Agreements (Agreements).

II. LEGAL AUTHORIZATION

Chapter 18.12 of the City's Municipal Code and Cardiff Sanitation District Code allow the City or District (herein referred to as "District" for both the Cardiff Sanitation District or Encinitas Sanitary Division) to enter into Agreements with private developers or property owners (OWNER) to charge an additional connection fee for connection to the sewer system (REIMBURSEMENT FEE), when the sewer service has been made available by that OWNER prior to the time that the District would have been able to make the sewer service available. The purpose of the REIMBURSEMENT FEE is to reimburse the OWNER for a portion of the costs incurred to extend the District's sewer lines to the previously unserved area. The District does not provide Agreements for OWNERS building private sewer lines.

When an OWNER desires or is required to construct a sewer line (SEWER LINE) to the District's sewer system, and other unserved properties may be serviced by that SEWER LINE, the District Engineer may require the OWNER to construct the SEWER LINE to public standards and provide stub-outs at various locations to provide a connection point for the unserved properties. The District may also require the OWNER to dedicate the SEWER LINE to the District before the OWNER may discharge into the District's sewer system.

The OWNER shall be informed of these requirements before final sewer plans are approved and shall have the option of entering into an Agreement. The DISTRICT shall notify the OWNER, in writing, of the District's requirements and policies concerning Agreements. By providing a copy of this policy statement to the OWNER, the City shall have given sufficient written notification. The decision to enter into an Agreement shall be agreed upon by both parties prior to the issuance of a sewer construction permit. The OWNER shall agree to the terms of the Agreement, as stipulated by the Municipal or Cardiff Sanitation District Code and Sewer Construction Reimbursement Agreement Policy, by signing the Sewer Construction Reimbursement Agreement Consent Statement at the end of this document. Should the OWNER not consent to the Agreement policies and codes, the District may deny the OWNER a sewer construction permit and access to the District's public sewer system.

III. TERMS OF THE AGREEMENT

The proposed sewer shall be designed in compliance with public standards and as directed by the District Engineer. All public sewer access easements must be secured prior to the commencement of construction of the SEWER LINE. The OWNER shall incur all costs associated with the construction of the sewer including, but not limited to, design, acquisition of easements or right-of-way, construction, inspection, material testing, permits, and legal, technical, or administrative assistance. The OWNER must also pay an administrative fee to the District for setting up the Agreement. The OWNER will be required to open a deposit account with the District in the amount of $1,000. The District will charge against the deposit account on a time and materials basis until the Agreement is finalized. The OWNER shall retain copies of all invoices pertaining to the sewer construction and proof of payment of these invoices. Copies of invoices and proof of payment shall be submitted to the District Engineer after all reimbursable invoices have been paid by the OWNER, but no more than 90 days after the SEWER LINE has been accepted by the District.

Reimbursable costs shall ultimately be determined by the District Engineer and may include payments made by the OWNER for preliminary engineering, right-of-way or easement acquisition, permits, material testing, construction, inspection, and installation related to the SEWER LINE.

IV. CALCULATION OF THE REIMBURSEMENT FEE

The District Engineer shall determine the number of equivalent dwelling units (EDUs) that could ultimately connect to the SEWER LINE, including the OWNER's property. The number of EDUs shall be based on the existing zoning at the time that the SEWER LINE is constructed and shall assume that vacant properties will be developed to mid-range density allowed by the zoning. The REIMBURSEMENT FEE shall be calculated by dividing the total reimbursable costs, as determined by the District Engineer, by the total number of possible EDU connections to the SEWER LINE.

EXAMPLE:
If the reimbursable costs of the SEWER LINE total $100,000 and there are 10 potential EDU*
Connections to the SEWER LINE, the REIMBURSEMENT FEE is $10,000 per EDU.

Total Reimbursable Costs (as approved by District Engineer):	$100,000
Total Possible EDU Connections:	10
Reimbursement Fee:	$100,000/10 = $10,000 per EDU

*Generally, one (1) EDU is equivalent to one (1) single family house

In addition, property owners subject to the REIMBURSEMENT FEE shall also be required to pay 6% simple interest on the REIMBURSEMENT FEE, to be computed

from the time that the SEWER LINE was accepted by the District. The District shall charge for setting up the Agreement on a time and materials basis and shall charge a collection fee for each reimbursement collected and sent to the OWNER as set by the District's adopted fee schedule.

EXAMPLE:
A property owner wishes to build a sewer lateral from his single-family house to the SEWER LINE 3 years and 3 months after the SEWER LINE is accepted by the District. How is the interest fee calculated?

Interest Calculation: Reimbursement Fee x Interest Rate x Time
10,000 x 0.06 x 3.25 = $1,950

Total Reimbursement: $10,000 + $1,950 = $11,950
Reimbursement to OWNER: $11,950 less Collection Fee

The REIMBURSEMENT FEE shall be collected in addition to all applicable fees. The OWNER's property shall also be subject to the reimbursement fee, however this fee will be deducted from the total reimbursable costs, rather than collected at a future time. The total reimbursement to OWNER shall not exceed the maximum reimbursement amount. The maximum reimbursement amount is defined as the total reimbursable costs plus interest, less the OWNER's pro-rata share of the cost of the SEWER, less collection fees. The District does not guarantee that the OWNER will receive the full amount, or any portion, of the maximum reimbursement amount.

EXAMPLE:
If the reimbursable costs total $100,000 and there are 10 potential EDU connections and two of the EDUs belong to the OWNER, the cost attributed to the OWNER is $20,000 and the total reimbursable amount to the OWNER is $80,000, plus 6% simple interest, less the District's collection fee.

Total Reimbursable Costs: $100,000
Reimbursement Fee per EDU: $10,000
Total Possible EDU Connections: 10
Total EDUs belonging to OWNER: 2
Cost to OWNER: $10,000 X 2 = $20,000
Total Reimburseable amount: $100,000 - $20,000 = $80,000
(plus interest and

less collection fees)

If the District collects any REIMBURSEMENT FEES, such payments shall be sent to the OWNER semi-annually commencing on January 1 or July 1, whichever comes first following the effective date of the Agreement and shall continue semi-annually on January 1 and July 1, until the OWNER has been reimbursed the maximum reimbursable amount or until the agreement expires.

In accordance with the Municipal and Cardiff Sanitation District Codes 18.12.030, if the reimbursable costs of the SEWER LINE are less than $50,000 the Agreement shall remain in effect for a period of 10 years. If the total reimbursable costs of the SEWER LINE are $50,000 or more, the Agreement shall remain in effect for a period of 20 years.

V. OVERVIEW OF PROCESS

The process for Agreement adoption is summarized below:

- ❑ OWNER meets with District Engineer or Engineering Services Department staff to discuss alternatives for connection to the public Sewer System.
- ❑ District Engineer and OWNER agree on conceptual design and location of sewer.
- ❑ If the proposed sewer may serve other unserved properties, the OWNER is notified of the Sewer Construction Reimbursement Agreement Policy and is issued the policy statement and consent form.
- ❑ OWNER signs consent form, designs the sewer to approved standards and specifications, and provides a cost estimate to the District Engineer.
- ❑ Properties that may be affected by the sewer reimbursement agreement are notified.
- ❑ Sewer construction plans are submitted to District Engineer for approval.
- ❑ Once sewer plans are approved and consent form is received, the District issues a sewer construction permit and SEWER LINE is completed.
- ❑ Upon completion, the District accepts the SEWER LINE and the SEWER LINE is dedicated to the District.
- ❑ Proof of payment for reimbursable costs are submitted to District Engineer, within 90 days of the District's acceptance of the SEWER LINE.
- ❑ District Engineer calculates REIMBURSEMENT FEE and draws up agreement.
- ❑ Ordinance adopting the Agreement is scheduled for Introduction and notices are sent to affected property owners.
- ❑ *Ordinance is introduced and adopted by District.*
- ❑ *Both parties sign agreement and Municipal or Cardiff Sanitation District Code is amended to include Agreement.*

If during this process a property owner wishes to connect to the SEWER LINE, prior to the issuance of a Wastewater Discharge Permit, the District will collect an amount equal to the proposed REIMBURSEMENT FEE or the City's best estimate if a REIMBURSEMENT FEE has not yet been calculated. Those funds will then be placed into a deposit account until the Agreement goes into effect.

VI. OWNER CONSENT STATEMENT

I, _____, have read and understand the policies governing Sewer Construction Reimbursement Agreements in the Cardiff Sanitation District and Encinitas Sanitary Division. I agree to the terms set forth in this policy and consent to any and all regulations, standards, fees and conditions established and set forth by the Cardiff Sanitation District Code/Cardiff Sanitation District Board or the Municipal Code/City Council.

_____ _____

Signature *Date*

CITY OF ENCINITAS- DEPARTMENT OF ENGINEERING
AVERAGE DAILY SEWER FLOW PROJECTIONS

Average Daily Sewer Flow Projections

Pop	Gal (80 pcd)	ADWF cfs	SD Peaking Factor 6.2945 x pop^-.1342 80 gpcd	SD PDWF cfs
200	16000	0.0248	3.0915	0.0765
500	40000	0.0619	2.7338	0.1692
1000	80000	0.1238	2.4909	0.3083
1500	120000	0.1857	2.3590	0.4380
2000	160000	0.2476	2.2697	0.5619
2500	200000	0.3094	2.2027	0.6816
3000	240000	0.3713	2.1495	0.7982
3500	280000	0.4332	2.1055	0.9121
4000	320000	0.4951	2.0681	1.0239
4500	360000	0.5570	2.0356	1.1339
5000	400000	0.6189	2.0071	1.2421
10000	800000	1.2378	1.8288	2.2636
15000	1200000	1.8567	1.7319	3.2156
20000	1600000	2.4756	1.6663	4.1251
30000	2400000	3.7133	1.5781	5.8600
40000	3200000	4.9511	1.5183	7.5174
50000	4000000	6.1889	1.4735	9.1196
60000	4800000	7.4267	1.4379	10.6790
70000	5600000	8.6645	1.4085	12.2037
80000	6400000	9.9023	1.3835	13.6994
90000	7200000	11.1400	1.3618	15.1701
100000	8000000	12.3778	1.3426	16.6190

CARDIFF SANITATION DISTRICT ANNEXATION APPLICATION

1. The attached "Change of Organization/Reorganization" application is a generic form for all types of annexations. Some sections may not be relevant to a sanitary sewer annexation. Please complete those sections that are applicable to the proposed project to the best of your ability. Application items marked with an * are especially important to complete.

2. All annexations require the consent signatures of all of the owners of the properties to be annexed. If the applicant is married, both spouses must sign. Please sign and date at all applicable locations.

3. Please submit the following items with the annexation application:

   a. Completed and signed application.
   b. Copy of the property's metes-and-bounds legal description and grant deed.
   c. Two site plans that include the proposed or existing structures, property perimeters, and adjacent right-of-ways (streets, alleys, access easements). If the application is a new residential subdivision, 10 copies of the tentative or final tract or parcel map must be submitted with the application. Commercial applications must include a development plan.
   d. Two vicinity maps.
   e. Environmental Documentation.
   f. Annexation Fees (including the City of Encinitas, L.A.F.C.O. (Local Agency Formation Commission), and State Board of Equalization fees). Attachment 1 outlines the required annexation and permit fees. The State Board of Equalization fee will be collected after the annexation is approved by L.A.F.C.O. City of Encinitas and L.A.F.C.O. fees are due with submittal of the application to the City.
   g. If the annexation application includes a request for an emergency connection due to health and safety reasons, a letter from a duly licensed plumbing, sanitation, or engineering contractor, that indicates the existing system is failing, must be submitted. An additional "Contractual Service Agreement Application" and a $150 processing fee made payable to the City of Encinitas must also be submitted. Please note that L.A.F.C.O. may also require a processing charge of 30% of the L.A.F.C.O. annexation fees.

4. Submit the above information to:

   Attn: Engineering Department
   City of Encinitas
   Department of Engineering Services
   505 S. Vulcan Ave.
   Encinitas, CA 92024
   Phone No. (760)-633-2770

Note: Annexation to the sewer district is required before a Wastewater Discharge

permit that allows connection to the sewer can be issued. Depending on the complexity of the annexation, the process generally takes four to seven months. A typical single family residential lot is usually annexed within four months, while a more complex residential subdivision or commercial development may take up to seven months.

Attachment 1, "Cardiff Sanitation District Annexation," indicates the required fees. Additional costs may be incurred by the property owner for other permits, easements, construction, reimbursements, environmental studies, or documentation. Please visit the Engineering Services and Community Development counters for a complete listing of processing fees and permits.

ATTACHMENT 1

Cardiff Sanitation District Annexation/Wastewater Discharge Fee Schedule

Site Address _____ Assessor's Parcel No. _____

Name _____ Date _____

Mailing Address _____ ( ) Telephone

City _____ State _____ Zip Code _____

Annexation Fees – All Fees Are Required When the Application is Submitted

1. **Annexation Process Fee Payable to the City of Encinitas:**
   $700 for 0 – 21 acres
   $800 for over 21.1 acres

2. **L.A.F.C.O. Process Fee (Payable to L.A.F.C.O.):**
   See separate schedule as attached

3. **Filling Fee Payable to the State Board of Equalization:**
   See separate schedule as attached
   (May be deferred until L.A.F.C.O. approval)

Wastewater Discharge Permit is Required Prior to Connection to the Public Sewer

See separate schedule.

Sewer Construction Permit is Required Prior to Connection to the Public Sewer

See separate schedule.

SAN DIEGO L.A.F.C.O. (LOCAL AGENCY FORMATION COMMISSION) FEE SCHEDULE

PROCESSING FEES
Annexation, Detachment, or Sphere Amendment Fees**

Acres	Fee
Under 0.50 acre	$1,800
0.51 - .99 acre	$2,300
1 - 9.9	$2,800
10 - 19.9	$3,300
20 - 49.9	$3,850
50 - 99.9	$4,480
100 - 149.9	$5,200
150 - 199.9	$6,000

200 + ($6,000 plus an acreage fee of $60 for every 100 acres over 200 acres)

** The above fees are charged for each jurisdictional change and apply to actions involving cities and districts. For contractual service agreements, payment of the applicable annexation/detachment fees must be made upon submittal of a contractual service agreement application. Fees for activation or expansion of latent powers shall be based on the above acreage categories, not to exceed $11,500. Proponents shall be responsible for actual hearing notification and mailing costs for public hearing items.

Incorporation	$10,000 deposit, plus 50% of actual LAFCO review costs
District Formation	$7,000
Consolidation/Merger/Dissolution/Subsidiary District	$4,000
Dissolution for Inactivity	$500

SURCHARGE

There will be a 30% surcharge for consideration of contractual service agreements. This surcharge is due prior to LAFCO consideration of the related annexation/detachment application. The surcharge does not apply to service agreements involving health or safety concerns where the property is eligible for immediate annexation.

CITY SPHERE OF INFLUENCE UPDATE

Base rate for all city sphere update proposals	$4,000
Acreage fee for every 100 acres included in the sphere update proposal beyond the current sphere	$300

REQUEST FOR RECONSIDERATION/TIME EXTENSION

Request for reconsideration of LAFCO determination	$750
Request for extension of time to complete proceedings	$250

PETITION FILING FEES

In addition to the proposal processing fee, each application submitted by petition will be charged LAFCO's actual costs to verify the signatures.

ENVIRONMENTAL REVIEW
(P.R.C. Section 21089)

CEQA Exemption	No charge
Review of Initial Study and preparation of Negative Declaration, OR determination that EIR is required	Actual cost
Extended Initial Study (if required)	Actual cost
Preparation of EIR	Actual cost

Department of Fish and Game Fee: Effective January 1, 1991	
Negative Declaration	$1,250
EIR	$850
County Clerk - handling fee	$25

INCORPORATION FISCAL ANALYSIS REVIEW

Processing of Request for State Controller's Review of an incorporation fiscal analysis	$2,900
State Controller's review of fiscal analysis	Actual cost

PAYMENT OF FEES: Fees are due when proposals are submitted to LAFCO. A supplemental fee may be charged and collected prior to the LAFCO hearing if additional acreage or actions are required.

EXCEPTIONS: Fees may be waived or reduced by the Executive Officer if financial hardship is demonstrated, OR if application is in response to a LAFCO condition or recommendation.

STATE BOARD OF EQUALIZATION
FEE SCHEDULE AND DEFINITIONS

When a proposal has been approved by LAFCO, a fee payable to the State Board of Equalization must be collected and forwarded to that office.

Processing fees: See definitions for modifications of the fee structure under certain circumstances. A separate fee must be computed for each ordinance or resolution. The fee for single area transactions is as follows:

Acreage	Fee
Less than 1 acre	$300
1-5	$350
6-10	$500
11-20	$800
21-50	$1,200
51-100	$1,500
101-500	$2,000
501-1,000	$2,500
1,001-2,000	$3,000
2,001 and above	$3,500

Miscellaneous fees:

Deferral of Fees	$35
Additional County per transaction	$300
Consolidation per district or zone	$300
Entire district transaction	$300
Coterminus transaction	$300
Dissolution or name change	$0

Definitions and special fee provisions:

A. "Single area" means any separate geographical area regardless of ownership. A lot, a subdivision, or a township could each be a "Single area". For the purpose of this schedule, a geographical area which is divided into two or more parcels by a roadway, railroad right-of-way, river or stream shall be considered a "Single area". Separate geographical areas that are not contiguous to each other shall not be considered a "Single area". A "Single area" does not include two areas that are contiguous to an existing boundary of a city or district but not to each other.

B. "Contiguous" shall be defined as two polygons that share a common line.

C. "Zones" include temporary zones in highway lighting districts, other zones, zone of improvement, zone of benefit, improvement districts, or any other sub-units of a county, city, or parent district.

D. "Concurrent transaction" includes any combination of formations, annexations, and withdrawals of a single area under one resolution or ordinance. The fee shall be according to the fee schedule; there is no additional costs for the number of transactions involved. If there is more than one resolution or ordinance, each single

area must be separately computed under the above fee schedule.

E. The fees in this schedule are based on the concept that any given action is confined to a single county. If more than one county is involved, add $300 for the second and each additional county involved.

F. Coterminous transaction: If an annexed or detached territory comprises an entire city, district, or zone without affecting the existence of that city, district, or zone, the total processing fee shall be $300. If the coterminous transaction contains areas of exclusion, each area of exclusion shall be considered a single area transaction, and all requirements shall apply and the fees calculated as such. Example: A district is formed coterminous with a city boundary and contains two areas of exclusion of four acres each; the total fee is $1,000.

G. Payment of the fee for the formation of a city or district may be deferred until that city or district receives its first revenue. Each deferment shall be subject to a $35 billing charge.

Note: If you have an unusual situation or are unsure, do not guess at the fee. Contact the LAFCO office at (619) 531-5400 for assistance.

CHANGE OF ORGANIZATION / REORGANIZATION APPLICATION

Submit the following items for any change(s) of organization:

1. Change of organization/reorganization application.

2. A certified Resolution of Application from an affected district or city, OR a petition of landowners or registered voters making application.

3. One copy of a metes-and-bounds legal description of the perimeter of the subject area.

4. One reproducible plat map with 10 prints.

5. Two copies of a vicinity map of the subject territory.

6. Environmental documentation: (submit documents from one category)

   Initial Study: If no environmental review has been conducted, submit a completed Initial Study form available from the LAFCO office.

   Categorical Exemption: If an agency has certified that the project qualifies for a categorical exemption from CEQA, please submit one copy of this finding.

   Negative Declaration: If a Negative Declaration (ND) has been prepared, submit one copy of the ND with its certifying resolution and Initial Study.

   Environmental Impact Report: If an Environmental Impact Report (EIR) has been prepared, submit 15 copies of the EIR with the certifying resolution. If applicable, only one copy of an appendix is required.

7. If the proposal includes annexation to a city, submit one copy of the city's resolution approving the prezoning and general plan land use designations for the subject territory.

8. LAFCO processing fee (refer to fee schedule or contact LAFCO office).

9. Disclosure Statement (available from LAFCO office).

Additional information may be requested during staff's review of the proposal.

San Diego Local Agency Formation Commission
1600 Pacific Highway, Room 452
San Diego, CA 92101
(619) 531-5400

CHANGE OF ORGANIZATION / REORGANIZATION APPLICATION

The information in this application is used by LAFCO staff to evaluate requests for changes to government organization. Please respond to all items in this form, and indicate "NA" when an item does NOT apply.

Agency(ies) (City or District)	Change of Organization / Action (Annexation,Detachment, SphereAmendment, etc.)
1.	
2.	
3.	
4.	

The person signing this application will be considered the proponent for the proposed action(s) and will receive all related notices and other communications.

*Signature: _____ Date: _____

Print/Type Name: _____

Address: _____

Phone #: _____

Property Address: _____

Cross Street(s): _____

Assessor Parcel #: _____ Acres: _____

If anyone in addition to the person signing this application is to receive notices of these proceedings, please indicate.

Name: _____

Address: _____

_____

Phone #: _____

DESCRIPTION / JUSTIFICATION

*1. Explain in detail why the proposal is necessary at this time (e.g., condition of an approved tentative map, an existing structure requires a new service, etc.).

_____

_____

_____

*2. Describe the use of developed property, including details about existing structures. Describe the anticipated development of vacant property, including the types of buildings, number of units, supporting facilities, etc., and when development is scheduled to occur.

_____

_____

_____

*3. Describe the topography and physical features of the territory, as well as its general location in relation to communities, major freeways/highways, roads, etc.

_____

_____

_____

4. How many residents live within the subject territory? _____

How many of these residents are registered voters? _____

LAND USE INFORMATION

If the territory is not within a city, County general plan and zoning information may be obtained by calling 619-565-5981 with the Assessor Parcel Number(s) of the subject property. If the territory is within a city, please call the appropriate city's planning department.

1. ***County:***

Which community plan encompasses the territory? _____
What is the County General Plan or community plan designation? _____
What is the current County zoning? _____

2. ***City:***

The territory is within the general plan area for the City of _____

What is the land use designation? _____

What is the current City zoning? _____

___

What is the current City prezoning? _____

3. Indicate below ALL permits or approvals that will be needed by the County or any city to complete the project. If already granted, please note the date of approval and attach a copy of each resolution of approval. If approval is pending, please note the anticipated approval date.

Type of Approval or Permit	File No.	Approval Date	Is Resolution Attached?
Tentative Subdivision Map			
Tentative Parcel Map			
Major Use Permit			
City or County General Plan Amendment			
City Prezoning			
County Rezone			
(Other)			

4. Describe the predominant uses of adjacent land (vacant, residential, commercial, etc.):

North: _____ East: _____

South: _____ West: _____

5. Indicate with a " " if any portion of the territory contains the following:

_____ Agricultural Land Uses
_____ Agricultural Preserve
_____ Open Space Easement
_____ Unusual features such as: _____

_____ Coastal Permit Zone
_____ Sewer Moratorium area
_____ Slopes greater than 25%

***PUBLIC SERVICES** (Identify agencies that provide services to the subject territory.)

Sewer and Water Services:

1. Is a developed parcel requesting annexation due to a failed septic system? If yes, please include a copy of any letters from the Environmental Health Department or qualified septic system company. YES NO

2. Is the subject territory within a district or city that provides public sewer service? If yes, which agency? YES NO

   _____

3. Is annexation for sewer service necessary? If yes, which district or city? YES NO

   _____

4. Has the affected agency issued a letter of sewer availability? If yes, please provide a copy of the letter with this application. YES NO

5. Will the affected agency be prepared to furnish sewer service upon annexation? If not, please explain YES NO

   _____

   _____

   _____

6. Does the affected agency have the necessary contractual and design capacity to provide sewer service to the proposal area? If not, please describe the agency's plans to increase its capacity. YES NO

   _____

   _____

7. Will the subject territory be annexed to a sewer improvement district? YES NO

8. Specify any sewer improvements (on and off site) that will be necessary to connect and serve the anticipated development. Indicate the total cost of these improvements and method of financing (e.g., general property tax, assessment district, landowner or developer fees).

   _____

   _____

   _____

9. What is the distance for connection to the agency's existing sewer system? _____ ft.

10. Is the subject territory within a district or city that provides public water service? If yes, which agency? YES NO

_____

11a. If the answer to #10 is no, is a well or other on-site water system currently used on the property? YES NO

11b. Is an on-site water system proposed to be used when the property is developed? YES NO

12. Is annexation for water service necessary? If yes, which district or city? YES NO

_____

13. Will the affected agency be prepared to furnish water service upon annexation? If not, please explain. YES NO

_____

_____

14. Does the affected agency have the necessary contractual and design capacity to serve the proposal area? If not, what plans does the agency have to increase its capacity? YES NO

_____

_____

_____

15. Will the subject territory be annexed to an improvement district? YES NO

16. Specify any improvements (on and off site) that will be necessary to connect and serve the anticipated development. Indicate the total cost of these improvements and method of financing (e.g., general property tax, assessment district, landowner or developer fees).

_____

_____

_____

17. What is the distance for connection to the agency's existing water system? _____ ft.

COMPLETE THE FOLLOWING SECTION ONLY IF YOU NEED FIRE PROTECTION SERVICE OR IF YOUR FIRE PROTECTION PROVIDER IS PROPOSED TO CHANGE

Fire Protection:

1. Is the subject territory currently within a district or city that provides fire protection service? If yes, which agency? YES NO

_____

2. Is annexation for fire service part of this application? YES NO

3. Is structural fire protection necessary? YES NO

4. Location of nearest fire station: _____

Estimated response times are: priority _____ min.

non-priority _____ min.

PLEASE COMPLETE THE FOLLOWING SECTION ONLY IF YOUR POLICE PROTECTION PROVIDER IS PROPOSED TO CHANGE

Police Protection:

1. Which police agency currently serves this territory? _____

2. Location/address of nearest police station _____

_____

Estimated response times are: priority _____ min.

non-priority _____ min.

3. Which police agency would serve the territory if this jurisdictional change is approved? _____

4. Location/address of their nearest police station: _____

Estimated response times are: priority _____ min.

non-priority _____ min.

FISCAL AND PUBLIC SERVICE INFORMATION: (To be completed by the annexing city or district)

1. Is the territory within an agency's sphere of influence? If yes, which city or district? YES NO

   _____

2. Upon annexation, will the territory be included within any assessment district and be subject to assessment for new or extended services? YES NO

3. Does the city or district have plans to establish any new assessment district that would included the annexing area? YES NO

4. Will the annexing area assume any existing bonded indebtedness? If yes, indicate any taxpayer cost. YES NO

   _____

5. Will the annexing area be subject to any special taxes, benefit charges, or fees? If yes, please provide details of all costs. YES NO

   _____

   _____

6. Does the affected territory contain existing commercial development that generates retail sales of ten million dollars or more per year? YES NO

7. Is the city or district requesting an exchange of property tax revenues as a result of this proposal? YES NO

8. Is this jurisdictional change subject to a master property tax exchange agreement? YES NO

_____ _____

Representative/Title Date

Representing: _____

(City/District)

Phone #: _____

SAN DIEGO LAFCO
CAMPAIGN CONTRIBUTION DISCLOSURE PROVISIONS/
PARTY DISCLOSURE FORM

LAFCOs are subject to the campaign disclosure provisions detailed in Government Code Section 84308, and the Regulations of the Fair Political Practices Commission (FPPC), Section 18438. **Please carefully read th e following information to determine whether the provisions apply to you. If you determine that the provisions are applicable, the attached form must be completed and returned with your proposal application.**

1. No LAFCO commissioner shall accept, solicit, or direct a contribution of more than $250 from any party, or agent, while a change of organization proceeding is pending, and for three months subsequent to the date a final decision is rendered by LAFCO. This prohibition commences when your application has been filed, or the proceeding is otherwise initiated.

   "Party" is defined as any person who files an application for, or is the subject of, a proceeding.

   "Agent" is defined as a person who represents a party in connection with a proceeding. If an individual acting as an agent also is acting as an employee or member of a law, architectural, engineering, or consulting firm, or a similar entity or corporation, both the individual and the entity or corporation are agents. When a closed corporation is a party to a proceeding, the majority shareholder is subject to these provisions.

2. A party to a LAFCO proceeding shall disclose on the record of the proceeding any contribution of more than $250 made to any commissioner by the party, or agent, during the preceding 12 months. No party to a LAFCO proceeding, or agent, shall make a contribution to a commissioner during the proceeding and for three months following the date a final decision is rendered by LAFCO.

3. Prior to rendering a decision on a proceeding, any commissioner who received contribution of more than $250 within the preceding 12 months from any party, or agent, to a proceeding shall disclose that fact on the record of the proceeding, and shall be disqualified from participating in the proceeding. However, if any commissioner receives a contribution that otherwise would require disqualification, and returns the contribution within 30 days of knowing about the contribution and the relevant proceeding, that commissioner shall be permitted to participate in the proceeding.

To determine whether a campaign contribution of more than $250 has been made by you or your agent to a commissioner within the preceding 12 months, all contributions made by you or your agent during that period must be aggregated.

The names of the current commissioners are listed on the roster available on this web site for your reference. If you have any questions about Government Code Section 84308, the FPPC regulation, or the disclosure form, please contact the LAFCO office at 1600 Pacific Highway, Room 452, San Diego CA 92101, telephone (619) 53l-5400.

City of
Encinitas

TO: Board of Directors

Cardiff Sanitation District

The undersigned property owners in the vicinity of _____
Respectfully request and consent to the commencement of proceeding for the annexation of the property described opposite our names to the Cardiff Sanitation District and further consent to this annexation subject to any and all regulations, fees, and/or changes established under the provisions of existing Cardiff Sanitation District ordinances.

Please Sign

Legal Description of Property Involved

Date

Name and Address

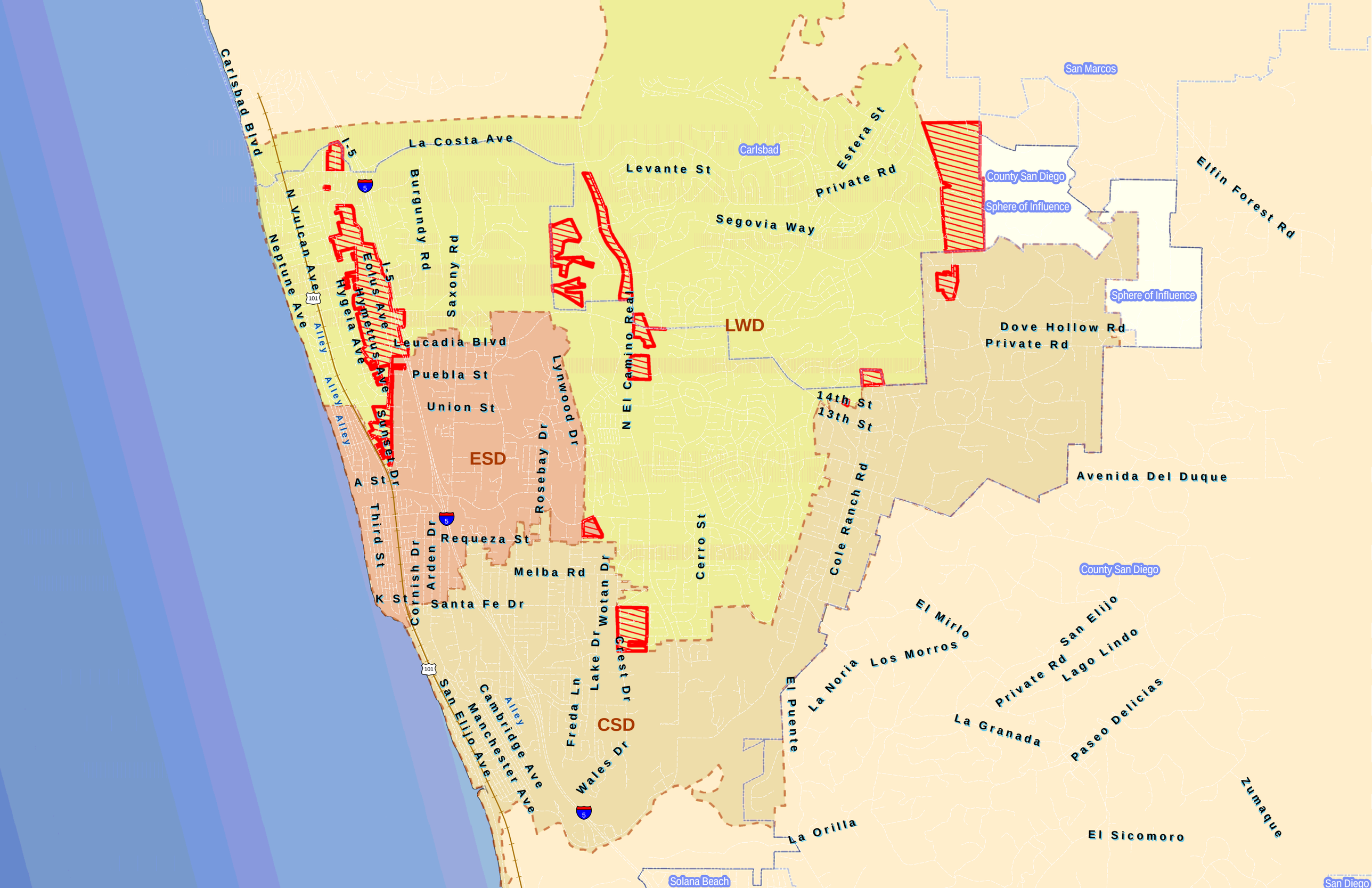
Range or Address of Property

Assessor's Parcel No.

*Signature: Date:

Note: If property is in escrow, please note the approximate date of completion of the escrow.

SEWER DISTRICT MAP


Carlsbad Blvd
N Vulcan Ave
Neptune Ave
I-5
La Costa Ave
Burgundy Rd
Saxony Rd
Eolus Ave
Hygeia Ave
I-5
Leucadia Blvd
Puebla St
Union St
Alley
Alley
Alley
Sunset Dr
A St
Third St
ESD
Rosebay Dr
Lynwood Dr
Requeza St
Melba Rd
Santa Fe Dr
K St
Cornish Dr
Arden Dr
Levante St
N El Camino Real
LWD
Carlsbad
Esfera St
Private Rd
Segovia Way
San Marcos
County San Diego
Sphere of Influence
Sphere of Influence
Elfin Forest Rd
Dove Hollow Rd
Private Rd
14th St
13th St
Cole Ranch Rd
Avenida Del Duque
Cerro St
Wotan Dr
Lake Dr
Freda Ln
Wales Dr
CSD
Alley
Cambridge Ave
Manchester Ave
San Elijo Ave
El Puente
La Orilla
Solana Beach
County San Diego
El Mirlo
La Noria
Los Morros
Private Rd
San Elijo
Lago Lindo
La Granada
Paseo Delicias
El Sicomoro
Zumaque
San Diego

ENCINITAS SANITARY DIVISION APPLICATION

Date: _____ **Permit No.:** _____

Building Permit No.: _____

Site Address: _____

APN: _____

Applicant Name: _____ Telephone No.: _____

APPLICATION FEES

DES # _____ **Wastewater Discharge # _____**

Description	Code	Account	Amount	Total
Sewer Lateral Construction	EFE2	10151410-344.1	$632	
Wastewater Discharge Permit Capacity Fees	EFCP	52396662-395	$2680 / EDU	
Wastewater Discharge Reimbursement Fees	EFSR	52100000-241	$_____	
Wastewater Discharge Service Charge	EFSC	52171661-347.2	$_____	
Wastewater Discharge Processing Fee	EFWP	10151410-344.1	$66	

GRAND TOTAL: _____

AUTHORIZATION:

ENGINEERING DIVISION SIGNATURE: _____

FINANCE:

PROCESSED BY: _____ DATE: _____

RECEIPT NUMBER: _____ CHECK #: _____

CARDIFF SANITATION DISTRICT APPLICATION

Date: _____ **Permit No.:** _____

Building Permit No.: _____

Site Address: _____

APN: _____

Applicant Name: _____ Telephone No.: _____

APPLICATION FEES

DCS # _____ **Wastewater Discharge # _____**

Description	Code	Account	Amount	Total
Sewer Lateral Construction	EFCE1	10151410-344.1	$632	
Wastewater Discharge Permit Capacity Fees	EFCCP	51396662-395	$3417 / EDU	
Wastewater Discharge Reimbursement Fees	EFCSR	51100000-241	$_____	
Wastewater Discharge Service Charge	EFCSC	51171661-347.2	$_____	
Wastewater Discharge Processing Fee	EFCCWP	10151410-344.1	$66	

GRAND TOTAL: _____

AUTHORIZATION: ENGINEERING DIVISION SIGNATURE: _____

FINANCE:

PROCESSED BY: _____ DATE: _____

RECEIPT NUMBER: _____ CHECK #: _____

CHAPTER 5: WATER DESIGN REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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RESOLUTION 2009-43

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING CHAPTER 5 OF THE ENGINEERING DESIGN MANUAL

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the first six chapters of the Engineering Design Manual have been made available for review by members of the public and the professional community in public workshops and on the City of Encinitas web page; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF CHAPTER 5 OF THE ENGINEERING DESIGN MANUAL

Chapter 5 of the Engineering Design Manual, Attachment 1 to this resolution, is hereby adopted by the City Council and is to be a comprehensive guide to the policies and processes for processing water designs.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of Chapter 5 of the Engineering Design Manual will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the Design Manual will not directly result in development; any development permit processed as a result of the policies and processes contained within the Engineering Design Manual may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

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CHAPTER 5– WATER DESIGN REQUIREMENTS

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Pressure Criteria	5.103	5-1
Static Pressure	5.103.1	5-2
Dynamic (Operating) Pressures	5.103.2	5-2
Pressure Requirements During Fires	5.103.3	5-2
Velocity Criteria	5.104	5-3

CHAPTER 5
WATER DESIGN REQUIREMENTS

5.100 GENERAL INFORMATION.

The City of Encinitas in served by two water districts: San Dieguito Water District and Olivenhain Municipal Water District. The City Engineering Department reviews engineering improvements within the City, but is not the approving agency for water improvements. These districts are separate from the City and must be contacted separately for that district's requirements.

5.101 *PURPOSE.*

This section is to notify the Engineer of Work to contact each water district for design criteria, rules and regulations, fees and other charges for the development of projects.

5.102 *FIRE DEMANDS.*

Fire flow requirements and fire hydrant spacing shall comply with the requirements of the Uniform Fire Code and California Fire Code (Ord. 2007-12) and as amended by the City of Encinitas Municipal Code Title 10 - FIRE PREVENTION, Chapter 10.04 Section 508.3 Fire Flow Requirements and Section 508.5.1.1 Water Supplies and Fire Hydrants.

A. The required fire flow demand shall be supplied from at least two fire hydrants (assumes ½ flow from each hydrant) within a maximum radius of 750 feet from the fire.

B. Maximum fire hydrant supply, in some cases, can be obtained from the District. The supply will be based on an actual flow test if fire hydrants are in the vicinity of the desired location and a calculated flow rate at 20 psi

will be provided. If hydrants are not available, then hydraulic modeling is required.

5.103 *PRESSURE CRITERIA.*

5.103.1 Static Pressures.

A. Static Pressure is defined as the pressure in the system with no demand occurring in the distribution system.

B. It is desirable to have water distribution pipelines in each pressure zone capable of supplying a minimum static pressure of 65 psi.

5.103.2 Dynamic (Operating) Pressures.

A. In analyzing the supply to a pressure zone, the minimum hydraulic grade line elevation available from the water source shall be used; a level that typically occurs during peak hour demand conditions.

B. Operating pressures under peak hour demand conditions shall not fall more than 25 psi below the static pressure of 65 psi, equating to a residual water distribution pipeline pressure of 40 psi. Operating pressures are determined in the distribution system pipelines at the service connection or fire hydrant.

5.103.3 Pressure Requirements During Fires.

A. For the simulation of fire conditions, a minimum operating pressure of 20 psi is required in the distribution pipelines in the vicinity of the fire. The residual pressure is determined given the fire demand concentrated at a hydrant within a radius of 750 feet of the fire.

B. For water systems, the residual pressures in the distribution system during a fire shall be maintained given the following conditions:

1. The water level in the storage facility at the time of the fire is at the minimum operational level that

typically occurs during peak hour demand conditions.

2. The prescribed fire duration as determined by the governing fire department is coincident with the maximum day demand condition.

3. Areas outside of the fire circumference in the same pressure zone maintain a minimum pressure of 20 psi.

5.104 *VELOCITY CRITERIA.*

The maximum fire hydrant lateral velocity shall not exceed 15 feet per second under maximum day plus fire flow conditions.

CHAPTER 6: DRAINAGE DESIGN REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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RESOLUTION 2009-44

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA ADOPTING CHAPTER 6 OF THE ENGINEERING DESIGN MANUAL

WHEREAS, the City of Encinitas Engineering Services Department has prepared an Engineering Design Manual to guide the public and professionals in the submittal of required material to the Engineering Services Departments for the processing of Engineering permits, grading plans, subdivision maps and parcel maps, drainage designs, sewer designs and water designs; and

WHEREAS, the first six chapters of the Engineering Design Manual have been made available for review by members of the public and the professional community in public workshops and on the City of Encinitas web page; and

NOW, THEREFORE, the City Council of the City of Encinitas hereby ordains as follows:

SECTION 1: ADOPTION OF CHAPTER 6 OF THE ENGINEERING DESIGN MANUAL

Chapter 6 of the Engineering Design Manual, Attachment 1 to this resolution, is hereby adopted by the City Council and is to be a comprehensive guide to the policies and processes for processing drainage designs.

SECTION 2: ENVIRONMENTAL FINDING:

The City Council, in their independent judgment, finds that the adoption of Chapter 6 of the Engineering Design Manual will be exempt from Environmental Review pursuant to General Rule 15061 (b) (3) since there would be no possibility of a significant effect on the environment because the Design Manual will not directly result in development; any development permit processed as a result of the policies and processes contained within the Engineering Design Manual may be subject to CEQA review and analysis as part of the processing of the permit.

SECTION 3: EFFECTIVE DATE:

This resolution was adopted on October 28, 2009 and will immediately become effective.

PASSED AND ADOPTED this 28th day of October, 2009 by the following vote, to wit:

AYES: Barth, Bond, Dalager, Houlihan, Stocks.

NAYS: None.

ABSTAIN: None.

ABSENT: None.

Maggie Houlihan, Mayor

ATTEST:

Deborah Cervone, City Clerk

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CHAPTER 6
DRAINAGE DESIGN REQUIREMENTS

6.100 GENERAL INFORMATION.

6.101 *PURPOSE.*

The purpose of this chapter is to assist the engineer with the preparation of hydrology and hydraulics studies and calculations and with the design of storm drain facilities. Alternate methodologies than those described herein may be allowed at the discretion of the City Engineer. This chapter also contains requirements pertaining to development within flood-prone areas.

The City of Encinitas requires drainage studies to be prepared based upon the most recent County of San Diego Hydrology and Drainage Design Manuals adopted by the City.

6.102 *STANDARDS AND REFERENCES.*

The following resources, listed in order of precedence, are to be utilized for drainage analysis and design. In case of conflict, the document of higher precedence shall be used. The most current City-adopted version of all documents shall be used.

A. City of Encinitas Municipal Code.

B. Requirements and guidelines specified in this manual.

C. City and staff policies.

D. The City of Encinitas Best Management Practice Manual, Part II.

E. County of San Diego Hydrology Manual.

F. County of San Diego Drainage Design Manual.

G. San Diego Area Regional Standard Drawings.

H. Standard Specifications for Public Works Construction, a.k.a. "The Greenbook".

I. Generally accepted standards for professional engineering and construction practices.

6.103 *STORMWATER QUALITY REGULATIONS.*

Drainage designs shall also comply with the requirements of the Regional Water Quality Control Board and the City of Encinitas Jurisdictional Urban Runoff Management Plan, the Standard Urban Stormwater Mitigation Plan (SUSMP), and stormwater quality requirements, which are discussed in Chapter 7 of this manual.

6.104 *HYDROMODIFICATION AND LOW IMPACT DEVELOPMENT.*

Project designs shall comply with current low impact development and hydromodification objectives, such as limiting graded and hardscape areas to allow greater natural infiltration and to manage increases in the volume and rate of runoff above predevelopment levels. Hydromodification and low impact development requirements are discussed in the City of Encinitas Standard Urban Stormwater Mitigation Plan (SUSMP), which is discussed in Chapter 7 of this manual.

6.200 HYDROLOGY STUDY.

6.201 *GENERAL INFORMATION.*

The City of Encinitas requires drainage studies to be prepared based upon the most recent County of San Diego Hydrology and Drainage Design Manuals adopted by the City.

The hydrology study shall be composed utilizing available record drawings, information in the City GIS database, other applicable records maintained by the City, and a field review. The field review is essential to ensure all existing drainage facilities are appropriately represented in the study and that the drainage areas are accurate.

The most current version of the San Diego County Hydrology Manual shall be utilized for the study, with the modifications noted below. Deviations from the minimum requirements noted below shall be approved in advance by the City Engineer.

6.202 *HYDROLOGIC SOIL GROUP.*

Due to the variation in soils occurring in Encinitas, all hydrology studies shall assume soil group 'D' for the hydrology analysis. This approach ensures a conservative study since soils group 'D' allows the least infiltration of storm runoff. Other soil groups may be allowed if supporting documentation is approved in advance by the City Engineer.

6.203 *COEFFICIENT OF RUNOFF.*

The following policies pertain to the calculation of the coefficient of runoff, the 'c' value, for drainage calculations.

6.203.1 Area-Weighted Coefficient of Runoff. The City of Encinitas requires the calculation of an area- weighted average coefficient of runoff. Studies shall calculate the average coefficient of runoff, 'c', by assuming a 'c' value of 0.9 for all roof, pavement, and other hardscape areas and a 'c' value of .45 for all pervious areas. A sample calculation is provided in Appendix 6.1. More detailed studies utilizing

other values for the coefficient of runoff shall be approved in advance by the City Engineer.

6.203.2 Greenhouses and the Coefficient of Runoff. Because greenhouse facilities are not a use requiring a permit, the construction of the greenhouse facilities would not have necessitated a drainage study or the construction of storm drain facilities to handle the runoff from the development. If greenhouse facilities exist onsite and will be demolished as a part of the proposed development, the coefficient of runoff for the predevelopment condition shall assume an undeveloped condition, vacant land.

6.204 *STORM FREQUENCY.*

Drainage studies shall consider a 100-year storm frequency. For the rational method, both six-hour and 24-hour storms shall be considered in the hydrology study.

6.205 *TIME OF CONCENTRATION.*

The time of concentration is the time required for the runoff from the most remote region of the watershed to reach the point of concentration at which the flow is to be calculated. The minimum time of concentration as established by the San Diego County Hydrology Manual shall be assumed unless calculations for the time of concentration are included in the study. As an alternative, the nomograph for Time of Concentration for Initial Subarea taken from the Orange County Hydrology Manual may be utilized with prior approval from the City Engineer (see Appendix 6.3).

6.206 *COMPUTER-AIDED STUDIES.*

When a computer program is utilized in the preparation of the drainage study, the computer data shall be added to the study submitted to the City. This shall include the name, version, and maker of the program, an explanation of the required inputs and the values entered, and a list of the variables used by the program.

6.207 *DRAINAGE AREAS AND DRAINAGE AREA MAPS.*

Drainage area maps shall be prepared as discussed below.

6.207.1 General Information. Separate drainage area maps shall be included for the existing and proposed conditions in order to avoid confusion when the existing drainage pattern is being modified. Existing and offsite drainage area maps shall include topography contours for the entire area of concern imposed upon an aerial photograph of the drainage area. When a grading plan is being prepared, it shall be used as the base for the proposed condition drainage area map, with the pertinent hydrology study information shown and plan features not related to the hydrology study excluded. Grades shown on the drainage area map and used in the study shall be based upon the North American Vertical Datum of 1988 (NAVD 88). Storm drain systems, inlets, culverts, natural water courses, and cross-gutters shall be included with the flow tributary to each labeled. The drainage area map shall clearly show each drainage area used in the study labeled with the number corresponding to the study, the acreage, and the Q_{100} value. The direction of flow for the longest time of concentration, points of confluence, and discharge point locations shall be labeled.

6.207.2 Offsite Tributary Areas. Runoff from offsite tributary areas that discharge to or across the project site shall be considered in the hydrology study, and the proposed drainage system shall be designed to accommodate flows originating onsite and in offsite tributary areas. The calculations for onsite and offsite areas shall be presented separately in the study. When necessary for clarity, separate drainage area maps shall be presented to show the onsite and offsite areas at appropriate scales.

6.208 *OTHER CALCULATIONS REQUIRED.*

The project planchecker may require that any necessary calculations for stormwater treatment facilities be included in the hydrology study. Stormwater treatment requirements are discussed in Chapter 7 of this Manual. Similarly, the hydrology study shall include any

calculations necessary to demonstrate the impact of the proposed development on downstream properties. Pipe strength and/ or loading calculations may be required for cases in which the D-load table does not apply. If detention/ infiltration basin is required for the project, basin routing and staging calculations may be required.

6.300 HYDRAULICS.

Drainage systems shall be designed such that the flows from a 100-year storm will be contained within the underground storm drain systems and/or the public right-of-way. On circulation element roads and higher street classifications, a 12' wide travel lane shall be maintained for each direction of travel during a 100-year storm, unless otherwise authorized by the City Engineer. Cross-gutters shall be constructed only at street intersections, unless otherwise allowed by the City Engineer.

Storm drain inlet, drainage swale, and pipe sizing/ capacity calculations shall be provided. Where applicable, velocity calculations showing that non-erosive velocities are maintained shall be provided.

At the discretion of the City Engineer, a downstream drainage study may be required to assess the capacity of the storm drain system to handle runoff from the development.

If a detention/ infiltration basin is required to mitigate cross-lot drainage, calculations shall be provided showing that the impact of the proposed development on downstream properties does not exceed the predevelopment condition. Basin routing calculations shall be provided. Design requirements for detention/ infiltration systems are discussed in Section 6.601 below.

6.400 STORM DRAIN DESIGN.

The following are the minimum design requirements for storm drain systems, and deviations shall be approved in advance by the City Engineer. More stringent design criteria may be required by the City Engineer. Requirements are for public systems unless otherwise noted.

6.401 *SLOPE.*

The minimum allowable pipe slope is 0.5%. A flatter slope may be approved in special situations by the City Engineer.

6.402 *CLEANOUTS AND ACCESS STRUCTURES.*

Cleanouts shall be provided at angle points, grade breaks, and as necessary to ensure proper access for maintenance and repair. The maximum cleanout spacing shall be 300' for 30" or smaller storm drains and 400', 600', and 800' respectively for 30"-42", 42"-60", and greater than 60" storm drains. All intersections, changes in direction, and changes in pipe cross-sectional dimensions shall have an access structure approved by the City Engineer. Existing substandard downstream drainage structures may be required to be replaced, at the discretion of the City Engineer.

6.403 *PIPE MATERIAL.*

Storm drains shall be constructed of reinforced concrete pipe (RCP). Drainage structures shall be cast-in-place reinforced concrete; precast concrete components may be allowed if inspected in the manufacturing plant by the City. The strength classification or gauge shall be shown on the plans; RCP shall be 1350-D minimum. HDPE pipe or other alternative pipe materials may be utilized with prior written approval by the City Engineer. Where it is installed beneath the roadway, HDPE pipe shall be encased in concrete as protection from future construction activities in the area of the pipe and to avoid accidental cuts into the pipe once it is installed.

6.404 *PIPE SIZING.*

The minimum allowable pipe size shall be 18", unless otherwise approved by the City Engineer. Calculations for the determination of the required pipe size shall be included in the drainage study. The storm drain pipe may not connect to a smaller pipe downstream.

6.405 *HORIZONTAL CURVES.*

Horizontal curves shall be as per the manufacturer's specifications or as approved by the City Engineer. Where horizontal curves are proposed, the plan shall be labeled with the radius, length, and delta of the curve.

6.406 *FLOW VELOCITY.*

The drainage system shall be designed with a minimum flow velocity of four feet per second (fps) and with a maximum of 20 fps. Exceptions shall be approved in advance by the City Engineer. In cases in which the velocity exceeds 20 fps and excessive erosion of the pipe due to sedimentation may occur, a special wall RCP may be required. Energy dissipater systems to the satisfaction of the City Engineer shall be utilized to provide protection from erosive velocities at discharge points.

6.407 *SEPARATION FROM WATER AND RECLAIMED WATER LINES.*

Water-tight joints will be required for locations in which a storm drain must cross within five feet of a water or reclaimed water main.

6.408 *REQUIREMENT FOR WATER-TIGHT JOINTS.*

Pressure flow may be allowed at the discretion of the City Engineer for storm frequencies equal to or greater than a 10-year storm provided that the depth below surface allows adequate head to prevent potential flooding throughout the system. When such systems are allowed, they shall be designed to the satisfaction of the City Engineer, and they may require water-tight joints in the pressurized sections of pipe plus an additional safety length beyond the pipe length experiencing pressure flow. The additional safety length required shall be at the

discretion of the City Engineer based upon the Q_{100}, pipe size, and flow velocity.

6.409 *PIPE DEPTH.*

Storm drain systems shall be constructed with the top of pipe a minimum of two feet deep, unless otherwise allowed by the City Engineer. Storm drains constructed at a depth greater than fifteen feet are deep storm drains and shall be avoided whenever possible. When the City Engineer approves the construction of a deep system, oversized specially designed access holes, pipe encasements, greater pipe size, increased easement requirements for maintenance access, water-tight joints, and/or additional pipe thickness may be required.

6.410 *STORM DRAIN EASEMENT REQUIREMENTS.*

Storm drain maintenance and/ or access easements shall be required in order to ensure adequate access to any public storm drain facilities. Requirements for storm drain easements and all-weather access roads parallel those for sewer easements, which are discussed in Chapter 4, Section 4.400.

6.500 STORM DRAIN IMPROVEMENT PLANS.

6.501 *GENERAL INFORMATION.*

The construction of public storm drain improvements requires a public improvement permit from the City of Encinitas. At the discretion of the City Engineer, private storm drain improvements may be permitted with the grading permit. Grading and improvement plans are required to be prepared by a qualified civil engineer licensed within the state of California. Storm drain plans shall satisfy the requirements discussed below.

6.502 *PLAN PREPARATION.*

6.502.1 Plan Requirements. The storm drain improvement plan shall include a plan and profile view of the proposed drainage improvements. The plan view of the storm drain shall be shown on the same sheet as any proposed grading or pavement work in order to facilitate checking of proposed grades. The plan shall show curb, gutter, and other drainage structures within the vicinity of the proposed project with flow line elevations. Proposed flowline elevations shall be labeled to show continuity of flow. Where stationing from a previous improvement plan exists in the area of the proposed work, the same stationing shall be used to prepare the plan.

6.502.2 Profile Requirements. Each segment of the profile shall be labeled with pipe invert elevations, slope, length, material, D-loading, and Q_{100}. The hydraulic and energy grade lines shall be shown. Each inlet or other drainage structure shall be shown on the profile and labeled. The existing and proposed ground elevations shall be shown, and all infrastructure crossings and potential conflicts shall be indicated on the profile with the minimum clearance distance called out.

6.502.3 Cross-Section Requirements. Cross sections and construction details shall be provided through swales, detention/ infiltration basins, and non-standard drainage facilities and structures. Swale and basin sideslopes shall not exceed a 2:1 ratio without prior approval from the City

Engineer. Parabolic or trapezoidal cross-sections are encouraged for swales due to enhanced stormwater treatment capabilities.

6.502.4 Maintenance Responsibility. The long-term maintenance responsibility of the storm drain facilities shall be indicated for each element on the improvement plan. If a system is public, it shall be labeled as such. If a private party or a homeowner's association will be responsible for the maintenance, the name, contact phone number, and address shall be provided on the plan. A covenant for perpetual private maintenance of the storm drain system may be required to record against the property, at the discretion of the City Engineer. If so, the recoding information for the covenant shall be entered on the improvement plan.

6.600 SPECIAL DRAINAGE SITUATIONS.

6.601 *CROSS-LOT DRAINAGE.*

New cross-lot drainage situations shall not be allowed under any circumstances, and existing cross-lot drainage shall not be allowed if an alternate solution is feasible. If the historic drainage pattern is cross-lot, alternatives shall be examined that evaluate the impact on other downstream properties of re-routing the runoff. At the discretion of the City Engineer, Private Maintenance Agreements for the drainage facilities and/ or a Hold Harmless for Drainage covenant shall be recorded against the property. Examples of these documents are included in Appendices 1.18 and 1.19.

In cases in which an alternative to the historical cross-lot drainage situation is infeasible, the development shall be designed in such a way as to ensure that the impact of the drainage on the downstream property following development does not exceed the pre-development impact. This is typically achieved by minimizing new paved and hard-surface areas and by draining the impervious areas to an infiltration and/ or detention basin that is designed and sized in accordance with Engineering Department standards. Drainage systems to mitigate cross-lot drainage shall be designed for the 100-year storm. For the rational method, both six and 24 hour storm durations shall be analyzed to determine the required detention capacity. Calculations for the required and provided detention/ infiltration volumes shall be included in the project drainage study.

A sample design for an infiltration basin is included as Appendix 6.2. The basin is designed to receive all site runoff discharging onto the adjacent property and is constructed underground, lined with filter fabric, and filled with 3/4" crushed rock. Surface runoff enters the crushed rock storage through a grate inlet and is dispersed via a 4" perforated pipe running laterally through the crushed rock.

The designs of infiltration systems shall allow for a controlled release of the runoff and shall include an emergency overflow and/ or spillway. The discharge of any proposed system that drains cross-lot shall ensure

that the post-development pattern of drainage to the adjacent property mimics the pre-development pattern, typically by designing a system that allows sheet flow to the downstream property. Concentration of runoff to an adjacent property shall not be allowed.

6.602 *DRAINAGE OF BLUFF-TOP PROPERTIES.*

Discharge of stormwater and irrigation runoff over the top of a bluff shall not be allowed. Infiltration areas are discouraged on bluff-top properties because of the potential of the runoff for disturbing the stability of the bluff. Bluff-top properties shall be graded to drain away from the bluff. If surface drainage away from the bluff is not possible due to the existing/ proposed grades, a drainage system shall be constructed to intercept the runoff prior to it flowing over the bluff. The runoff shall be routed to a water-tight holding tank/ wet well designed to handle the 50-year storm event and then pumped to a discharge point from which the runoff can surface flow off the property. Bluff-top drainage requirements do not alleviate the project of the obligation to comply with stormwater treatment requirements.

If an automatic irrigation system is proposed for a bluff-top property, the system shall be designed to avoid excess watering. An automatic shut-off system, moisture shut-off sensors, and other advanced controls will be required for the installation of the automatic irrigation system. The system shall be approved by the City Engineer prior to installation.

In order to mitigate to the maximum extent the drainage impact of proposed development on the bluff, projects shall incorporate native, drought-tolerant plant material appropriate for the exposed coastal bluff area. All plant material shall have the ability to naturalize without supplemental irrigation after an establishment period of three years or less. A landscape plan may be required by the City in order to ensure that the irrigation impacts have been appropriately addressed.

6.603 *PRIVATE LANDSCAPE DRAINAGE SYSTEMS.*

For ease of maintenance, stormwater quality, and low impact development, engineers are encouraged to design systems that allow gravity flow from the project site to the street with minimal use of storm drain pipes that don't allow stormwater treatment. The location of the proposed area drains and drainage facilities are required to be shown on the grading plan. Inlets and catch basins shall be located within pervious areas that provide stormwater treatment, and the use of inlets and catch basins shall be limited in order to allow the maximum time of travel of the stormwater runoff over those treatment areas/ or building permit site plan. The installation of a drainage system not shown on the grading plan and/ or building permit site plan and not approved by the City Engineer may violate the stormwater quality features approved by the City, and it therefore will require a permit from the Engineering Department unless determined otherwise by the City Engineer. Drainage systems not shown on the grading plan and/or building permit site plan are subject to a construction permit requirement and potential removal/ redesign/ relocation, at the discretion of the City Engineer.

Any landscape drainage system required within the public right-of-way requires prior approval from the City Engineer and an encroachment permit. The encroachment permit shall be issued prior to issuance of the grading permit, and the recording information for the encroachment permit shall be shown on the grading plan.

6.700 FLOODPLAIN AND FLOODWAY.

Work within the floodplain/ floodway as shown on the most recent Flood Insurance Rate Map (FIRM) shall comply with FEMA requirements and the Chapter 23.40 of the Municipal Code. Boundaries of the 100-year and 500-year floodplain and floodway are also available at City Hall through the City GIS system.

6.701 *CONSTRUCTION WITHIN THE FLOODPLAIN.*

No grading is allowed in the floodplain unless a hydrologic and hydraulic study is prepared and approved by both the City Engineer and FEMA, and the appropriate NFIP applications such as a Conditional Letter of Map Revision (CLOMR) or a Letter of Map Revision (LOMR) are processed with FEMA. New construction and any substantial improvement of any structure shall have the lowest floor, including any basement, elevated at least two feet above the 100-year floodplain or meet the standards in Section 23.40.040(A)(3)(c) of the Municipal Code.

Structures and/ or portions of structures below the 100-year base flood elevation shall be of materials not readily susceptible to water damage. Enclosed areas below the base flood elevation shall be designed to allow the free passage of floodwaters through openings. The openings shall be deigned such that the bottom is no more than one foot above grade and shall allow a total open area of one square inch for every square foot of enclosed area below the base flood elevation. The City Engineer may require that the building plans or a portion of the building plans be attached and approved with the grading plan in order to ensure that the Municipal Code and City requirements are being met.

The elevation of the lowest floor shall be certified upon completion of construction by a registered professional engineer or surveyor to be constructed at an elevation as required by Municipal Code 23.40.040. Any non-habitable construction below the 100-year base flood elevation shall be certified by a registered professional engineer to be in compliance with the requirements of the Municipal Code and the City Engineer. The certifications shall be

submitted for review and approval by the City Engineer prior to final of the project.

6.702 *DEVELOPMENT WITHIN THE FLOODWAY.*

Encroachments including earthwork, new construction, improvements, and other development in the floodway are prohibited without a permit from the City. Floodway encroachment or improvement is allowed only if a hydrological study approved by the City and by FEMA shows that no adverse impacts, including no rise in the flood water surface elevation and if the Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) are processed with FEMA. Any proposed improvements shall meet with the federal requirements for development within the floodway.

6.703 *LEUCADIA SPECIAL FLOOD AREA.*

A study of the flooded area along North Coast Highway 101 in Leucadia was performed by Rick Engineering and is on file with the City. The study specifies the area affected by the Leucadia flood and provides sections with water surface elevation profiles along the corridor. The study is available for review from the Engineering Department, and the bounds of the flooded areas are identified in the City digital GIS database and are available to the public.

Development proposed within the area of the Leucadia special flood shall be constructed such that the floor elevation of all habitable areas are at or above the 100-year water surface elevation specified in the study. Development within the Leucadia Special Flood Area shall be designed to ensure that the proposed development will provide an onsite floodwater storage capacity equal to the volume of runoff displaced by the development in a 10-year storm event. This is typically achieved by providing above- or below-ground stormwater storage. The storage area shall be designed to fill without reliance on pumps or mechanical systems and shall include a discharge system that will release flows uniformly and within six hours after the storm. The storage area shall be designed to fill automatically during a storm and to discharge the runoff slowly after the storm peak. The storage pump system

shall be designed as a part of the grading plan, and the system and pump specifications shall be approved prior to approval of the plan. The storage area shall be designed with a manhole access that is accessible by a vac-con truck or similar equipment to allow regular maintenance and emergency pumping in the event of a system failure.

APPENDIX CHAPTER 6:
DRAINAGE DESIGN REQUIREMENTS

ENGINEERING DESIGN MANUAL
OCTOBER 28, 2009

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APPENDIX - DRAINAGE DESIGN REQUIREMENTS

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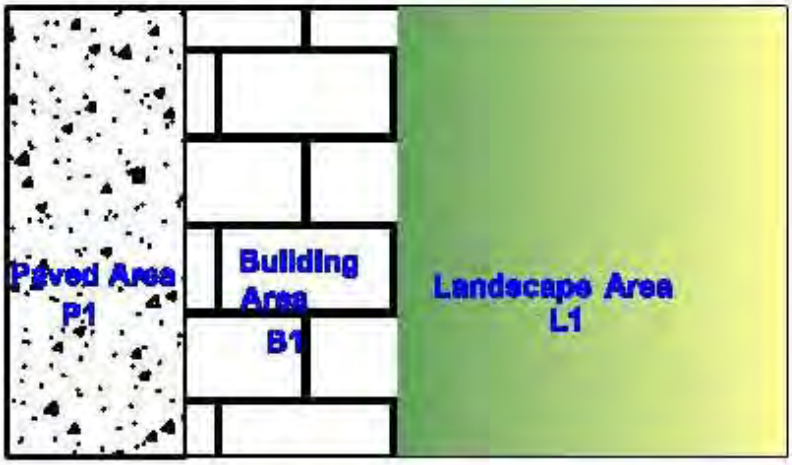
6.3	Time of Concentration for Initial Subarea Nomograph	6-5

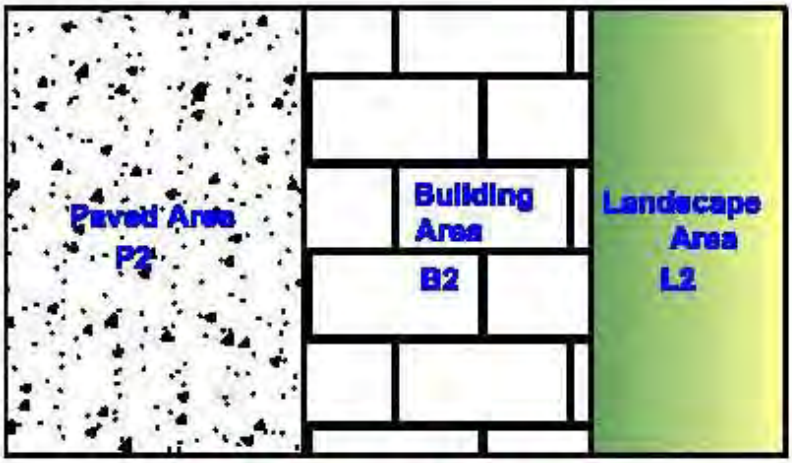
DETERMINING AN AREA-WEIGHTED COEFFICIENT OF RUNOFF

Total Area = P1 + B1 + L1



Pre-Developed Condition

Total Area = P2 + B2 + L2



Post-Developed Condition

Predeveloped Coefficient of Runoff:

$$Cpre = \frac{(0.95 \times P1) + (0.95 \times B1) + (0.45 \times L1)}{P1 + B1 + L1}$$

Postdeveloped Coefficient of Runoff:

$$Cpost = \frac{(0.95 \times P2) + (0.95 \times B2) + (0.45 \times L2)}{P2 + B2 + L2}$$

Postdeveloped Coefficient of Runoff: ^c = Cpost - Cpre

SIZING AN INFILTRATION BASIN

Why an Infiltration Basin:

- A detention basin assures that the Q (cfs) generated on the site of concern and draining to the downstream property does not increase. The discharge of the detention basin is designed such that the discharge rate in the developed condition is equal to or less than the predevelopment rate of runoff.
- However, a detention basin is not mean to regulate low-flows to a downstream property, such as irrigation and nuisance runoff. An infiltration basin can fill this function and is pictured on the next page.

How the Necessary Volume is Determined:

1) Find the area-weighted predevelopment and post-development runoff coefficients. See Attachments 1 and 2. Find ^C as:

$$^C = C_{post} - C_{pre} \quad \text{(dimensionless)}$$

2) Using P6 = 2.5 (inches) and assuming the minimum time of concentration, Tc, as 5 minutes, determine rainfall intensity, I (inches/ hr) as: (See Attachment 3)

$$I = 7.44 * P6 * Tc^{-0.645}$$

Given P6 = 2.5 inches and Tc = 5 min, I should be around 6.6 in/hr

3) Determine the increase in Q over the pre-development Q as:

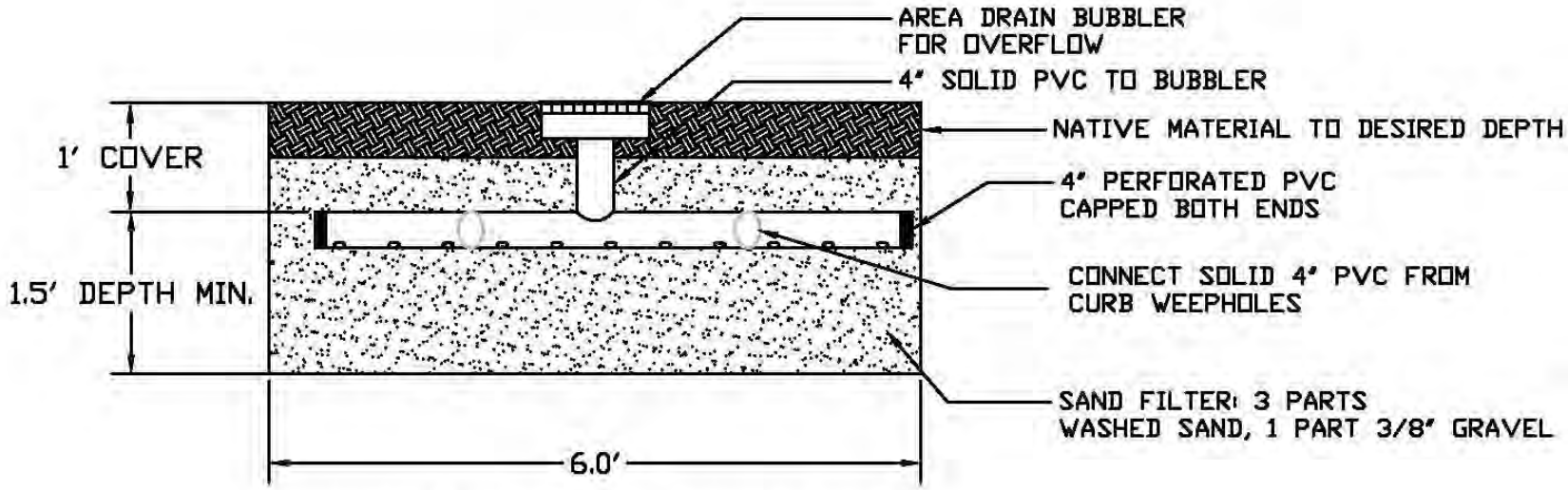
$$Q = {}^C * I \text{ (in/hr)} * A \text{ (acres)}$$

4) Determine the required volume for the infiltration basin, V (cf) as:

$$V = 1.5 * 2.65 * Q \text{ (cfs)} * Tc \text{ (sec)}$$

Where Tc is converted from minutes to seconds, 1.5 is a factor to account for the volume occupied by the gravel in the basin, and 2.65 is an empirical scale factor for the required storage volume.

In the equations above, the variables are as follows:
A = entire site acreage (acres)
c = coefficient of runoff (dimensionless)
^c = change in c from predeveloped to developed condition
I = rainfall intensity (in/hr)
P6 = 6 hour precipitation (in)
Q = rate of runoff (cfs)
Tc = time of concentration (minutes)



Typical Infiltration Trench Detail

Notes:

1. Trench depth and location may be adjusted to avoid conflicts
2. Typical trench dimensions 4'Wx6'Lx2.5'D

TIME OF CONCENTRATION FOR INITIAL SUBAREA

ORANGE COUNTY HYDROLOGY MANUAL ADDENDUM NO. 1

INTRODUCTION

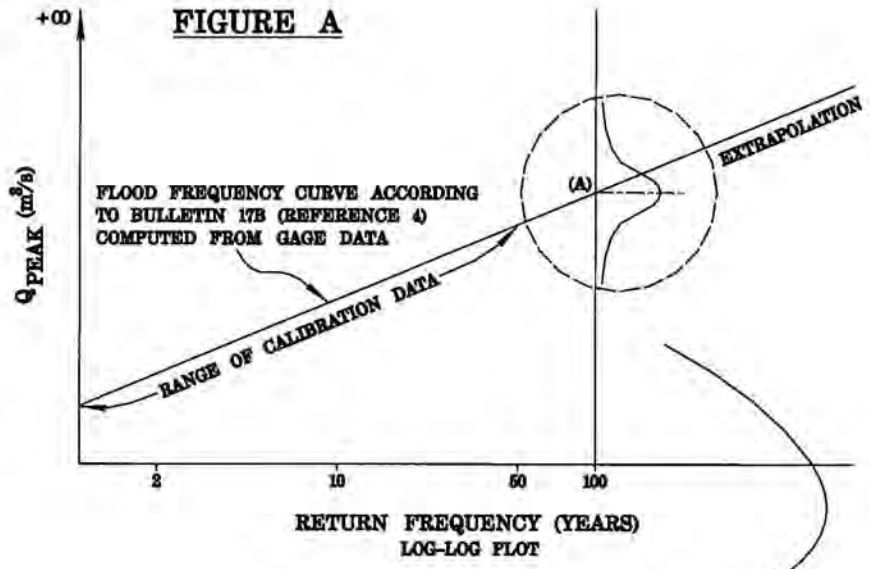
The criteria and methods used in the 1986 Orange County Hydrology Manual (hereinafter "Manual") yield high confidence (85% confidence interval) peak discharges and volumes that are appropriate for most flood control design purposes. The Manual parameters were originally based on a regional calibration study that was subsequently expanded by the U.S. Army Corps of Engineers in "Derivation of a Rainfall-Runoff Model to Compute N-Year Floods for Orange County Watersheds", November, 1987[1] and by Williamson and Schmid in "Determination of 500-Year Floodplain, Confluence of San Diego Creek and Sand Canyon Wash", March 12, 1991[2]. There are special circumstances where such high confidence discharges may not be appropriate. This addendum establishes criteria for the use of expected value (50% confidence interval) peak discharges for design under such circumstances. Figures A and B show the definition sketches for 85% and 50% confidence intervals.

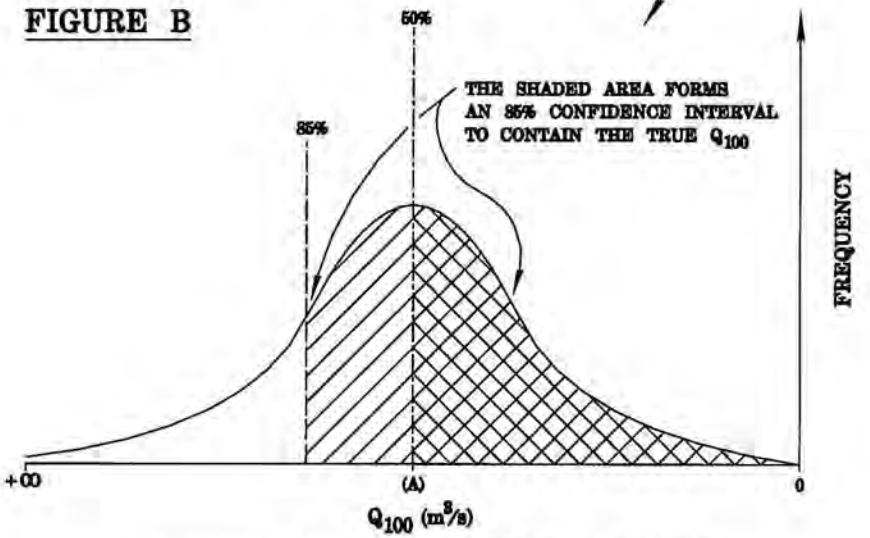
The addendum provides new guidelines for use of the initial area nomograph (Manual Figure D-1) for both high confidence and expected value calculations.

CRITERIA FOR SELECTING EXPECTED VALUE DISCHARGES

Expected value (50% confidence interval) discharges should be used for the following:

- Calculating incremental increases in peak discharge for purposes of implementing development mitigation requirements.
- Flood plain delineations under existing conditions.
- Estimation of water resources related variables such as sedimentation and water quality.
- Evaluating protection level provided by existing facilities.





FREQUENCY DISTRIBUTION OF Q_{100} VALUES
(VARIATION IN Q_{100} VALUES DUE TO SAMPLING ERROR)

ORANGE COUNTY
HYDROLOGY MANUAL

Metric

ADDENDUM NO.1
DEFINITION SKETCHES FOR
85% AND 50% CONFIDENCE INTERVALS

The Manual's criteria and parameter values remain in force for development proposals, subdivision improvement plans and regional flood control design as described herein. On an individual basis and where appropriate, expected value (50% confidence interval) discharges may be authorized by the Chief Engineer, Public Facilities and Resources Department for design and reconstruction of flood control facilities. However, under no circumstance should the design discharge be less than the Federal Emergency Management Agency's 100-year discharge, where such FEMA discharge is known and/or available.

CONFIDENCE INTERVAL: WHAT IT MEANS

A regional calibration considering the relationship between measured rainfall and measured peak discharges on seven Southern California watersheds was accomplished in order to determine the rainfall data to be used in the County's hydrologic models. This relationship between rainfall and peak discharges expressed in a statistical regression equation yields an "expected value" for each required recurrence interval (N-year) peak discharge (Figure A). On a regional basis half of the peak discharges calculated with these calibrated parameters would be less than the expected value and the other half would be greater than the expected value, whereas with 85% confidence interval, only a 15% probability exists for the N-year peak discharge to be exceeded. Further a probability always remains that the true N-year peak discharge may be larger or smaller than the peak discharge calculated for a given confidence interval.

MITIGATION OF DEVELOPMENT EFFECTS ON RUNOFF

The need to mitigate effects of increased runoff from developments on downstream segments of watersheds has made it necessary to consider the more frequently occurring storm flows (e.g., 2-year and 5-year). The criteria in the present Manual, mainly aimed at predicting 100-year peak discharges, is not well suited to analyze more frequently occurring storm flows that are used for mitigation. Table 2 provides the loss rate and precipitation model input required for regionally calibrated expected value 2-year and 5-year results.

LOSS RATE CALCULATIONS AND PRECIPITATION MODEL INPUT

Table 1 presents the T-year precipitation required to obtain the N-year expected value peak discharges for F_p = 7. 6 mm/hr (0.3 in/hr) and AMC-II condition. The pervious loss rates (F_p) using AMC-II for 2-year and 5-year events will be 15.2 mm/hr (0.6 in/hr) and 12.7 mm/hr (0.5 in/hr) respectively, based on "Investigation of Mitigation Needs for Changes in Duration Floodflows Due to Development" by Williamson and Schmid, July, 1989[3] (see Table 2).

INITIAL SUBAREA NOMOGRAPH

After extensive review within the County and with other agencies, the maximum distance of unchannelized flow over lawns and parking lots will be limited to 100 m (330') in developed areas, i.e., residential subdivisions and commercial lots. In well defined arroyos, a maximum length of 100 m may be used. The initial subarea nomograph (Manual Figure D-1) with the maximum length limit of 300 m (1000') should only be used, after appropriate justification, for flat areas such as farmland with conservation tillage, artificial surfaces like baseball/football fields, public parks, and other similar conditions.

The initial subarea nomograph, (Manual Figure D-1) which applies to both high confidence and expected value calculations, should never be used for the blueline streams shown on USGS 1:24000 quadrangle maps.

TABLE 1[a]

T-year Precipitation Required From Depth-Duration-Frequency Tables Assuming a Pervious Loss Rate F_p = 7.6 mm/hr (0.3 in/hr) and AMC-II	
Expected Value N-year Runoff	T-Year Precipitation Model Input
10	5
25	10
50	15
100	25
500[b]	125[b]

TABLE 2[c]

Expected Value N-Year Runoff	Pervious Loss Rate F_p AMC-II	Proportion of N-Year Precipitation Model Input
2-yr	15.2 mm/hr (0.6 in/hr)	0.7
5-yr	12.7 mm/hr (0.5 in/hr)	0.7

Notes:

a. Table 1 is derived from "Derivation of a Rainfall-Runoff Model to Compute N-Year Floods for Orange County Watersheds", U.S. Army Corps of Engineers, Los Angeles District, November, 1987 (Reference 1).

b. Values have been extracted from "Determination of 500-Year Floodplain, Confluence of San Diego Creek and Sand Canyon Wash", Williamson and Schmid, March 12, 1991 (Reference 2).

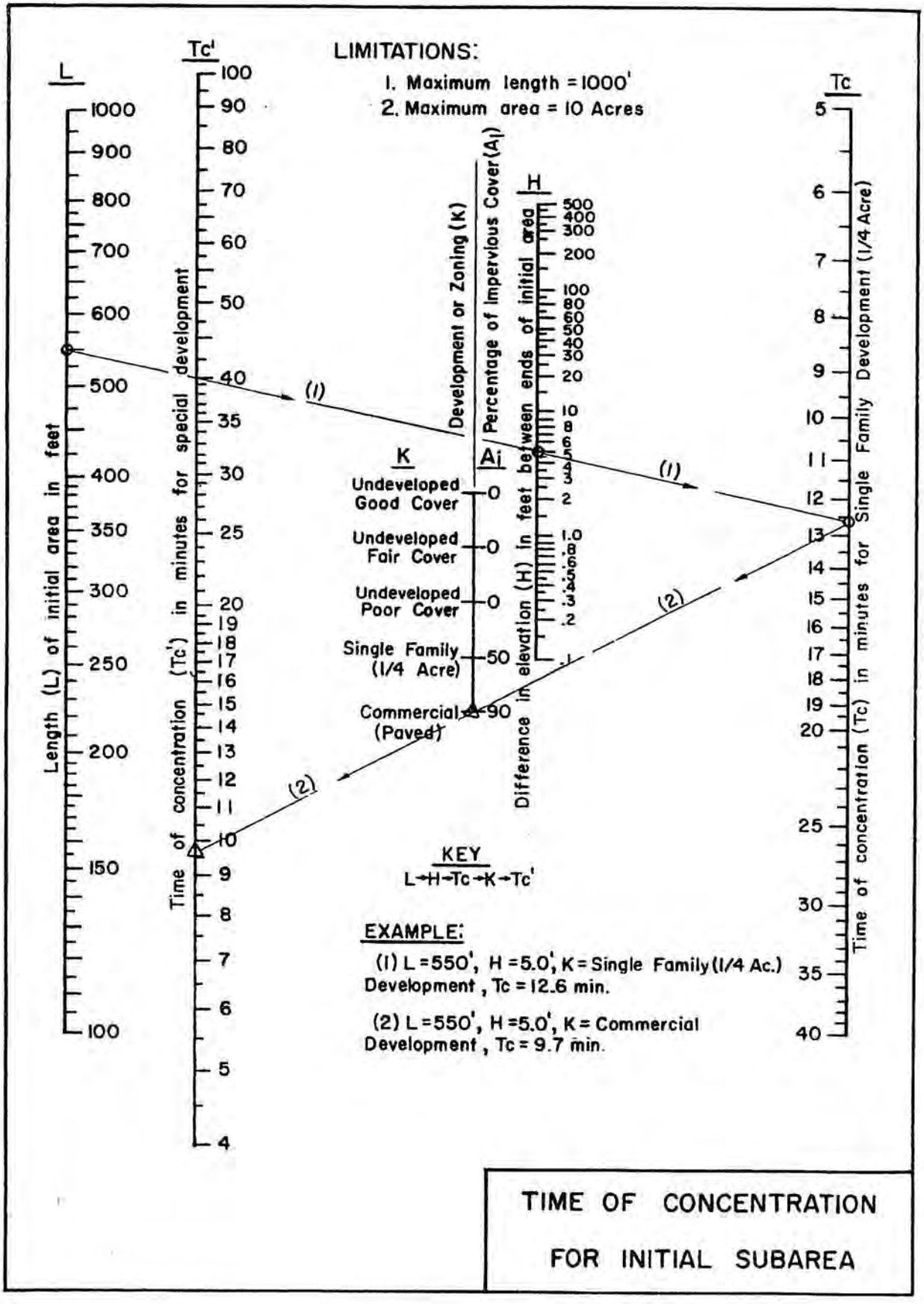
c. Table 2 is derived from "Investigation of Mitigation Needs for Changes in Duration Floodflows Due to Development", Williamson and Schmid, July, 1989 (Reference 3) and may be used for 2 and 5-year existing conditions estimates.

CONCLUSION

Notwithstanding Addendum No. 1, Manual criteria and parameter values remain in force for development proposals, subdivision improvement plans and regional flood control design, except for the initial area nomograph changes as discussed above.

REFERENCES

1. "Derivation of Rainfall-Runoff Model to Compute N-Year Floods for Orange County Watersheds", U. S. Army Corps of Engineers, Los Angeles District, November, 1987.
2. "Determination of 500-Year Floodplain, Confluence of San Diego Creek and Sand Canyon Wash", Williamson and Schmid, March 12, 1991.
3. "Investigation of Mitigation Needs for Changes in Duration Floodflows Due to Development", Williamson and Schmid, July, 1989.
4. "Guidelines for Determining Flood Flow Frequency, Bulletin 17B", U. S. Department of the Interior, Geological Survey, Office of Water Data Coordination, revised September 1981.


LIMITATIONS:
1. Maximum length = 1000'
2. Maximum area = 10 Acres
L
Length (L) of initial area in feet
Tc'
Time of concentration (Tc') in minutes for special development
Development or Zoning (K)
Percentage of Impervious Cover (Ai)
H
Difference in elevation (H) in feet between ends of initial area
K
Ai
Undeveloped Good Cover
Undeveloped Fair Cover
Undeveloped Poor Cover
Single Family (1/4 Acre)
Commercial (Paved)
Tc
Time of concentration (Tc) in minutes for Single Family Development (1/4 Acre)
(1)
(2)
KEY
L→H→Tc→K→Tc'
EXAMPLE:
(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.
(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.
TIME OF CONCENTRATION FOR INITIAL SUBAREA

ENGINEERING DESIGN MANUAL

CHAPTER 7: BMP DESIGN MANUAL

ADOPTED JANUARY 27, 2016
EFFECTIVE FEBRUARY 16, 2016

RESOLUTION 2016-17

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA, APPROVING THE BEST MANAGEMENT PRACTICES (BMP) DESIGN MANUAL FOR PERMANENT SITE DESIGN, STORMWATER TREATMENT AND HYDROMODIFICATION MANAGEMENT

WHEREAS, on May 8, 2013, the San Diego Regional Water Quality Control Board (RWQCB) issued NPDES Order No. R9-2013-0001 (2013 Municipal Stormwater Permit), which includes requirements in addition to those that were imposed on the Copermittees, including the City of Encinitas, in NPDES Permit No. R9-2007-001;

WHEREAS, Provision E.3.d of the 2013 Municipal Stormwater Permit requires the City of Encinitas to update its BMP Design Manual;

WHEREAS, per Resolution 2010-18, the City of Encinitas approved the City of Encinitas Stormwater Manual as required by NPDES Order No. 2007-0001 and is the City's current BMP Design Manual;

WHEREAS, The "Model BMP Design Manual - San Diego Region" was approved by the RWQCB on May 29, 2015;

WHEREAS, the approved City of Encinitas BMP Design Manual will replace the existing Encinitas Stormwater Manual in Chapter 7 of the Engineering Design Manual, satisfying the Provision E.3.d of the 2013 Municipal Stormwater Permit;

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Encinitas does hereby approve the City of Encinitas Best Management Practices Design Manual as Chapter 7 of the Engineering Design Manual effective February 16, 2016;

PASSED AND ADOPTED by the City Council of the City of Encinitas at a regular meeting thereof, held on the 27th day of January, 2016, by the following vote to wit:

AYES: Blakespear, Gaspar, Kranz, Muir, Shaffer.
NAYS: None.
ABSENT: None.
ABSTAIN: None.

Kristin Gaspar, Mayor

ATTEST:

Kathy Hollywood, City Clerk

City of Encinitas

BMP Design Manual

This manual was adapted from the Model BMP Design Manual for the San Diego Region.

February 2016

Summary

In May 2013, the California Regional Water Quality Control Board for the San Diego Region (SDRWQCB) reissued the National Pollutant Discharge Elimination System permit for Municipal Separate Storm Sewer Systems (MS4s) for the San Diego Copermittees.

The reissued MS4 Permit updates and expands stormwater requirements for new developments and redevelopments. The MS4 Permit reissuance to the San Diego County Copermittees went into effect in 2013 (Order No. R9-2013-0001) and was amended in February 2015 by Order No. R9-2015-0001. As required by the reissued MS4 Permit, the City of Encinitas has adopted this Best Management Practices (BMP) Design Manual (from here in referred to as the "**manual**") to replace the Encinitas Stormwater Manual (Chapter 7 of the Engineering Design Manual), which was based on the requirements of the 2007 MS4 Permit.

This Manual is intended to address:

This Manual addresses updated onsite post-construction stormwater requirements for Standard Projects and Priority Development Projects (PDPs), and provides updated procedures for planning, preliminary design, selection, and final design of permanent stormwater BMPs based on the performance standards presented in the MS4 Permit. The intended users of the BMP Design Manual include project applicants for both private and public developments, their representatives responsible for preparation of Stormwater Quality Management Plans (SWQMPs), and City personnel responsible for review of these plans.

The following are significant updates to stormwater requirements of the MS4 Permit compared to the 2007 MS4 Permit and 2011 Countywide Model SUSMP:

- PDP categories have been updated, and the minimum threshold of impervious area to qualify as a PDP has been reduced.
- Many of the low impact development (LID) requirements for site design that were applicable only to PDPs under the 2007 MS4 Permit are applicable to all projects (Standard, Basic and Exempt Projects and PDPs) under the MS4 Permit.
- The standard for stormwater pollutant control (formerly treatment control) is retention of the 24-hour 85th percentile storm volume, defined as the event that has a precipitation total greater than or equal to 85 percent of all daily storm events larger than 0.01 inches over a given period of record in a specific area or location.
- For situations where onsite retention of the 85th percentile storm volume is technically not feasible, biofiltration must be provided to satisfy specific "biofiltration standards". These standards consist of a set of siting, selection, sizing, design, and operation and maintenance (O&M) criteria that must be met for a BMP to be considered a "biofiltration BMP" – see Section 2.2.1 and Appendix F.
- Exemptions from hydromodification management are reduced, and certain categories of exemptions that are not identified in the MS4 Permit must be identified in a Watershed Management Area Analysis (WMAA).
- The flow control performance standard for hydromodification management is based on controlling flow to pre-development (natural) condition rather than pre-project condition.
- Hydromodification management requirements are expanded to include requirements to

protect critical coarse sediment yield areas.

- Alternative (offsite) compliance approaches are provided as an option to satisfy pollutant control or hydromodification management performance standards if a Copermittee implements an alternative compliance program. Copermittees are given discretion by the MS4 Permit to allow the project applicants to participate in an alternative compliance program without demonstrating technical infeasibility of retention and/or biofiltration BMPs onsite.

This manual is organized in the following manner:

An introductory section titled **"How to Use this Manual"** provides a practical orientation to intended uses and provides examples of recommended workflows for using the manual.

Chapter 1 provides information to help the manual user determine which of the stormwater management requirements are applicable to the project: source controls/site design BMPs, pollutant controls, and/or hydromodification management. This chapter also introduces the procedural requirements for preparation, review, processing, and approval of project submittals.

Chapter 2 defines the performance standards for source control and site design BMPs, stormwater pollutant control BMPs, and hydromodification management BMPs. This chapter also presents information on the underlying concepts associated with these performance standards to provide the project applicant with technical background, explains why the performance standards are important, and gives a general description of how the performance standards can be met.

Chapter 3 describes the essential steps in preparing a comprehensive stormwater management design and explains the importance of starting the process early during the preliminary design phase. By following the recommended procedures in Chapter 3, project applicants can develop a design that complies with the complex and overlapping stormwater requirements. This chapter is intended to be used by Standard, Basic and Exempt Projects and PDPs; however, certain steps will not apply to Standard, Basic and Exempt Projects (as identified in the chapter).

Chapter 4 presents the source control and site design requirements to be met by all development projects and is therefore intended to be used by all projects.

Chapter 5 applies to PDPs only. It presents the specific process for determining which category or combination of onsite pollutant control BMPs is most appropriate for the PDP site and explains how to design the BMP(s) to meet the stormwater performance standards. The prioritization order of onsite pollutant control BMPs begins with retention, then biofiltration, and finally flow-thru treatment control (in combination with offsite alternative compliance).

Chapter 6 applies only to PDPs that are subject to hydromodification management requirements. This chapter provides guidance for meeting the performance standards for the two components of hydromodification management: protection of critical coarse sediment yield areas and flow control for post-project runoff from the project site. Chapter 6 incorporates applicable requirements of the "Final Hydromodification Management Plan (HMP) Prepared for County of San Diego, California," dated March 2011, with modifications based on updated requirements in the MS4 Permit. Chapter 6 does not apply to Standard Projects or to PDPs with only pollutant control requirements.

Chapter 7 addresses the long term O&M requirements of structural BMPs presented in this manual and discusses mechanisms to ensure O&M in perpetuity. Chapter 7 applies to PDPs only and is not required for Standard Projects; however Standard Projects may use this chapter as a reference.

Chapter 8 describes the specific requirements for the content of project submittals to facilitate local

jurisdictions' review of project plans for compliance with applicable requirements of the manual and the MS4 Permit for both Standard Projects and PDPs. This chapter pertains specifically to the content of project submittals, and not to specific details of jurisdictional requirements for processing of submittals; it is intended to complement the requirements for processing of project submittals that are included in Chapter 1.

Appendices to this manual provide detailed guidance for BMP design, calculation procedures, worksheets, maps, and other figures to be referenced for BMP design. These Appendices are not intended to be used independently from the overall manual – rather they are intended to be used only as referenced in the main body of the manual.

This manual is organized based on project category. Requirements that are applicable to all projects are presented in Chapter 4. Additional requirements applicable only to PDPs are presented in Chapters 5 through 7.

Throughout this manual, the term "structural BMP" is a general term that encompasses the pollutant control BMPs and hydromodification management BMPs required for PDPs under the MS4 Permit. A structural BMP may be a pollutant control BMP, a hydromodification management BMP, or an integrated pollutant control and hydromodification management BMP. Hydromodification management BMPs are also referred to as flow control BMPs in this manual.

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List of Acronyms

303(d)	Refers to Clean Water Act Section 303(d) list of impaired and threatened waters
ASTM	American Society for Testing and Materials
BF	Biofiltration (BMP Category)
BMPs	Best Management Practices
CEQA	California Environmental Quality Act
DCV	Design Capture Volume
DMA	Drainage Management Area
ESA	Environmentally Sensitive Area
FT	Flow-thru Treatment Control BMP (BMP Category)
GLUs	Geomorphic Landscape Units
GR	General Requirements
HMP	Hydromodification Management Plan
HSPF	Hydrologic Simulation Program-FORTRAN
HU	Harvest and Use
INF	Infiltration (BMP Category)
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NRCS	Natural Resource Conservation Service
O&M	Operation and Maintenance
PDPs	Priority Development Projects
POC	Point of Compliance
PR	Partial Retention (BMP Category)
SC	Source Control
SCCWRP	Southern California Coastal Water Research Project
SD	Site Design
SDHM	San Diego Hydrology Model
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SUSMP	Standard Urban Stormwater Mitigation Plan
SWMM	Stormwater Management Model
SWQMP	Stormwater Quality Management Plan
TN	Total Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

How to Use this Manual

This manual is intended to help a project applicant develop a Stormwater Quality Management Plan (SWQMP) for a development project (public or private) that complies with local and MS4 Permit requirements. Most applicants will require the assistance of a qualified civil engineer, architect, and/or landscape architect to prepare a SWQMP.

Beginning Steps for All Projects: What requirements apply?

Start by reviewing **Chapter 1** to determine whether the proposed project is a "Standard Project", "Basic Project", "Exempt Project" or a "PDP", the primary factor affecting which stormwater quality requirements apply.

Not all of the requirements and processes described in this manual apply to all projects. Therefore, it is important to begin with a careful analysis of which requirements apply and to verify with City staff, since every project is different.. Chapter 1 provides an overview of the process of planning, design, construction, operation and maintenance, with associated jurisdictional review and approval steps leading to compliance. The flow chart below shows how to categorize a project in terms of applicable post-construction stormwater requirements. The flow chart is followed by a table that lists the applicable section of this manual for each project type.

Once an applicant has determined which requirements apply, **Chapter 2** describes the specific performance standards associated with each requirement. For example, an applicant may learn from Chapter 1 that the project must meet stormwater pollutant control requirements. Chapter 2 describes what these requirements entail, why they requirements are in place, and how they can be met. Refer to the list of acronyms and glossary as guidance to understanding the meaning of key terms within the context of this manual.

Next Steps for All Projects: How should an applicant approach a project stormwater management design?

Most projects will then proceed to **Chapter 3** to follow the step-by-step guidance to prepare a stormwater project submittal for the site. This chapter does not specify any regulatory criteria beyond those already specified in Chapter 1 and 2 – rather it is intended to serve as a resource for project applicants to help navigate the task of developing a compliant Stormwater Quality Management Plan submittal. Note that the first steps in Chapter 3 apply to all projects, while other steps in Chapter 3 only apply to PDPs.

The use of a step-by-step approach is highly recommended because it helps ensure that the right information is collected, analyzed, and incorporated into project plans and submittals at the appropriate time in the jurisdictional review process. It also helps facilitate a common framework for discussion between the applicant and the reviewer. However, each project is different, and it may be appropriate to use a different approach as long as the applicant demonstrates compliance with the MS4 Permit requirements that apply to the project.

Final Steps in Using This Manual: How should an applicant design BMPs and prepare documents for compliance?

Standard and Basic Projects	PDPs
Standard and Basic Projects will proceed to **Chapter 4** for guidance on implementing source control and site design requirements. After Chapter 4, Standard Projects shall provide BMPs based on Section 1.4.3.1 and then will proceed to **Chapter 8** for project submittal requirements.	PDPs will proceed to **Chapter 4** for guidance on implementing source control and site design requirements. PDPs will use **Chapters 5 through 7** and associated Appendices to implement pollutant control and hydromodification management requirements for the project site, as applicable. These projects will proceed to **Chapter 8** for project submittal requirements.

Plan Ahead to Avoid Common Mistakes

The following list identifies strategies to avoid some common errors that delay or compromise development approvals with respect to stormwater compliance.

- Plan for compliance as a first step. The strategy for stormwater quality compliance should be considered before completing a conceptual site design or sketching a layout of project site or subdivision lots (see Chapter 3). Planning early is crucial; for example, LID/Site Design is required for all development projects and onsite retention of stormwater runoff is required for PDPs. Additionally, collection of necessary information early in the planning process (e.g. geotechnical conditions, groundwater conditions) can help avoid delays resulting from redesign.

- Know that proprietary stormwater treatment facilities and strategies acceptable under previous MS4 Permits may not be sufficient to achieve compliance. Under the MS4 Permit, the standard for pollutant control for PDPs is **retention of the 85th percentile storm volume** (see Chapter 5). Flow-thru treatment cannot be used to satisfy permit requirements unless the project also participates in an alternate compliance program. stormwater

- Plan for on-going inspections and maintenance of PDP structural BMPs in perpetuity. It is essential to select structural BMPs that can be effectively operated and maintained by the ultimate property owner, to ensure access for maintenance, to control maintenance costs, and to secure a mechanism for funding of long term Operation & Maintenance of structural BMPs, (see Chapter 7).

Chapter 1

Policies and Procedural Requirements

This chapter introduces stormwater management policies and is intended to help categorize a project, determine the applicable stormwater management requirements, and provide options for achieving compliance. This chapter also introduces the procedural requirements for preparation, review, and approval of project submittals.

1.1 Introduction to Stormwater Management Policies

MS4 Permit Provision E.3.a-c; E.3.d.(1)

Stormwater management requirements for development projects are derived from the MS4 Permit and implemented by local jurisdictions.

On May 8, 2013, the California Regional Water Quality Control Board San Diego Region (referred to as "San Diego Water Board") reissued a municipal stormwater permit titled "National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the MS4s Draining the Watersheds within the San Diego Region" (Order No. R9-2013-0001; referred to as MS4 Permit) to the municipal Copermittees. The MS4 Permit was issued by the San Diego Water Board pursuant to section 402 of the federal Clean Water Act, implementing regulations (Code of Federal Regulations Title 40, Part 122) adopted by the United States Environmental Protection Agency, and Chapter 5.5, Division 7 of the California Water Code. The MS4 Permit, in part, requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in stormwater from new development and significant redevelopment to the maximum extent practicable (MEP). MEP is defined in the MS4 Permit.

Different requirements apply to different project types.

The MS4 Permit requires all development projects to implement source control and site design practices that will minimize the generation of pollutants. While all development projects are required to implement source control and site design/LID practices, the MS4 Permit has additional requirements for development projects that exceed size thresholds and/or fit under specific use categories. These projects, referred to as PDPs, are required to incorporate structural BMPs into the project plan to reduce the discharge of pollutants and to address potential hydromodification impacts from changes in flow and sediment supply.

1.2 Purpose and Use of the Manual

This manual presents a "unified BMP design approach".

To assist the land development community, streamline project reviews, and maximize cost-effective environmental benefits, the Copermittees developed a unified BMP design approach[1] that meets the performance standards specified in the MS4 Permit. By following the process outlined in this manual, project applicants (for both private and public developments) can develop a single, integrated design that complies with the complex and overlapping MS4 Permit source control and site design requirements, stormwater pollutant control requirements (i.e. water quality), and hydromodification management (flow-control and sediment supply) requirements.

1.2.1 Determining Applicability of Permanent BMP Requirements

Figure 1-1 below presents a flow chart of the decision process that the manual user should use to:

1. Categorize a project;
2. Determine stormwater requirements; and
3. Understand how to submit projects for review and verification.

This figure also indicates where specific procedural steps associated with this process are addressed in Chapter 1.

Refer to appendix I-1 for a step-by-step checklist that will aid in determining applicability of permanent, post-construction stormwater BMP requirements to your project.

[1] The term "unified BMP design approach" refers to the standardized process for site and watershed investigation, BMP selection, BMP sizing, and BMP design that is outlined and described in this manual with associated appendices and templates. This approach is considered to be "unified" because it represents a pathway for compliance with the MS4 Permit requirements that is anticipated to be reasonably consistent across the local jurisdictions in San Diego County. In contrast, applicants may choose to take an alternative approach where they demonstrate to the satisfaction of the Copermittee, in their submittal, compliance with applicable performance standards without necessarily following the process identified in this manual.

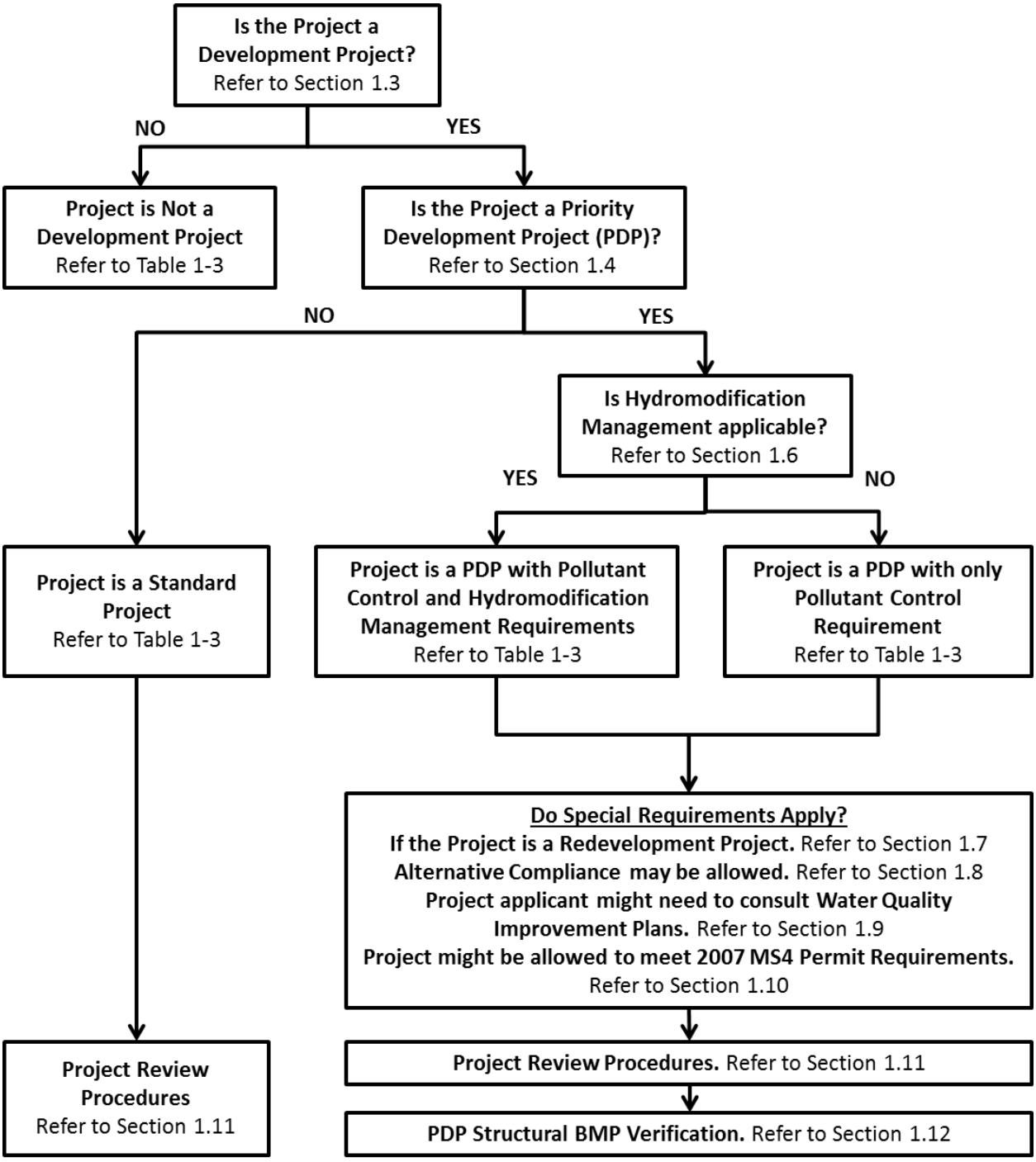


FIGURE 1-1. Procedural Requirements for a Project to Identify Stormwater Requirements

1.2.2 Determine Applicability of Construction BMP Requirements

All projects and phases of projects, even if exempted from meeting some or all of the Permanent BMP Requirements, are required to implement temporary erosion, sediment, good housekeeping and pollution prevention BMPs to mitigate stormwater pollutants during the construction phase.

Refer to the City's Stormwater Standards Manual for detailed information on these requirements.

1.3 Defining a Project

Not all site improvements are considered "development projects" under the MS4 Permit.

This manual is intended for new development and redevelopment projects, inclusive of both private and public projects. Development projects are defined by the MS4 Permit as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects". Development projects are issued local permits to allow construction activities. To further clarify, this manual applies only to development or redevelopment activities that have the potential to contact stormwater and contribute an anthropogenic source of pollutants, or reduce the natural absorption and infiltration abilities of the land.

A project must be defined consistent with the California Environmental Quality Act (CEQA) definitions of "project."

CEQA defines a project as: a discretionary action being undertaken by a public agency that would have a direct or reasonably foreseeable indirect impact on the physical environment. This includes actions by the agency, financing, grants, permits, licenses, plans, and regulations or other entitlements granted by the agency. CEQA requires that the project include "the whole of the action" before the agency. This requirement precludes "piecemealing," which is the improper (and often artificial) separation of a project into smaller parts in order to avoid triggering requirement thresholds.

In the context of this manual, the "project" is the "whole of the action" which has the potential for adding or replacing or resulting in the addition or replacement of roofs, pavement, or other impervious surfaces and thereby resulting in increased flows and stormwater pollutants. "Whole of the action" means the project may not be segmented or phased into small parts either onsite or offsite if the effect is to reduce the quantity of impervious area and fall below thresholds for applicability of stormwater requirements.

When defining the project, the following questions are considered:

- What are the project activities?
- Do they occur onsite or offsite?
- What are the limits of the project (project boundary)?
- What is the whole of the action associated with the project (i.e. what is the total amount of new or replaced impervious area considering all of the collective project components through all phases of the project)?
- Are any facilities or agreements to build facilities offsite in conjunction with providing service to the project (street widening, utilities)?

For subdivisions where homes, driveways, hardscape, and other impervious surfaces will be created, the "whole of the action" consists of grading and build out of the approved new homes and any proposed hardscape. Installation of any new and/or replaced hardscape by a subsequent new homeowner will be considered a separate project for purposes of determining relevant stormwater management requirements.

For subdivisions where homes are not proposed, but home construction is anticipated in the near future, the "whole of the action" shall include the subdivision project and anticipated future homes, roads, driveways and any other related impervious surface. An estimate of total impervious surface created and/or replaced shall be included in the permanent BMP sizing calculations.

For subdivisions where no homes are proposed, and the lots are intended to be sold separately to individual owners for custom home builds, the "whole of the action" shall be considered the proposed subdivision only. Any future homes or other improvements built by a separate owner will be considered a separate project.

If a project applicant plans on developing and constructing homes or other impervious surfaces on more than one lot in a subdivision, the entire scope of work proposed shall be considered the "whole of the action". Likewise, projects proposed by a single person or entity on adjacent lands at the same time shall not be piecemealed into separate projects.

Table 1-2 is used to determine whether stormwater management requirements defined in the MS4 Permit and presented in this manual apply to the project.

If a project meets one of the exemptions in Table 1-2 then permanent BMP requirements do not apply to the project; i.e. requirements in this manual are not applicable. If permanent BMP requirements apply to a project, Sections 1.4 to 1.7 will further define the extent of the applicable requirements based on the MS4 Permit. The MS4 Permit contains standard requirements that are applicable to all projects (Standard, Basic and Exempt Projects and PDPs), and more specific requirements for projects that are classified as PDPs.

TABLE 1-1. Applicability of Permanent, Post-Construction Stormwater Requirements

Do permanent stormwater requirements apply to your project?
Requirements DO NOT apply to:
Replacement of impervious surfaces that are part of a routine maintenance activity, such as: • Replacing roof material on an existing building • Rebuilding a structure to original design after damage from earthquake, fire, or similar disaster • Restoring pavement or other surface materials affected by trenches from utility work • Resurfacing existing roads and parking lots, including milling, slurrying, overlaying, and restriping • Routine replacement of damaged pavement, including full depth replacement, if the sole purpose is to repair the damage • Constructing new sidewalk, pedestrian ramps or bike lanes on existing roads (within existing street right-of-way) if designed as described in Section 1.4.3. • Restoring a historic building to its original historic design Repair or improvements to an existing building or structure that do not alter the size: • Plumbing, electrical and HVAC work • Interior alterations including major interior remodels and tenant build-out within an existing commercial building

- Exterior alterations that do not change the general dimensions and structural framing of the building (does not include building additions or projects where the existing building is demolished)

Development project type determination and permanent BMP requirement applicability shall be at the sole discretion of the City Engineer.

1.4 Is the Project a PDP?

MS4 Permit Provision E.3.b.(1)

This section presents the PDP categories defined in the MS4 Permit and describes the limited exemption categories available.

1.4.1 PDP Categories

In the MS4 Permit, PDP categories are defined based on project size, type and design features.

Projects shall be classified as PDPs if they are in one or more of the PDP categories presented in the MS4 Permit, which are listed below. Review each category, defined in (a) through (f), below. A PDP applicability checklist for these categories is also provided in Appendix I-2. If any of the categories match the project, the entire project is a PDP. For example, if a project feature such as a parking lot falls into a PDP category, then the entire development footprint including project components that otherwise would not have been designated a PDP on their own (such as other impervious components that did not meet PDP size thresholds, and/or landscaped areas), shall be subject to PDP requirements. Note that size thresholds for impervious surface created or replaced vary based on land use, land characteristics, and whether the project is a new development or redevelopment project. Therefore, all definitions must be reviewed carefully. Also, note that categories are defined by the total quantity of "added or replaced" impervious surface, not the **net change** in impervious surface.

For example, consider a redevelopment project that adds 7,500 square feet of new impervious surface and removes 4,000 square feet of existing impervious surface. The project has a net increase of 3,500 square feet of impervious surface. However, the project is still classified as a PDP because the total added or replaced impervious surface is 7,500 square feet, which is greater than 5,000 square feet.

"**Collectively**" for the purposes of the manual means that all contiguous and non-contiguous parts of the project that represent the whole of the action must be summed up. For example, consider a residential development project that will include the following impervious components:

- 3,600 square feet of roadway
- 350 square feet of sidewalk
- 4,800 square feet of roofs

- 1,200 square feet of driveways
- 500 square feet of walkways/porches

The collective impervious area is 10,450 square feet.

PDP Categories defined by the MS4 Permit:

(a) New development projects or redevelopment projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812).

Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html.

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the

Copermittee (see Section 1.4.2 below to determine if any other local areas have been identified).

For projects adjacent to an ESA, but not discharging to an ESA, the 2,500 sq. ft. threshold does not apply as long as the project does not physically disturb the ESA and the ESA is upstream of the project.

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html.

(ii) Retail gasoline outlets. This category includes Retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

Exclusions that apply to this category only: Projects creating less than 5,000 sf of impervious surface and where any added landscaping does not require regular use of pesticides and fertilizers, such as a slope stabilization project using native plants, are excluded from this category. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as for emergency or maintenance access or for bicycle or pedestrian use, if they are built with pervious surfaces or if they sheet flow to surrounding pervious surfaces. See Section 1.4.2 for additional guidance.

Area that may be excluded from impervious area calculations for determining if the project is a PDP:

(a) Consistent with Table 1-2, areas of a project that are considered exempt from stormwater requirements (e.g. routine maintenance activities, resurfacing, etc.) shall not be included as part of "added or replaced" impervious surface in determining project classification.

(b) Swimming pools and decorative ponds with adequate freeboard or an overflow structure that does not release overflow to the MS4.

Redevelopment projects may have special considerations with regards to the total area required to be treated. Refer to Section 1.7.

1.4.2 Local Additional PDP Categories and/or Expanded PDP Definitions

To determine whether your project discharges directly to an Environmentally Sensitive Area, begin by referring to the map of ESAs in Appendix J. This map includes all locally known ESAs as defined by the MS4 Permit. Additionally, if a site-specific open space area and/or wetland area has been identified on the property or downstream of the property, this must be considered when determining whether the project is a PDP. Consult with City staff for additional guidance.

1.4.3 Requirements for Standard and Basic Projects and Local PDP Exemptions

1.4.3.1 Requirements for Standard and Basic Projects

The City of Encinitas, in addition to the PDPs categorized in section 1.4.1, categorizes non-PDP projects as Standard or Basic Projects. Projects that create and/or replace 500 square feet or more of impervious surface but are not classified as one of the PDP categories described above are considered **Standard Projects**. Projects that create and/or replace less than 500 square feet of impervious surface and are not classified as one of the PDP categories described above are considered **Basic Projects**.

Standard projects shall provide natural bioretention BMPs for stormwater pollution control based on the following sizing calculation method or the DCV calculation method described in Chapter 5 and Appendix B. The total surface area shall include new and replaced impervious areas of the proposed project. If it is determined that bioretention BMPs are not feasible, at the discretion of the City Engineer, partial retention BMPs or biofiltration BMPs may be used. The following sizing calculation or the DCV calculation method may be used to size partial retention or biofiltration BMPs. All Standard Projects must also implement source control and site design measures as described in Chapter 4. Consult Chapter 5 for structural BMP design options.

MINIMUM BMP AREA = 0.03 Σ (Surface Type SF X Surface Type Runoff Factor)

Basic Projects must also implement source control and site design measures as described in Chapter 4 but are not required to provide structural BMPs.

In situations with uncontrolled cross lot drainage that do not drain into a controlled, engineered drainage conveyance system the City Engineer may require additional or upsized stormwater treatment and flow control facilities. These facilities shall be designed for the greater surface area and volume of either treatment sizing required for new or removed and replaced impervious surface areas OR sizing for Hydromodification based on the net new impervious surface area. Special attention shall be made to design the overflow of these facilities to maintain the historical drainage pattern to the maximum extent practical.

1.4.3.2 Local PDP Exemptions

As defined in the MS4 Permit, projects that meet the following criteria may qualify for an exemption from PDP requirements:

1) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:
    a) Designed and constructed to direct stormwater runoff to adjacent vegetated areas, or

other non-erodible permeable areas; OR

b) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

c) Designed and constructed with permeable pavements or surfaces in accordance with current USEPA Green Streets guidance, "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, most recent edition).

2) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the current USEPA Green Streets guidance, "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, most recent edition).

Consult City staff if you think your project may qualify for an exemption based on the above definitions. Note that the source control and site design stormwater requirements that are applicable to all projects will still apply even if a project is exempt from PDP requirements.

1.5 Determining Applicable Stormwater Management Requirements

MS4 Permit Provision E.3.c.(1)

Depending on project type and receiving water, different stormwater management requirements apply.

New development or redevelopment projects that are subject to this manual requirement pursuant to Section 1.3, but are not classified as PDPs based on Section 1.4, include Standard Projects, Basic Projects and Exempt projects. Source control and site design requirements apply to all projects including Standard Projects, Basic Projects, Exempt Projects and PDPs. Additional structural BMP requirements (i.e. pollutant control and hydromodification management) apply to PDPs and Standard projects (on a more limited basis). Stormwater management requirements for a project, and the applicable sections of this manual, are summarized in Table 1-3.

TABLE 1-2. Applicability of Manual Sections for Different Project Types

Project Type	**Project Development Process** (Chapter 3 and 8)	**Source Control and Site Design** (Section 2.1 and Chapter 4)	**Structural Pollutant Control** (Section 2.2 and Chapter 5 and 7)	**Structural Hydromodification Management** (Section 2.3, 2.4 and Chapter 6 and 7)
Not a Development Project	The requirements of this manual do not apply			
Basic Project	☑	☑	NA	NA
Standard Project[1]	☑	☑	☑	NA

PDP with only Pollutant Control Requirements[2]	☑	☑	☑	NA
PDPs with Pollutant Control and Hydromodification Management Requirements	☑	☑	☑	☑

[1] Standard Projects refer to Section 1.4.3.1 for designing required structural BMPs.
[2] Some PDPs may be exempt from Structural Hydromodification Management BMPs, refer to Section 1.6 to determine.

1.6 Applicability of Hydromodification Management Requirements

MS4 Permit Provision E.3.c.(2)

Hydromodification management requirements apply to PDPs only.

If the project is a Standard, Basic or Exempt Project, hydromodification management requirements do not apply. Hydromodification management requirements apply to PDPs (both new and re-development) unless the project meets specific exemptions discussed below.

PDP exemptions from hydromodification management requirements are based on the receiving water system.

The City has the discretion to exempt a PDP from hydromodification management requirements where the project discharges stormwater runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional WMAA incorporated into the Water Quality Improvement Plan (WQIP) pursuant to Provision B.3.b.(4) of the MS4 permit.

As allowed by the MS4 Permit, projects discharging directly to the Pacific Ocean, by either existing underground storm drain systems or conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to the Pacific Ocean, are exempt. This exemption is subject to the following additional criteria defined by this manual:

a) The outfall must be located on the beach (not within or on top of a bluff),

b) A properly sized energy dissipation system must be provided to mitigate outlet discharge velocity from the direct discharge to the ocean for the ultimate condition peak design flow of the direct discharge,

c) The invert elevation of the direct discharge conveyance system (at the point of discharge to the ocean) should be equal to or below the mean high tide water surface elevation at the point of discharge, unless the outfall discharges to quay or other non-erodible shore protection.

As allowed by the MS4 Permit, projects discharging directly to a water storage reservoir or lake, by either existing underground storm drain systems or conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to the water storage reservoir or lake, are exempt. This exemption is subject to the following additional criteria defined by this manual:

a) A properly sized energy dissipation system must be provided in accordance with local design standards to mitigate outlet discharge velocity from the direct discharge to the water storage reservoir or lake for the ultimate condition peak design flow of the direct discharge,

b) The invert elevation of the direct discharge conveyance system (at the point of discharge to the water storage reservoir or lake) should be equal to or below the lowest normal operating water surface elevation at the point of discharge, unless the outfall discharges to quay or other non-erodible shore protection. Normal operating water surface elevation may vary by season; contact the reservoir operator to determine the elevation. For cases in which the direct discharge conveyance system outlet invert elevation is above the lowest normal operating water surface elevation but below the reservoir spillway elevation, additional analysis is required to determine if energy dissipation should be extended between the conveyance system outlet and the elevation associated with the lowest normal operating water surface level.

c) No exemption may be granted for conveyance system outlet invert elevations located above the reservoir spillway elevation.

As allowed by the MS4 Permit, projects discharging directly to an area identified as appropriate for an exemption in the WMAA for the watershed in which the project resides, by either existing underground storm drain systems or conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to the designated area, are exempt. Consult the WMAA within the WQIP for the watershed in which the project resides to determine areas identified as appropriate for an exemption. Exemption is subject to any criteria defined within the WMAA, and criteria defined below by this manual:

a) A properly sized energy dissipation system must be provided to mitigate outlet discharge velocity from the direct discharge to the exempt river reach for the ultimate condition peak design flow of the direct discharge,

b) The invert elevation of the direct discharge conveyance system (at the point of discharge to the exempt river reach) should be equal to or below the 10-year floodplain elevation. Exceptions may be made at the discretion of the City Engineer, but shall never exceed the 100-year floodplain elevation. The City Engineer may require additional analysis of the potential for erosion between the outfall and the 10-year floodplain elevation.

c) No exemption may be granted for conveyance system outlet invert elevations located above the 100-year floodplain elevation.

1.7 Special Considerations for Redevelopment Projects (50% Rule)

MS4 Permit Provision E.3.b.(2)

Redevelopment PDPs (PDPs on previously developed sites) may need to meet stormwater management requirements for ALL impervious areas (collectively) within the ENTIRE project site.

If the project is a redevelopment project, the structural BMP performance requirements and hydromodification management requirements apply to redevelopment PDPs as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c [of the MS4 Permit] apply to the entire development.

These requirements for managing stormwater on an entire redevelopment project site are commonly referred to as the "50% rule". For the purpose of calculating the ratio, the surface area of the previously existing development shall be the area of impervious surface within the previously existing development. The following steps shall be followed to estimate the area that requires treatment to satisfy the MS4 Permit requirements:

1. How much total impervious area currently exists on the site?
2. How much existing impervious area will be replaced with new impervious area?
3. How much new impervious area will be created in areas that are pervious in the existing condition?
4. Total created and/or replaced impervious surface = Step 2 + Step 3.
5. **50% rule test**: Is step 4 more than 50% of Step 1? If yes, treat all impervious surface on the site. If no, then treat only Step 4 impervious surface and any area that comingles with created and/or replaced impervious surface area.

Note: Step 2 and Step 3 must not overlap as it is fundamentally not possible for a given area to be both "replaced" and "created" at the same time. Also activities that occur as routine maintenance shall not be included in Step 2 and Step 3 calculation.

For example, a 10,000 sq. ft. development proposes replacement of 4,000 sq. ft. of impervious area. The treated area is less than 50% of the total development area and only the 4,000 sq. ft. area is required to be treated.

1.8 Alternative Compliance Program[2]

MS4 Permit Provision E.3.c.(1).(b); E.3.c.(2).(c); E.3.c.(3)

PDPs may be allowed to participate in an alternative compliance program.

Copermittees have the discretion to independently develop an alternative compliance program for their jurisdiction. The alternative compliance program allows PDPs to participate in this program in lieu of meeting either the PDP structural BMP performance requirements for retention or a portion of DCV that is not retained onsite in conjunction with onsite mitigation.

At this time, the City of Encinitas does not have an Alternative Compliance Program Project based Alternative Compliance may be approved by the City provided that the proposed design has added water quality and hydromodification benefits for the City compared to on-site stormwater management. The proposed design for Alternative Compliance shall be in accordance with the Water Quality Equivalency Guidance approved by Water Quality Control Board, Region 9. If the City establishes an Alternative Compliance Program in the future, this section of the BMP Design Manual will be updated.

Participation in an alternative compliance program would allow a PDP to fulfill the requirement of providing retention and/or biofiltration pollutant controls onsite that completely fulfill the performance standards specified in Chapter 5 (pollutant controls) with onsite flow-thru treatment controls and offsite mitigation of the DCV not retained onsite.

PDPs may be allowed to participate in an alternative compliance program by using onsite BMPs to treat offsite runoff. The PDP utilizing the alternative compliance program would (at a minimum) provide flow-thru treatment control BMPs onsite, then fund, contribute to, or implement an offsite alternative compliance project deemed by the jurisdiction-specific alternative compliance program to provide a greater overall water quality benefit for the portion of the pollutants not addressed onsite through retention and/or biofiltration BMPs. Offsite alternative compliance program locations for the purpose of this manual are defined as location within the same watershed management area as the PDP. Participation in an alternative compliance program would also potentially relieve hydromodification management flow control obligations that are not provided onsite (see Chapter 6 for hydromodification management requirements). PDPs must consult the local jurisdiction for specific guidelines and requirements for participation in potential alternative compliance programs.

Figure 1-2 generally represents two potential pathways for participating in alternative compliance (i.e. offsite projects that supplement the PDPs onsite BMP obligations).

- The first pathway (illustrated using solid line, left side) ultimately ends at alternative compliance if the PDP cannot meet all of the onsite pollutant control obligations via retention and/or biofiltration. This pathway requires performing feasibility analysis for retention and biofiltration BMPs prior to participation in an alternative compliance project.

[2] The City of Encinitas does not currently have an Alternative Compliance Program.

- The second pathway (illustrated using dashed line, right side) is a discretionary pathway along which jurisdictions may allow for PDPs to proceed directly to an alternative compliance project without demonstrating infeasibility of retention and/or biofiltration BMPs onsite.

Participation in an alternative compliance program also requires onsite flow-thru treatment control BMPs.

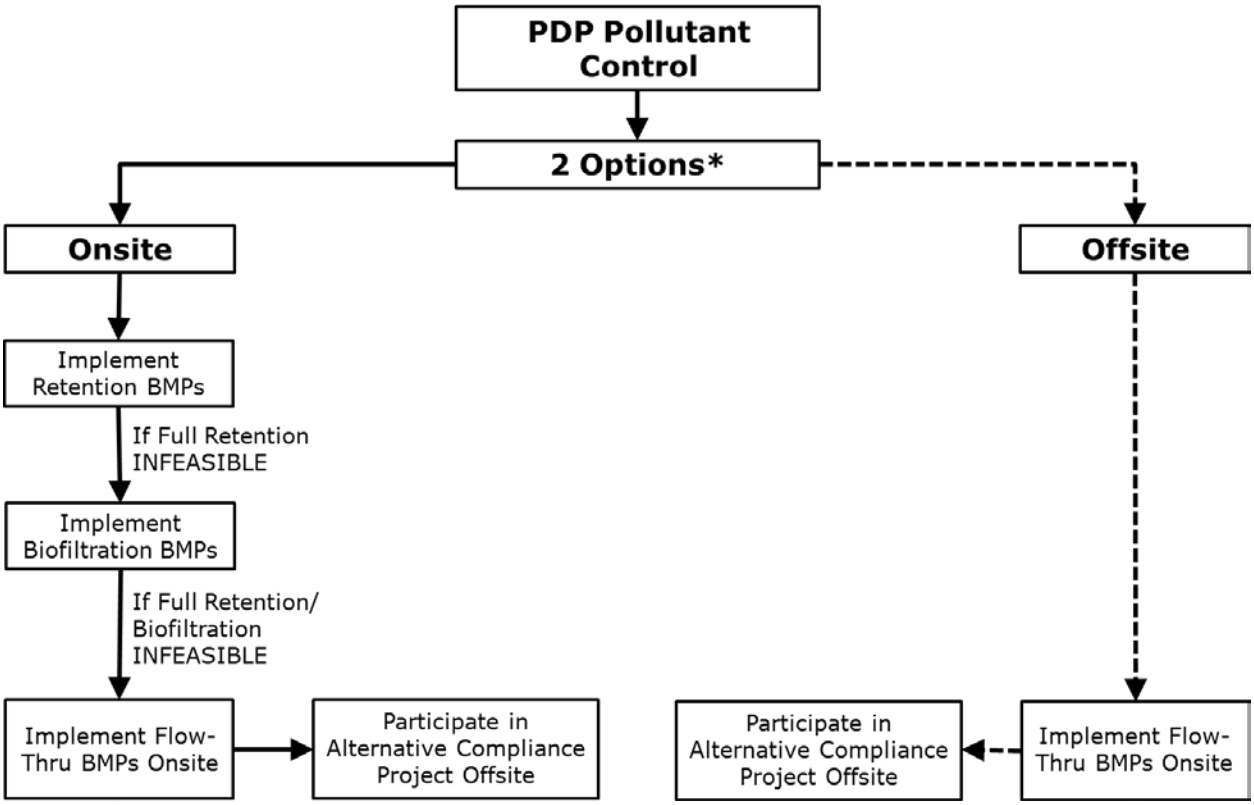
Participation in an offsite alternative compliance project **and** the obligation to implement flow-thru treatment controls for the DCV not reliably retained or biofiltered onsite, are linked and cannot be separated. Therefore, if a jurisdiction either does not have an alternative compliance program or does not allow the PDP to participate in the program or propose a project-specific offsite alternative compliance project, then the PDP may not utilize flow-thru treatment control. The PDP should consult with the jurisdiction regarding processing requirements if this is the case.

PDPs may be required to provide temporal mitigation when participating in an alternative compliance program.

Finally, if the PDP is allowed to participate in an offsite alternative compliance project that is constructed after the completion of the development project, the PDP must provide temporal mitigation to address this interim time period. Temporal mitigation must provide equivalent or better pollutant removal and/or hydrologic control (as applicable) as compared to the case where the offsite alternative compliance project is completed at the same time as the PDP.

Water Quality Equivalency calculations must be accepted by the Regional Board before the City may administer an Alternate Compliance Program.

The Water Quality Equivalency (WQE) calculation must be accepted by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program. The Water Quality Equivalency provides currency calculations to assess water quality and hydromodification management benefits for a variety of potential offsite project types and provides regional and technical basis for demonstrating a greater water quality benefit for the watershed.



*PDP may be allowed to directly participate in an offsite project without demonstrating infeasibility of retention and/or biofiltration BMPs onsite. Consult the local jurisdiction for specific guidelines.

FIGURE 1-2. Pathways to Participating in Alternative Compliance Program

An Applicant Implemented Alternative Compliance Project may be allowed.[3]

The City may allow an applicant to implement an alternative compliance project in lieu of complying on site. In this scenario, the applicant is fully responsible for the alternative compliance project design, construction, operation and long term maintenance. Applicant proposed alternative compliance projects shall not be authorized by the City prior to acceptance of the water quality equivalency calculations by the Regional Water Quality Board.

1.9 Relationship between this Manual and WQIPs

This manual is connected to other permit-specified planning efforts.

The MS4 Permit requires each Watershed Management Area within the San Diego Region to develop a **WQIP** that identifies priority and highest priority water quality conditions and strategies that will be implemented with associated goals to demonstrate progress towards addressing the conditions in the watershed. The MS4 Permit also provides an option to perform a **WMAA** as part

[3] The City of Encinitas does not currently have an Alternative Compliance Program.

of the WQIP to develop watershed specific requirements for structural BMP implementation in the watershed management area. PDPs should expect to consult either of these separate planning efforts as appropriate when using this manual as follows:

1. For PDPs that implement flow-thru treatment BMPs, selection of the type of BMP shall consider the pollutants and conditions of concerns. Among the selection considerations, the PDP must consult the highest priority water quality condition as identified in the WQIP for that particular watershed management area.

2. There may be watershed management area specific BMPs or strategies that are identified in WQIPs, for which PDPs should consult and incorporate as appropriate.

3. As part of the hydromodification management obligations that PDPs must comply with, PDPs shall consult the mapping of potential critical coarse sediment yield areas provided in the WMAA attachment to the WQIPs and design the project according to the procedures outlined in this manual if these sediments will be impacted by the project.

4. PDPs may be exempt from implementing hydromodification management BMPs (Chapter 6) based on the exemptions indicated in Section 1.6, and potentially from additional exemptions recommended in the WMAA attachment to the WQIPs. PDPs should consult the WMAA for recommended hydromodification management exemptions to determine if the project is eligible.

5. PDPs may have the option of participating in an alternative compliance program. Refer to Section 1.8.

These relationships between this manual and WQIP are presented in Figure 1-3.

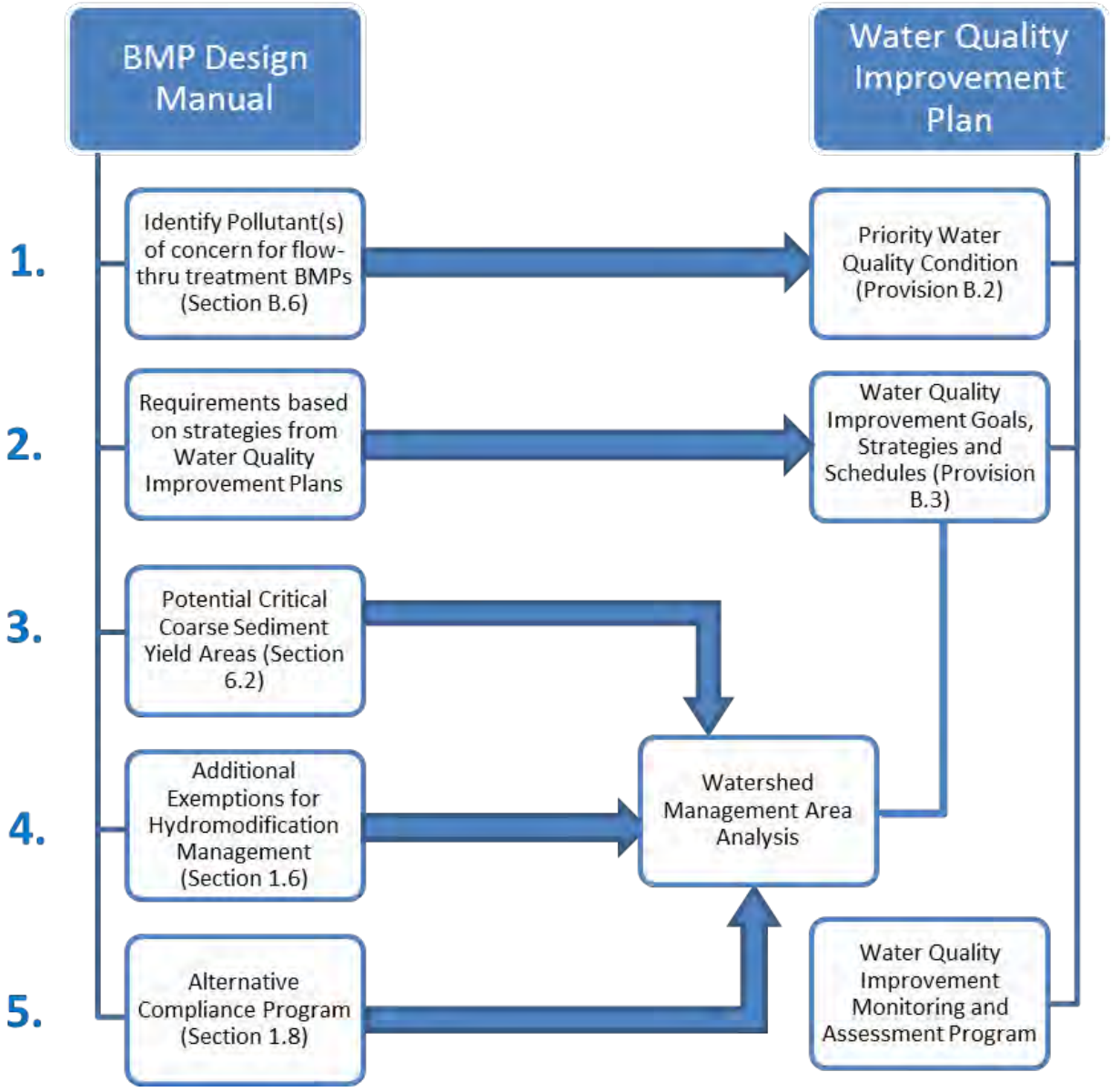


FIGURE 1-3. Relationship between this Manual and WQIP

The City of Encinitas is a Copermittee within the Carlsbad WMA. The Carlsbad WMA WQIP may be accessed at the Project Clean Water website (www.projectcleanwater.org).

1.10 Stormwater Requirement Applicability Timeline

MS4 Permit Provision E.3.e.(1)

The City must require and confirm that all Priority Development Projects implement the requirements of Provision E.3 of the MS4 Permit. For project applicants that have received prior lawful approval before the effective date of this manual, the City has the discretion to allow previous land development requirements to apply under certain conditions. At the discretion of the City

Engineer, the City will allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1) of the MS4 Permit are met.

1.11 Project Review Procedures

Local jurisdictions review project plans for compliance with applicable requirements of this manual and the MS4 Permit.

The project applicant must provide sufficient documentation to demonstrate that applicable requirements of the BMP Design Manual and the MS4 Permit will be met.

For Standard and Basic Projects, a Standard Project SWQMP must be completed prior to first plan check to document that the following general requirements of the MS4 Permit are met, and showing applicable features onsite grading, building, improvement and landscaping plans:

- BMP Requirements for All Development Projects, which includes general requirements, source control BMP requirements, and narrative (i.e. not numerically-sized) site design requirements (MS4 Permit Provision E.3.a).

For PDPs, a PDP SWQMP must be completed prior to first plan check to document that the following general requirements of the MS4 Permit are met, and showing applicable features onsite grading and landscaping plans:

- BMP Requirements for All Development Projects, which includes general requirements for siting of permanent, post-construction BMPs, source control BMP requirements, and narrative (i.e. not numerically-sized) site design requirements (MS4 Permit Provision E.3.a);
- Stormwater Pollutant Control BMP Requirements, for numerically sized onsite structural BMPs to control pollutants in stormwater (MS4 Permit Provision E.3.c.(1)); and
- Hydromodification Management BMP Requirements, which includes protection of critical sediment yield areas and numerically sized onsite BMPs to manage hydromodification that may be caused by stormwater runoff discharged from a project (MS4 Permit Provision E.3.c.(2)).

Detailed submittal requirements are provided in Chapter 8 of this manual. Documentation of the permanent, post-construction stormwater BMPs must be provided with the first submittal of a project. Stormwater requirements will directly affect the layout of the project. Therefore stormwater requirements must be considered from the initial project planning phases, and will be reviewed with each submittal, beginning with the first submittal.

1.12 PDP Structural BMP Verification

MS4 Permit Provision E.3.e.(1)

Structural BMPs must be verified by the local jurisdiction prior to project occupancy.

Pursuant to MS4 Permit Provision E.3.e.(1), each Copermittee must require and confirm the following with respect to PDPs constructed within their jurisdiction:

(a) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate

parties when there is a change in project or site ownership.

(b) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the PDP, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of [the MS4 Permit].

For PDPs, this means that, the City inspector for the project will require the project owner's engineer to inspect and provide a certification that the site improvements for the project have been constructed in conformance with the approved stormwater management documents and drawings. A note stating this requirement must be placed on project plans.

Inspection of structural BMPs is required at each significant construction stage and at completion. If the need arises to modify a BMP during construction, the proposed change must be submitted to City plan check engineers for review and approval. Modifications must meet the permanent BMP sizing requirements in order to be approved. Following construction, the City may require an addendum to the SWQMP and As Builts to address any changes to the structural BMPs that occurred during construction that were approved by the City Engineer. The City may also require a final update to the O&M Plan, and/or execution of a maintenance agreement that will be recorded for the property. A maintenance agreement that is recorded with the property title can then be transferred to future owners.

Certification of structural BMPs, updates to reports, and recordation of a maintenance agreement must occur prior to project final and occupancy and/or intended use of the project. Specific procedures are provided in Chapter 8 of this manual.

Chapter

2

Performance Standards and Concepts

Projects must meet three separate performance standards, as applicable.

The MS4 Permit establishes separate performance standards for (1) source control and site design practices, (2) stormwater pollutant control BMPs, and (3) hydromodification management BMPs. Chapter 1 provided guidance for determining which performance standards apply to a given project. This chapter defines these performance standards based on the MS4 Permit, and presents concepts that provide the project applicant with technical background, explains why the performance standards are important, and gives a general description of how these performance standards can be met. Detailed procedures for meeting the performance standards are presented in Chapters 4, 5, and 6.

Performance standards can be met through an integrated approach.

While three separate performance standards are defined by this manual, an overlapping set of design features can be used as part of demonstrating conformance to each standard. Further discussion of the relationship between performance standards is provided in Section 2.4.

2.1 Source Control and Site Design Requirements for All Development Projects

2.1.1 Performance Standards

MS4 Permit Provision E.3.a

This section defines performance standards for source control and site design practices that are applicable to all projects (regardless of project type or size; both Standard Projects and PDPs) when local permits are issued, including unpaved roads and flood management projects.

2.1.1.1 General Requirements

All projects shall meet the following general requirements:

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the United States (U.S.); and

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

2.1.1.2 Source Control Requirements

Pollutant source control BMPs are features that must be implemented to address specific sources of pollutants.

The following source control BMPs must be implemented at all development projects where applicable and technically feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protection of outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protection of materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protection of trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Use of any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

Further guidance is provided in Section 2.1.2 and Chapter 4.

2.1.1.3 Site Design Requirements

Site design requirements are qualitative requirements that apply to the layout and design of ALL development project sites (Standard, Basic and Exempt Projects and PDPs).

Site design performance standards define minimum requirements for how a site must incorporate LID BMPs, including the location of BMPs and the use of integrated site design practices. The following site design practices must be implemented at all development projects, where applicable and technically feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)[4];

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[4] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where stormwater initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

A key aspect of this performance standard is that these design features must be used where applicable and feasible. Responsible implementation of this performance standard depends on evaluating applicability and feasibility. Further guidance is provided in Section 2.1.2 and Chapter 4.

Additional site design requirements may apply to PDPs.

Site design decisions may influence the ability of a PDP to meet applicable performance standards for pollutant control and hydromodification management BMPs (as defined in Section 2.2 and 2.3). For example, the layout of the site drainage and reservation of areas for BMPs relative to areas of infiltrative soils may influence the feasibility of capturing and managing stormwater to meet stormwater pollutant control and/or hydromodification management requirements. As such, the City may require additional site design practices, beyond those listed above, to be considered and documented as part of demonstrating conformance to stormwater pollutant control and hydromodification management requirements.

2.1.2 Concepts and References

Land development tends to increase the amount of pollutants in stormwater runoff.

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces facilitate entrainment of urban pollutants in stormwater runoff (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not generally found in high concentrations in the runoff from the natural environment. Pollutants that accumulate on impervious surfaces and actively landscaped pervious surfaces may contribute to elevated levels of pollutants in runoff relative to the natural condition.

Land development also impacts site hydrology.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration, retention, evapotranspiration and treatment of stormwater runoff to take place. Instead, stormwater runoff from impervious surfaces is typically and has traditionally been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at

significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, stormwater volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek beds and banks. Compaction of pervious areas can have a similar effect to impervious surfaces on natural hydrology.

Site Design LID involves attempting to maintain or restore the predevelopment hydrologic regime.

LID is a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds. LID design seeks to control stormwater at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain stormwater runoff by minimizing soil compaction and impervious surfaces, and disconnecting stormwater runoff from conveyances to the storm drain system. Site Design LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in stormwater before it is discharged from a site. Examples of Site Design LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Site design must be considered early in the design process.

Site designs tend to be more flexible in the early stages of project planning than later on when plans become more detailed. Because of the importance of the location of BMPs, site design shall be considered as early as the planning/tentative design stage. Site design is critical for feasibility of stormwater pollutant control BMPs (Section 2.2) as well as coarse sediment supply considerations associated with hydromodification management (introduced in Section 2.3).

Source control and site design (LID) requirements help avoid impacts by controlling pollutant sources and changes in hydrology.

Source control and site design practices prescribed by the MS4 Permit are the minimum management practices, control techniques and system, design and engineering methods to be included in the planning procedures to reduce the discharge of pollutants from development projects, regardless of size or purpose of the development. In contrast to stormwater pollutant control BMPs and hydromodification control BMPs which are intended to mitigate impacts, source control and site design BMPs are intended to avoid or minimize these impacts by managing site hydrology, providing treatment features integrated within the site, and reducing or preventing the introduction of pollutants from specific sources. Implementation of site design BMPs will result in reduction in stormwater runoff generated by the site. Methods to estimate effective runoff coefficients and the stormwater runoff produced by the site after site design BMPs are implemented are presented in Appendix B.2. This methodology is applicable for PDPs that are required to estimate runoff produced from the site with site design BMPs implemented so that they can appropriately size stormwater pollutant control BMPs and hydromodification control BMPs.

The location of BMPs matters.

The site design BMPs listed in the performance standard include practices that either prevent runoff from occurring or manage runoff as close to the source as possible. This helps create a more hydrologically effective site and reduces the requirements that pollutant control and hydromodification control BMPs must meet, where required. Additionally, because sites may have

spatially-variable conditions, the locations reserved for structural BMPs within the site can influence whether these BMPs can feasibly retain, treat, and/or detain stormwater to comply with structural pollutant control and hydromodification control requirements, where applicable. Finally, the performance standard specifies that onsite BMPs must remove pollutants from runoff prior to discharge to any receiving waters or the MS4, be located/constructed as close to the pollutant generating source as possible and must not be constructed within waters of the U.S.

The selection of BMPs also matters.

The lists of source control and site design BMPs specified in the performance standard must be used "where applicable and feasible." This is an important concept – BMPs should be selected to meet the R9-2013-0001 permit requirements and are feasible with consideration of site conditions and project type. By using BMPs that are applicable and feasible, the project can achieve benefits of these practices, while not incurring unnecessary expenses (associated with using practices that do not apply or would not be effective) or creating undesirable conditions (for example, infiltration-related issues, vector concerns including mosquito breeding, etc.).

Methods to select and design BMPs and demonstrate compliance with source control and site design requirements are presented in Chapter 4 of this manual.

2.2 Stormwater Pollutant Control Requirements for PDPs

2.2.1 Stormwater Pollutant Control Performance Standard

MS4 Permit Provision E.3.c.(1)

Stormwater Pollutant Control BMPs for PDPs shall meet the following performance standards:

(a) Each PDP shall implement BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of stormwater runoff produced from a 24-hour, 85th percentile storm event (Design Capture Volume (DCV)). The 24-hour, 85th percentile storm event shall be based on Figure B.1-1 in Appendix B or an approved site-specific rainfall analysis.

(i) If it is not technically feasible to implement retention BMPs for the full DCV onsite for a PDP, then the PDP shall utilize biofiltration BMPs for the remaining volume not reliably retained. Biofiltration BMPs must be designed as described in Appendix F to have an appropriate hydraulic loading rate to maximize stormwater retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:

[a]. Treat 1.5 times the DCV not reliably retained onsite, OR

[b]. Treat the DCV not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite.

(ii) If biofiltration BMPs are not technically feasible, then the PDP shall utilize flow-thru treatment control BMPs (selected and designed per Appendix B.6) to treat runoff

leaving the site, AND participate in alternative compliance to mitigate for the pollutants from the DCV not reliably retained onsite pursuant to Section 2.2.1.(b). Flow-thru treatment control BMPs must be sized and designed to:

[a]. Remove pollutants from stormwater to the MEP (defined by the MS4 Permit) by following the guidance in Appendix B.6; and

[b]. Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two (both methods may be adjusted for the portion of the DCV retained onsite as described in Appendix B.6) and

[c]. Meet the flow-thru treatment control BMP treatment performance standard described in Appendix B.6.

(b) A PDP may be allowed to participate in an alternative compliance program in lieu of fully complying with the performance standards for stormwater pollutant control BMPs onsite if an alternative compliance program is available in the jurisdiction the project is located, see Section 1.8. When an alternative compliance program is utilized:

(i) The PDP must mitigate for the portion of the DCV not reliably retained onsite and

(ii) Flow-thru treatment control BMPs must be implemented to treat the portion of the DCV that is not reliably retained onsite. Flow-thru treatment control BMPs must be selected and sized in accordance with Appendix B.6.

(iii) A PDP may be allowed to propose an alternative compliance project not identified in the WMAA of the WQIP if the requirements in Section 1.8 are met at the discretion of the City.

Demonstrations of feasibility findings and calculations to justify BMP selection and design shall be provided by the project applicant in the SWQMP to the satisfaction of the City. Methodology to demonstrate compliance with the performance standards, described above, applicable to stormwater pollutant control BMPs for PDPs is detailed in Chapter 5.

2.2.2 Concepts and References

Retention BMPs are the most effective type of BMPs to reduce pollutants discharging to MS4s when they are sited and designed appropriately.

Retention of the required DCV will achieve 100 percent pollutant removal efficiency (i.e. prevent pollutants from discharging directly to the MS4). Thus, retention of as much stormwater onsite as technically feasible is the most effective way to reduce pollutants in stormwater discharges to, and consequently from the MS4, and remove pollutants in stormwater discharges from a site to the MEP.

However, in order to accrue these benefits, retention BMPs must be technically feasible and suitable for the project. Retention BMPs that fail prematurely, under-perform, or result in unintended consequences as a result of improper selection or siting may achieve performance that is inferior to

other BMP types while posing other issues for property owners and the City. Therefore, this manual provides criteria for evaluating feasibility and provides options for other types of BMPs to be used if retention is not technically feasible.

Biofiltration BMPs can be sized to achieve approximately the same pollutant removal as retention BMPs.

In the case, where the entire DCV cannot be retained onsite because it is not technically feasible PDPs are required to use biofiltration BMPs with specific sizing and design criteria listed in Appendix B.5 and Appendix F. These sizing and design criteria are intended to provide a level of long term pollutant removal that is reasonably equivalent to retention of the DCV.

Flow-thru treatment BMPs are required to treat the pollutant loads in the DCV not retained or biofiltered onsite to the MEP.

If the pollutant loads from the full DCV cannot feasibly be retained or biofiltered onsite, then PDPs are required to implement flow-thru treatment control BMPs to remove the pollutants to the MEP for the portion of the DCV that could not be feasibly retained or biofiltered. Flow-thru treatment BMPs may only be implemented to address onsite stormwater pollutant control requirements if coupled with an offsite alternative compliance project that mitigates for the portion of the pollutant load in the DCV not retained or biofiltered onsite. Onsite and offsite mitigation is required when a PDP is allowed to use an alternative compliance program. Note that alternative offsite compliance is not currently an option in the City of Encinitas but may be incorporated into future updates of this manual.

Offsite Alternative Compliance Program is not currently available in the City of Encinitas.

The MS4 Permit allows the Copermittee the option to grant PDPs permission to utilize an alternative compliance program for meeting the pollutant control performance standard once water quality equivalency (WQE) standards have been established. WQE standards have not been established and an alternative compliance program is not currently available in the City of Encinitas. Refer to Section 1.8 for more information about the optional alternative compliance program.

Methods to design and demonstrate compliance with stormwater pollutant control BMPs are presented in Chapter 5 of this manual. Definitions and concepts that should be understood when sizing stormwater pollutant control BMPs to be in compliance with the performance standards are explained below:

2.2.2.1 Best Management Practices

To minimize confusion, this manual considers all references to "facilities," "features," or "controls" to be incorporated into development projects as BMPs.

2.2.2.2 DCV

The MS4 Permit requires pollutants be addressed for the runoff from the 24-hour 85th percentile storm event ("DCV") as the design standard to which PDPs must comply.

The 85th percentile, 24-hour storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, the

following steps would be followed:

- Obtain representative precipitation data, preferably no less than 30-years period if possible.
- Divide the recorded precipitation into 24-hour precipitation totals.
- Filter out events with no measurable precipitation (less than 0.01 inches of precipitation).
- Of the remaining events, calculate the 85th percentile value (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile, 24-hour storm). The 85th percentile storm in Encinitas is around 0.6 in, depending on what area of the City the project is located.

The 85th percentile, 24-hour storm event depth is then used in hydrologic calculations to calculate the DCV for sizing stormwater pollutant control BMPs. An exhibit showing the 85th percentile, 24-hour storm depth across San Diego County and the methodology used to develop this exhibit is included in Appendix B.1.3. Guidance to estimate the DCV is presented in Appendix B.1.

2.2.2.3 Implementation of Stormwater Pollutant Control BMPs

The MS4 Permit requires that the PDP applicants proposing to meet the performance standards onsite implement stormwater pollutant control BMPs in the order listed below. That is, the PDP applicant first needs to implement **all** feasible onsite retention BMPs needed to meet the stormwater pollutant control BMP requirements prior to installing onsite biofiltration BMPs, and then onsite biofiltration BMPs prior to installing onsite flow-thru treatment control BMPs.

Retention BMPs: Structural measures that provide retention (i.e. intercept, store, infiltrate, evaporate and evapotranspire) of stormwater as part of pollutant control strategy. Examples include infiltration BMPs and cisterns, bioretention BMP's and biofiltration with partial retention BMP's.

Biofiltration BMPs: Structural measures that provide biofiltration of stormwater as part of the pollutant control strategy. Example includes Biofiltration BMPs.

Flow-thru treatment control BMPs: Structural measures that provide flow-thru treatment as part of the pollutant control strategy. Examples include vegetated swales and media filters.

For example, if the DCV from a site is 10,000 cubic feet (ft^3) and it is technically feasible to implement 2,000 ft^3 of retention BMPs and 9,000 ft^3 of biofiltration BMPs sized using Section 2.2.1.(a)(i)[a], and the jurisdiction has an alternative compliance program[5] to satisfy the requirements of this manual the project applicant should:

1) First, design retention BMPs for 2,000 ft^3.
2) Then complete a technical feasibility form for retention BMPs (included in Appendix C and D) demonstrating that it's only technically feasible to implement retention BMPs for 2,000 ft^3.
3) Then design biofiltration BMPs for 9,000 ft^3 (calculate equivalent volume for which the pollutants are retained = 9,000/1.5 = 6,000 ft^3).

[5] The City of Encinitas does not currently have an Alternative Compliance Program.

4) Then complete a technical feasibility for biofiltration BMPs demonstrating that its only technically feasible to implement biofiltration BMPS for 9,000 ft^3.
5) Estimate the DCV that could not be retained or biofiltered = 10,000 ft^3 – (2,000 ft^3 + 6,000 ft^3) = 2,000 ft^3.
6) Implement flow-thru treatment control BMPs to treat the pollutants in the remaining 2,000 ft^3. Refer to Appendix B.6 for guidance for designing flow-thru treatment control BMPs.
7) Also participate in an alternative compliance project for 2,000 ft^3. Refer to Section 1.8 for additional guidance on participation in an alternative compliance program.

2.2.2.4 Technical Feasibility

MS4 Permit Requirement E.3.c.(5)

Analysis of technical feasibility is necessary to select the appropriate BMPs for a site.

PDPs are required to implement pollutant control BMPs in the order of priority in Section 2.2.2.3 based on determinations of technical feasibility. In order to assist the project applicant in selecting BMPs, this manual includes a defined process for evaluating feasibility. Conceptually, the feasibility criteria contained in this manual are intended to:

- Promote reliable and effective long term operations of BMPs by providing a BMP selection process that eliminates the use of BMPs that are not suitable for site conditions, project type or other factors;
- Minimize significant risks to property, human health, and/or environmental degradation (e.g. geotechnical stability, groundwater quality) as a result of selection of BMPs that are undesirable for a given site; and
- If an alternative compliance program is in effect, describe circumstances under which regional and watershed-based strategies, as part of an approved WMAA **and** an alternative compliance program developed by the jurisdiction where the project resides, may be selected.

Steps for performing technical feasibility analyses are described in detail in Chapter 5. More specific guidance related to geotechnical investigation guidelines for feasibility of stormwater infiltration and groundwater quality and water balance factors are provided in Appendices C and D, respectively.

2.2.2.5 Biofiltration BMPs

The MS4 Permit requires Biofiltration BMPs be designed to have an appropriate hydraulic loading rate to maximize stormwater retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Appendix F of this manual has guidance for hydraulic loading rates and other biofiltration design criteria to meet these required goals. Appendix F also has a checklist that will need to be completed by the project SWQMP preparer during plan submittal. Guidance for sizing Biofiltration BMPs is included in Chapter 5 and Appendices B.5 and F.

2.2.2.6 Flow-thru Treatment Control BMPs (for use with Alternative Compliance[6])

MS4 Permit Requirement E.3.d.2-3

Flow-thru treatment control BMPs may only be used if a jurisdiction has an alternative compliance program in place. The MS4 Permit requires that the flow-thru treatment control BMP selected by the PDP applicant be ranked with high or medium pollutant removal efficiency for the most significant pollutant of concern. Steps to select the flow-thru treatment control BMP include:

- Step 1: Identify the pollutant(s) of concern by considering the following at a minimum a) Receiving water quality; b) Highest priority water quality conditions identified in the Watershed Management Areas Water Quality Improvement Plan; c) Land use type of the project and pollutants associated with that land use type and d) Pollutants expected to be present onsite
- Step 2: Identify the most significant pollutant of concern. A project could have multiple most significant pollutants of concerns and shall include the highest priority water quality condition identified in the watershed WQIP and pollutants expected to be presented onsite/from land use.
- Step 3: Determine the effectiveness of the flow-thru treatment control BMP for the identified most significant pollutant of concern.

Methodology for sizing flow-thru treatment control BMPs and the resources required to identify the pollutant(s) of concern and effectiveness of flow-thru treatment control BMPs are included in Chapter 5 and Appendix B.6.

2.3 Hydromodification Management Requirements for PDPs

2.3.1 Hydromodification Management Performance Standards

MS4 Permit Provision E.3.c.(2)

This section defines performance standards for hydromodification management, including flow control of post-project stormwater runoff and protection of critical sediment yield areas, that shall be met by all PDPs unless exempt from hydromodification management requirements per Section 1.6 of this manual. Each PDP shall implement onsite BMPs to manage hydromodification that may be caused by stormwater runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of PDPs).

    (i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the

[6] The City of Encinitas does not currently have an Alternative Compliance Program.

critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) [of the MS4 Permit] to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each PDP must avoid critical sediment yield areas known to the Copermittee or identified by the optional WMAA pursuant to Provision B.3.b.(4) [of the MS4 Permit], or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A PDP may be allowed to utilize alternative compliance under Provision E.3.c.(3) [of the MS4 Permit] in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The PDP must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

Hydromodification management requirements apply to both new development and redevelopment PDPs, except those that are exempt based on discharging to downstream channels or water bodies that are not subject to erosion, as defined in either the MS4 Permit (Provision E.3.c.(2).(d)) or the WMAA for the watershed in which the project resides. Exemptions from hydromodification management requirements are described in Section 1.6 of this manual.

For undisturbed sites, the existing condition shall be taken to be the pre-development runoff condition. For redevelopment PDPs or sites that have been previously disturbed, pre-development runoff conditions shall be approximated by applying the parameters of a pervious area rather than an impervious area to the existing site, using the existing onsite grade and assuming the infiltration characteristics of the underlying soil.

For San Diego area watersheds, the range of flows that result in increased potential for erosion or degraded instream habitat downstream of PDPs and the critical channel flow shall be based on the "Final Hydromodification Management Plan Prepared for County of San Diego, California March 2011" (herein, "March 2011 Final HMP"). For PDPs subject to hydromodification management requirements, the range of flows to control depends on the erosion susceptibility of the receiving stream and shall be:

- 0.1Q2 to Q10 for streams with high susceptibility to erosion (this is the default range of flows to control when a stream susceptibility study has not been prepared);
- 0.3Q2 to Q10 for streams with medium susceptibility to erosion and which has a stream susceptibility study prepared and approved by the City; or
- 0.5Q2 to Q10 for streams with low susceptibility to erosion and which has a stream susceptibility study prepared and approved by the City.

Tools for assessing stream susceptibility to erosion have been developed by Southern California Coastal Water Research Project (SCCWRP). The tools are presented in the March 2011 Final HMP and also available through SCCWRP's website. If a PDP intends to select 0.3Q2 or 0.5Q2 threshold, the SCCWRP screening tool must be completed and submitted with other project documentation.

The March 2011 Final HMP does not provide criteria for protection of critical sediment yield areas. The standard as presented in the MS4 Permit and shown above is: avoid critical sediment yield areas

or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

Methods to demonstrate compliance with hydromodification management requirements, including protection of critical coarse sediment yield areas and flow control for post-project runoff from the project site, are presented in Chapter 6 of this manual. Hydromodification management concepts, theories, and references are described below.

2.3.2 Hydromodification Management Concepts and References

2.3.2.1 What is Hydromodification?

The MS4 Permit defines hydromodification as the change in the natural watershed hydrologic processes and runoff characteristics (i.e. interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Typical impacts to natural watershed hydrologic processes and runoff characteristics resulting from new development and redevelopment include:

- Decreased interception and infiltration of rainfall at the project site due to removal of native vegetation, compaction of pervious area soils, and the addition of impervious area;
- Increased connectivity and efficiency of drainage systems serving the project site, including concentration of project-site runoff to discrete outfalls;
- Increased runoff volume, flow rate, and duration from the project site due to addition of impervious area, removal of native vegetation, and compaction of pervious area soils;
- Reduction of critical coarse sediment supply from the project site to downstream natural systems (e.g. streams) due to stabilization of developed areas, stabilization of streams, and addition of basins that trap sediment (either by design as a permanent desilting basin or stormwater quality treatment basin that settles sediment, or incidentally as a peak flow management basin); and
- Interruption of critical coarse sediment transport in streams due to stream crossings such as culverts or ford crossings that incidentally slow stream flow and allow coarse sediment to settle upstream of the crossing.

Any of these changes can result in increased potential for erosion, or degraded instream habitat downstream of PDPs. The changes to delivery of runoff to streams typically modify the timing, frequency, magnitude, and duration of both storm flows and baseflow. Changes to delivery of coarse sediment and transport of coarse sediment result in increased transport capacity and the potential for adverse channel erosion.

Note that this manual is intended for design of permanent, post-construction BMPs, therefore this discussion is focused on the permanent, post-construction effects of development. The process of construction also has impacts, such as a temporary increase in sediment load produced from

surfaces exposed by vegetation removal and grading, which is often deposited within stream channels, initiating aggradation and/or channel widening. Temporary construction BMPs to mitigate the sediment delivery are outside the purview of this manual.

Channel erosion resulting from PDP stormwater discharge can begin at the point where runoff is discharged to natural systems, regardless of the distance from the PDP to the natural system. It could also begin some distance downstream from the actual discharge point if the stream condition is stable at the discharge point but more susceptible to erosion at a downstream location. The March 2011 HMP defines a domain of analysis for evaluation of stream susceptibility to erosion from PDP stormwater discharge.

2.3.2.2 How Can Hydromodification be Controlled?

In the big picture, watershed-scale solutions are necessary to address hydromodification. Factors causing hydromodification are watershed-wide, and all of San Diego's major watersheds include some degree of legacy hydromodification effects from existing development and existing channel modifications, which cannot be reversed by onsite measures implemented at new development and redevelopment projects alone. As recommended by SCCWRP in Technical Report 667, "Hydromodification Assessment and Management in California," dated April 2012, "management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed," and "potential objectives for specific stream reaches may include: protect, restore, or manage as a new channel form."

Development of such management strategies and objectives for San Diego watersheds will evolve over successive MS4 Permit cycles. The current MS4 Permit (Order No. R9-2013-0001) requires the Copermittees to prepare WQIPs for all Watershed Management Areas within the San Diego Region. The WQIPs may include WMAAs which would assess watershed-wide hydrologic processes. These documents may be used to develop watershed-specific requirements for structural BMP implementation, including watershed-scale hydromodification management strategies.

This manual addresses development and redevelopment project-level hydromodification management measures currently required for PDPs by the MS4 Permit. Until optional watershed-specific performance recommendations or alternative compliance programs are developed, hydromodification management strategies for new development and redevelopment projects will consist of onsite measures designed to meet the performance requirements of Provisions E.3.c.(2).(a) and (b) of the MS4 Permit shown in Section 2.3.1. While development project-level measures alone will not reverse hydromodification of major streams, onsite measures are a necessary component of a watershed-wide solution, particularly while watershed-wide management strategies are still being developed. Also, development project-level measures are necessary to protect a project's specific stormwater discharge points, which are typically discharging in smaller tributaries not studied in detail in larger watershed studies. Typical measures for development projects include:

- Protecting critical sediment yield areas by designing the project to avoid them or implementing measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project;
- Using site design/LID measures to minimize impervious areas onsite and reduce post-project runoff; and
- Providing structural BMPs designed using continuous simulation hydrologic modeling to

provide flow control of post-project runoff (e.g. BMPs that store post-project runoff and infiltrate, evaporate, harvest and use, or discharge excess runoff at a rate below the critical flow rate).

Structural BMPs for hydromodification management provide volume to control a range of flows from a fraction of Q2 to Q10. The volume determined for hydromodification management is different from the DCV for pollutant control. Methodology to demonstrate compliance with hydromodification management requirements are presented in Chapter 6 of this BMP Design manual. See Section 2.4 regarding the relationship between pollutant control and hydromodification management performance standards.

2.4 Relationship between Performance Standards

An integrated approach can provide significant cost savings by utilizing design features that meet multiple standards.

Site design/LID, stormwater pollutant control, and hydromodification management are separate requirements to be addressed in development project design. Each has its own purpose and each has separate performance standards that must be met. However, effective project planning involves understanding the ways in which these standards are related and how single suites of design features can meet more than one standard.

Site design features (aka LID) can be effective at reducing the runoff to downstream BMPs.

Site design BMPs serve the purpose of minimizing impervious areas and therefore reducing post-project runoff, and reducing the potential transport of pollutants offsite and reducing the potential for downstream erosion caused by increased flow rates and durations. By reducing post-project runoff through, site design BMPs, the amount of runoff that must be managed for pollutant control and hydromodification flow control can be reduced.

Single structural BMPs, particularly retention BMPs, can meet or contribute to both pollutant control and hydromodification management objectives.

The objective of structural BMPs for pollutant control is to reduce offsite transport of pollutants, and the objective of structural BMPs for hydromodification management is to control flow rates and durations for control of downstream erosion. In either case, the most effective structural BMP to meet the objective are BMPs that are based on retention of stormwater runoff where feasible. Both stormwater pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). However, demonstrating that the separate performance requirements for pollutant control and hydromodification management are met must be shown separately.

The design process should start with an assessment of the feasibility to retain or partially retain the DCV for pollutant control, and then determine what kind of BMPs will be used for pollutant control and hydromodification management.

A typical design process for a single structural BMP to meet two separate performance standards at once involves (1) initiating the structural BMP design based on the performance standard that is expected to require the largest volume of stormwater to be retained, (2) checking whether the initial

design incidentally meets the second performance standard, and (3) adjusting the design as necessary until it can be demonstrated that both performance standards are met.

Chapter 3

Development Project Planning and Design

Compliance with source control/site design, pollutant control, and hydromodification management BMPs, as applicable, requires coordination of site, landscape, and project stormwater plans. It also involves provisions for operation and maintenance of structural BMPs. This chapter outlines a step-wise, systematic approach (Figure 3-1) to preparing a comprehensive stormwater management design for Standard, Basic and Exempt Projects and PDPs.

STEP 1: **Coordinate Between Disciplines** Refer to Section 3.1	*Purpose:* Engage and coordinate with owner and other project disciplines (e.g. architect, engineer) early in the design and throughout the design process to support appropriate project decisions.
⇓	
STEP 2: **Gather Project Site Information** Refer to Section 3.2	*Purpose:* Gather information necessary to inform overall stormwater planning process and specific aspects of BMP selection; determine the applicable stormwater requirements for the project.
⇓	
STEP 3: **Develop Conceptual Site Layout and Stormwater Control Strategies** Refer to Section 3.3	*Purpose:* Use the information obtained in Step 2 to inform the preliminary site design and stormwater management strategy. The scope of this step varies depending on whether the project is a Standard, Basic, or Exempt Project or a PDP.
⇓	
STEP 4: **Develop Complete Stormwater Management Design** Refer to Section 3.4	*Purpose:* Develop the complete stormwater management design by incorporating the site design and stormwater management strategies identified in Step 3 and conducting design level analyses. Integrate the stormwater design with the site plan and other infrastructure plans.

FIGURE 3-1. Approach for Developing a Comprehensive Stormwater Management Design

Use of this step-wise approach is encouraged and has a number of advantages. First, it helps ensure that applicable requirements and design goals are identified early in the planning process. Second, it helps ensure that key data about the site, watershed, and project are collected at the appropriate time in the project development process, and the analyses are suited to the decisions that need to be made at each phase. Third, taking a systematic approach helps identify opportunities for retention of stormwater that may not be identified in a less systematic process. Finally, a systematic approach helps ensure that constraints and unintended consequences are considered and used to inform BMP selection, design, and related project decisions.

3.1 Coordination Between Disciplines

Stormwater management design will affect the site layout and should therefore be coordinated among the project team as necessary from the start. The following list describes entities/disciplines that are frequently involved with stormwater management design and potential roles that these entities/disciplines may play.

Owner:

- Engage the appropriate disciplines needed for the project and facilitate exchange of information between disciplines.
- Identify who will be responsible for long term O&M of stormwater management features and initiate maintenance agreements when applicable.
- Ensure that whole lifecycle costs are considered in the selection and design of stormwater management features and a source of funding is provided for long-term maintenance.
- Identify the party responsible to inspect structural BMPs at each significant construction stage and at completion in order to provide certification of structural BMPs following construction.

Planner:

- Communicate overall project planning criteria to the team, such as planned development density, parking requirements, project-specific planning conditions, conditions of approval from prior entitlement actions (e.g. CEQA, 401 certifications) etc., and locations of open space and conservation easements, and environmentally sensitive areas that are protected from disturbance.
- Consider location of stormwater facilities early in the conceptual site layout process.
- Assist in developing the site plan.

Architect:

- Participate in siting and design (architectural elements) of stormwater BMPs.

Civil Engineer:

- Determine stormwater requirements applicable to the site (e.g. Standard, Basic, or Exempt Project or PDP).
- Obtain site-specific information (e.g. watershed information, infiltration rates) and develop viable stormwater management options.
- Reconcile stormwater management requirements with other site requirements (e.g. fire access, Americans with Disabilities Act accessibility, parking, open space).
- Develop preliminary and final design documents.
- Select and design BMPs; conduct and document associated analyses; prepare BMP design sheets, details, and specifications.
- Prepare project SWQMP submittals.

Landscape Architect and/or Horticulturist/Agronomist:

- Select appropriate plants for vegetated stormwater features and prepare planting plans.
- Develop specifications for planting, vegetation establishment, and maintenance.

- Assist in developing irrigation plans/rates to minimize water application and non-stormwater runoff from the project site.

Geotechnical Engineer

- Assist in preliminary infiltration feasibility screening of the site to help inform project layout and initial BMP selection, including characterizing soil, groundwater, geotechnical hazards, and any other factors, as applicable for the site.
- Conduct detailed analyses at proposed infiltration BMP locations to confirm or revise feasibility findings and provide design infiltration rates.

Geomorphologist and/or Geologist

- Provide specialized services, as needed, related to sediment source assessment and/or channel stability or sensitivity assessment.

3.2 Gathering Project Site Information

In order to make decisions related to selection and design of stormwater management BMPs, it is necessary to gather relevant project site information. This could include physical site information, proposed uses of the site, whether the project is a Standard, Basic, or Exempt Project or a PDP, proposed stormwater discharge locations, potential/anticipated stormwater pollutants based on the proposed uses of the site, receiving water sensitivity to pollutants and susceptibility to erosion, hydromodification management requirements, and other site requirements and constraints.

The amount and type of information that should be collected depends whether the project is a Standard, Basic or Exempt Project, a PDP subject to all requirements, or a PDP with only pollutant control requirements. Refer to Figure 1-1 in Chapter 1 to identify the project type.

Information should only be gathered to the extent necessary to inform the stormwater management design. In some cases, it is not necessary to conduct site specific analyses to precisely characterize conditions. For example, if depth to groundwater is known to be approximately 100 feet based on regional surveys, it is not necessary to also conduct site specific assessment of depth to groundwater to determine whether it is actually 90 feet or 110 feet on the project site. The difference between these values would not influence the stormwater management design. In other cases, some information will not be applicable. For example, on an existing development site, there may be no natural hydrologic features remaining, therefore these features do not need to be characterized. The lack of natural hydrologic features can be simply noted without further effort required.

Checklists (in Appendix I) and submittal templates (in Appendix A) are provided to facilitate gathering information about the project site for BMP selection and design. As part of planning for site investigation, it is helpful to review the subsequent steps (Section 3.3 and 3.4) to gain familiarity with how the site information will be used in making decisions about site layout and stormwater BMP selection and design. This can help prioritize the data that are collected.

3.3 Developing Conceptual Site Layout and Stormwater Control Strategies

Once preliminary site information has been obtained, it is essential to identify potential locations for stormwater management features at a conceptual level during the site planning phase. Preliminary design of permanent stormwater BMPs is partially influenced by whether the project is a Standard Project or a PDP. Table 3-1 presents the applicability of different subsections in this chapter based on project type and must be used to determine which requirements apply to a given project.

TABLE 3-1. Applicability of Section 3.3 Sub-sections for Different Project Types

Project Type	Section 3.3.1	Section 3.3.2	Section 3.3.3	Section 3.3.4
Standard, Basic and Exempt Projects	☑	NA	NA	NA
Standard Projects	☑	NA	☑	☑ [1]
PDP with only Pollutant Control Requirements	☑	NA	☑	☑
PDP with Pollutant and Hydromodification Management Requirements	☑	☑	☑	☑

[1] Shall provide BMPs based on Section 1.4.3.1

3.3.1 Preliminary Design Steps for All Development Projects

All projects must incorporate source control and site design BMPs. The following systematic approach outlines these site planning considerations for all development projects:

1 Review Chapter 4 of this manual to become familiar with the menu of source control and site design practices that are required.

2 Review the preliminary site information gathered in Section 3.2, specifically related to:

   a. Natural hydrologic features that can be preserved and/or protected;

   b. Soil information;

   c. General drainage patterns (i.e. general topography, points of connection to the storm drain or receiving water);

   d. Pollutant sources that require source controls; and

   e. Information gathered and summarized in the Site Information Checklist for Standard, Basic and Exempt Projects (Appendix I-3A).

3 Create opportunities for source control and site design BMPs by developing an overall conceptual site layout that allocates space for site design BMPs and promotes

drainage patterns that are effective for hydrologic control and pollutant source control. For example:

a. Locate pervious areas down gradient from buildings where possible to allow for dispersion.
b. Identify parts of the project that could be drained via overland vegetated conveyance rather than piped connections.
c. Develop traffic circulation patterns that are compatible with minimizing street widths.

4 As part of Section 3.4, refine the selection and placement of source control and site design BMPs and incorporate them into project plans. Compliance with site design and source control requirements shall be documented as described in Chapter 4.

3.3.2 Evaluation of Critical Coarse Sediment Yield Areas

For PDPs that are required to meet hydromodification management requirements, evaluate whether critical coarse sediment yield areas exist within or upstream of the project site. Identification of critical coarse sediment yield areas is discussed in Chapter 6 of this manual. Conceptual layout of the project site must consider the following items:

a. Can onsite critical coarse sediment yield areas be avoided?
b. What measures will be necessary to ensure that the conveyance of coarse sediment from critical coarse sediment yield areas within the site is uninterrupted?
c. If critical coarse sediment yield areas within the site are not avoided, or conveyance of critical coarse sediment will be interrupted, how will this be mitigated on-site?
d. If runoff from upstream, offsite critical coarse sediment yield areas will be conveyed through the project site, what measures will be necessary to ensure the conveyance of coarse sediment from offsite is uninterrupted?

3.3.3 Drainage Management Areas

Drainage management areas (DMAs) provide an important framework for feasibility screening, BMP prioritization, and stormwater management system configuration. BMP selection, sizing, and feasibility determinations must be made at the DMA level; therefore delineation of DMAs is highly recommended at the conceptual site planning phase and is mandatory for completing the project design and meeting submittal requirements. This section provides guidance on delineating DMAs that is intended to be used as part of Section 3.3 and 3.4.

DMAs are defined based on the proposed drainage patterns of the site and the BMPs to which they drain. On site DMAs should not overlap and should be similar with respect to BMP opportunities and feasibility constraints. More than one DMA can drain to the same BMP, or to another DMA. However, because the BMP sizes are determined by the runoff from the DMA, a single DMA may not drain to more than one BMP. See Figure 3-2.

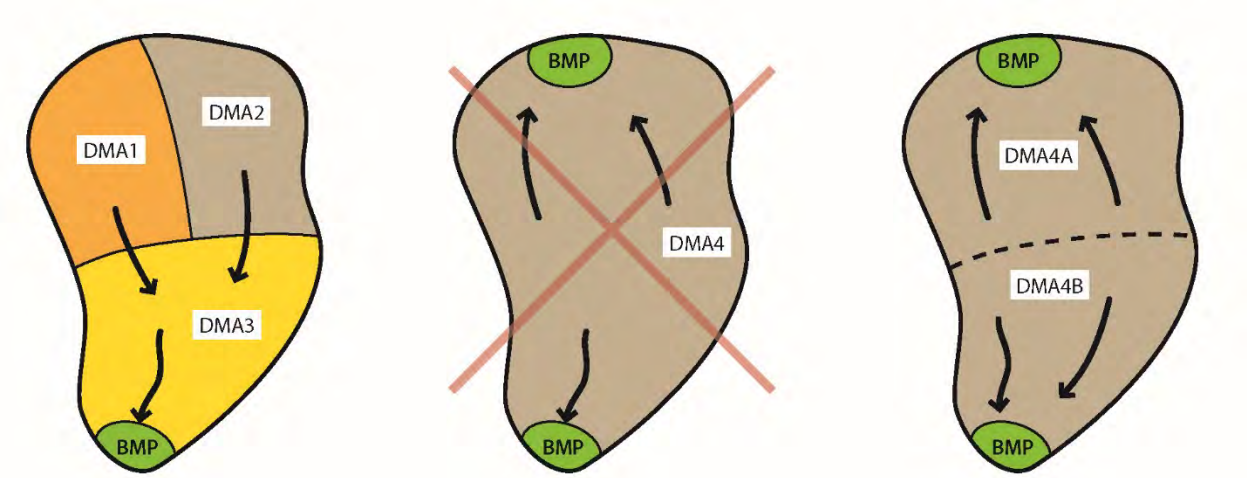


FIGURE 3-2. DMA Delineation

In some cases, in early planning phases, it may be appropriate to generalize the proposed treatment plan by simply assigning a certain BMP type to an entire planning area (e.g. Parking lot X will be treated with bioretention) and calculating the total sizing requirement without identifying the specific BMP locations at that time. This planning area would be later subdivided for design-level calculations. Section 5.2 provides additional guidance on DMA delineation. A runoff factor (similar to a "C" factor used in the rational method) should be used to estimate the runoff draining to the BMP. Appendix B.1 provides guidance in estimating the runoff factor for the drainage area draining to a BMP.

BMPs must be sized to treat the DCV from the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drain to the BMP. To minimize offsite flows treated by project BMPs, consider diverting upgradient flows subject to local drainage and flood control regulation. An example is shown in Figure 3-3.

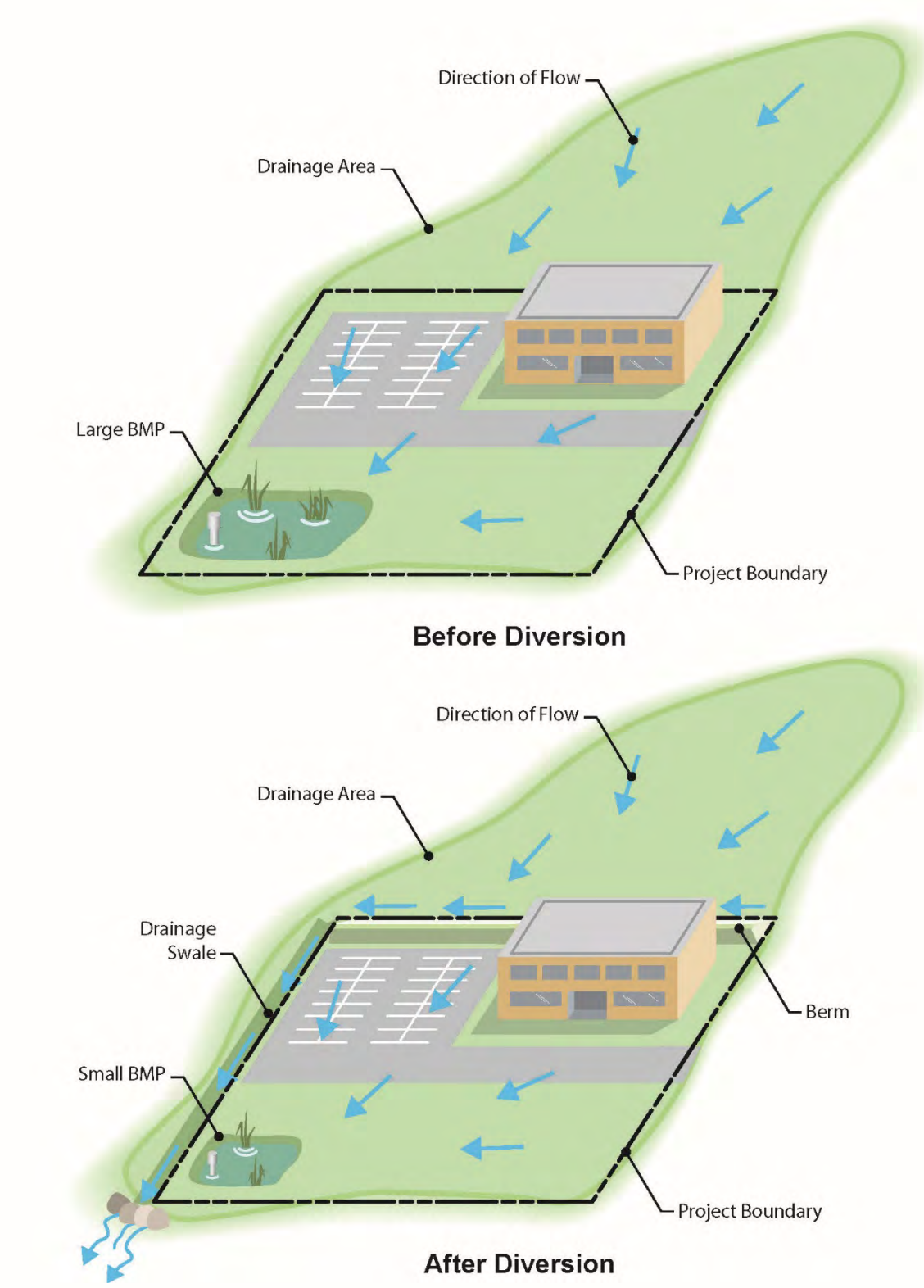


FIGURE 3-3. Tributary Area for BMP Sizing

3.3.4 Developing Conceptual Stormwater Control Strategies

This step applies to PDPs only. The goal of this step is to develop conceptual stormwater control strategies that are compatible with the site conditions, including siting and preliminary selection of structural BMPs. The end product of this step should be a general, but concrete understanding of the stormwater management parameters for each DMA, the compatibility of this approach with the site design, and preliminary estimates of BMP selection. For simpler sites, this step could be abbreviated in favor of skipping forward to design-level analyses in Section 3.4. However, for larger and/or more complex sites, this section can provide considerable value and help allow evaluation of stormwater management requirements on common ground with other site planning considerations.

The following systematic approach is recommended:

1. Review the preliminary site information gathered in Section 3.2, specifically related to information gathered and summarized in the Site Information Checklist for PDPs (Appendix I-3B).
2. Identify self-mitigating, de minimis areas, and/or potential self-retaining DMAs that can be isolated from the remainder of the site (See Section 5.2).
3. Estimate DCV for each of the remaining DMAs (See Appendix B.1).
4. Determine if there is a potential opportunity for harvest and use of stormwater from the project site. See Section 5.4.1 for harvest and use feasibility screening, which is based on water demand at the project site. For most sites, there is limited opportunity; therefore evaluating this factor early can help simplify later decisions.
5. Estimate potential runoff reduction and the DCV that could be achieved with site design BMPs (See Section 5.3 and Appendix B.2) and harvest and use BMPs (See Appendix B.3).
6. Based on the remaining runoff after accounting for steps 2 to 5, estimate BMP space requirements. Identify applicable structural BMP requirements (i.e. stormwater pollutant control versus hydromodification management) and conduct approximate sizing calculations to determine the overall amount of storage volume and/or footprint area required for BMPs. Use worksheets presented in Appendices B.4 and B.5 to estimate sizing requirements for different types of BMPs.
7. Conduct preliminary screening of infiltration feasibility conditions as part of site planning to identify areas that are more or less conducive to infiltration. Recommended factors to consider include:
    a. Soil types (determined from available geotechnical testing data, soil maps, site observations, and/or other data sources)
    b. Approximate infiltration rates at various points on the site, obtained via approximate methods (e.g. simple pit test), if practicable
    c. Groundwater elevations
    d. Proposed depths of fill
    e. New or existing utilities that will remain with development
    f. Soil or groundwater contamination issues within the site or in the vicinity of the site
    g. Slopes and other potential geotechnical hazards that are unavoidable as part of site development

h. Safety and accessibility considerations

This assessment is not intended to be final or account for all potential factors. Rather, it is intended to help in identifying site opportunities and constraints as they relate to site planning. After potential BMP locations are established, a more detailed feasibility analysis is necessary (see Section 3.4 and 5.4.2). Additionally, Appendix C and D provide methods for geotechnical and groundwater assessment applicable for screening at the planning level and design-level requirements. The jurisdiction may allow alternate assessment methods with appropriate documentation at the discretion of the City Engineer.

8. Identify tentative BMP locations based on preliminary feasibility screening, natural opportunities for BMPs (e.g. low areas of the site, areas near storm drain or stream connections), and other BMP sites that can potentially be created through effective site design (e.g. oddly configured or otherwise unbuildable parcels, easements, and landscape amenities including open space and buffers which can double as locations for bioretention or biofiltration facilities). **Centralized stormwater management BMPs that treat runoff from all portions of the project are required unless otherwise authorized by the City Engineer.**

9. Based on the results of feasibility screening and tentative DMA and BMP locations, determine the general infiltration feasibility condition at these locations. Categories are described in Section 5.4.2 and include:
    a. Full infiltration condition;
    b. Partial infiltration condition; and
    c. No infiltration condition.

    Adapt the site layout to attempt to achieve infiltration to the greatest extent feasible.

10. Consider how stormwater management BMPs will be accessed for inspection and maintenance and provide necessary site planning allowances (access roads, inspection openings, setbacks, etc.). On private projects, stormwater management BMPs are only allowed within the bounds of the private property unless otherwise authorized by the City Engineer.

11. In the SWQMP document site planning and opportunity assessment activities as a record of the decisions that led to the development of the final stormwater management plan. The SWQMP primarily will show the complete design rather than the preliminary steps in the process. However, to comply with the requirements of this manual, the applicant is required to describe how stormwater management objectives have been considered as early as possible in the site planning process and how opportunities to incorporate BMPs have been identified.

3.4 Developing Complete Stormwater Management Design

The complete stormwater management design consists of all of the elements describing the BMPs to be implemented as well as integration of the BMPs with the site design and other infrastructure. The scope of this step varies depending on whether the project is an Exempt Project, a Basic Project, a Standard Project, a PDP with only pollutant control BMP requirements, or a PDP with pollutant

control and hydromodification management requirements. The following systematic approach is recommended to develop a final site layout and stormwater management design. Table 3-2 presents the applicability of different subsections based on project type and must be used to determine which requirements apply to a given project.

TABLE 3-2. Applicability of Section 3.4 Sub-sections for Different Project Types

Project Type	Section 3.4.1	Section 3.4.2	Section 3.4.3
Standard, Basic and Exempt Projects	☑	☑[1]	NA
PDP with only Pollutant Control Requirements	☑	☑	NA
PDP with Pollutant Control and Hydromodification Management Requirements	☑	NA	☑

[1] Shall provide BMPs based on Section 1.4.3.1

3.4.1 Steps for All Development Projects

Standard, Basic and Exempt Projects only need to satisfy the source control and site design requirements of Chapter 4 of this manual, and then proceed to Chapter 8 of this manual to determine submittal requirements.

1. Select, identify and detail specific source control BMPs. See Section 4.2.
2. Select, identify and detail specific site design BMPs. See Section 4.3.
3. Document that all applicable source control and site design BMPs have been used. See Chapter 8.

3.4.2 Steps for PDPs with only Pollutant Control Requirements

The steps below primarily consist of refinements to the conceptual steps completed as part of Section 3.3, accompanied by design-level detail and calculations. More detailed instructions for selection and design of stormwater pollutant treatment BMPs are provided in Chapter 5.

1. Select locations for stormwater pollutant control BMPs, and delineate and characterize DMAs using information gathered during the site planning phase.
2. Conduct feasibility analysis for harvest and use BMPs. See Section 5.4.1.
3. Conduct feasibility analysis for infiltration to determine the infiltration condition. See Section 5.4.2.
4. Based on the results of steps 2 and 3, select the BMP category that is most appropriate for the site. See Section 5.5.
5. Calculate required BMP sizes and footprints. See Appendix B (sizing methods) and Appendix E (design criteria).

6. Evaluate whether the required BMP footprints will fit within the site considering the site constraints; if not, then document infeasibility and move to the next step.
7. If using biofiltration BMPs, document conformance with the criteria for biofiltration BMPs found in Appendix F, including Appendix F.1.
8. If needed, implement flow-thru treatment control BMPs (for use with Alternative Compliance[7]) for the remaining DCV. See Section 5.5.4 and Appendix B.6 for additional guidance
9. If flow-thru treatment control BMPs (for use with Alternative Compliance[7]) were implemented, refer to Section 1.8.
10. Prepare SWQMP documenting site planning and opportunity assessment activities, final site layout, and stormwater management design. See Chapter 8.
11. Determine and document O&M requirements. See Chapters 7 and 8.

3.4.3 Steps for Projects with Pollutant Control and Hydromodification Management Requirements

The steps below primarily consist of refinements to the conceptual steps completed as part of Section 3.3, accompanied by design-level detail and calculations. More detailed instruction for selection and design of stormwater pollutant treatment and hydromodification control BMPs are provided in Chapters 5 and 6, respectively.

1. If critical coarse sediment yield areas were determined to exist within or upstream of the project site (Section 3.3.2), incorporate on-site mitigation measures when applicable (Section 6.2).
2. Determine the point of compliance and evaluate the susceptibility to erosion of the downstream channel.
3. Select locations for stormwater pollutant control and hydromodification management BMPs. Delineate and characterize DMAs using information gathered during the site planning phase.
4. Conduct feasibility analysis for harvest and use BMPs. See Section 5.4.1.
5. Conduct feasibility analysis for infiltration to determine the infiltration condition. See Section 5.4.2.
6. Based on the results of steps 3 and 4, select the BMP category for pollutant treatment BMPs that is most appropriate for the site. See Section 5.5.
7. Develop the design approach for integrating stormwater pollutant treatment and hydromodification control. The same location(s) can serve both functions (e.g. a biofiltration area that provides both pollutant control and flow control), or separate pollutant control and flow control locations may be identified (e.g. several dispersed retention areas for pollutant control, with overflow directed to a single location of additional storage for flow control).
8. Calculate BMP sizing requirements for pollutant control and flow control. See Appendix B

[7] The City of Encinitas does not currently have an Alternative Compliance Program.

(sizing methods) and Appendix E (design criteria).

   a. When the same BMP will serve both functions, Section 6.3.6 of this manual provides recommendations for assessing the controlling design factor and initiating the design process.

9. Evaluate whether the required BMP footprints will fit within the site considering the site constraints:
   a. If they fit within the site, design BMPs to meet applicable sizing and design criteria. Document sizing and design separately for pollutant control and hydromodification management even when the same BMP is serving both functions.
   b. If they do not fit the site, document infeasibility and move to the next step.[8]
10. Implement flow-thru treatment control BMPs (for use with Alternative Compliance) for the remaining DCV. See Section 5.5.4 and Appendix B.6 for additional guidance. [9]
11. If flow-thru treatment control BMPs (for use with Alternative Compliance) were implemented, refer to Section 1.8. [9]
12. Prepare a SWQMP documenting site planning and opportunity assessment activities, final site layout, stormwater pollutant control design, and hydromodification management design. See Chapter 8.
13. Determine and document O&M requirements. See Chapters 7 and 8.

3.5 Project Planning and Design Requirements Specific to Local Jurisdiction

For projects within the City of Encinitas, the following local project planning and design requirements must be met.

3.5.1 Maximum Ponding Depth

For all bioretention, partial retention and flow through BMPs, a maximum ponding depth of 18 inches must not be exceeded. The ponding depth is measured from the top opening of the grate inlet to the top of finished grade of the BMP. BMPs with ponding depths that exceed 18 inches tend to lose effectiveness more quickly over time and therefore are not allowed.

3.5.2 SCCWRP Analysis

SCCWRP analysis that was conducted for a nearby project may be used for your project at the discretion of the City Engineer on a case by case basis.

[8] Steps 8-10 only apply if the City of Encinitas has implemented an Alternative Compliance Program or approved a project based Alternative Compliance design.

3.5.3 Location of BMPs on the project site

When water quality treatment and hydromodification management is deemed to be technically infeasible within given DMA, the City Engineer may authorize BMPs to be located within an alternate DMA on the within the project site, as long as both DMAs are tributary to the same downstream point of compliance and as long as the water quality benefit is equal to or greater than the treatment necessary for the of the infeasible area. For example, a project that is required to provide road widening along the property frontage where treatment of the runoff from the additional pavement is deemed infeasible, may be authorized to treat the runoff from another portion of the site in-lieu of the actual pavement being created, as long there is an equal or greater water quality benefit.

3.5.4 Centralized Facilities

Centralized structural BMPs that treat runoff from all portions of the project are required unless otherwise authorized by the City Engineer. Where BMPs are authorized on individual residential lots, BMPs must be located in the front yards unless otherwise authorized by the City Engineer. Centralized facilities must be maintained by a Homeowner's Association, unless otherwise authorized by the City Engineer. Adequate access for maintenance and inspection of the centralized facility shall be provided. Centralized facilities and their corresponding maintenance access shall be deed restricted to prevent future development of the land for any other purpose.

3.5.5 Impervious area calculations for subdivisions

When calculating the proposed impervious area on a proposed residential subdivision, a 15 percent contingency for hardscape added by future homeowners must be included in the proposed impervious area measurement.

3.5.6 Infiltration Testing

Infiltration testing on the existing site must be conducted at the discretionary review phase of PDPs. Results of infiltration testing must be included in the SWQMP submittal.

3.5.7 Temporary Improvements

Unforeseen circumstances may cause temporary improvements to be installed for much longer than anticipated. Examples of temporary improvements include parking lots for model home visitors and construction site management offices. At the discretion of the City Engineer, temporary improvements may require stormwater treatment to avoid downstream water quality impacts.

3.5.8 City Engineer has the final discretion

The City Engineer has the ultimate discretion to determine the project category (PDP, Standard, Basic or Exempt) and approve proposed stormwater management BMP sizing and design.

3.6 Phased Projects

Phased projects typically require a conceptual or master PDP SWQMP followed by more detailed

submittals. See section 1.3 for more details regarding the definition of a project.

Chapter 4

Source Control and Site Design Requirements for All Development Projects

This chapter presents the source control and site design requirements to be met by —Exempt Projects, Basic Projects, Standard Projects and PDPs. Checklists I.4 for source control and I.5 for site design included in Appendix I can be used by all project types to document conformance with the requirements.

4.1 General Requirements (GR)

GR-1: Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible.

The location of the BMP affects the ability of the BMP to retain and/or treat the pollutants from the contributing drainage area. BMPs should be placed as close to the pollutant source as possible.

> **How to comply**: Projects shall comply by implementing source control (Section 4.2) and site design BMPs (Section 4.3) that are applicable to the project and site conditions.

GR-2: Structural BMPs must not be constructed within the Waters of the United States

The definition of Waters of the U.S. can be found in Clean Water Rule 40 CFR 230.2. Structural BMPs must not be constructed within navigable waters, impoundments, tributaries to navigable waters, wetlands, vernal pools, and the 100-year floodplain.

Construction, operation, and maintenance of a structural BMP in a water body can negatively impact the physical, chemical, and biological integrity of the water body, as well as its beneficial uses. However, alternative compliance[9] opportunities involving restoration of areas within Waters of the U.S. may be identified by local jurisdictions.

> **How to comply**: Projects shall demonstrate compliance with this requirement by showing the location of structural BMPs on project plans and describing or depicting the location of receiving waters.

[9] The City of Encinitas does not currently have an Alternative Compliance Program.

GR-3: Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisances or pollutants associated with vectors (e.g. mosquitos, rodents, and flies).

According to the California Department of Health, site design features and structural BMPs that retain standing water for over 96 hours may facilitate mosquito breeding.

> **How to comply**: Projects shall comply by incorporating design, construction, and maintenance principles to minimize standing water and to drain retained water within **96 hours**. Design calculations shall be provided to demonstrate that the potential for surface water ponding accessible to mosquitos has been addressed. This criterion is not applicable to ponding water that is not accessible to vectors, such as water retained in the amended soil of a biofiltration facility.

4.2 Source Control (SC) BMP Requirements

Source control BMPs avoid and reduce pollutants in stormwater runoff. Everyday activities such as recycling, trash disposal, and irrigation generate pollutants that have the potential to drain to the stormwater conveyance system. Source control BMPs are defined as activities that reduce the potential for stormwater runoff to come into contact with pollutants. An activity could include an administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance and inspection of an area. Where applicable and feasible, all development projects are required to implement source control BMPs. Applicability and feasibility determinations and selection of source control BMPs will be reviewed and approved by the City during the plan check process. Source control BMPs (SC-1 through SC-6) are discussed below.

> **How to comply**: Projects shall comply with this requirement by implementing source control BMPs listed in this section that are applicable to their project. Applicability shall be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E provides guidance for identifying source control BMPs applicable to a project. The "Source Control BMP Checklist for All Development Projects" located in Appendix I-4 shall be used to document compliance with source control BMP requirements.

SC-1: Prevent illicit discharges into the MS4

An illicit discharge is any discharge to the MS4 that is not composed entirely of stormwater except discharges pursuant to a National Pollutant Discharge Elimination System permit and discharges resulting from emergency firefighting activities. Projects must effectively eliminate discharges of non-stormwater into the MS4. This may involve a suite of housekeeping BMPs which could include effective irrigation, dispersion of non-stormwater discharges into landscaping for infiltration, and controlling wash water from vehicle washing.

SC-2: Identify the storm drain system using stenciling or signage

Storm drain signs and stencils are visible source controls typically placed adjacent to the inlets. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Stenciling shall be provided for all stormwater conveyance system inlets and catch basins within the project area. Inlet stenciling may include concrete stamping, concrete painting, placards, or other methods approved by the local municipality. In addition to storm drain stenciling, projects are encouraged to post signs and prohibitive language with graphical icons which prohibit illegal dumping at trailheads, parks, building entrances and public access points along channels and creeks within the project area.

SC-3: Protect *outdoor material storage areas* from rainfall, run-on, runoff, and wind dispersal

Materials with the potential to pollute stormwater runoff shall be stored in a manner that prevents contact with rainfall and stormwater runoff. Contaminated runoff shall be managed for treatment and disposal (e.g. secondary containment directed to sanitary sewer). All development projects shall incorporate the following structural or pollutant control BMPs for outdoor material storage areas, as applicable and feasible:

- Materials with the potential to contaminate stormwater shall be:
    - Placed in an enclosure such as, but not limited to, a cabinet, or similar structure, or under a roof or awning that prevents contact with rainfall runoff or spillage to the stormwater conveyance system; or
    - Protected by secondary containment structures such as berms, dikes, or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills, where necessary.
- The storage area shall be sloped towards a sump or another equivalent measure that is effective to contain spills.
- Runoff from downspouts/roofs shall be directed away from storage areas.
- The storage area shall have a roof or awning that extends beyond the storage area to minimize collection of stormwater within the secondary containment area. A manufactured storage shed may be used for small containers.

SC-4: Protect *materials stored in outdoor work areas* from rainfall, run-on, runoff, and wind dispersal

Outdoor work areas have an elevated potential for pollutant loading and spills. All development projects shall include the following structural or pollutant control BMPs for any outdoor work areas with potential for pollutant generation, as applicable and feasible:

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the size needed to protect the materials.
- Cover the area with a roof or other acceptable cover.
- Berm the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff to sanitary sewer or other specialized containment system(s), as needed and where feasible. This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
- Locate the work area away from storm drains or catch basins.

SC-5: Protect *trash, grease, and manure storage areas* from rainfall, run-on, runoff, and wind dispersal

Stormwater runoff from areas where trash, cooking grease and horse manure is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. All development projects shall include the following structural or pollutant control BMPs, as applicable:

- Trash enclosure areas and manure storage areas must be walled and covered with a waterproof roof to prevent offsite transport of trash or manure and rainwater intrusion. Provide an impervious, non-combustible roof, on all trash enclosures and manure storage areas to minimize direct precipitation and prevent rainfall from entering the area. If there is an open area between the roof and the perimeter wall, the roof overhang shall be equal or larger than the opening width.
- Design trash enclosures areas and manure storage areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. Use a berm or wall to prevent run-on of stormwater. A berm or wall shall be installed at all openings to hold in any liquids that escape from the area and to prevent any flow of storm water through the containment area. The berm can be designed wide and flat to allow rolling of the dumpster in and out.
- The trash enclosure shall be lockable and locked when not in use.
- The trash enclosure shall have a drain that discharges through an adequately sized oil/ grease separator (if an oil/ grease separator is required by building code) and then is filtered through a City-approved hydrocarbon filter and discharged into the public sanitary sewer system and not to planters or the storm drain system. The trash enclosure finish floor shall be at least six inches higher than 100-year storm water surface elevation. The finished floor shall also be sloped at 2%, minimum, to the middle of the enclosure or the back wall, wherever the drain is located. A separate building permit may be required for this structure.
- Locate used grease storage bins inside restaurant facilities, if permitted by San Diego County Department of Environmental Health. If the grease bin must be located outside for health purposes, the bin must have secondary containment for any potential spills and overhead coverage large enough to cover the bin and the secondary containment unit.
- Locate storm drains away from immediate vicinity of the trash storage, grease storage and manure storage areas and vice versa.
- Post signs on all dumpsters informing users that hazardous material are not to be disposed.

SC-6: Use any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project site

Appendix E provides guidance on permanent controls and operational BMPs that are applicable at a project site based on potential sources of runoff pollutants at the project site. The applicant shall implement all applicable and feasible source control BMPs listed in Appendix E. Additional source control BMPs may be required by the City Engineer based on the project scope and potential for stormwater pollution. Additional source control BMPs may include but are not limited to:

- Waste discharge from water softeners cannot be discharged to the sanitary sewer or the storm drain system and must be directed to landscaped areas.

- Condensate lines from air conditioning units cannot be discharged to the storm drain or any impervious area that is hydrologically connected to the storm drain. Condensate lines shall be directed to a landscaped area or the sanitary sewer (with permission from the sanitary sewer agency).

- If commercial vehicle washing is a proposed use on the property, a vehicle washing area must be designated. The vehicle washing area must be designed such that wash water discharge is directed towards a landscaped area. Vehicle wash water shall not be directed to enter the storm drain.

- All food establishments must have a mop sink for washing large items and discharging wash water to the sewer system. Wash water shall not be discharge to the storm drain.

- All projects that include a parking lot must plan to clean and maintain the parking lot at least of once per year prior to the beginning rainy season (October 1).

4.3 Site Design (SD) BMP Requirements

Site design BMPs (also referred to as LID BMPs) are intended to reduce the rate and volume of stormwater runoff and associated pollutant loads**.** Site design BMPs include practices that reduce the rate and/or volume of stormwater runoff by minimizing surface soil compaction, reducing impervious surfaces, and/or providing flow pathways that are "disconnected" from the storm drain system, such as by routing flow over pervious surfaces. Site design BMPs may incorporate interception, storage, evaporation, evapotranspiration, infiltration, and/or filtration processes to retain and/or treat pollutants in stormwater before it is discharged from a site.

Site design BMPs shall be applied to all development projects as appropriate and practicable for the project site and project conditions. Site design BMPs are described in the following subsections.

> **How to comply**: Projects shall comply with this requirement by using all of the site design BMPs listed in this section that are applicable and practicable to their project type and site conditions. Applicability of a given site design BMP shall be determined based on project type, soil conditions, presence of natural features (e.g. streams), and presence of site features (e.g. parking areas). Explanation shall be provided by the applicant when a certain site design BMP is considered to be not applicable or not practicable/feasible. Site plans shall show site design BMPs and provide adequate details necessary for effective implementation of site design BMPs. The "Site Design BMP Checklist for All Development Projects" located in Appendix I-5 shall be used to document compliance with site design BMP requirements.

SD-1: Maintain natural drainage pathways and hydrologic features

- Maintain or restore natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)

- Buffer zones for natural water bodies (where buffer zones are technically infeasible, require

project applicant to include other buffers such as trees, access restrictions, etc.)

During the site assessment, natural drainages must be identified along with their connection to creeks and/or streams, if any. Natural drainages offer a benefit to stormwater management as the soils and habitat already function as a natural filtering/infiltrating swale. When determining the development footprint of the site, natural drainages should be avoided. By providing a development envelope set back from natural drainages, the drainage can retain some water quality benefits to the watershed. In some situations, site constraints, regulations, economics, or other factors may not allow avoidance of drainages and sensitive areas. Projects proposing to dredge or fill materials in Waters of the U.S. must obtain Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements. Both the 401 Certification and the Waste Discharge Requirements are administered by the San Diego Water Board. The project applicant shall consult the local jurisdiction for other specific requirements.

Source: County of San Diego LID Handbook

Per Encinitas Municipal Code Section 30.34.040, when planning out your project, a buffer of 100 feet in width shall be maintained around all identified coastal lagoons and wetland areas. In addition, all riparian areas require a minimum 50-foot-wide buffer.

Projects can incorporate SD-1 into a project by implementing the following planning and design phase techniques as applicable and practicable:

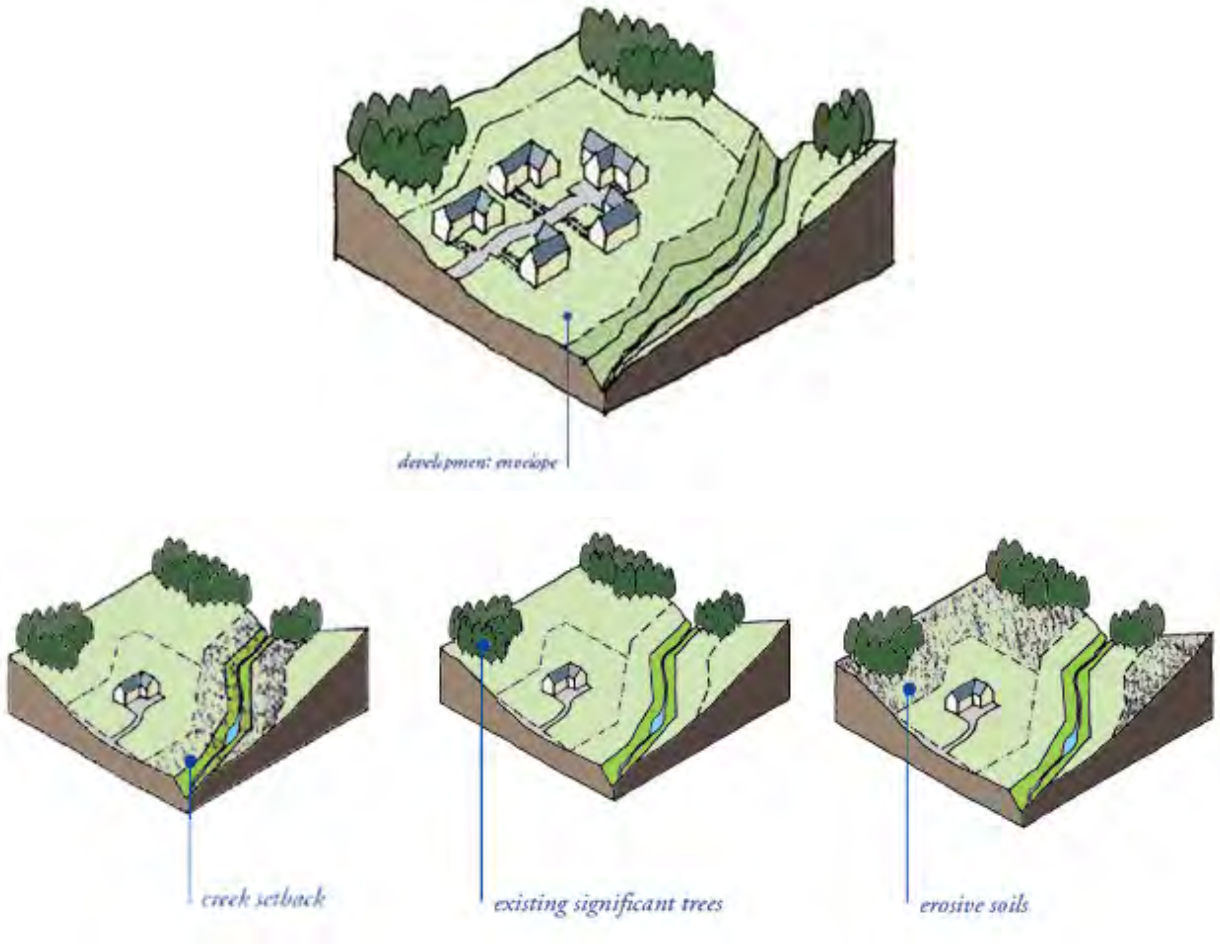
- Evaluate surface drainage and topography in considering selection of Site Design BMPs that will be most beneficial for a given project site. Where feasible, maintain topographic depressions for infiltration.
- Optimize the site layout and reduce the need for grading. Where possible, conform the site layout along natural landforms, avoid grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Integrating existing drainage patterns into the site plan will help maintain the site's predevelopment hydrologic function.
- Preserve existing drainage paths and depressions, where feasible and applicable, to help maintain the time of concentration and infiltration rates of runoff, and decrease peak flow.
- Structural BMPs cannot be located in buffer zones if a State and/or Federal resource agency (e.g. SDRWQCB, California Department of Fish and Wildlife; U.S. Army Corps of Engineers, etc.) prohibits maintenance or activity in the area.

SD-2: Conserve natural areas, soils and vegetation

- Conserve natural areas within the project footprint including existing trees, other vegetation,

and soils

To enhance a site's ability to support source control and reduce runoff, the conservation and restoration of natural areas must be considered in the site design process. By conserving or restoring the natural drainage features, natural processes are able to intercept stormwater, thereby reducing the amount of runoff.



Source: County of San Diego LID Handbook

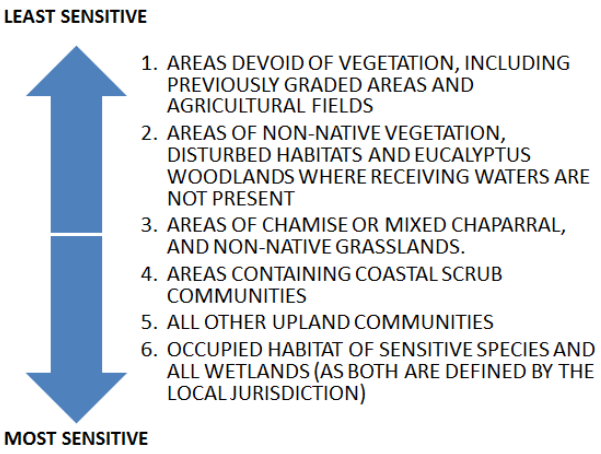
The upper soil layers of a natural area contain organic material, soil biota, vegetation, and a configuration favorable for storing and slowly conveying stormwater and establishing or restoring vegetation to stabilize the site after construction. The canopy of existing native trees and shrubs also provide a water conservation benefit by intercepting rain water before it hits the ground. By minimizing disturbances in these areas, natural processes are able to intercept stormwater, providing a water quality benefit. By keeping the development concentrated to the least environmentally sensitive areas of the site and set back from natural areas, stormwater runoff is reduced, water quality can be improved, environmental impacts can be decreased, and many of the site's most attractive native landscape features can be retained. In some situations, site constraints, regulations, economics, and/or other factors may not allow avoidance of all sensitive areas on a project site. Project applicant shall consult the local municipality for jurisdictional specific requirements for mitigation of removal of sensitive areas.

When a proposed project is reviewed by the Encinitas Planning Department, the project must comply with regulations identified in the following policies:

- Hillside Bluff Overlay Zone: EMC 30.34.030
- General Plan Resource Management Element Policies
- Urban Forest Management Plan
- Multiple Habitat Conservation Program
- Draft Encinitas Subarea Plan
- CEQA

Projects can incorporate SD-2 by implementing the following planning and design phase techniques as applicable and practicable:

- Identify areas most suitable for development and areas that must be left undisturbed. Additionally, reduced disturbance can be accomplished by increasing building density and increasing height, if possible.
- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.



- Avoid areas with thick, undisturbed vegetation. Soils in these areas have a much higher capacity to store and infiltrate runoff than disturbed soils, and reestablishment of a mature vegetative community can take decades. Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events.
- Preserve trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs.
- In areas of disturbance, topsoil should be removed before construction and replaced after the project is completed. When handled carefully, such an approach limits the disturbance to native soils and reduces the need for additional (purchased) topsoil during later phases.
- Sensitive areas, such as wetlands, biological open space areas, biological mitigation sites, streams, floodplains, or particular vegetation communities, such as coastal sage scrub and intact forest must be avoided. Areas that are habitat for sensitive plants and animals—particularly those State or federally listed as endangered, threatened or rare—must be avoided. Development in these areas is restricted by federal, state and local laws.

SD-3: Minimize impervious area

- Construct streets, sidewalks or parking lots aisles to the minimum widths necessary, provided public safety is not compromised
- Minimize the impervious footprint of the project

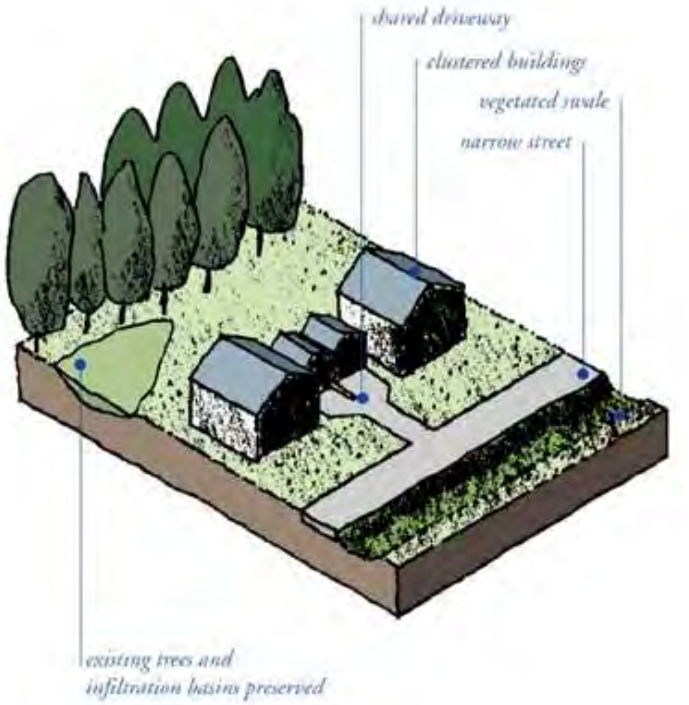
One of the principal causes of environmental impacts by development is the creation of impervious surfaces. Imperviousness links urban land development to degradation of aquatic ecosystems in two ways:

- First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.
- Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat.

Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Reducing impervious surfaces retains the permeability of the project site, allowing natural processes to filter and reduce sources of pollution.

Projects can incorporate SD-3 by implementing the following planning and design phase techniques as applicable and practicable:

- Decrease building footprint through (the design of compact and taller structures when allowed by local zoning and design standards and provided public safety is not compromised.
- Construct walkways, trails, patios, overflow parking lots, alleys and other low-traffic areas with permeable surfaces.
- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and alternative transportation (e.g. pedestrians, bikes) are not compromised.
- Consider the implementation of shared parking lots and driveways where possible.



Source: County of San Diego LID Handbook

- Landscaped area in the center of a cul-de-sac can reduce impervious area depending on configuration. Design of a landscaped cul-de-sac must be coordinated with fire department personnel to accommodate turning radii and other operational needs.
- Design smaller parking lots with fewer stalls, smaller stalls, more efficient lanes.
- Design indoor or underground parking.
- Minimize the use of impervious surfaces in the landscape design.

SD-4: Minimize soil compaction

- ☐ Minimize soil compaction in landscaped areas

The upper soil layers contain organic material, soil biota, and a configuration favorable for storing and slowly conveying stormwater down gradient. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development the site can retain some of its existing beneficial hydrologic function. Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates. It is important to recognize that areas adjacent to and under building foundations, roads and manufactured slopes must be compacted with minimum soil density requirements in compliance with local building and grading ordinances.

Projects can incorporate SD-4 by implementing the following planning and design phase techniques as applicable and practicable:

- Avoid disturbance in planned green space and proposed landscaped areas where feasible. These areas that are planned for retaining their beneficial hydrological function should be protected during the grading/construction phase so that vehicles and construction equipment do not intrude and inadvertently compact the area.
- In areas planned for landscaping where compaction could not be avoided, re-till the top 8 inches of soil surface to allow for better infiltration capacity. Soil amendments are recommended and may be necessary to increase permeability and organic content. Soil stability, density requirements, and other geotechnical considerations associated with soil compaction must be reviewed by a qualified landscape architect or licensed geotechnical, civil or other professional engineer.

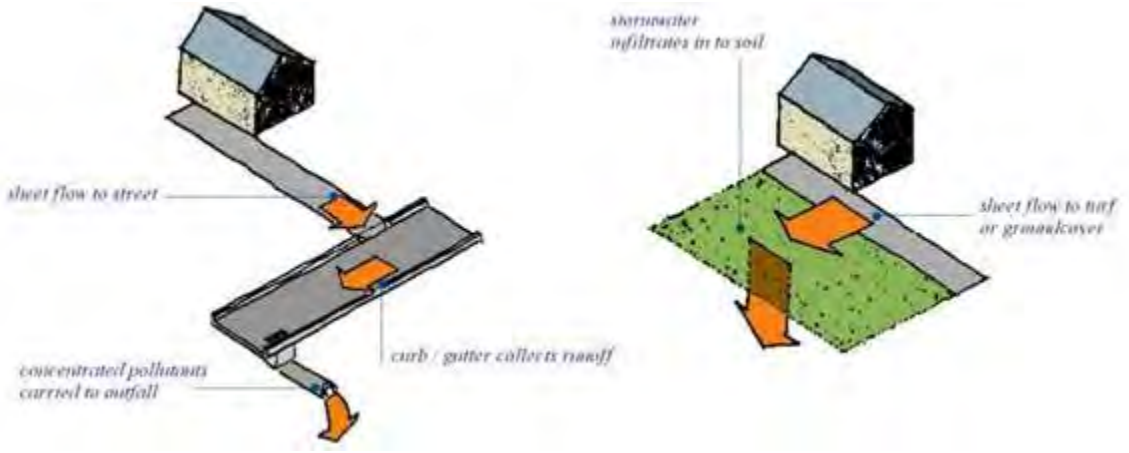
SD-5: Disperse impervious areas

- ☐ Disconnect impervious surfaces through distributed pervious areas
- ☐ Design and construct landscaped or other pervious areas to effectively receive and infiltrate, retain and/or treat runoff from impervious areas prior to discharging to the MS4

Impervious area dispersion (dispersion) refers to the practice of disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops, walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges and reduce volumes while achieving incidental treatment. Volume reduction from dispersion is dependent on the infiltration characteristics of the pervious area and the amount of impervious area draining to the pervious area. Treatment is achieved through filtration, shallow sedimentation, sorption, infiltration, evapotranspiration, biochemical processes and plant uptake.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention of runoff reduces peak flows and volumes and allows pollutants to settle out or adhere to soils before they can be transported downstream. Disconnection practices may be applied in almost any location, but impervious surfaces must discharge into a suitable receiving area for the practices to be effective. Information gathered during the site assessment will help determine appropriate receiving areas.

Project designs should direct runoff from impervious areas to adjacent landscaping areas that have higher potential for infiltration and surface water storage. This will limit the amount of runoff generated, and therefore the size of the mitigation BMPs downstream. The design, including consideration of slopes and soils, must reflect a reasonable expectation that runoff will soak into the soil and produce no runoff of the DCV. On hillside sites, drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas that have higher potential for infiltration. Or use low retaining walls to create terraces that can accommodate LID areas.



Source: County of San Diego LID Handbook

Projects can incorporate SD-5 by implementing the following planning and design phase techniques as applicable and practicable:

- Implement design criteria and considerations listed in impervious area dispersion fact sheet (SD-5) presented in Appendix E.
- Drain rooftops into adjacent landscape areas.
- Drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscape areas.
- Reduce or eliminate curb and gutters from roadway sections, thus allowing roadway runoff to drain to adjacent pervious areas.
- Replace curbs and gutters with roadside vegetated swales and direct runoff from the paved street or parking areas to adjacent LID facilities. Such an approach for alternative design can reduce the overall capital cost of the site development while improving the stormwater quantity and quality issues and the site's aesthetics.
- Plan site layout and grading to allow for runoff from impervious surfaces to be directed into

distributed permeable areas such as turf, landscaped or permeable recreational areas, medians, parking islands, planter boxes, etc.

- Detain and retain runoff throughout the site. On flatter sites, landscaped areas can be interspersed among the buildings and pavement areas. On hillside sites, drainage from upper areas may be collected in conventional catch basins and conveyed to landscaped areas in lower areas of the site.
- Pervious area that receives run on from impervious surfaces should have a minimum width of 10 feet and a maximum slope of 5%.

SD-6: Collect runoff

- Use small collection strategies located at, or as close to as possible to the sources (i.e. the point where stormwater initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters
- Use permeable material for projects with low traffic areas and appropriate soil conditions

Distributed control of stormwater runoff from the site can be accomplished by applying small collection techniques (e.g. green roofs), or integrated management practices, on small sub-catchments or on residential lots. Small collection techniques foster opportunities to maintain the natural hydrology provide a much greater range of control practices. Integration of stormwater management into landscape design and natural features of the site, reduce site development and long-term maintenance costs, and provide redundancy if one technique fails. On flatter sites, it typically works best to intersperse landscaped areas and integrate small scale retention practices among the buildings and paving.

Permeable pavements contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete, permeable asphalt). Project applicants should identify locations where permeable pavements could be substituted for impervious concrete or asphalt paving. The O&M plan for the site must ensure that permeable pavements will not be sealed in the future. In areas where infiltration is not appropriate, permeable paving systems can be fitted with an under drain to allow filtration, storage, and evaporation, prior to drainage into the storm drain system.

Projects can incorporate SD-6 by implementing the following planning and design phase techniques as applicable and practicable:

- Implementing distributed small collection techniques to collect and retain runoff
- Installing permeable pavements (see SD-6B in Appendix E)

SD-7: Landscape with native or drought tolerant species

All development projects are required to select a landscape design and plant palette that minimizes required resources (irrigation, fertilizers and pesticides) and pollutants generated from landscape areas. Native plants require less fertilizers and pesticides because they are already adapted to the rainfall patterns and soils conditions. Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering should only be required during prolonged dry periods after plants are established. Final selection of plant material needs to be made

by a landscape architect experienced with LID techniques. Microclimates vary significantly throughout the region and consulting local municipal resources will help to select plant material suitable for a specific geographic location.

Photograph Courtesy of Arid Solutions, Inc.

Projects can incorporate SD-7 by landscaping with native and drought tolerant species. Recommended plant list is included in Appendix E (Fact Sheet PL).

SD-8: Harvest and use precipitation

Harvest and use BMPs capture and store stormwater runoff for later use. Harvest and use can be applied at smaller scales (Standard Projects) using rain barrels or at larger scales (PDPs) using cisterns. This harvest and use technique has been successful in reducing runoff discharged to the storm drain system conserving potable water and recharging groundwater. PDPs would still need to meet hydromodification management requirements, as applicable.

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. The temporary storage of roof runoff reduces the runoff volume from a property and may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of stormwater runoff that flows overland into a stormwater conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into local creeks and the ocean. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater. SD-8 fact sheet in Appendix E provides additional detail for designing Harvest and Use BMPs. Projects can incorporate SD-8 by installing rain barrels or cisterns, as applicable.

Chapter

5

Stormwater Pollutant Control Requirements for PDPs

This chapter describes the specific process for determining which category of pollutant control BMP, or combination of BMPs, is most appropriate for the PDP site and how to design the BMP to meet the stormwater pollutant control performance standard (per Section 2.2).

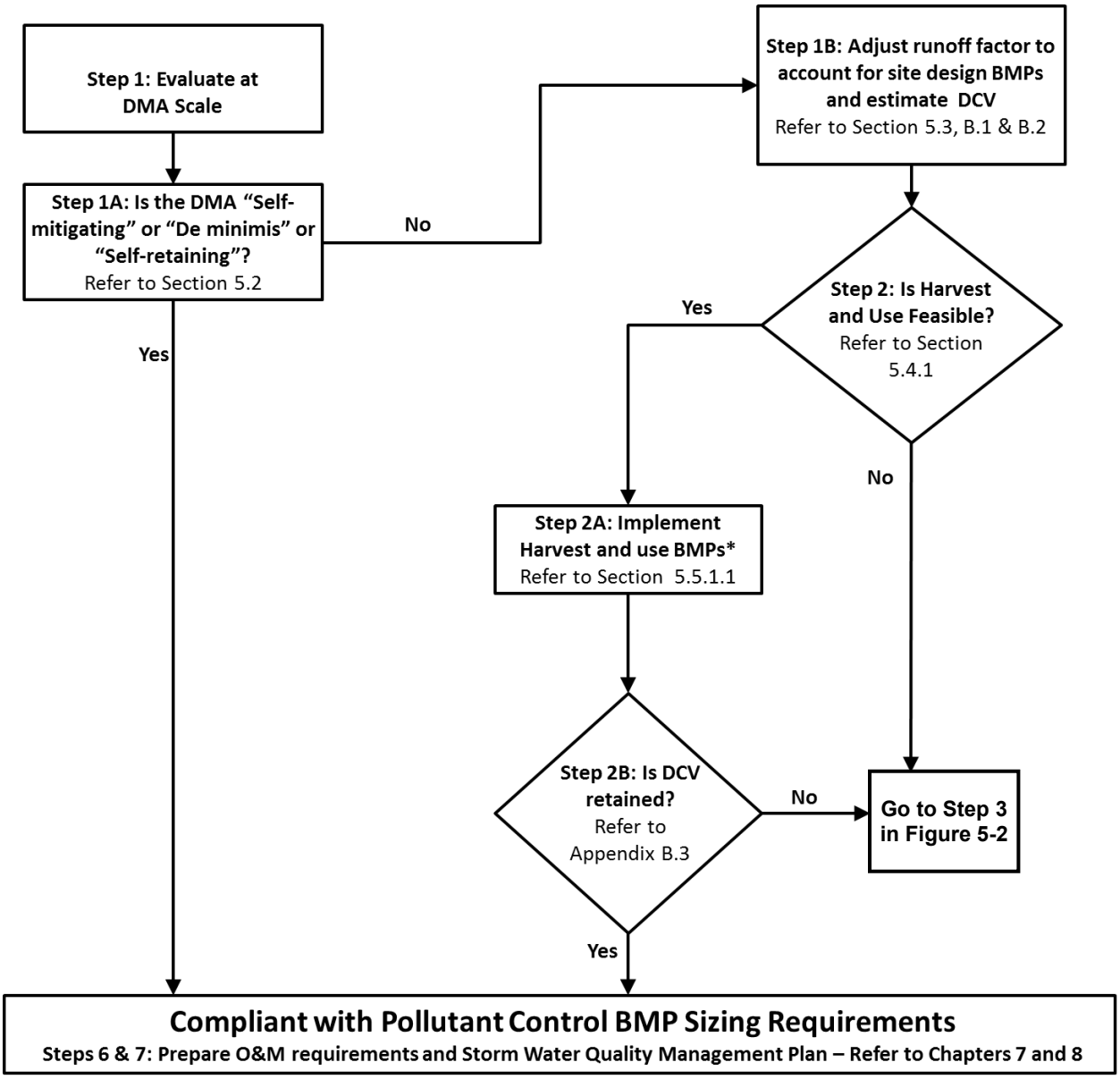
This chapter by itself is not a complete design guide for project development. It is intended to provide guidance for selecting and designing stormwater pollutant control BMPs.

Specifically:

- This chapter should be followed after having conducted site planning that maximizes opportunities for stormwater retention and biofiltration as discussed in Chapter 3.
- The steps in this chapter pertain specifically to stormwater pollutant control BMPs. For guidance on how to integrate both hydromodification management and pollutant control BMPs (in cases where both requirements apply), see Sections 3.4.3, 5.6 and Chapter 6.

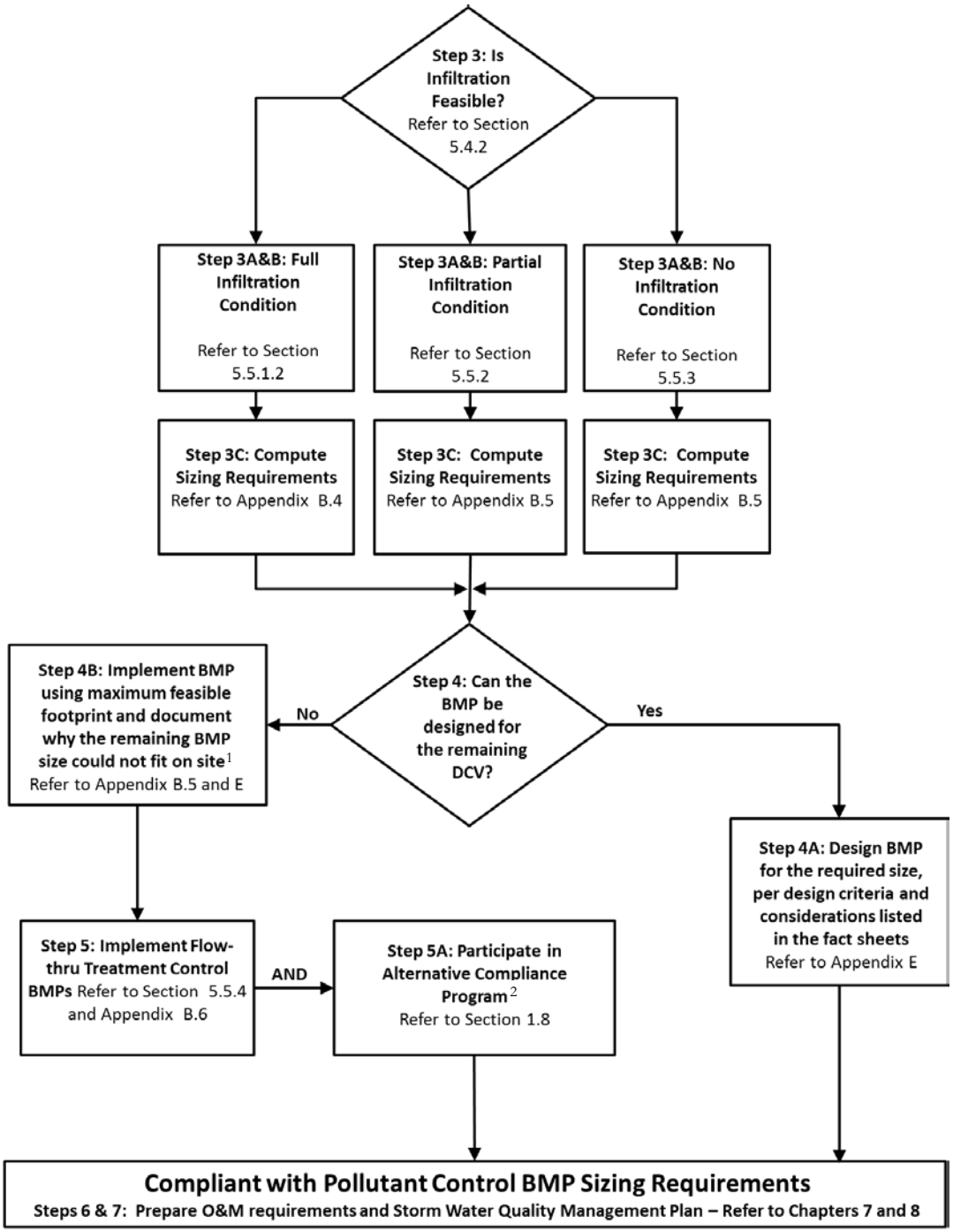
5.1 Steps for Selecting and Designing Stormwater Pollutant Control BMPs

Figures 5-1 and 5-2 present the flow chart for complying with stormwater pollutant control BMP requirements. The steps associated with this flow chart are described below. A project is considered to be in compliance with stormwater pollutant control performance standards if it follows and implements this flow chart and follows the supporting technical guidance referenced from this flow chart. This section is applicable whether or not hydromodification management requirements apply, however the overall sequencing of project development may be different if hydromodification management requirements apply.



* Step 2C: Project applicant has an option to also conduct feasibility analysis for infiltration and if infiltration is fully or partially feasible has an option to choose between infiltration and harvest and use BMPs. But if infiltration is not feasible and harvest and use is feasible, project applicant must implement harvest and use BMPs

FIGURE 5-1. Stormwater Pollutant Control BMP Selection Flow Chart



[1] Project approval at the discretion of the City Engineer.
[2] The City of Encinitas does not currently have an Alternative Compliance Program.

FIGURE 5-2. Stormwater Pollutant Control BMP Selection Flow Chart

Description of Steps:

Step 1. Calculate the DCV. The DCV is based on the locations for stormwater pollutant control BMPs and the DMA delineations developed during the site planning phase

(See Section 3.3.3).

A. Identify DMAs that meet the criteria in Section 5.2 (self-mitigating and/or de minimis areas and/or self-retaining via qualifying site design BMPs).

B. Estimate DCV for each remaining DMA. See Section 5.3.

Step 2. Conduct a feasibility screening analysis for harvest and use BMPs. See Section 5.4.1.

A. If it is feasible, implement harvest and use BMPs (See Section 5.5.1.1) or go to Step 3.

B. Evaluate if the DCV can be retained onsite using harvest and use BMPs. See Appendix B.3. If the DCV can be retained onsite, then the pollutant control performance standards are met.

C. The applicant also has the option to conduct a feasibility analysis for infiltration. If infiltration is feasible, the applicant may choose between infiltration and harvest and use BMPs. But if infiltration is not feasible but harvest and use is feasible, the applicant must implement harvest and use BMPs.

Step 3. Conduct feasibility analysis for infiltration for the BMP locations selected. See Section 5.4.2.

A. Determine the preliminary feasibility categories of BMP locations based on available site information. Determine the additional information needed to conclusively support findings. Use the "Categorization of Infiltration Feasibility Condition" checklist located in Appendix I-8 to conduct preliminary feasibility screening.

B. Select the stormwater pollutant control BMP category based on preliminary feasibility condition.

i. Full Infiltration Condition– Implement infiltration BMP category, See Section 5.5.1.2

ii. Partial Infiltration Condition – Implement partial retention BMP category. See Section 5.5.2

iii. No Infiltration Condition – Implement biofiltration BMP category. See Section 5.5.3

C. After selecting BMPs, conduct design level feasibility analyses at each BMP location. The purpose of these analyses is to conform or adapt selected BMPs to maximize stormwater retention and to determine BMP design parameters (e.g. infiltration rates, elevations). Document findings to substantiate BMP selection, feasibility, and design in the SWQMP. See Appendix C and D for additional guidance.

Step 4. Evaluate if the required BMP footprint will fit considering the site design and constraints.

A. If the calculated footprint fits, then size and design the selected BMPs accordingly using design criteria and considerations from fact sheets presented in Appendix E. The project has met the pollutant control performance standards.

B. If the calculated BMP footprint does not fit, evaluate additional options to make space for BMPs. Examples include potential design revisions, reconfiguring DMAs,

evaluating other or additional BMP locations and evaluating other BMP types. If no additional options are practicable for making adequate space for the BMPs, then document why the remaining DCV could not be treated onsite and then implement the BMP using the maximum feasible footprint, design criteria and considerations from fact sheets presented in Appendix E, then continue to the next step. If the entire DCV could not be treated because the BMP size could not fit within the project footprint, project approval is at the discretion of the City Engineer.

Step 5. Implement flow-thru treatment control BMPs for the remaining DCV. See Section 5.5.4 and B.6 for additional guidance.

A. When flow-thru treatment control BMPs are implemented the project applicant must also participate in an alternative compliance program. See Section 1.8.

Step 6. Prepare a SWQMP documenting site planning and opportunity assessment activities, final site layout and stormwater management design. See Chapter 8.

Step 7. Identify and document O&M requirements and confirm acceptable to the responsible party. See Chapters 7 and Chapter 8.

5.2 DMAs Excluded from DCV Calculation

This manual provides project applicants the option to exclude DMAs from DCV calculations if they meet the criteria specified below. These DMAs must implement source control and site design BMPs from Chapter 4 as applicable and feasible. These exclusions will be evaluated on a case-by-case basis and approvals of these exclusions are at the discretion of the City Engineer.

5.2.1 Self-mitigating DMAs

Self-mitigating DMAs consist of natural or landscaped areas that drain directly offsite or to the public storm drain system. Self-mitigating DMAs must meet **ALL** the following characteristics to be eligible for exclusion:

- Vegetation in the natural or landscaped area is native and/or non-native/non-invasive drought tolerant species that do not require regular application of fertilizers and pesticides.
- Soils are undisturbed native topsoil, or disturbed soils that have been amended and aerated to promote water retention characteristics equivalent to undisturbed native topsoil.
- The incidental impervious areas are less than 5 percent of the self-mitigating area.
- Impervious area within the self-mitigated area should not be hydraulically connected to other impervious areas unless it is a stormwater conveyance system (such as brow ditches).
- The self-mitigating area is hydraulically separate from DMAs that contain permanent stormwater pollutant control BMPs.

Figure 5.3 illustrates the concept of self-mitigating DMAs.

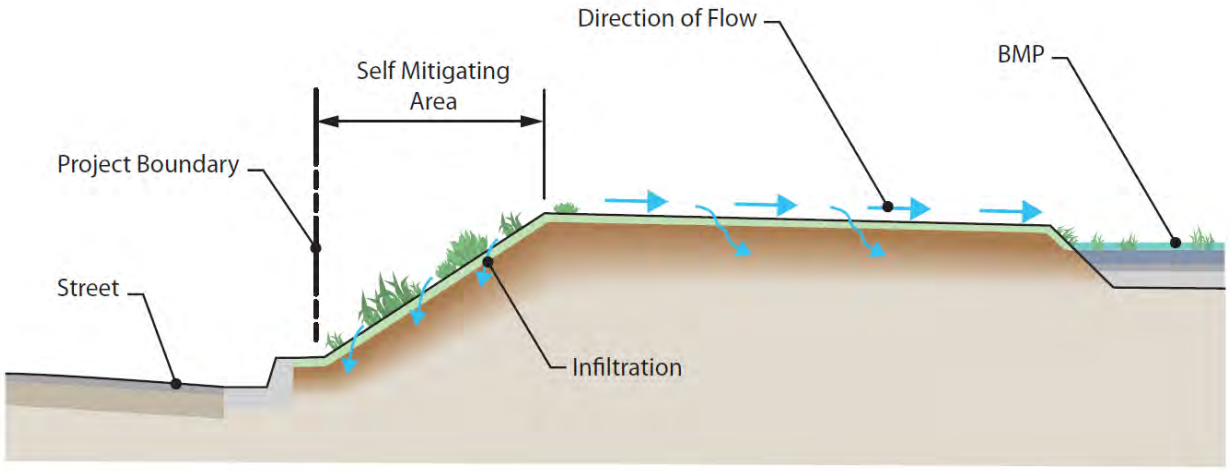


FIGURE 5-3. Self Mitigating Area

5.2.2 De Minimis DMAs

De minimis DMAs consist of areas that are very small, and therefore are not considered to be significant contributors of pollutants, and are considered by the owner and the City Engineer not practicable to drain to a BMP. It is anticipated that only a small subset of projects will qualify for de minimis DMA exclusion. Examples include driveway aprons connecting to existing streets, portions of sidewalks, retaining walls at the external boundaries of a project, and similar features. De minimis DMAs must include **ALL** of the following characteristics to be eligible for exclusion:

- Areas abut the perimeter of the development site.
- Topography and land ownership constraints make BMP construction to reasonably capture runoff technically infeasible.
- The portion of the site falling into this category is minimized through effective site design
- Each DMA should be less than 250 square feet and the sum of all de minimis DMAs should represent less than 2 percent of the total added or replaced impervious surface of the project. For projects where 2 percent of the total added or replaced impervious surface of the project is less than 250 square feet, a de minimis DMA of 250 square feet or less is allowed.
- Two de minimis DMAs cannot be hydraulically connected.
- The SWQMP must document the reason that each de minimis area could not be addressed otherwise.

5.2.3 Self-retaining DMAs via Qualifying Site Design BMPs

Self-retaining DMAs are areas that are designed with site design BMPs to retain runoff to a level equivalent to pervious land. BMP Fact Sheets for impervious area dispersion (SD-5 in Appendix E) and permeable pavement (SD-6B in Appendix E) describe the design criteria by which BMPs can be considered self-retaining. DMAs that are categorized as self-retaining DMAs are considered to meet

only the stormwater pollutant control obligations.

Requirements for utilizing this category of DMA:

- Site design BMPs such as impervious area dispersion and permeable pavement may be used individually or in combination to reduce or eliminate runoff from a portion of a PDP.
- If a site design BMP is used to create a self-retaining DMA, then the site design BMPs must be designed and implemented per the criteria in the applicable fact sheet. These criteria are conservatively developed to anticipate potential changes in DMA characteristics with time. The fact sheet criteria for impervious area dispersion and permeable pavement for meeting pollutant control requirement developed using continuous simulation are summarized below:
    - SD-5 Impervious Area Dispersion: a DMA is considered self-retaining if the impervious to pervious ratio is:
        - 2:1 when the pervious area is composed of Hydrologic Soil Group A
        - 1:1 when the pervious area is composed of Hydrologic Soil Group B
        - Impervious area dispersion is not allowed when the pervious area is composed of Hydrologic Soils Group C and D.
    - SD-6B Self-retaining permeable pavement: a DMA is considered self-retaining if the ratio of total drainage area (including permeable pavement) to area of permeable pavement of 1.5:1 or less.
- Site design BMPs used as part of a self-retaining DMA or as part of reducing runoff coefficients from a DMA must be clearly called out on project plans and in the SWQMP.
- The City Engineer may accept or reject a proposed self-retaining DMA meeting these criteria at its discretion. Examples of rationale for rejection may include the potential for negative impacts (such as infiltration or vector issues), potential for significant future alteration of this feature, inability to visually inspect and confirm the feature, etc.
- PDPs subject to hydromodification requirements should note that Self-retaining DMAs must be included in hydromodification analysis. Reductions in DCV realized through Site Design BMPs are applicable to treatment control only and do not relax hydromodification requirements.

Other site design BMPs can be considered self-retaining for meeting stormwater pollutant control obligations if the long term annual runoff volume (estimated using continuous simulation following guidelines listed in Appendix G) from the DMA is reduced to a level equivalent to pervious land and the applicant provides supporting analysis and rationale for the reduction in long term runoff volume. Approval of other self-retaining areas is at the discretion of the City Engineer. Figure 5.4 illustrates the concept of self-retaining DMAs.

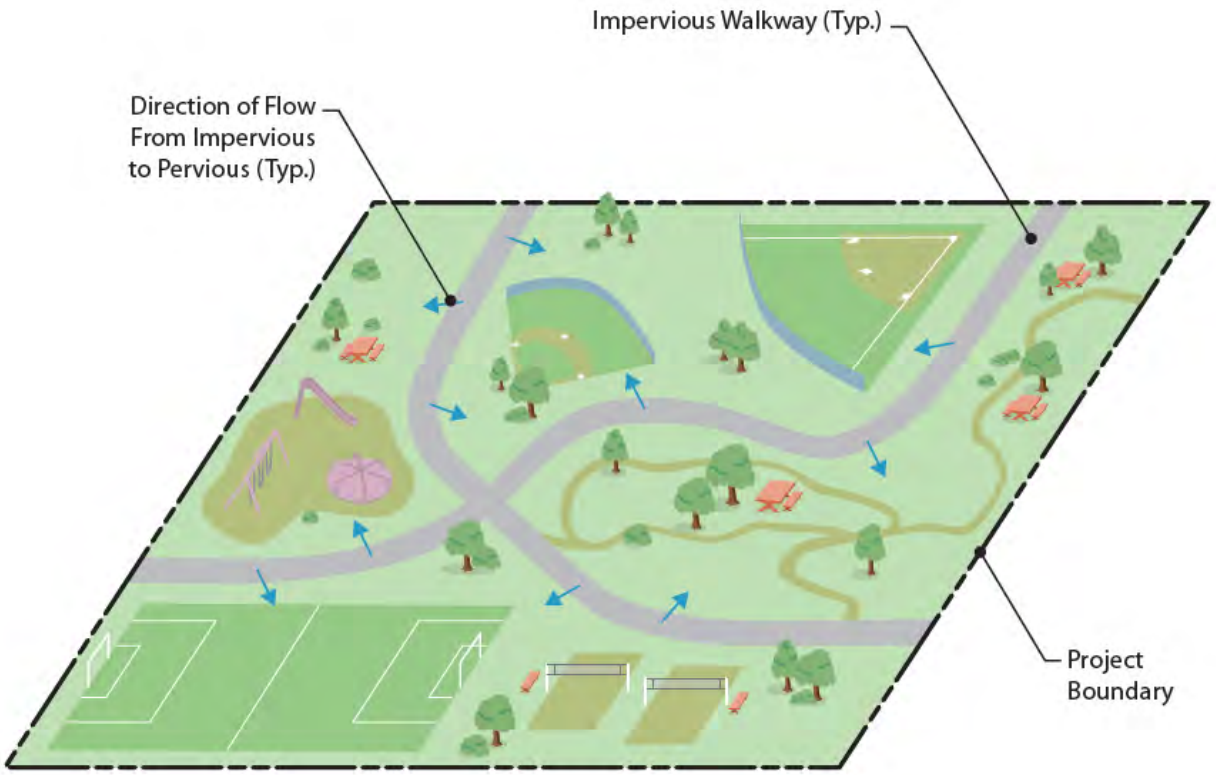


FIGURE 5-4. Self-retaining Site

5.3 DCV Reduction through Site Design BMPs

Site design BMPs, as discussed in Chapter 4, reduce the rate and volume of stormwater runoff from the project site. This manual provides adjustments to runoff factors for the following site design BMPs that may be incorporated into the project as part of an effective site design so that the downstream structural BMPs can be sized appropriately:

- SD-1 Street trees
- SD-5 Impervious area dispersion
- SD-6A Green roofs
- SD-6B Permeable pavement
- SD-8 Rain barrels

Methods for adjusting runoff factors for site design BMPs listed above are presented in Appendix B.2. Site design BMPs used for reducing runoff coefficients from a DMA must be clearly called out on project plans and in the SWQMP. Approval of the claimed reduction of runoff factors is at the discretion of the City Engineer.

5.4 Evaluating Feasibility of Stormwater Pollutant Control BMP Options

This section provides the fundamental process to establish which category, or combination of categories, of pollutant control BMP is feasible and to determine the volume of onsite retention that is feasible, either through harvest and use, or infiltration of the DCV. The feasibility screening process presented below establishes the volume of retention that can be achieved to fully or partially meet the pollutant control performance standards.

5.4.1 Feasibility Screening for Harvest and Use Category BMPs

Harvest and use is a BMP that captures and stores stormwater runoff for later use. The primary question to be evaluated is:

- Is there a demand for harvested water within the project or project vicinity that can be met or partially met with rainwater harvesting in a practical manner?

Appendix B.3 provides guidance for determining the feasibility for using harvested stormwater based on onsite demand. Step 2 from Section 5.1 describes how the feasibility results need to be considered in the pollutant control BMP selection process.

5.4.2 Feasibility Screening for Infiltration Category BMPs

After accounting for any potential onsite use of stormwater, the next step is to evaluate how much stormwater can be retained onsite primarily through infiltration of the DCV. Infiltration of stormwater is dependent on many important factors that must be evaluated as part of infiltration feasibility screening. The key questions to determining the degree of infiltration that can be accomplished onsite are:

- Is infiltration potentially feasible and desirable?
- If so, what quantity of infiltration is potentially feasible and desirable?

These questions must be addressed in a systematic fashion to determine if full infiltration of the DCV is potentially feasible. If when answering these questions it is determined that full infiltration is not feasible, then the portion of the DCV that could be infiltrated must be quantified, or a determination that infiltration in any appreciable quantity is infeasible or must be avoided. **This process is illustrated in Figure 5-5.** As a result of this process, conditions can be characterized as one of the three categories listed and defined below.

- **Full Infiltration Condition**: Infiltration of the full DCV is potentially feasible and desirable. More rigorous design-level analyses should be used to confirm this classification and establish specific design parameters such as infiltration rate and factor of safety. BMPs in this category may include bioretention and infiltration basins. See Section 5.5.1.2.
- **Partial Infiltration Condition**: Infiltration of a significant portion of the DCV may be possible, but site factors may indicate that infiltration of the full DCV is either infeasible or not desirable. Select BMPs that provide opportunity for partial infiltration, e.g. biofiltration with partial retention. See Section 5.5.2.

- **No Infiltration Condition**: Infiltration of any appreciable volume should be avoided. Some incidental volume losses may still be possible, but any appreciable quantity of infiltration would introduce undesirable conditions. Other pollutant control BMPs should be considered e.g. biofiltration or flow-thru treatment control BMPs and participation in alternative compliance[10] (Section 1.8) for the portion of the DCV that is not retained or biofiltered onsite. See Section 5.5.3 and 5.5.4.

The "Categorization of Infiltration Feasibility Condition" checklist located in Appendix I must be used to document the findings of the infiltration feasibility assessment and must be supported by all associated information used in the feasibility findings. Appendix C and D in this manual provides additional guidance and criteria for performing feasibility analysis for infiltration. All PDPs are required to complete this worksheet. At the site planning phase, this worksheet can help guide the design process by influencing project layout and selection of infiltration BMPs, and identifying whether more detailed studies are needed. At the design and final report submittal phase, planning level categorizations related to infiltration must be confirmed or revised and rigorously documented and supported based on design-level investigations and analyses, as needed. A Geological Investigation Report must be prepared for all PDPs implementing onsite structural BMPs. This report should be attached to the SWQMP. Geotechnical and groundwater investigation report requirements are listed in Appendix C.

[10] The City of Encinitas does not currently have an Alternative Compliance Program.

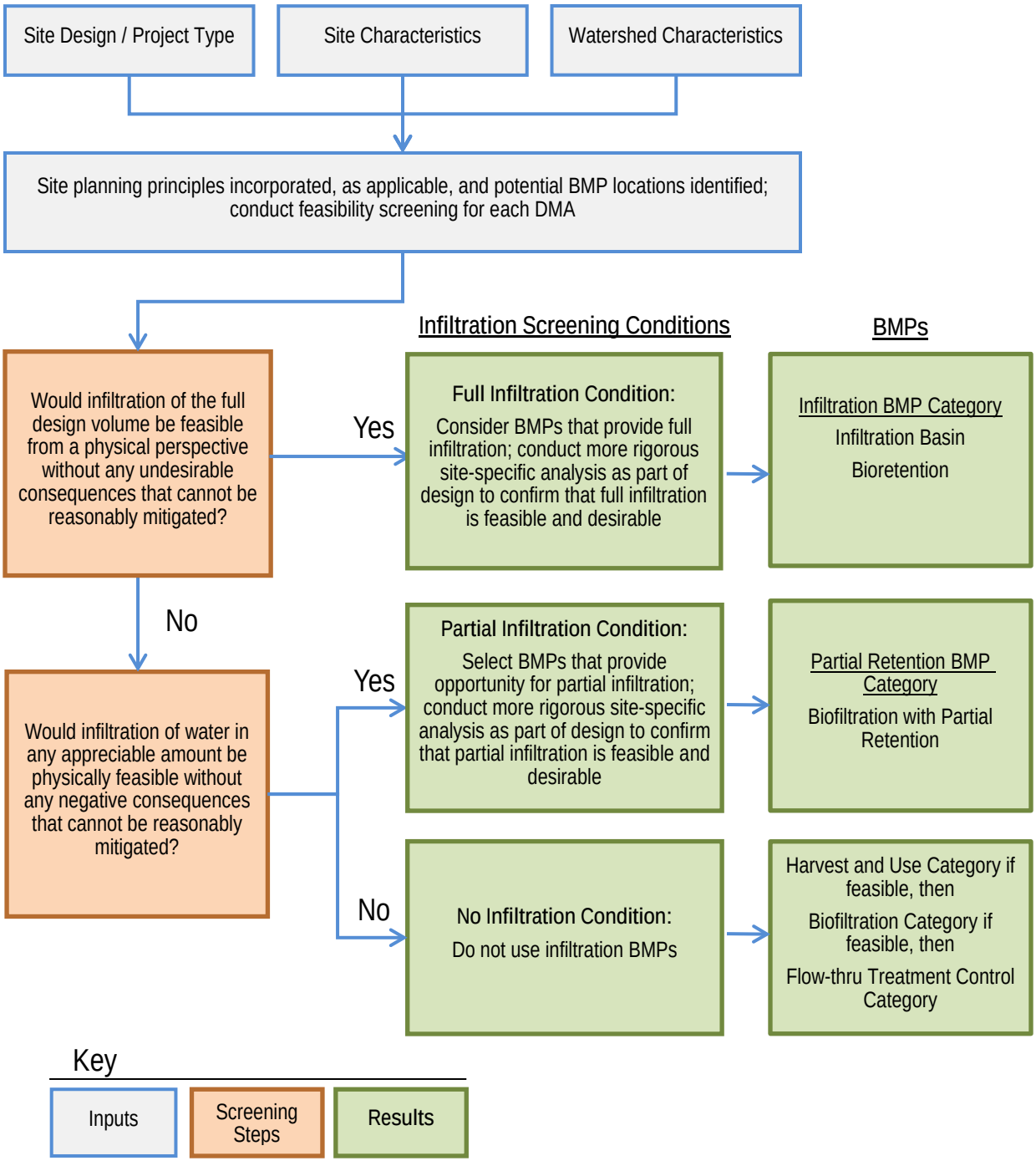


FIGURE 5-5. Infiltration Feasibility and Desirability Screening Flow Chart

5.5 BMP Selection and Design

BMP selection shall be based on steps listed in Section 5.1 and the feasibility screening process described in Section 5.4. Selected BMPs must be designed based on accepted design standards. The BMP designs described in the BMP Fact Sheets (Appendix E) shall constitute the allowable stormwater pollutant control BMPs for the purpose of meeting stormwater management requirements. Other BMP types and variations on these designs may be approved at the discretion of the City Engineer if documentation is provided demonstrating that the BMP is functionally equivalent or better than those described in this manual.

This section provides an introduction to each category of BMP and provides links to fact sheets that contain criteria for the design and implementation of BMPs. Table 5-1 maps the BMP category to the fact sheets provided in Appendix E. Criteria specifically described in these fact sheets override guidance contained in outside referenced source documents.

TABLE 5-1. Permanent Structural BMPs for PDPs

MS4 Permit Category	Manual Category	BMPs
Retention	Harvest and Use (HU)	HU-1: Cistern
Retention	Infiltration (INF)	INF-2: Bioretention
NA	Partial Retention (PR)	PR-1: Biofiltration with partial retention
Biofiltration	Biofiltration (BF)	BF-1: Biofiltration BF-2: Nutrient Sensitive Media Design BF-3: Proprietary Biofiltration
Flow-thru treatment control	Flow-thru treatment control with Alternative Compliance[11] (FT)	FT-1: Vegetated swales FT-2: Media filters FT-3: Sand filters FT-5: Proprietary flow-thru treatment control

5.5.1 Retention Category

5.5.1.1 Harvest and Use BMP Category

Harvest and use (also referred to as rainwater harvesting) BMPs capture and store stormwater runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. Uses of captured water shall not result in runoff to storm drains or receiving waters. Potential uses of captured water may include irrigation demand,

[11] The City of Encinitas does not currently have an Alternative Compliance Program.

indoor non-potable demand, industrial process water demand, or other demands.

Selection: Harvest and use BMPs shall be selected after performing a feasibility analysis per Section 5.4.1. Based on findings from Section 5.4 if both harvest and use and full infiltration of the DCV is feasible onsite, then the project applicant has an option to implement either harvest and use BMPs and/or infiltration BMPs to meet stormwater requirements.

Design: A worksheet for sizing harvest and use BMPs is presented in Appendix B.3 and the fact sheet for sizing and designing the harvest and use BMP is presented in Appendix E. Figure 5-6 shows a schematic of a harvest and use BMP.

BMP option under this category:

- HU-1: Cistern

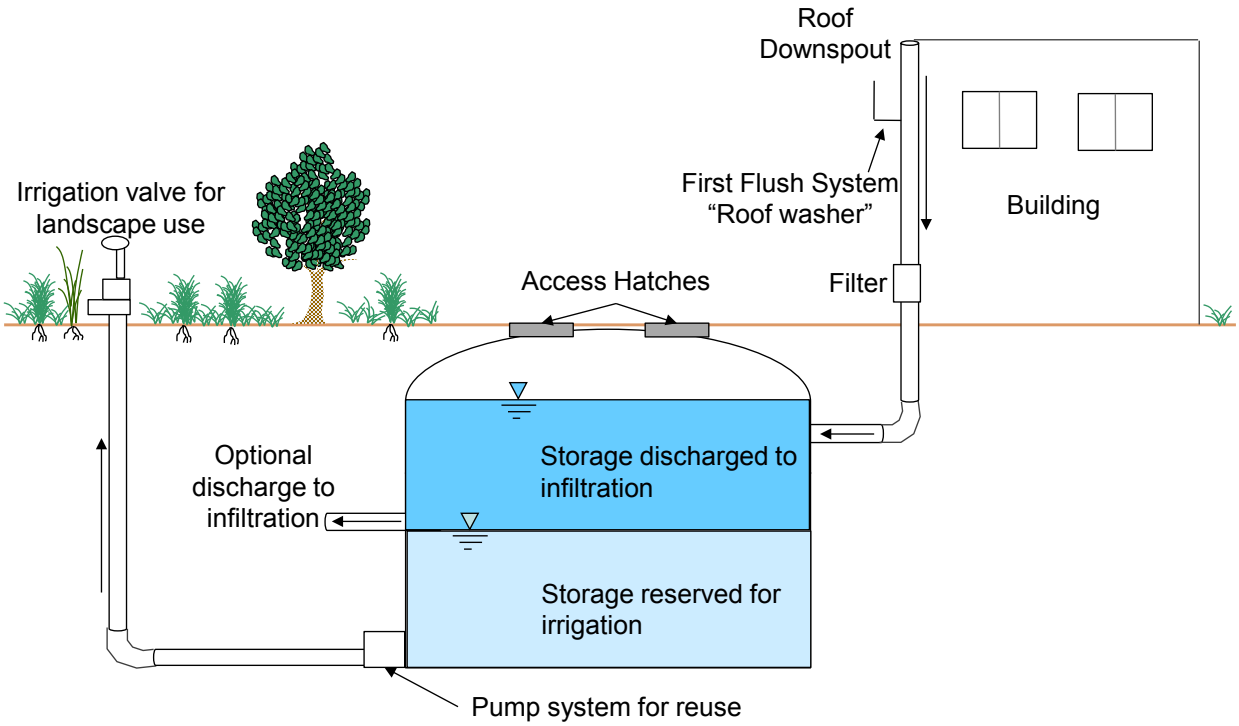


FIGURE 5-6. Schematic of a Typical Cistern

5.5.1.2 Infiltration BMP Category

Infiltration BMPs are structural measures that capture, store and infiltrate stormwater runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. These types of BMPs may also support evapotranspiration processes, but are characterized by having their most dominant volume losses due to infiltration. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality for areas draining to infiltration BMPs and runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration.

Selection: Selection of this BMP category shall be based on analysis according to Sections 5.1 and 5.4.2.

Design: Appendix B.4 has a worksheet for sizing infiltration BMPs, Appendix D has guidance for estimating infiltration rates for use in design the BMP and Appendix E provides fact sheets to design the infiltration BMPs. Appendices B.6.2.1, B.6.2.2 and D.5.3 have guidance for selecting appropriate pretreatment for infiltration BMPs. Figure 5-7 shows a schematic of a bioretention basin.

BMP options under this category:

- INF-2: Bioretention

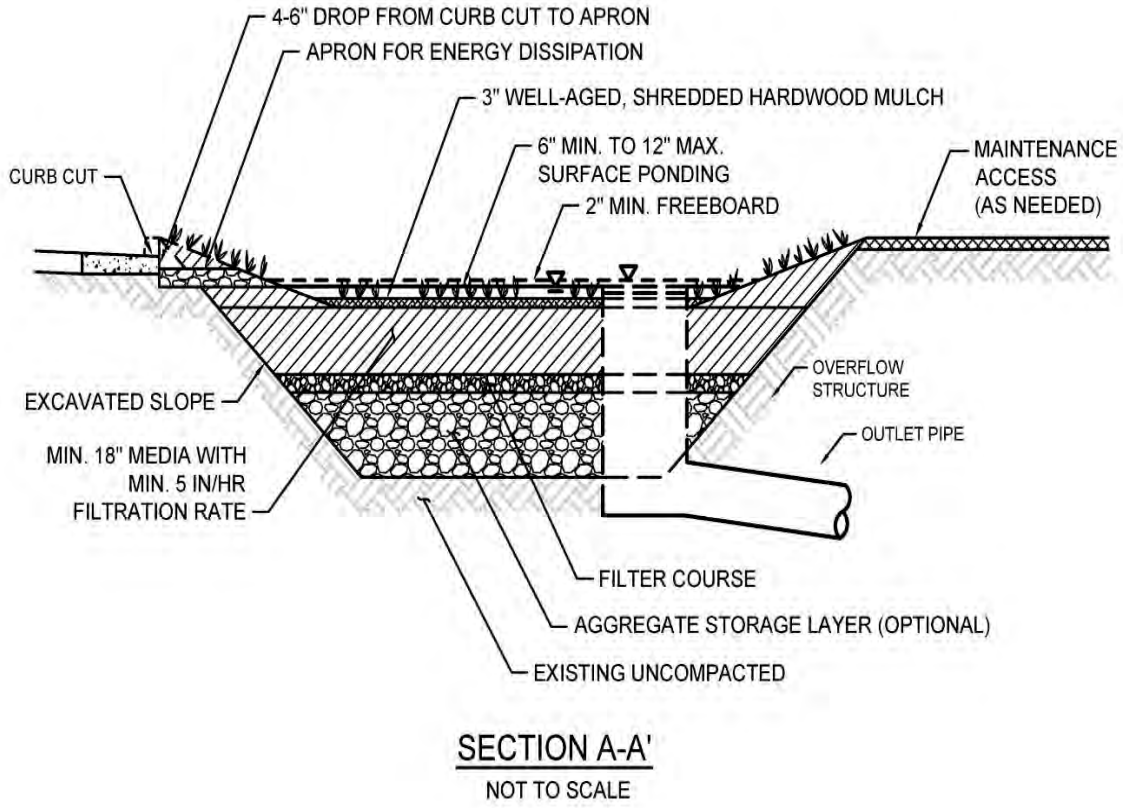


FIGURE 5-7. Schematic of a Typical Bioretention Basin

5.5.2 Partial Retention BMP Category

Partial retention category is defined by structural measures that incorporate both infiltration (in the lower treatment zone) and biofiltration (in the upper treatment zone). Example includes biofiltration with partial retention BMP.

5.5.2.1 Biofiltration with Partial Retention BMP

Biofiltration with partial retention BMPs are shallow basins filled with treatment media and drainage rock that manage stormwater runoff through infiltration, evapotranspiration, and biofiltration. These BMPs are characterized by a subsurface stone infiltration storage zone in the bottom of the BMP below the elevation of the discharge from the underdrains. The discharge of biofiltered water from the underdrain occurs when the water level in the infiltration storage zone exceeds the elevation of the underdrain outlet. The storage volume can be controlled by the elevation of the underdrain outlet (shown in Figure 5-8), or other configurations. Other typical biofiltration with partial retention components include a media layer and associated filtration rates, drainage layer with associated in-situ soil infiltration rates, and vegetation.

Selection: Biofiltration with partial retention BMP shall be selected if the project site feasibility analysis performed according to Section 5.4.2 determines a partial infiltration feasibility condition.

Design: Appendix B.5 provides guidance for sizing biofiltration with partial retention BMP and Appendix E provides a fact sheet to design biofiltration with partial retention BMP.

BMP option under this category:

- PR-1: Biofiltration with partial retention

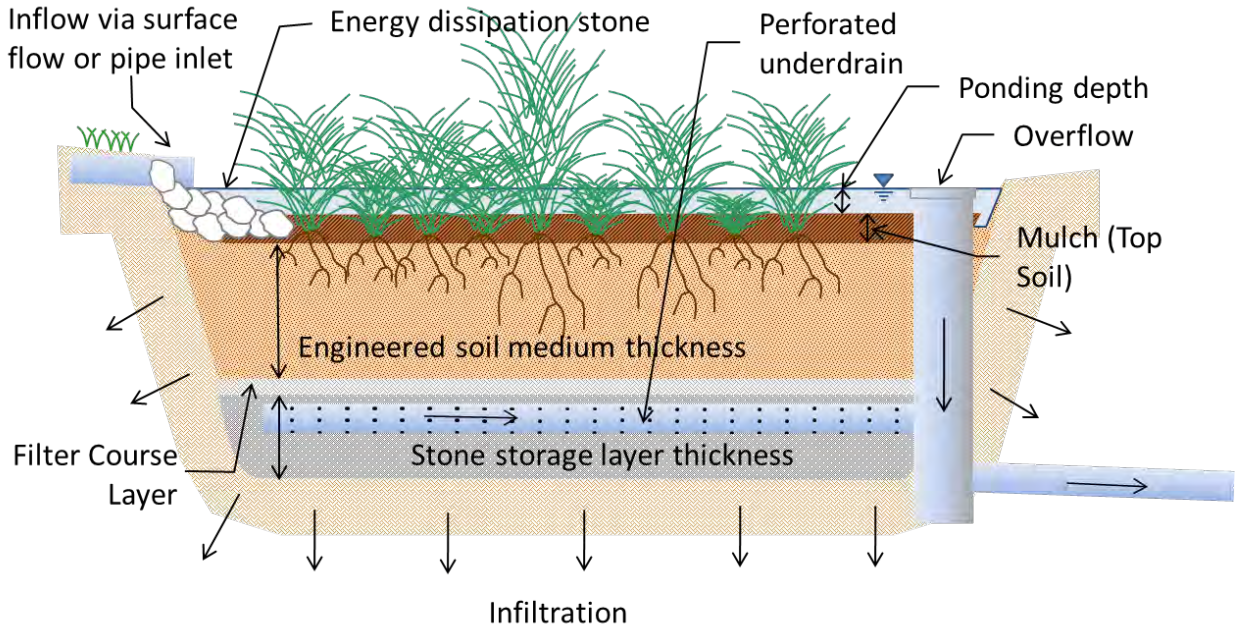


FIGURE 5-8. Schematic of a Typical Biofiltration with Partial Retention BMP

5.5.3 Biofiltration BMP Category

Biofiltration BMPs are shallow basins filled with treatment media and drainage rock that treat stormwater runoff by capturing and detaining inflows prior to controlled release through minimal

incidental infiltration, evapotranspiration, or discharge via underdrain or surface outlet structure. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and/or vegetative uptake. Biofiltration BMPs can be designed with or without vegetation, provided that biological treatment processes are present throughout the life of the BMP via maintenance of plants, media base flow, or other biota-supporting elements. Typical biofiltration components include a media layer with associated filtration rates, drainage layer with associated in-situ soil infiltration rates, underdrain, inflow and outflow control structures, and vegetation, with an optional impermeable liner installed on an as needed basis due to site constraints.

Selection: Biofiltration BMPs shall be selected if the project site feasibility analysis performed according to Section 5.4.2 determines a No Infiltration Feasibility Condition.

Design: Appendix B.5 has a worksheet for sizing biofiltration BMPs and Appendix E provides fact sheets to design the biofiltration BMP. Figure 5-9 shows the schematic of a biofiltration Basin.

BMP options under this category:

- BF-1: Biofiltration
- BF-2: Nutrient Sensitive Media Design
- BF-3: Proprietary Biofiltration

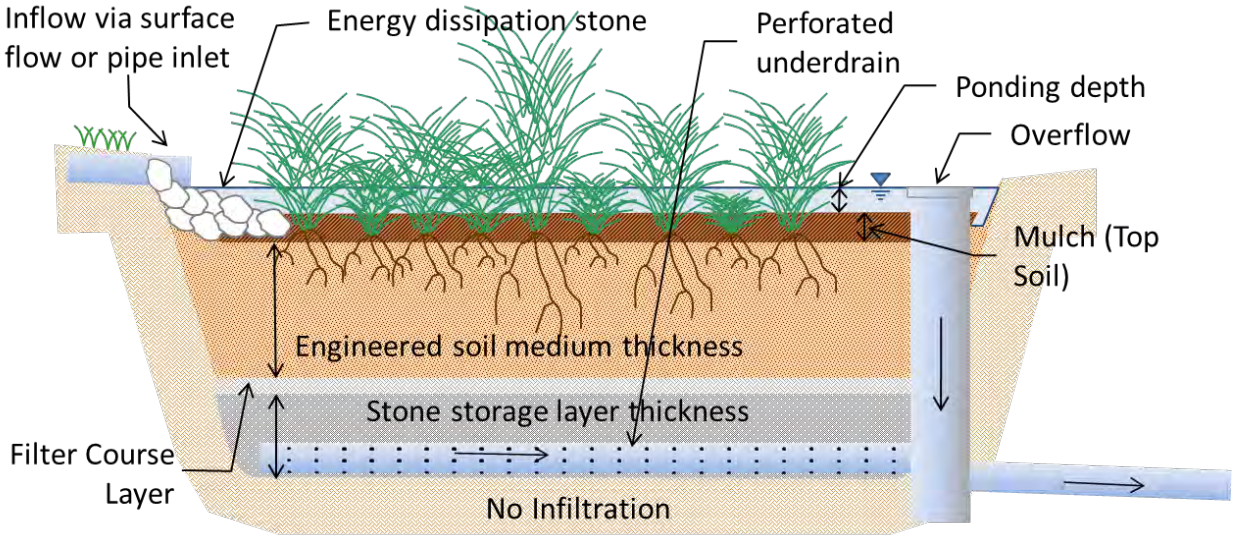


FIGURE 5-9. Schematic of a Typical Biofiltration Basin

Alternative Biofiltration Options: Other BMPs, including proprietary BMPs (See fact sheet BF-3) may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in Appendix F, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with applicable performance certifications, and (3) are acceptable at the discretion of the City Engineer. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met.

5.5.4 Flow-thru Treatment Control BMPs (for use with Alternative Compliance) Category[12]

Flow-thru treatment control BMPs are structural, engineered facilities that are designed to remove pollutants from stormwater runoff using treatment processes that do not incorporate significant biological methods.

Selection: Flow-thru treatment control BMPs shall be selected based on the criteria in Appendix B.6. Flow-thru treatment control BMPs may only be implemented to satisfy PDP structural BMP performance requirements if an appropriate offsite alternative compliance project is also constructed to mitigate for the pollutant load in the portion of the DCV not retained onsite. The alternative compliance program is an optional element that may be developed by each jurisdiction (See Section 1.8).

Design: Appendix B.6 provides the methodology, required tables and worksheet for sizing flow-thru treatment control BMPs and Appendix E provides fact sheets to design the following flow-thru treatment control BMPs. Figure 5-10 shows a schematic of a Vegetated Swale as an example of a flow-thru treatment control BMP.

BMP options under this category:

- FT-1: Vegetated swales
- FT-2: Media filters
- FT-3: Sand filters
- FT-5: Proprietary flow-thru treatment control

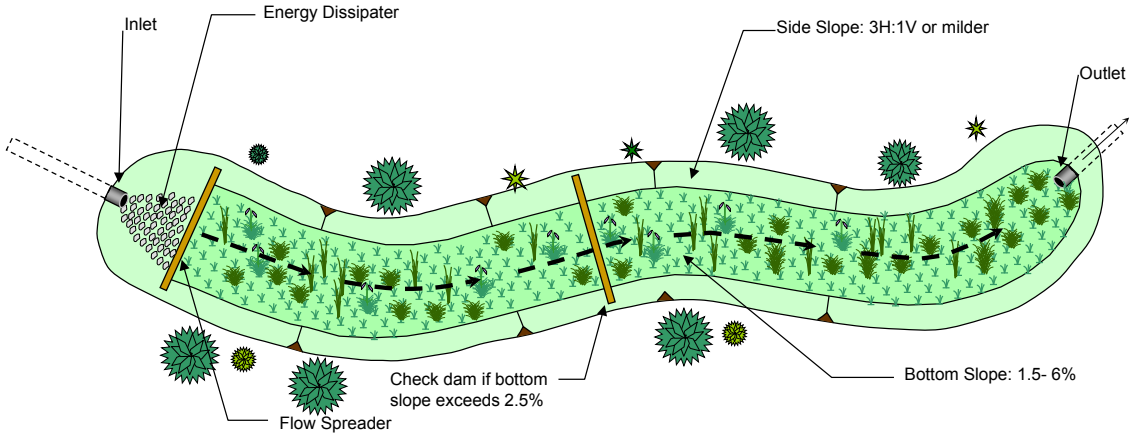


FIGURE 5-10. Schematic of a Vegetated Swale

Use of Proprietary BMP Options: A proprietary BMP (see fact sheet FT-5) can be classified as a flow-thru treatment control BMP if (1) it is demonstrated to meet the flow-thru treatment performance criteria in Appendix B.6, (2) is designed and maintained in a manner consistently with

[12] The City of Encinitas does not currently have an Alternative Compliance Program. An option for off-site alternative compliance is currently under review by the City.

applicable performance certifications, and (3) is acceptable at the discretion of the City Engineer. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to justify the use of a proprietary flow-thru treatment control BMP.

5.5.5 Alternate BMPs

New and proprietary BMP technologies may be available that meet the performance standards in Chapter 2 but are not discussed in this manual. Use of these alternate BMPs to comply with permit obligations is at the discretion of the City Engineer. Alternate BMPs must meet the standards for biofiltration BMPs or flow-thru BMPs (depending on how they are used), as described in Appendix F and Appendix B.6, respectively.

Note: Catch basin hydrocarbon filter inserts do not meet the stormwater treatment standards of this manual.

5.6 Documenting Stormwater Pollutant Control BMP Compliance when Hydromodification Management Applies

The steps and guidance presented in Chapter 5 apply to all PDPs for demonstrating conformance to stormwater pollutant control requirements regardless of whether hydromodification management applies. However, when hydromodification management applies, the approach for project design may be different. The following process can be used to document compliance with stormwater pollutant control BMPs in cases when hydromodification management applies:

1. Develop a combined BMP or treatment train (BMPs constructed in series) based on both stormwater pollutant control and hydromodification management requirements. Appendix E provides specific examples of how stormwater pollutant control BMPs can be configured to also address hydromodification management.
2. Dedicate a portion of the combined BMP or treatment train as the portion that is intended to comply with stormwater pollutant control requirements.
3. Follow all of the steps in this chapter related to demonstrating that the dedicated portion of the BMP or treatment train meets the applicable stormwater pollutant control criteria.
4. Check BMP design criteria in Appendix E and F to ensure that the hydromodification management design features (additional footprint, additional depth, modified outlet structure, lower discharge rates, etc.) do not compromise the treatment function of the BMP.
5. On project plans and in the O&M manual, clearly denote the portion of the BMP that serves the stormwater pollutant control function.

Alternative approaches that meet both the stormwater pollutant control and hydromodification management requirements may be acceptable at the discretion of the City Engineer and shall be documented in the SWQMP. Also refer to Section 6.3.6 for additional guidance.

Chapter 6

Hydromodification Management Requirements for PDPs

The purpose of hydromodification management requirements for PDPs is to minimize the potential of stormwater discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters. Hydromodification management implementation for PDPs includes two components: protection of critical coarse sediment yield areas and flow control for post-project runoff from the project site. For PDPs subject to hydromodification management requirements, this chapter provides guidance to meet the performance standards for the two components of hydromodification management.

Within this chapter, Appendix G, and the WMAA, the civil engineer preparing the hydromodification management study for a project will find and all the information necessary to meet the MS4 Permit standards. Should unique project circumstances require an understanding beyond what is provided in this manual, then consult the March 2011 Final HMP, which documents the historical development of the hydromodification management requirements.

Guidance for flow control of post-project runoff is based on the March 2011 Final HMP, with modifications in this manual based on updated requirements in the MS4 Permit. The March 2011 Final HMP was prepared based on the 2007 MS4 Permit, not the current MS4 Permit that drives this manual. In instances where there are changes to hydromodification management criteria or procedures based on the MS4 Permit, the criteria and procedures presented in this manual supersede the March 2011 Final HMP.

Protection of critical coarse sediment yield areas is a new requirement of the MS4 Permit and is not covered in the March 2011 Final HMP. The standards and management practices for protection of critical coarse sediment yield areas are presented here in this manual.

6.1 Hydromodification Management Applicability and Exemptions

As noted in Chapter 1, Section 1.6 a project may be exempt from hydromodification management requirements if it meets any one of the following conditions:

- The project is not a PDP;

- The proposed project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;
- The proposed project will discharge runoff directly to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or
- The proposed project will discharge runoff directly to an area identified by the Copermittees as appropriate for an exemption by the WMAA for the watershed in which the project resides.

The above criteria reflect the latest list of exemptions that are allowed under the MS4 Permit and therefore supersede criteria found in earlier publications.

To qualify for the potential exemption, the outlet elevation of the stormwater conveyance system discharging to the water storage reservoir or lake must be at or below either the normal operating water surface elevation, the reservoir spillway elevation, or at the elevation of the beach sand and properly designed energy dissipation must be provided.

6.2 Protection of Critical Coarse Sediment Yield Areas

When hydromodification management requirements are applicable according to Section 6.1, the applicant must determine if the project will impact any areas that are determined to be a critical coarse sediment yield area. A critical coarse sediment yield area is an area that has been identified as an active or potential source of coarse sediment to downstream channel reaches. Potential critical coarse sediment yield areas for each watershed management area are delineated in the associated WMAA.

If potential critical coarse sediment yield areas are identified within the project drainage boundaries based on the maps included in the WMAA, the areas should be assumed to be critical coarse sediment yield areas requiring protection unless further study determines either: (1) based on detailed project-level verification of Geomorphic Landscape Units (GLUs) described in Section 6.2.1, the areas are not actually potential critical coarse sediment yield areas, or (2) based on the flow chart in Section 6.2.2, the receiving water system is not sensitive to reduction of coarse sediment yield, or (3) based on detailed investigation described in Section 6.2.3, the areas are not producing sediment that is critical to receiving streams.

For projects that identify critical coarse sediment yield areas within the project drainage boundaries, Section 6.2.4 provides management measures for areas that are onsite, and Section 6.2.5 provides management measures for areas that are offsite and draining through the project. If no potential critical coarse sediment yield areas are identified within the project drainage boundaries, no measures for protection of critical coarse sediment are necessary. The project will require measures for flow control only (see Section 6.3).

The first step to determine if the project will impact any critical coarse sediment yield areas is to consult the map included in the WMAA. The outcome of that initial analysis will determine the need for subsequent analysis as follows:

- If the project is shown to not impact any potential critical coarse sediment yield areas according to the WMAA map, typically no further analysis is required. This includes reviewing the entire drainage area draining through the project site for nearby potential critical coarse sediment yield areas where the runoff will travel through the project site. Because the WMAA maps are macro-level maps that may not represent project-level detail, the City Engineer may require additional project-level investigation described in Section 6.2.1 even when the maps included in the WMAA do not indicate the presence of potential critical coarse sediment yield areas.
- If the project is shown to impact potential critical coarse sediment yield areas according to the WMAA map, then the applicant may conduct one or further analyses described in Sections 6.2.1, 6.2.2, and 6.2.3. The additional analyses are optional. The result of any of the additional analyses may invalidate the finding or modify the finding of the WMAA map, or it may confirm the finding of the WMAA map.
- If it is determined that the project will impact critical coarse sediment yield areas after the applicant has exercised all elected options for further analyses, then management measures described in Sections 6.2.4 and 6.2.5 are required.

6.2.1 Verification of GLUs Onsite

The Potential Critical Coarse Sediment Yield Area maps in the WMAAs identify areas that are considered potential critical coarse sediment yield areas based on their GLU. A GLU is a combination of slope, geology, and land cover. A regional-level WMAA identifies GLUs that are considered to be potential critical coarse sediment yield areas. These GLUs are areas with a combination of open (undeveloped) land cover, high relative sediment production based on a normalized revised universal soil loss equation analysis, and coarse grained geologic material (material that is expected to produce greater than 50% sand when weathered).

The maps included in the WMAA are macro-level maps that may not represent project-level detail. If the WMAA maps indicate the presence of potential critical coarse sediment yield areas within the project site, detailed project-level review of GLUs onsite may be performed to verify the presence or absence of potential critical coarse sediment yield areas within the project site. Some jurisdictions may require verification of GLUs for all projects (including projects where the WMAA maps do not indicate the presence of potential critical coarse sediment yield areas).

The following data are needed to verify the GLUs onsite:

- Project boundary
- Classification of pre-project slopes within the project boundary into four (4) categories defined in Appendix H
- Classification of underlying geology within the project boundary into seven (7) categories defined in Appendix H
- Classification of pre-project land cover within the project boundary into six (6) categories defined in Appendix H. In this context, use "pre-project" land cover, including any existing impervious areas. Assumption of "pre-development" land cover is not required for GLU analysis

Intersect the geologic categories, land cover categories, and slope categories within the project boundary to create GLUs. This is a similar procedure to intersecting land uses with soil types to

determine runoff coefficients or runoff curve numbers for hydrologic studies, but there are three categories to consider for the GLU analysis (slope, geology, and land cover), and the GLUs are not to be composited into a single GLU. When GLUs have been created, determine whether any of the GLUs listed in Table 6-1 are found within the project boundary. The GLUs listed in Table 6-1 are considered to be potential critical coarse sediment yield areas.

TABLE 6-1. Potential Critical Coarse Sediment Yield Areas

GLU	Geology	Land Cover	Slope (%)
CB-Agricultural/Grass-3	Coarse Bedrock	Agricultural/Grass	20% - 40%
CB-Agricultural/Grass-4	Coarse Bedrock	Agricultural/Grass	>40%
CB-Forest-2	Coarse Bedrock	Forest	10 – 20%
CB-Forest-3	Coarse Bedrock	Forest	20% - 40%
CB-Forest-4	Coarse Bedrock	Forest	>40%
CB-Scrub/Shrub-4	Coarse Bedrock	Scrub/Shrub	>40%
CB-Unknown-4	Coarse Bedrock	Unknown	>40%
CSI-Agricultural/Grass-2	Coarse Sedimentary Impermeable	Agricultural/Grass	10 – 20%
CSI-Agricultural/Grass-3	Coarse Sedimentary Impermeable	Agricultural/Grass	20% - 40%
CSI-Agricultural/Grass-4	Coarse Sedimentary Impermeable	Agricultural/Grass	>40%
CSP-Agricultural/Grass-4	Coarse Sedimentary Permeable	Agricultural/Grass	>40%
CSP-Forest-3	Coarse Sedimentary Permeable	Forest	20% - 40%
CSP-Forest-4	Coarse Sedimentary Permeable	Forest	>40%
CSP-Scrub/Shrub-4	Coarse Sedimentary Permeable	Scrub/Shrub	>40%

If none of the GLUs listed in Table 6-1 are present within the project boundary, then no measures for protection of critical coarse sediment yield areas onsite are necessary. If one or more GLUs listed in Table 6-1 are present within the project boundary, they shall be considered critical coarse sediment yield areas and protected with measures described in Section 6.2.4, or the project applicant may elect to continue to Section 6.2.2 to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. If any of the GLUs listed in Table 6-1 are present offsite within an area that drains through the project site, see Section 6.2.5 for management measures for critical coarse sediment yield areas offsite and draining through the project.

6.2.2 Downstream Systems Sensitivity to Coarse Sediment

If it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Protection of critical coarse sediment yield areas is a necessary element of hydromodification management because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows. However, not all downstream systems warrant preservation of coarse sediment supply. In some cases, downstream systems are negatively impacted by coarse sediment. For example, existing MS4 systems that cannot convey coarse sediment and become clogged, resulting in urban flood hazards and on-going maintenance needs. In some cases, downstream channels are aggrading with undesirable results (e.g.

impacts to habitat or urban flooding). Use Figure 6-1 and the associated node descriptions to determine whether downstream systems require protection.

A checklist based on Figure 6-1 is provided in Appendix I. If downstream systems do not warrant preservation of coarse sediment supply based on Figure 6-1, then no measures for protection of critical coarse sediment yield areas are necessary. If downstream systems must be protected based on Figure 6-1, continue to Section 6.2.3 for optional additional analysis that may refine the extents of critical coarse sediment yield areas onsite, and Section 6.2.4 for management measures.

- Figure 6-1, Node 1 – Determine what type of system receives the project site runoff: does the project connect to an existing hardened MS4 system or discharge to an un-lined channel?
- Figure 6-1, Node 2 – If the project discharges runoff to an existing hardened MS4 system, determine whether the system can convey sediment (self-cleaning system) or will trap (sink) sediment. Existing systems with very low slope, constrictions, existing treatment control (pollutant control) BMPs, or existing detention basins will typically trap sediment, which can result in flooding and increased maintenance costs. When the existing systems trap sediment, measures to allow coarse sediment to be conveyed into the MS4 system are not recommended. Consult the City Engineer to determine if existing MS4 systems are impacted by sediment, and any other criteria defined by the City Engineer.
- Figure 6-1, Node 3 – If the existing MS4 system can convey coarse sediment (self-cleaning system, e.g. velocity will be greater than 6 feet per second in a 2-year storm event), determine what type of system receives the runoff.
- Figure 6-1, Node 4 – Un-lined channels shall be assumed to require protection of coarse sediment supply unless the channel has been identified by the City Engineer's maintenance records as adversely impacted by deposition of sediment, and any other criteria defined by the City Engineer.

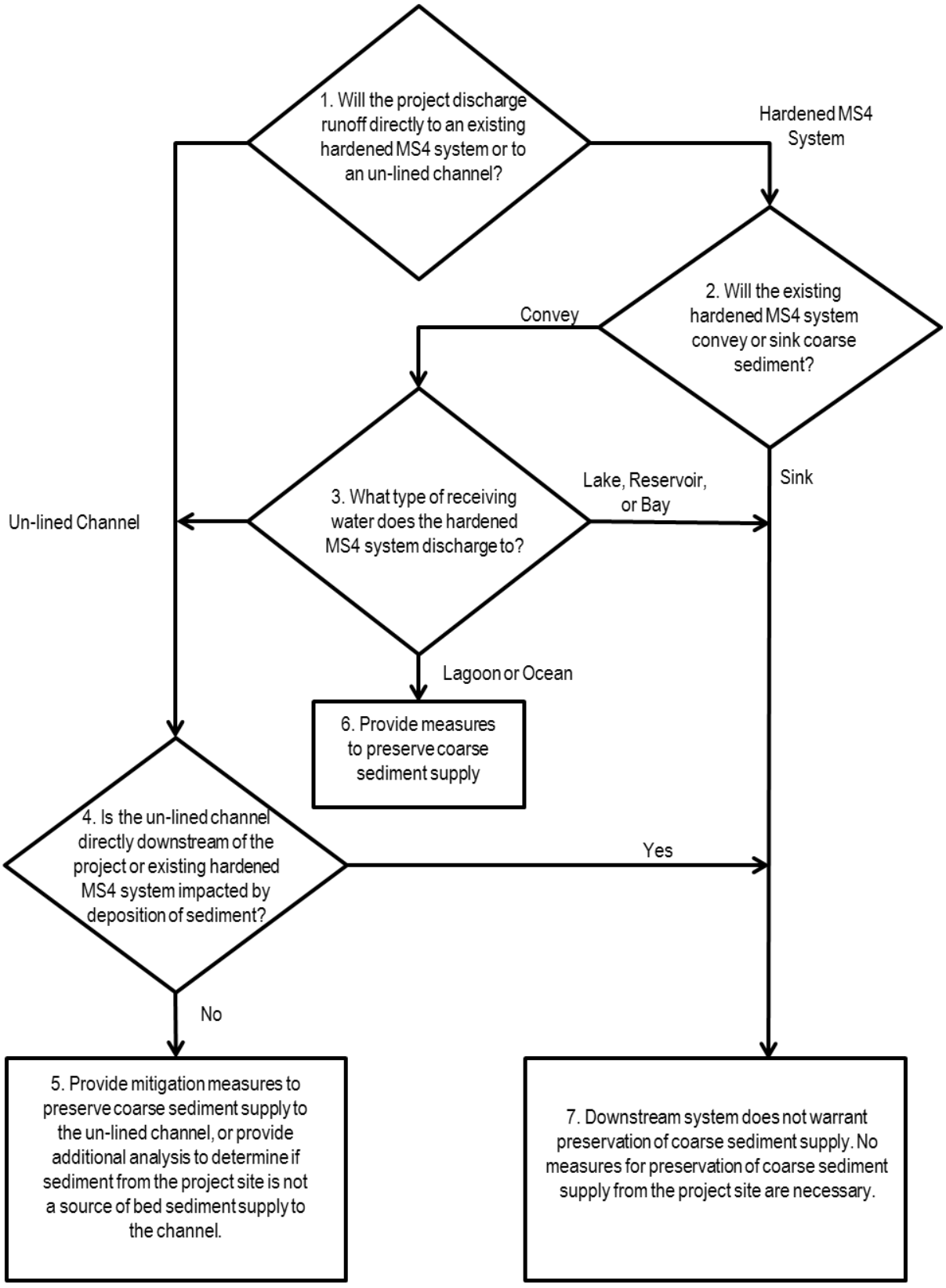


FIGURE 6-1. Evaluation of Downstream Systems Requirements for Preservation of Coarse Sediment Supply

6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

When it has been determined based on the GLU analysis that potential critical coarse sediment yield areas are present within the project boundary, and it has been determined that downstream systems require protection, additional analysis may be performed that may refine the extents of actual critical coarse sediment yield areas to be protected onsite.

The GLU analysis that identifies potential critical coarse sediment yield areas does not define whether the areas are actually producing sediment that is critical to receiving streams. The GLU analysis identifies "potential" areas, which will be assumed to be critical unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply).

Section 2.3.i of the "Santa Margarita Region HMP," dated May 2014 (herein "May 2014 SMR HMP"), provides methods of analysis to determine whether a portion of the site is a significant source of bed material to the receiving stream ("Step 1" of the May 2014 SMR HMP's three-step process for compliance with the sediment supply performance standard). The analysis will identify areas that are a significant source of bed sediment supply to the receiving stream, or eliminate areas that are not expected to be a significant source of bed sediment supply to the receiving stream. A civil engineer designing a PDP in San Diego may opt to prepare this analysis to refine the extents of actual critical coarse sediment yield areas to be protected onsite, using the worksheets that were developed for the Santa Margarita Region Water Quality Management Plan Template. A copy of the relevant portion of the May 2014 SMR HMP is included in Appendix H of this manual. For additional information, consult the May 2014 SMR HMP.

Areas that are not expected to be a significant source of bed sediment supply to the receiving stream do not require protection. If it is determined that the potential critical coarse sediment yield areas are producing sediment that is critical to receiving streams, or if the optional additional analysis presented above has not been performed, the project must provide management measures for protection of critical coarse sediment yield.

6.2.4 Management Measures for Critical Coarse Sediment Yield Areas Onsite

The following are management measures for protection of critical coarse sediment yield areas onsite:

1 Avoid disturbing critical coarse sediment yield areas, or

2 Subject to jurisdiction approval, provide project-specific onsite measures if critical coarse sediment yield areas will be disturbed.

6.2.4.1 Avoidance of Critical Coarse Sediment Yield Areas

Avoidance of critical coarse sediment yield areas is the preferred management measure.

The civil engineer shall designate onsite areas that are to be avoided (undisturbed) for the purpose of preserving coarse sediment yield. When feasible, the same areas should be considered as potential habitat preservation areas. If undisturbed critical coarse sediment yield areas will drain through developed portions of the project, these undisturbed areas must not be routed through detention

basins or other facilities with restricted outlets that will trap sediment. The project stormwater conveyance system shall be designed to bypass these areas to ensure that critical coarse sediment can be discharged to receiving waters, such that there is no net impact to the receiving water. The bypass shall be designed with sufficient capacity and slope to convey sediment from undisturbed areas and not result in sediment accumulation on developed areas of a site.

6.2.4.2 Project-Specific Onsite Measures

If it is determined that avoidance of critical coarse sediment yield areas is infeasible, the City Engineer may allow the civil engineer to propose project-specific onsite measures to ensure that critical coarse sediment can be discharged to receiving waters, such that there is no net impact to the receiving water.

For example, the civil engineer may be allowed to adjust the post-project flow duration curve to maintain pre-project conditions in the receiving channel based on the expected change in bed sediment supply from the site. The following text excerpted from pages 32-33 of the May 2014 SMR HMP provides potential methods of analysis:

"Alternatively, the User may propose adjusting the flow duration curve to maintain pre-project conditions in the receiving channel with the expected change in Bed Sediment Supply discharge from the project site. The erosion potential (total sediment transported in the proposed condition vs. the baseline) should be modeled and used to adjust the flow duration curve to ensure a condition that does not vary more than 10% from the natural condition. Bledsoe (2002) introduced the index of stream erosion potential (Ep), which compares the erosive power of pre- and post-development stream flows. This index allows comparison of sediment-transport relationships to ensure that an erosion potential that is comparable to pre-development conditions is achieved. Changes in Total Sediment Supply after development are accounted for by changing the target Ep from 1.0 (proposed is the same as pre-project) in proportion to the change in Bed Sediment Supply (post-development/pre-development), calculated using the six steps above. This option may not be practical when changes in Bed Sediment Supply are relatively large (greater than 50%). The User should determine, using best professional judgment, if the alternative modeling approach is applicable."

"The alternative modeling approach must include the following:

1 Continuous hydrologic simulation for the project baseline condition and proposed condition over the range of flow values up to the pre-project 10-year event;
2 Sediment transport model of the receiving channel for the PDP baseline condition and proposed condition;
3 Analysis of the change in Bed Sediment Supply from the PDP baseline condition to the proposed condition;
4 Explanation of method used to control the discharge from the PDP to account for changes in the delivered Bed Sediment Supply; and
5 Summary report."

"The User must demonstrate through a channel stability impact assessment that the changes to both the amount of Bed Sediment Load being transported and the amount of sediment supplied to the receiving channel will maintain the general trends of aggradation and degradation in the different impacted channel reaches, which are representative of the pre-development geormorphologic state

of a channel. Typical channel sediment continuity analysis procedures may be performed using moveable bed fluvial models such as HEC-6t or equivalent."

"Receiving channel monitoring may be required for the project site to verify that the PDP does not result in long-term changes to the receiving channel. The User should make a recommendation if long-term monitoring is required, for concurrence by the Copermittee with jurisdiction over the project site. Some of the considerations in assessing the need for a long-term monitoring program are:

1. Total area of the watershed at the PDP discharge point vs. the PDP area;
2. Condition and type of receiving channel;
3. Magnitude of change in Bed Sediment Supply to the receiving channel;
4. Relief of the land on the project site;
5. Number of channels (density) potentially delivering Bed Sediment Supply to the receiving channel, and the delivery ratio; and
6. Soil characteristics on the project site."

The project-specific onsite measures described above may be approved subject to the discretion of the City Engineer. Applicants considering such measures should consult the City Engineer to determine study requirements.

6.2.5 Management Measures for Critical Coarse Sediment Yield Areas Offsite and Draining Through the Project

Critical coarse sediment yield areas that are offsite and draining through the project also require attention in the project design.

When critical coarse sediment yield areas are identified adjacent to the project site (e.g. hillsides that will drain through the site), protection of these areas is similar to protection of undisturbed critical coarse sediment yield areas onsite. These areas must not be routed through detention basins or other facilities with restricted outlets that will trap sediment. The project stormwater conveyance system shall be designed to bypass these areas to ensure that critical coarse sediment can be discharged to receiving waters, such that there is no net impact to the receiving water. The bypass shall be designed with sufficient capacity and slope to convey sediment from undisturbed areas and not result in sediment accumulation atop developed areas of a site.

6.3 Flow Control for Hydromodification Management

PDPs subject to hydromodification management requirements must provide flow control for post-project runoff to meet the flow control performance standard.

This is typically accomplished using structural BMPs that may include any combination of infiltration basins; bioretention, biofiltration with partial retention, or biofiltration basins; or detention basins. This section will discuss design of flow control measures for hydromodification management. This section is intended for use following the source control and site design processes described in Chapter 4 and the stormwater pollutant control design process described in Chapter 5.

The flow control performance standard is as follows (adapted from the March 2011 Final HMP, with modifications to meet the requirements of the MS4 Permit):

1 For flow rates ranging from 10 percent, 30 percent or 50 percent of the pre-development 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) to the pre-development 10-year runoff event (Q_{10}), the post-project discharge rates and durations shall not deviate above the pre-development rates and durations by more than 10 percent over and more than 10 percent of the length of the flow duration curve. The specific lower flow threshold will depend on the erosion susceptibility of the receiving stream for the project site (see Section 6.3.4).

2 For flow rates ranging from the lower flow threshold to Q_5, the post-project peak flows shall not exceed pre-development peak flows. For flow rates from Q_5 to Q_{10}, post-project peak flows may exceed pre-development flows by up to 10 percent for a 1-year frequency interval. For example, post-project flows could exceed pre-development flows by up to 10 percent for the interval from Q_9 to Q_{10} or from $Q_{5.5}$ to $Q_{6.5}$, but not from Q_8 to Q_{10}.

In this context, Q_2 and Q_{10} refer to flow rates determined based on continuous simulation hydrologic modeling. The range from a fraction of Q_2 to Q_{10} represents the range of geomorphically significant flows for hydromodification management in San Diego. The upper bound of the range of flows to control is pre-development Q_{10} for all projects. The lower bound of the range of flows to control, or "lower flow threshold" is a fraction of pre-development Q_2 that is based on the erosion susceptibility of the stream and depends on the specific natural system (stream) that a project will discharge to. Tools have been developed in the March 2011 Final HMP for assessing the erosion susceptibility of the stream (see Section 6.3.4 below for further discussion of the lower flow threshold).

When selecting the type of structural BMP to be used for flow control, consider the types of structural BMPs that will be utilized onsite for pollutant control.

Both stormwater pollutant control and flow control for hydromodification management can be achieved within the same structural BMPs. For example, a full infiltration BMP that infiltrates the DCV for pollutant control could include additional storage volume above or below ground to provide either additional infiltration of stormwater or control of outflow for hydromodification management. If possible, the structural BMPs for pollutant control should be modified to meet flow control performance standards in addition to the pollutant control performance standards. See Section 6.3.6 for further discussion of integrating structural BMPs for pollutant control and flow control.

6.3.1 Point(s) of Compliance

For PDPs subject to hydromodification management requirements, the flow control performance standard must be met for each natural or un-lined channel that will receive runoff from the project.

This may require multiple structural BMPs within the project site if the project site discharges to multiple discrete outfalls. When runoff is discharged to multiple natural or un-lined channels within a project site, each natural or un-lined channel must be considered separately and points of compliance (POCs) for flow control must be provided for each natural or un-lined channel, including situations where the channels will confluence before leaving the project boundary. When runoff from the project site does not meet a natural or un-lined channel onsite, instead traveling some distance downstream of the project in storm drain systems or lined channels prior to discharge to natural or un-lined channels, the POC(s) for flow control analysis shall be placed at the project boundary (i.e., comparing the pre-development and post-project flows from the project area only,

not analyzing the total watershed draining to the offsite POC), unless the project is draining to and accommodated by an approved master planned or regional flow control BMP.

For individual projects draining to approved central or regional flow control BMPs, the POC for flow control analysis may be offsite of the specific project application.

In these instances, the individual project draining to a central or regional flow control BMP shall reference the approved design documents for the BMP, and shall demonstrate that either (a) the individual project design is consistent with assumptions made for imperviousness and features of the project area when the central or regional BMP was designed, or (b) the central or regional BMP still meets performance standards when the actual proposed imperviousness and features of the project area are considered.

6.3.2 Offsite Area Restrictions

Runoff from offsite undeveloped areas should be routed around structural BMPs for flow control whenever feasible.

Methods to route flows around structural BMPs include designing the site to avoid natural drainage courses, or using parallel storm drain systems. If geographic constraints prohibit the rerouting of flows from undeveloped areas around a structural BMP, a detailed description of the constraints must be included in the SWQMP submittal.

Structural BMPs for flow control must be designed to avoid trapping sediment from natural areas regardless of whether the natural areas are critical coarse sediment yield areas or not.

Reduction in coarse sediment supply contributes to downstream channel instability. Capture and removal of natural sediment from the downstream watercourse can create "hungry water" conditions and the increased potential for downstream erosion. Additionally, coarse or fine sediment from natural areas can quickly fill the available storage volume in the structural BMP and/or clog a small flow control outlet, which can cause the structural BMP to overflow during events that should have been controlled, and will require frequent maintenance. Failure to prevent clogging of the principal control orifice defeats the purpose of a flow control BMP, since basin inflows would simply overtop the control structure and flow unattenuated downstream, potentially worsening downstream erosion.

6.3.3 Requirement to Control to Pre-Development (Not Pre-Project) Condition

The MS4 Permit requires that post-project runoff must be controlled to match pre-development runoff conditions, not pre-project conditions, for the range of flow rates to be controlled.

Pre-development runoff conditions are defined in the MS4 Permit as "approximate flow rates and durations that exist or existed onsite before land development occurs."

- **Redevelopment PDPs:** Use available maps or development plans that depict the topography of the site prior to development; otherwise use existing onsite grades if historic topography is not available. Assume the infiltration characteristics of the underlying soil. Use available information pertaining to existing underlying soil type such as soil maps published by the Natural Resource

Conservation Service (NRCS). Do not use runoff parameters for concrete or asphalt to estimate pre-development runoff conditions.

- **New development PDPs:** The pre-development condition typically equates to runoff conditions immediately before project construction. However if there is existing impervious area onsite, as with redevelopment, the new development project must not use runoff parameters for concrete or asphalt to estimate pre-development runoff conditions.

When it is necessary for runoff from offsite impervious area (not a part of the project) to co-mingle with project site runoff and be conveyed through a project's structural flow control BMP, the offsite impervious area may be modeled as impervious in both the pre- and post- condition models. A project is not required to provide flow control for stormwater from offsite. This also means that for redevelopment projects not subject to the 50% rule (i.e., redevelopment projects that result in the creation or replacement of impervious surface in an amount of less than 50% of the area of impervious surface of the previously existing development), comingled runoff from undisturbed portions of the previously existing development (i.e., areas that are not a part of the project) will not require flow control. Flow control facilities for comingled offsite and onsite runoff would be designed to process the total volume of the comingled runoff through the facility, but would provide mitigation for the excess runoff (difference of developed to pre-developed condition) based on onsite impervious areas only. The project applicant must clearly explain why it was not feasible or practical to provide a bypass system for stormwater from offsite. The City Engineer may request that the project applicant provide a supplemental analysis of onsite runoff only (i.e., supplemental model of the project area only).

6.3.4 Determining the Low Flow Threshold for Hydromodification Flow Control

The range of flows to control for hydromodification management depends on the erosion susceptibility of the receiving stream.

The range of flows to control is either:

- $0.1Q_2$ to Q_{10} for projects discharging to streams with high susceptibility to erosion (and this is the default range of flows to control when a stream susceptibility study has not been prepared),
- $0.3Q_2$ to Q_{10} for projects discharging to streams with medium susceptibility to erosion as determined by a stream susceptibility study approved by the City Engineer, or
- $0.5Q_2$ to Q_{10} for projects discharging to streams with low susceptibility to erosion as determined by a stream susceptibility study approved by the City Engineer.

The project applicant may opt to design to the default low flow threshold of 0.1Q2, or provide assessment of the receiving stream ("channel screening" a.k.a. "geomorphic assessment"), which may result in a higher low flow threshold of 0.3Q2 or 0.5Q2 for project hydromodification management.

Use of a higher low flow threshold of 0.3Q2 or 0.5Q2 must be supported by a channel screening report. Channel screening is based on a tool developed by the Southern California Coastal Water Research Project (SCCWRP), documented in SCCWRP's Technical Report 606 dated March 2010, "Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility." The SCCWRP channel screening tool considers channel conditions including channel braiding, mass

wasting, and proximity to the erosion threshold. SCCWRP's Technical Report 606 is included in Appendix B of the March 2011 Final HMP, and can also be accessed through SCCWRP's website. The result of applying the channel screening tool will be classification of high, medium, or low susceptibility to erosion, corresponding to low flow thresholds of 0.1Q2, 0.3Q2, and 0.5Q2, respectively, for the receiving stream. Note that the City Engineer may require that the channel screening study has been completed within a specific time frame prior to their review, and/or may apply a sunset date to their approval of a channel screening study. Other projects may rely on previously approved SCCWRP analyses at the discretion of the City Engineer.

The receiving stream is the location where runoff from the project is discharged to natural or un-lined channels.

The receiving stream may be onsite or offsite. The POC for channel screening is the point where runoff initially meets an un-lined or natural channel, regardless of whether the POC for flow control facility sizing is at or within the project boundary or is offsite. A project may have a different POC for channel screening and flow control facility sizing if runoff from the project site is conveyed in hardened systems from the project site to the un-lined or natural channel. The erosion susceptibility of the receiving stream must be evaluated at the POC for channel screening, and for an additional distance known as the domain of analysis, defined in SCCWRP's Technical Report 606.

6.3.5 Designing a Flow Control Facility

Flow control facilities for hydromodification management must be designed based on continuous simulation hydrologic modeling.

Continuous simulation hydrologic modeling uses an extended time series of recorded precipitation data and evapotranspiration data as input and generates hydrologic output, such as surface runoff, groundwater recharge, and evapotranspiration, for each model time step. Using the continuous flow output, peak flow frequency and duration statistics can be generated for the pre-development and post-project conditions for the purpose of matching pre-development hydrologic conditions in the range of geomorphically significant flow rates. Peak flow frequency statistics estimate how often flow rates will exceed a given threshold. Flow duration statistics determine how often a particular flow rate is exceeded. To determine if a flow control facility meets hydromodification management performance standards, peak flow frequency and flow duration curves must be generated and compared for pre-development and post-project conditions.

Flow control facilities may be designed using either sizing factors presented in Appendix B of this manual, or using project-specific continuous simulation modeling. The sizing factors were developed based on unit-area continuous simulation models. This means the continuous simulation hydrologic modeling has already been done and the project applicant needs only to apply the sizing factors to the project's effective impervious area to size a facility that meets flow control performance standards. The sizing factor method is intended for simple studies that do not include diversion, do not include significant offsite area draining through the project from upstream, and do not include offsite area downstream of the project area. Use of the sizing factors is limited to the specific structural BMPs for which sizing factors were prepared. Project-specific continuous simulation modeling offers the most flexibility in the design, but requires the project applicant to prepare and submit a complete continuous simulation hydrologic model for review.

6.3.5.1 Sizing Factor Method

A project applicant may use sizing factors that were created to facilitate sizing of certain specific BMPs for hydromodification management.

Unit runoff ratios for determination of pre-development Q_2 and sizing factors for certain specific structural BMPs were previously developed based on continuous simulation hydrologic modeling of hypothetical unit watersheds. Details and descriptions for the sizing factors and specific BMPs are presented in the "San Diego BMP Sizing Calculator Methodology," dated January 2012, prepared by Brown and Caldwell (herein "BMP Sizing Calculator Methodology"). Although the sizing factors were developed under the 2007 MS4 Permit, the unit runoff ratios and some sizing factors developed for flow control facility sizing may still be applied. Users should note that due to the MS4 Permit requirement to control flow rates to pre-development condition instead of pre-project condition, unit runoff ratios for "impervious" soil cover categories from Table 1-6 of the BMP Sizing Calculator Methodology shall not be used when determining pre-development Q_2. Sizing factors are to be applied to the effective impervious area draining to the facility. Calculations may be prepared using either the BMP Sizing Spreadsheet that was developed by the County of San Diego and is available on the Project Clean Water website, or using hand calculations. Refer to Appendix G.2 of this manual for guidance to use the sizing factor method.

6.3.5.2 Project-Specific Continuous Simulation Modeling

A project applicant may prepare a project-specific continuous simulation model to demonstrate compliance with hydromodification management performance standards.

This option offers the most flexibility in the design. In this case, the project applicant shall prepare continuous simulation hydrologic models for pre-development and post-project conditions, and compare the pre-development and post-project (with hydromodification flow control BMPs) runoff peaks and durations until compliance with the flow control performance standards is demonstrated. The project applicant will be required to quantify the long term pre-development and post-project runoff response from the site and establish runoff routing and stage-storage-discharge relationships for the planned flow control BMPs. There are several available hydrologic models that can perform continuous simulation analyses. Refer to Appendix G.1 of this manual for guidance for continuous simulation hydrologic modeling.

6.3.6 Integrating HMP Flow Control Measures with Pollutant Control BMPs

Both stormwater pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s) or by a series of structural BMP(s).

The design process should start with an assessment of the controlling design factor, then the typical design process for an integrated structural BMP or series of BMPs to meet two separate performance standards at once involves (1) initiating the design based on the performance standard that is expected to require the largest volume of stormwater to be retained, (2) checking whether the initial design incidentally meets the second performance standard, and (3) adjusting the design as necessary until it can be demonstrated that both performance standards are met. The following are recommendations for initiating the design process:

- **Full infiltration condition:** retention for pollutant control performance standard is the controlling design factor. For a system that is based on full retention for stormwater pollutant control, first design an initial retention area to meet stormwater pollutant control standards for retention, then check whether the facility meets flow control performance standards. If the initial retention facility does not meet flow control performance standards: increase the volume of the facility, increasing retention if feasible or employing outflow control for runoff to be discharged from the facility; as needed to meet the flow control performance standards.
- **Partial infiltration condition:** retention for pollutant control performance standard is the controlling design factor. For a system that is based on partial retention for stormwater pollutant control, first design the retention area to maximize retention as feasible. Then design an additional runoff storage area with outflow control for runoff to be discharged from the facility; as needed to meet the flow control performance standards. Then address pollutant control needs for the portion of the stormwater pollutant control DCV that could not be retained onsite.
- **No infiltration condition:** flow control for hydromodification management standard is the controlling design factor. For a system that is based on biofiltration with no infiltration for stormwater pollutant control, first design the facility to meet flow control performance standards, then check whether the facility meets biofiltration design standards for stormwater pollutant control. If the flow control biofiltration facility does not meet performance standards for stormwater pollutant control by biofiltration, increase the volume of the biofiltration facility as needed to meet pollutant control performance standards, or identify other methods to address pollutant control needs for the portion of the stormwater pollutant control DCV that could not be processed with biofiltration onsite.

When an integrated structural BMP or series of BMPs is used for both stormwater pollutant control and flow control for hydromodification management, separate calculations are required to demonstrate that pollutant control performance standards and hydromodification management standards are met.

When an integrated structural BMP or series of BMPs is proposed to meet the stormwater pollutant control and flow control for hydromodification management obligations, the applicant shall either:

- Perform separate calculations to show that both hydromodification management and pollutant control performance standards are met independently by using guidance from Appendices B and G. Calculations performed shall be documented in the SQWMP. **or**
- Develop an integrated design that meets the separate performance standards presented in Chapter 2 for both hydromodification management and pollutant control. In this option the BMP requirements to meet the pollutant control performance standard are optimized to account for the BMP storage provided for flow control, and vice versa. Calculations performed to develop an integrated design shall be documented in the SQWMP. Project approval when this option is selected is at the discretion of the City Engineer.

6.3.7 Drawdown Time

The maximum recommended drawdown time for hydromodification management facilities is 96 hours based on Section 6.4.6 of the March 2011 Final HMP.

This is based on instruction from the County of San Diego Department of Environmental Health for mitigation of potential vector breeding issues and the subsequent risk to human health. This

standard applies to, but is not limited to, detention basins, underground storage vaults, and the above-ground storage portion of LID facilities. When this standard cannot be met due to large stored runoff volumes with limited maximum release rates, a vector management plan may be an acceptable solution if approved by the governing municipality.

In cases where a Vector Management Plan is necessary, it shall be incorporated into the SWQMP as an attachment. A Vector Management Plan will only be accepted after the applicant has proven infeasibility of meeting the required drawdown time using any and all allowable BMPs. The information included in the plan will vary based on the nature, extent and variety of potential vector sources. It is recommended that preparers consult with the Department of Environmental Health Vector Control Program for technical guidance. Plans should include the following information at a minimum:

- Project identification information;
- A description of the project, purpose of the report, and existing environmental conditions;
- A description of the management practices that will be employed to minimize vector breeding sources and any associated employee education required to run facilities and operations;
- A discussion of long term maintenance requirements;
- A summary of mitigation measures;
- References; and
- A list of persons and organizations contacted (project proponents are expected to obtain review and concurrence of proposed management practices from Department of Environmental Health Vector control program staff prior to submission).

The property owner and applicant must include and sign the following statement: "The measures identified herein are considered part of the proposed project design and will be carried out as part of project implementation. I understand the breeding of mosquitoes in unlawful under the State of California Health and Safety Code Section 2060-2067. I will permit the Vector Surveillance and Control program to place adult mosquito monitors and to enforce this document as needed."

Refer to the sources below for additional guidance:

Report Guidance: http://www.sandiegocounty.gov/dplu/docs/Vector_Report_Formats.pdf

Department of Environmental Health Vector Control Program:
http://www.sandiegocounty.gov/deh/pests/vector_disease.html

It should be noted that other design factors may influence the required drawdown when hydromodification management BMPs are integrated with stormwater pollutant control BMPs. Since hydromodification flow control BMPs are designed based on continuous simulation modeling, which is based on a continuous rainfall record and analyzes a continuous inflow and outflow of the BMPs, inter-event drawdown time and availability of the BMP for subsequent event inflow has been accounted for in the sizing. Therefore, drawdown recommendations for hydromodification management are based on public safety, not availability of the BMP for the next inflow event. Stormwater pollutant control BMPs are designed on a single-event basis for a DCV (the 85th percentile storm event). Some of the design standards presented in Chapter 5 or Appendix B require that the pollutant control portion of the BMP drain within a specific time frame to ensure the pollutant control portion of the BMP is available for subsequent storm events. When

hydromodification management BMPs are integrated with stormwater pollutant control BMPs, the designer must evaluate drawdown time based on both standards.

6.4 In-Stream Rehabilitation

An alternative to onsite flow control for post-project runoff may be in-stream rehabilitation.

Project applicant may be allowed to participate in an in-stream rehabilitation project in lieu of implementing onsite flow control BMPs. Refer to section 1.8 to determine if this option is available in the project watershed.[13]

[13] The City of Encinitas does not currently have an Alternative Compliance Program.

Chapter 7

Long Term Operation & Maintenance

Permanent structural BMPs require on-going inspection and maintenance into perpetuity to preserve the intended pollution control and/or flow control performance.

This chapter addresses procedural requirements for implementation of a long term Stormwater Maintenance Agreement and an Operation & Maintenance (O&M) Plan. This chapter also explains the typical maintenance requirements of structural BMPs presented in the manual. Specific requirements for O&M Plans will be discussed in Chapter 8 with the Submittal Requirements.

7.1 Need for Permanent Inspection and Maintenance

7.1.1 MS4 Permit Requirements

The MS4 Permit requires that each Copermittee implement a program that requires and confirms structural BMPs on all PDPs are designed, constructed, and maintained to remove pollutants in stormwater to the MEP.

Routine inspection and maintenance of BMPs will preserve the design and MS4 Permit objective to remove pollutants in stormwater to the MEP. The MS4 Permit requirement specifically applies to PDP structural BMPs; however, poor maintenance of source control, site design, or LID BMPs can lead to clogging or failure of structural BMPs due to greater delivery of runoff and pollutants than intended. Therefore, the City Engineer may also confirmation of maintenance of source control BMPs and site design / LID BMPs as part of the PDP structural BMP maintenance documentation requirements, as applicable (see Section 7.4).

7.1.2 Practical Considerations

Why do permanent structural BMPs require on-going inspection and maintenance into perpetuity?

By design, structural BMPs will trap pollutants transported by stormwater. Structural BMPs are subject to deposition of solids such as sediment, trash, pollutants, and other debris as well as to vegetation overgrowth. All components of the BMP, including both the surface and any sub-surface components, must be properly maintained to ensure ongoing pollutant capture capacity and to prevent flooding, standing water, and associated vector issues.

Vegetated structural BMPs, including vegetated infiltration or partial infiltration BMPs, and above-

ground detention basins, also require routine maintenance so that they don't inadvertently become wetlands, waters of the state, or sensitive species habitat under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and Wildlife Service. A structural BMP that is constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. Proper placement and routine maintenance of structural BMPs are key to preventing this scenario and the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP.

7.2 Summary of Steps to Maintenance Agreement

Ownership and maintenance responsibility for structural BMPs should be discussed at the beginning of project planning, typically at the pre-application meeting with the planning and zoning agency.

Structuring provisions to finance and implement maintenance of BMPs can be a major stumbling block to project approval. A maintenance agreement must be completed prior to the issuance of any construction, grading, building permit, site development permit, or any other applicable permit. The Operation and Maintenance plan is an attachment to the Stormwater Maintenance Agreement. Below are the typical steps and schedule for establishing a plan to ensure on-going maintenance of structural BMPs.

TABLE 7-1. Schedule for Developing O&M Plan and Agreement

Item	Description	Time Frame
1	Determine structural BMP ownership, party responsible for permanent O&M, and maintenance funding mechanism	Prior to first submittal of a project application – discuss with staff at pre-application meeting
2	Identify expected maintenance actions	First submittal of a project application – identify in SWQMP
3	Develop detailed O&M Plan and submit to City for review and approval.	Prior to issuance of construction, grading, building, site development, or other applicable permits
4	Prepare and record a Stormwater Maintenance Agreement (legal agreement to be recorded against the property by the County Recorder) with the O&M Plan attached.	Prior to issuance of permit and/or recordation of parcel/final map.
5	Upon completion of construction, at the discretion of the City Engineer, the Stormwater Maintenance Agreement may be revised and rerecorded if conditions warrant.	Prior to final and release of securities.

7.3 Maintenance Responsibility

The property owner is responsible for the maintenance of the permanent structural BMPs into perpetuity.

The property owner is responsible to ensure inspection and O&M of permanent structural BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district. When property ownership changes (i.e. the property is sold or otherwise transferred to a new owner), maintenance responsibility runs with the land and automatically transfers to the new owner. For structural BMPs that will be transferred to an agency, community facilities district, homeowners association, property owners association, or other special district, there may be an interim period during which the property owner is responsible until maintenance responsibility is formally transferred.

In the City of Encinitas, a Stormwater Maintenance Agreement must be prepared for all PDPs. The Stormwater Maintenance Agreement and attached O&M Plan must document the following:

- Property ownership and maintenance responsibility,
- Transfer of ownership/maintenance responsibility upon sale of the property,
- Structural BMPs that were installed per plan, and
- Required maintenance activities and frequency.

The Stormwater Maintenance Agreement is a legal agreement to be recorded against the property by the County Recorder. The City of Encinitas maintains four different maintenance agreement templates, depending on the property ownership arrangement. The four types of maintenance agreements include:

- Agreement for Maintenance by a Homeowner
- Agreement for Maintenance by a Homeowners' Association
- Agreement for Maintenance by an Agent
- Agreement for Maintenance by an Agent of a Commercial Facility

7.4 Long-Term Maintenance Documentation

As part of on-going structural BMP maintenance into perpetuity, property owners are required to provide documentation of maintenance for the structural BMPs on their property on an annual basis to support the Copermittees' reporting requirements to the SDRWQCB.

The MS4 Permit requires each Copermittee to verify that structural BMPs on each PDP "are adequately maintained, and continue to operate effectively to remove pollutants in stormwater to the MEP through inspections, self-certifications, surveys, or other equally effective approaches."

Based on these MS4 Permit requirements, the City Engineer requires that all permanent structural BMPs installed at PDPs be inspected by the property owner and maintained as

necessary. Inspection and proper maintenance of all permanent structural BMPs shall be verified annually by the party responsible for maintenance. The City sends annual reminder letters to the responsible party for each site in the City's PDP inventory. Annual verification documentation can conveniently be submitted via a specially designed City website, http://cleanwaterbmp.cityofencinitas.org/. Maintenance verification submitted via email, mail or in person are also accepted.

In addition to the mandatory annual self-verifications, the City conducts inspections of all permanent structural BMPs at the PDP site to verify that each BMP is working, being maintained properly, and is in compliance with all applicable City ordinances and permits. Inspection frequencies vary with the established project inspection priority. Table 4-3 below presents structural BMP priorities and their corresponding inspection frequencies. For instance, all PDPs designated as High priority for inspection, as determined in Section 4.5.2, are inspected by City staff on an annual basis prior to October 1.

Table 7-2. Permanent BMP Maintenance Verification and Inspection Requirements

Project Inspection Priority	Maintenance Verification	Inspection Frequency
High	Required from all projects annually	100% inspected annually by City staff prior to the start of the rainy season (October 1)
Low	Required from all projects annually	Inspected by City staff if verification documentation is not provided or is not adequate.

7.5 Inspection and Maintenance Frequency

How often is a property owner required to inspect and maintain permanent structural BMPs on their property?

The minimum inspection and maintenance frequency is once per year, reported annually. However, maintenance needs depend on the amount and quality of runoff delivered to the structural BMP, and annual maintenance is not always sufficient. Maintenance must be performed each time the maintenance threshold for removal of materials (sediment, trash, debris or overgrown vegetation) is met; maintenance indicators are presented in Section 7.7. If the annual inspection reveals that the maintenance threshold has already been exceeded, then the structural BMP has been operating at a reduced capacity; more frequent inspections and maintenance will be necessary in the future to avoid expensive rehabilitation of such inadequately maintained BMPs.

During the first year of normal operation of a structural BMP (i.e. when the project is fully built out and occupied), inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during and after a storm event is also recommended to verify proper BMP function. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined, based on the results of the first year inspections.

7.6 Measures to Control Maintenance Costs

Because structural BMPs must be maintained into perpetuity, it is essential to include measures to control maintenance costs.

The most effective way to reduce maintenance of structural BMPs is to reduce the pollutants they receive by implementing source control and site design BMPs onsite, as required and described in Chapter 4. In addition, structural BMPs should include design features to facilitate maintenance, as listed below.

Considerations for placement of vegetated BMPs:

- Locate structural BMPs outside of floodway, floodplain, and other jurisdictional areas.
- Avoid direct connection to a natural surface water body.
- Discuss the location of the structural BMP with a wetland biologist to avoid placing a structural BMP in a location where it could become a jurisdictional wetland or be connected to a jurisdictional wetland area.

Measures to facilitate collection of the trapped pollutants:

- Design a forebay to trap gross pollutants in a contained area that is readily accessible for maintenance. A forebay may be a dedicated area at the inlet entrance to an infiltration BMP, biofiltration BMP, or detention basin, or may be a gross pollutant separator installed in the storm drain system that drains to the primary structural BMP.

Measures to access the structural BMP:

- The BMP must be accessible to equipment needed for maintenance. Access requirements for maintenance will vary with the type of facility selected.
- Infiltration BMPs and biofiltration BMPs typically require routine landscape maintenance using the same equipment that is used for general landscape maintenance. At times these BMPs may require excavation of clogged media (e.g. bioretention soil media, or sand for the sand filter), and should be accessible to appropriate equipment for excavation and removal/replacement of media.
- Above-ground detention basins should include access ramps for trucks to enter the basin to bring equipment and to remove materials.
- Underground BMPs such as detention vaults, media filters, or gross pollutant separators used as forebays to other BMPs, typically require access for a vactor truck to remove materials. Proprietary BMPs such as media filters or gross pollutant separators may require access by a forklift or other truck for delivery and removal of media cartridges or other internal components. Access requirements must be verified with the manufacturer of proprietary BMPs.
- Vactor trucks are large, heavy, and difficult to maneuver. Structural BMPs that are maintained by vactor truck must include a level pad adjacent to the structural BMP, preferably with no vegetation or irrigation system (otherwise vegetation or irrigation system may be destroyed by the vactor truck).
- The sump area of a structural BMP should not exceed 20 feet in depth due to the loss of efficiency of a vactor truck. The water removal rate is three to four times longer when the depth

is greater than 20 feet. Deep structures may require additional equipment (stronger vactor trucks, ladders, more vactor pipe segments).

- All manhole access points to underground structural BMPs must include a ladder or steps.

Measures to facilitate inspection of the structural BMP:

- Structural BMPs shall include inspection ports for observing all underground components that require inspection and maintenance.
- Silt level posts or other markings shall be included in all BMP components that will trap and store sediment, trash, and/or debris, so that the inspector may determine how full the BMP is, and the maintenance personnel may determine where the bottom of the BMP is. Posts or other markings shall be indicated and described on structural BMP plans.
- Vegetation requirements including plant type, coverage, and minimum height when applicable shall be provided on the structural BMP and/or landscaping plans as appropriate or as required by the City Engineer.
- Signage indicating the location and boundary of the structural BMP is recommended.

When designing a structural BMP, the engineer should review the typical structural BMP maintenance actions listed in Section 7.7 to determine the potential maintenance equipment and access needs.

When selecting permanent structural BMPs for a project, the engineer and project owner should consider the long term cost of maintenance and what type of maintenance contracts a future property owner, homeowners association or property owners association will need to manage. The types of materials used (e.g. proprietary vs. non-proprietary parts), equipment used (e.g. landscape equipment vs. vactor truck), actions/labor expected in the maintenance process and required qualifications of maintenance personnel (e.g. confined space entry) affect the cost of long term O&M of the structural BMPs.

7.7 Maintenance Indicators and Actions for Structural BMPs

This section presents typical maintenance indicators and routine and corrective maintenance actions for typical structural BMPs.

Structural BMPs are grouped into four categories based on common maintenance requirements:

- Vegetated infiltration or filtration BMPs
- Non-vegetated infiltration BMPs
- Non-vegetated filtration BMPs
- Detention BMPs

The components of the structural BMP will determine its maintenance category and therefore the applicable maintenance indicators. Maintenance indicators and actions shall be shown in the project-specific O&M Plan.

During inspection, the inspector checks the maintenance indicators. If one or more thresholds are met or exceeded, maintenance must be performed to ensure the structural BMP will function as designed during the next storm event. At a minimum, maintenance shall be performed once annually.

7.7.1 Maintenance of Vegetated Infiltration or Filtration BMPs

"Vegetated infiltration or filtration BMPs" are BMPs that include vegetation as a component of the BMP. Applicable Fact Sheets may include INF-2 (bioretention), PR-1 (biofiltration with partial retention), BF-1 (biofiltration) or FT-1 (vegetated swale). The vegetated BMP may or may not include amended soils, subsurface gravel layer, underdrain, and/or impermeable liner. Maintenance indicators and associated actions for vegetated infiltration and filtration BMPs are presented below.

TABLE 7-3. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans. Evaluate proper functioning of irrigation system, if applicable.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas. If necessary, perform minor re-grading to restore proper drainage according to the original plan. Adjust the irrigation system to prevent further erosion.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading, to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, clearing any underdrains, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as appropriate.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

7.7.2 Maintenance of Non-Vegetated Infiltration BMPs

"Non-vegetated infiltration BMPs" are BMPs that store stormwater runoff until it infiltrates into the ground, and do not include vegetation as a component of the BMP (refer to the "vegetated BMPs" category for infiltration BMPs that include vegetation). Non-vegetated infiltration BMPs generally include non-vegetated infiltration trenches and infiltration basins, dry wells, underground infiltration galleries, and permeable pavement with underground infiltration gallery. Applicable Fact Sheets may include INF-1 (infiltration basin) or INF-3 (permeable pavement). The non-vegetated infiltration BMP may or may not include a pre-treatment device, and may or may not include above-ground storage of runoff. Maintenance indicators and associated actions for non-vegetated infiltration BMPs are presented below.

TABLE 7-4. Maintenance Indicators and Actions for Non-Vegetated Infiltration BMPs

Typical Maintenance Indicator(s) for Non-Vegetated Infiltration BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris in infiltration basin, pre-treatment device, or on permeable pavement surface	Remove and properly dispose accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Standing water in infiltration basin without subsurface infiltration gallery for longer than 96 hours following a storm event	Remove and replace clogged surface soils.

Standing water in subsurface infiltration gallery for longer than 96 hours following a storm event	This condition requires investigation of why infiltration is not occurring. If feasible, corrective action shall be taken to restore infiltration (e.g. flush fine sediment or remove and replace clogged soils). BMP may require retrofit if infiltration cannot be restored. If retrofit is necessary, the City Engineer shall be contacted prior to any repairs or reconstruction.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel. Provide routine vacuuming of permeable paving areas to prevent clogging.
Damage to permeable paving surface	Repair or replace damaged surface as appropriate.

7.7.3 Maintenance of Non-Vegetated Filtration BMPs

"Non-vegetated filtration BMPs" include media filters (FT-2). These BMPs function by passing runoff through the media to remove pollutants. Maintenance indicators and associated actions for non-vegetated filtration BMPs are presented below.

TABLE 7-5. Maintenance Indicators and Actions for Filtration BMPs

Typical Maintenance Indicator(s) for Filtration BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Obstructed inlet or outlet structure	Clear obstructions.
Clogged filter media	Remove and properly dispose of filter media, and replace with fresh media.
Damage to components of the filtration system	Repair or replace as appropriate.
Note: For proprietary media filters, refer to the manufacturer's maintenance guide.	

7.7.4 Maintenance of Detention BMPs

"Detention BMPs" include basins, cisterns, vaults, and underground galleries that are primarily designed to store runoff for controlled release to downstream systems. For the purpose of the maintenance discussion, this category does not include an infiltration component (refer to "vegetated infiltration or filtration BMPs" or "non-vegetated infiltration BMPs" above). Applicable Fact Sheets may include HU-1 (cistern) or FT-4 (extended detention basin). Maintenance indicators and associated actions for detention BMPs are presented below.

TABLE 7-6. Maintenance Indicators and Actions for Detention BMPs

Typical Maintenance Indicator(s) for Detention Basins	Maintenance Actions
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans. Evaluate proper functioning of irrigation system, if applicable.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of

	the vegetation per original plans when applicable (e.g. effective function may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas. If necessary, perform minor re-grading to restore proper drainage according to the original plan. Adjust the irrigation system to prevent further erosion.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed/re-plant eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction.
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Standing water	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as appropriate.

Chapter 8

Submittal Requirements

The City Engineer will review project plans for compliance with applicable requirements of this manual and the MS4 Permit.

The review process must verify that stormwater management objectives were considered in the project planning process and that opportunities to incorporate BMPs have been identified. The review process must confirm the site plan, landscape plan, and project stormwater documents are congruent. Therefore, the City of Encinitas requires a submittal documenting the stormwater management design for every project that is subject to the requirements of this manual. Herein the submittal is called a Stormwater Quality Management Plan (SWQMP). A complete and thorough project submittal will facilitate and expedite the review and approval, and may result in fewer submittals by the applicant. The sections below discuss submittal requirements. The project applicant must provide sufficient documentation to demonstrate that applicable requirements of this manual and the MS4 Permit will be met.

8.1 Submittal Requirement for Standard Projects

8.1.1 Standard Project SWQMP

For Standard Projects, the project submittal shall include a "Standard Project SWQMP."

The Standard Project SWQMP is a compilation of checklists that document that all permanent source control and site design BMPs have been considered for the project and implemented where feasible. All applicable features shall be shown on site plans and landscaping plans. The Standard Project SWQMP shall consist of the following forms and/or checklists included in Appendix I of this manual:

- Form I-1: Applicability of Permanent BMP Requirements
- Form I-2: Project Type Determination (Standard Project or PDP)
- Form I-3A: Site Information for Standard Projects
- Form I-4: Source Control BMP Checklist
- Form I-5: Site Design BMP Checklist

The Standard Project SWQMP shall also include copies of the relevant plan sheets showing source control and site design BMPs.

8.2 Submittal Requirements for PDPs

8.2.1 PDP SWQMP

For PDPs, the project submittal shall include a "PDP SWQMP."

The PDP SWQMP shall document that all permanent source control and site design BMPs have been considered for the project and implemented where feasible; document the planning process and the decisions that led to the selection of structural BMPs; provide the calculations for design of structural BMPs to demonstrate that applicable performance standards are met by the structural BMP design; identify O&M requirements of the selected structural BMPs; and identify the maintenance mechanism (see Sections 7.2 and 7.3) for long term O&M of structural BMPs. PDPs shall use the PDP SWQMP Template provided in Appendix A, which will include forms and/or checklists included in Appendix I of this manual as well as checklists for documentation of pollutant control and hydromodification management structural BMP design. The PDP SWQMP shall include copies of the relevant plan sheets showing site design, source control, and structural BMPs, and structural BMP maintenance requirements.

A PDP SWQMP must be provided with the first submittal of a project application, including all backup documentation. If a project's stormwater treatment design relies on continuous simulation modeling or a SCCWRP channel assessment, the corresponding reports must be included with the first project submittal.

Stormwater requirements will directly affect the layout of the project. Stormwater requirements must be considered from the initial project planning or in project concept stage, and will be reviewed upon each submittal, beginning with the first submittal. The process from initial project application through approval of the project plans often includes design changes to the site layout and features. Changes may be driven by stormwater management requirements or other site requirements. Each time the site layout is adjusted, whether the adjustment is directly due to stormwater management requirements identified during the City Engineer's review of the stormwater submittal, or is driven by other site requirements, the stormwater management design must be revisited to ensure the revised project layout and features meet the requirements of this manual and the MS4 Permit. An updated PDP SWQMP must be provided with each submittal of revised project plans. The updated PDP SWQMP should include documentation of changes to the site layout and features, and reasons for the changes. In the event that other site requirements identified during plan review render certain proposed stormwater features infeasible (e.g. if fire department access requirements were identified that precluded use of certain surfaces or landscaping features that had been proposed), this must be documented as part of the decisions that led to the development of the final stormwater management design.

8.2.1.1 PDP O&M Plan

While the PDP SWQMP must include general O&M requirements for structural BMPs, the PDP SWQMP may not be the final O&M Plan.

The O&M requirements documented in the PDP SWQMP must be sufficient to show that O&M requirements have been considered in the project planning and design. However, a final O&M Plan should reflect actual constructed structural BMPs to be maintained. Photographs and as-built plans

for the constructed structural BMPs should be included. See Section 8.2.3 for project closeout procedures including local requirements for final O&M Plans, and Section 8.2.4 for additional requirements for private entity O&M of structural BMPs.

8.2.2 Requirements for Construction Plans

8.2.2.1 BMP Identification and Display on Construction Plans

Plans for construction of the project (grading plans, improvement plans, and landscaping plans, as applicable) must show all permanent site design, source control, and structural BMPs, and must be congruent with the PDP SWQMP.

8.2.2.2 Structural BMP Maintenance Information on Construction Plans

Plans for construction of the project must provide applicable detail to support maintenance activities for structural BMPs.

For the purpose of long term O&M, the project plans must identify the following:

- How to access the structural BMP to inspect and perform maintenance;
- Features that are provided to facilitate inspection (e.g. observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds);
- Manufacturer and part number for proprietary parts;

8.2.3 Design Changes During Construction and Project Closeout Procedures

8.2.3.1 Design Changes During Construction

Prior to occupancy and/or intended use of any portion of a PDP, the site must be in compliance with the requirements of this manual and the MS4 Permit.

During construction, any changes that affect the design of stormwater management features must be reviewed and approved by the City Engineer prior to implementation of any changes during construction. This might include changes to drainage patterns that occurred based on actual site grading and construction of stormwater conveyance structures or modifications to stormwater management features. The proposed changes will be reviewed to ensure the revised project layout and features meet the requirements of this manual and the MS4 Permit.

8.2.3.2 Certification of Constructed Structural BMPs

As part of the "Structural BMP Approval and Verification Process" required by the MS4 Permit, each structural BMP must be inspected by the City inspector and the project owner's engineer to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of the MS4 Permit.

The City inspector for the project will require the project owner's engineer to inspect and provide certification that the site improvements for the project have been constructed in conformance with

the approved stormwater management documents and drawings. A note stating this requirement must be placed on project plans.

Since some portions of the structural BMP will not be readily visible after completion of construction (e.g. subsurface layers), the City Engineer will require inspections at each significant phase of construction, photographs taken during construction, and certification by the project owner's engineer that the BMP has been constructed in conformance with the approved plans. The City Engineer may require forms or other documentation be submitted prior to the City inspection in order to facilitate the structural BMP inspection. Specific requirements for this process during construction may vary by project. Typical documentation that may be required includes: certified engineered soil specification, proprietary BMP activation report, proof of washed rock size install, etc.

8.2.4 Final O&M Plan

If any approved construction changes will result in modifications to O&M procedures, the City Engineer will require a revised final O&M Plan to be submitted.

A final O&M Plan shall reflect project-specific constructed structural BMPs with project-specific drawings, photographs, and maps, and identify specific maintenance requirements and actions for the constructed structural BMPs. Project bonds will not be released until the final O&M Plan is submitted and approved. Additional Requirements for Private Entity O&M

This section discusses private structural BMPs to be operated and maintained on private property by the property owner or manager.

8.2.4.1 Agreements for Private Structural BMP Maintenance

For privately owned and operated structural BMPs, the local jurisdiction requires execution of a Stormwater BMP Maintenance Agreement.

A Stormwater BMP Maintenance Agreement is a recorded document signed by the property owner committing the property owner and any future property owners to maintain the permanent structural BMPs into perpetuity. Prior to final approval of the project a BMP maintenance agreement will have been required to be recorded. If any approved construction changes will result in modifications to structural BMPs or O&M procedures, the City Engineer may require an updated BMP Maintenance agreement to be recorded with the County Recorder.

8.2.4.2 Interim Security Period of Maintenance Funding for Private Structural BMP Maintenance

At the discretion of the City Engineer, an interim security period of maintenance funding may be required. Prior to project final and security release, the developer shall notify the City of the person or party responsible for long-term BMP maintenance. The following information must be provided to the City, including:

- HOA Name
- Property Management Company Name
- Contact Person
- Mailing Address

- Phone Number
- Email

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ENGINEERING DESIGN MANUAL
CHAPTER 7: BMP DESIGN MANUAL

APPENDICES

ADOPTED JANUARY 27, 2016
EFFECTIVE FEBRUARY 16, 2016

RESOLUTION 2016-17

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS, CALIFORNIA, APPROVING THE BEST MANAGEMENT PRACTICES (BMP) DESIGN MANUAL FOR PERMANENT SITE DESIGN, STORMWATER TREATMENT AND HYDROMODIFICATION MANAGEMENT

WHEREAS, on May 8, 2013, the San Diego Regional Water Quality Control Board (RWQCB) issued NPDES Order No. R9-2013-0001 (2013 Municipal Stormwater Permit), which includes requirements in addition to those that were imposed on the Copermittees, including the City of Encinitas, in NPDES Permit No. R9-2007-001;

WHEREAS, Provision E.3.d of the 2013 Municipal Stormwater Permit requires the City of Encinitas to update its BMP Design Manual;

WHEREAS, per Resolution 2010-18, the City of Encinitas approved the City of Encinitas Stormwater Manual as required by NPDES Order No. 2007-0001 and is the City's current BMP Design Manual;

WHEREAS, The "Model BMP Design Manual - San Diego Region" was approved by the RWQCB on May 29, 2015;

WHEREAS, the approved City of Encinitas BMP Design Manual will replace the existing Encinitas Stormwater Manual in Chapter 7 of the Engineering Design Manual, satisfying the Provision E.3.d of the 2013 Municipal Stormwater Permit;

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Encinitas does hereby approve the City of Encinitas Best Management Practices Design Manual as Chapter 7 of the Engineering Design Manual effective February 16, 2016;

PASSED AND ADOPTED by the City Council of the City of Encinitas at a regular meeting thereof, held on the 27th day of January, 2016, by the following vote to wit:

AYES: Blakespear, Gaspar, Kranz, Muir, Shaffer.
NAYS: None.
ABSENT: None.
ABSTAIN: None.

Kristin Gaspar, Mayor

ATTEST:

Kathy Hollywood, City Clerk

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Appendix

A

Submittal Templates

The following templates were developed to assist the project applicant and the plan reviewer:

- Standard SWQMP
- PDP SWQMP

A.1 Standard SWQMP

City of Encinitas Standard Project SWQMP
(Stormwater Intake Form for All Development Projects)

Project Identification		
Project/Applicant Name:		
Permit/Application Number:		Date:
Scope of work/project description:		
Determination of Project Status and Requirements		
This form will identify permanent, post construction BMP requirements. Refer to City of Encinitas Stormwater BMP Design Manual for guidance.		
Step 1: Is the project a "development project"? Development projects are defined as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects". See Section 1.3 and Table 1-2 of the manual for guidance. For example, interior remodels, roof replacements, electrical and plumbing are not development projects.	☐ Yes	***Go to Step 2.***
	☐ No	***Stop.*** Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
If "No", provide discussion / justification explaining why the project is not a "development project":		

Step 2: Complete questions below for Project Type Determination.

The project is (select one): ☐ New Development ☐ Redevelopment

The total proposed, newly created and/or replaced impervious area is: _____ ft^2

Is the project in any of the following categories, (a) through (f) below?

Yes	No		
☐	☐	(a)	New development projects or redevelopment projects that create and/or replaced 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects.
☐	☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects.
☐	☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

			(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes □	No □	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area (ESA). "Discharge directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.
Yes □	No □	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes □	No □	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

□ Yes – **The project is a <u>Priority Development Project</u>, the applicant shall provide PDP Post Construction BMPs and provide a PDP SWQMP.** ***Stop here and complete PDP SWQMP.***

□ No – Does the project propose <u>500 SF</u> or more of new and/or replaced impervious surface area?

- □ Yes – **The project is a <u>Standard Project</u>, the applicant shall implement Structural Post Construction BMPs, site design, and source control BMPs.** ***Complete Step 3, 4, & 5.***
- □ No – **The project is a <u>Basic Project</u>, the applicant shall implement site design and source control measures.** ***Complete Step 3 & 4.***

Step 3: Source Control BMP Checklist – All "Development Projects" Must Complete

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	□ Yes	□ No	□ N/A
SC-2 Storm Drain Stenciling or Signage	□ Yes	□ No	□ N/A
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-6 Additional BMPs Based on Potential Sources of Pollutants Answer for each source listed below:			
□ Onsite storm drain inlets	□ Yes	□ No	□ N/A
□ Interior floor drains and elevator shaft sump pumps drain to sewer	□ Yes	□ No	□ N/A
□ Interior parking garages drain to sewer	□ Yes	□ No	□ N/A
□ Need for future indoor & structural pest control	□ Yes	□ No	□ N/A
□ Landscape/outdoor pesticide use	□ Yes	□ No	□ N/A
□ Pools, spas, ponds, decorative fountains, and other water features	□ Yes	□ No	□ N/A
□ Food service	□ Yes	□ No	□ N/A
□ Refuse/Trash areas must be covered	□ Yes	□ No	□ N/A
□ Industrial processes	□ Yes	□ No	□ N/A
□ Outdoor storage of equipment or materials must be covered	□ Yes	□ No	□ N/A
□ Vehicle and equipment cleaning	□ Yes	□ No	□ N/A
□ Vehicle/equipment repair and maintenance	□ Yes	□ No	□ N/A
□ Fuel dispensing areas	□ Yes	□ No	□ N/A
□ Loading docks	□ Yes	□ No	□ N/A
□ Fire sprinkler test water	□ Yes	□ No	□ N/A
□ Miscellaneous drain or wash water	□ Yes	□ No	□ N/A
□ Plazas, sidewalks, and parking lots	□ Yes	□ No	□ N/A

Discussion / justification if SC-1 through SC-6 not implemented. Justification must be provided for ALL "No" answers shown above.

Step 4: Site Design BMP Checklist – All "Development Projects" Must Complete

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	□ Yes	□ No	□ N/A
SD-2 Conserve Natural Areas, Soils, and Vegetation	□ Yes	□ No	□ N/A
SD-3 Minimize Impervious Area	□ Yes	□ No	□ N/A
SD-4 Minimize Soil Compaction	□ Yes	□ No	□ N/A
SD-5 Impervious Area Dispersion - Directly Connected Impervious Areas (e.g. roof downspouts connected to street) are not allowed	□ Yes	□ No	□ N/A
SD-6 Runoff Collection	□ Yes	□ No	□ N/A
SD-7 Landscaping with Native or Drought Tolerant Species	□ Yes	□ No	□ N/A
SD-8 Harvesting and Using Precipitation	□ Yes	□ No	□ N/A

Discussion / justification if SD-1 through SD-8 not implemented. Justification must be provided for ALL "No" answers shown above.

Step 5: Standard Project BMP Sizing for ≥500sf New/Replaced Impervious Surface Areas

Projects that create and/or remove and replace 500sf or greater of impervious surface collectively over the entire project site shall provide natural biofiltration and/or bioretention BMPs. The applicant may use the Design Capture Volume method (attach calculations hereon; see Appendix B of BMP Design Manual), or may utilize the following calculation:

_____ _____

MINIMUM EFFECTIVE BMP AREA = 0.03 x Σ (Surface Type SF X Surface Type Runoff Factor)

Describe the selected Structural BMP Design including type, location, size, etc. below:

A.2 PDP SWQMP

CITY OF ENCINITAS
STORMWATER INTAKE FORM AND PRIORITY DEVELOPMENT PROJECT STORMWATER QUALITY MANAGEMENT PLAN (SWQMP)

FOR:
[PROJECT NAME]
[APPLICATION/PERMIT NUMBER(S)]

[SITE ADDRESS]
[ENCINITAS, CA 92024]
[APN]

PREPARED BY:
[NAME OF ENGINEER OF RECORD]
[ENGINEERING FIRM]
[ADDRESS]
[CITY, STATE, ZIP]
[PHONE NUMBER]

PREPARED FOR:
[APPLICANT/OWNER]
[ADDRESS]
[CITY, STATE, ZIP]
[PHONE NUMBER]

DATE OF SWQMP:
[MM/DD/YY]
[REVISION #]

GRADING PLAN PREPARED BY:
[NAME OF ENGINEER OF RECORD]
[ENGINEERING FIRM]
[ADDRESS]
[CITY, STATE, ZIP]
[PHONE NUMBER]

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PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the Priority Development Project (PDP) requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP Storm Water Quality Management Plan (SWQMP) has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Engineer's Seal

_____

Engineer of Work's Signature, PE Number

_____

Print Name

_____

Company

_____

Date

PROJECT OWNER'S CERTIFICATION

This PDP SWQMP has been prepared for [INSERT PROJECT OWNER'S COMPANY NAME] by [INSERT SWQMP PREPARER'S COMPANY NAME]. The PDP SWQMP is intended to comply with the PDP requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

_____

Project Owner's Signature

_____

Print Name

_____

Company

_____

Date

SUBMITTAL RECORD

Use this table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In the fourth column, summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1		□ Preliminary Design / Planning/ CEQA □ Final Design	Initial Submittal
2		□ Preliminary Design / Planning/ CEQA □ Final Design	
3		□ Preliminary Design / Planning/ CEQA □ Final Design	
4		□ Preliminary Design / Planning/ CEQA □ Final Design	

PROJECT IDENTIFICATION

Project/Applicant Name:	
Permit/Application Number:	Date:
Site Address:	APN:
Scope of work/project description:	

DETERMINATION OF PROJECT STATUS AND REQUIREMENTS

This form will identify permanent, post construction BMP requirements. Refer to City of Encinitas Stormwater BMP Design Manual for guidance.

Step 1: Is the project a "development project"? Development projects are defined as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects". See Section 1.3 and Table 1-2 of the manual for guidance. For example, interior remodels, roof replacements, and electrical and plumbing work are not development projects.	□ Yes	***Go to Step 2.***
	□ No	***Stop.*** Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.

If "No", provide discussion / justification explaining why the project is not a "development project":

Step 2: Complete questions below for Project Type Determination.

The project is (select one): □New Development □ Redevelopment

The total proposed, newly created and/or replaced impervious area is: _____ ft^2

Is the project in any of the following categories, (a) through (f) below?

Yes □	No □	(a)	New development projects or redevelopment projects that create and/or replaced 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects.
Yes □	No □	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects.
Yes □	No □	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate

			consumption (SIC code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes □	No □	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area (ESA). "Discharge directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.
Yes □	No □	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (iii) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (iv) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes □	No □	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*
Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above? □ Yes – **The project is a Priority Development Project, the applicant shall provide PDP Post Construction BMPs and *continue to Step 3*.** □No – **The project is a Standard or Basic Project. *Stop here and complete the "City of Encinitas Stormwater Intake Form for All Developments and Standard Projects SWQMP".***			
The following is for *redevelopment PDPs* only: The area of existing (pre-project) impervious area at the project site is: _____ ft^2 (A) The total proposed newly created or replaced impervious area is: _____ ft^2 (B) Percent impervious surface created or replaced (B/A)*100: _____% The percent impervious surface created or replaced is (select one based on the above calculation): □ Less than or equal to fifty percent (50%) – only new and/or replaced impervious areas are considered PDP subject to treatment and HMP criteria OR □ Greater than fifty percent (50%) – the entire site is a PDP; treatment and HMP criteria apply to entire site regardless of whether it is replaced			

Step 3 (PDPs only): Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual for guidance.	□ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). ***Go to Step 4.***
	□ No	PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below. ***Go to "Site Information Checklist"***
Discussion / justification if hydromodification control requirements do not apply:		
Step 4 (PDPs subject to treatment and hydromodification controls): Does protection of critical coarse sediment yield areas apply based on review of the City of Encinitas Potential Critical Coarse Sediment Yield Area Map? See Section 6.2 of the BMP Design Manual for guidance.	□ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). ***Go to "Site Information Checklist"***
	□ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. ***Go to "Site Information Checklist"***
Discussion / justification if management measures not required for protection of critical coarse sediment yield areas:		

SITE INFORMATION CHECKLIST

Project's Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
Parcel Area (Total area of Assessor's Parcel(s) associated with the project)	_____ Acres (_____ Square Feet)
Area to be Disturbed by the Project (Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Impervious Area (Subset of Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Pervious Area (Subset of Project Area)	_____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	
Description of Existing Site Condition	
Current status of the site (select all that apply): □ Existing development □ Previously graded but not built out □ Demolition completed without new construction □ Agricultural or other non-impervious use □ Vacant, undeveloped/natural Description / Additional Information:	
Existing Land Cover includes (select all that apply): □ Vegetative Cover □ Non-Vegetated Pervious Areas □ Impervious Areas Description / Additional Information:	
Underlying soil belongs to Hydrologic Soil Group (select all that apply): □ NRCS Type A □ NRCS Type B □ NRCS Type C □ NRCS Type D	

Approximate Depth to Groundwater (GW):
□ GW Depth < 5 feet
□ 5 feet < GW Depth < 10 feet
□ 10 feet < GW Depth < 20 feet
□ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):
□ Watercourses
□ Seeps
□ Springs
□ Wetlands
□ None

Description / Additional Information:

Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1) Is existing drainage conveyance natural or urban?
2) Is runoff from offsite conveyed through the site? If yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site.
3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels. And
4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
List/describe proposed pervious features of the project (e.g., landscape areas):
Does the project include grading and changes to site topography? □ Yes □ No Description / Additional Information:

Description of Proposed Site Drainage Patterns
Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? □ Yes □ No If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations. Describe proposed site drainage patterns:

Identification and Narrative of Receiving Water and Pollutants of Concern
Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant

Identification of Project Site Pollutants*

***Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)**

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Expected from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)? ☐ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

*This section only required if hydromodification management requirements apply

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

- Yes
- No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the BMP Design Manual been performed?

- 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite
- 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
- 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
- No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what was the final result?

- No critical coarse sediment yield areas to be protected based on verification of GLUs onsite
- Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 2.b of the SWQMP.
- Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Flow Control for Post-Project Runoff* *This section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.
Has a geomorphic assessment been performed for the receiving channel(s)? □ No, the low flow threshold is 0.1Q2 (default low flow threshold) □ Yes, the result is low flow threshold 0.1Q2 □ Yes, the result is low flow threshold 0.3Q2 □ Yes, the result is low flow threshold 0.5Q2 If a geomorphic assessment has been performed, provide title, date, and preparer: Discussion / Additional Information: (optional)
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

SOURCE CONTROL BMP CHECKLIST

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	□ Yes	□ No	□ N/A
SC-2 Storm Drain Stenciling or Signage	□ Yes	□ No	□ N/A
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	□ Yes	□ No	□ N/A
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
□ Onsite storm drain inlets	□ Yes	□ No	□ N/A
□ Interior floor drains and elevator shaft sump pumps drain to sewer	□ Yes	□ No	□ N/A
□ Interior parking garages drain to sewer	□ Yes	□ No	□ N/A
□ Need for future indoor & structural pest control	□ Yes	□ No	□ N/A
□ Landscape/outdoor pesticide use	□ Yes	□ No	□ N/A
□ Pools, spas, ponds, decorative fountains, and other water features	□ Yes	□ No	□ N/A
□ Food service	□ Yes	□ No	□ N/A
□ Refuse/Trash areas must be covered	□ Yes	□ No	□ N/A
□ Industrial processes	□ Yes	□ No	□ N/A
□ Outdoor storage of equipment or materials must be covered	□ Yes	□ No	□ N/A
□ Vehicle and equipment cleaning	□ Yes	□ No	□ N/A
□ Vehicle/equipment repair and maintenance	□ Yes	□ No	□ N/A
□ Fuel dispensing areas	□ Yes	□ No	□ N/A
□ Loading docks	□ Yes	□ No	□ N/A
□ Fire sprinkler test water	□ Yes	□ No	□ N/A
□ Miscellaneous drain or wash water	□ Yes	□ No	□ N/A
□ Plazas, sidewalks, and parking lots	□ Yes	□ No	□ N/A

Discussion / justification if SC-1 through SC-6 not implemented. Justification must be provided for ALL "No" answers shown above.

SITE DESIGN BMP CHECKLIST

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	□ Yes	□ No	□ N/A
SD-2 Conserve Natural Areas, Soils, and Vegetation	□ Yes	□ No	□ N/A
SD-3 Minimize Impervious Area	□ Yes	□ No	□ N/A
SD-4 Minimize Soil Compaction	□ Yes	□ No	□ N/A
SD-5 Impervious Area Dispersion - Directly Connected Impervious Areas (e.g. roof downspouts connected to street) are not allowed	□ Yes	□ No	□ N/A
SD-6 Runoff Collection	□ Yes	□ No	□ N/A
SD-7 Landscaping with Native or Drought Tolerant Species	□ Yes	□ No	□ N/A
SD-8 Harvesting and Using Precipitation	□ Yes	□ No	□ N/A

Discussion / justification if SD-1 through SD-8 not implemented. Justification must be provided for ALL "No" answers shown above.

PDP STRUCTURAL BMPS

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity (see Section 7 of the BMP Design Manual). The local jurisdiction will confirm the maintenance annually.

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

STRUCTURAL BMP SUMMARY INFORMATION

Copy this page as necessary to provide information on each individual proposed structural BMP

Structural BMP ID No:	DMA No:
Construction Plan Sheet No:	
Type of structural BMP: □ Retention by harvest and use (HU-1) □ Retention by infiltration basin (INF-1) □ Retention by bioretention (INF-2) □ Retention by permeable pavement (INF-3) □ Partial retention by biofiltration with partial retention (PR-1) □ Biofiltration (BF-1) □ Biofiltration with Nutrient Sensitive Media Design (BF-2) □ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F □ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) □ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) □ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) □ Detention pond or vault for hydromodification management □ Other (describe in discussion section below)	
Purpose: □ Pollutant control only □ Hydromodification control only □ Combined pollutant control and hydromodification control □ Pre-treatment/forebay for another structural BMP □ Other (describe in discussion section below)	
Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	
Who will be the final owner of this BMP?	
Who will maintain this BMP into perpetuity?	
What is the funding mechanism for maintenance?	
Discussion (as needed):	

ATTACHMENT 1 - BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which items are included behind this cover sheet:

Attachment	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	□ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	□ Included on DMA Exhibit in Attachment 1a □ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	□ Included □ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	□ Included □ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	□ Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- ☐ Underlying hydrologic soil group
- ☐ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐ Critical coarse sediment yield areas to be protected
- ☐ Existing topography and impervious areas
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed demolition
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- ☐ Structural BMPs (identify location, type of BMP, and size/detail)

ATTACHMENT 2 - BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is not included because the project is exempt from PDP hydromodification management requirements.

Indicate which items are included behind this cover sheet:

Attachment	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☐ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☐ Not required because BMPs will drain in less than 96 hours

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- Underlying hydrologic soil group
- Approximate depth to groundwater
- Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- Critical coarse sediment yield areas to be protected
- Existing topography
- Existing and proposed site drainage network and connections to drainage offsite
- Proposed grading
- Proposed impervious features
- Proposed design features and surface treatments used to minimize imperviousness
- Point(s) of Compliance (POC) for Hydromodification Management
- Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

ATTACHMENT 3 - STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

Indicate which items are included behind this cover sheet:

Attachment	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	□ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	□ Included □ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

☐ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the City Engineer to obtain the current maintenance agreement forms).

ATTACHMENT 4 - COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- □ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- □ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- □ Details and specifications for construction of structural BMP(s)
- □ Signage indicating the location and boundary of structural BMP(s) as required by the [City Engineer]
- □ How to access the structural BMP(s) to inspect and perform maintenance
- □ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- □ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- □ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- □ Recommended equipment to perform maintenance
- □ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- □ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- □ All BMPs must be fully dimensioned on the plans
- □ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number shall be provided. Photocopies of general brochures are not acceptable.

Appendix

B

Stormwater Pollutant Control Hydrologic Calculations and Sizing Methods

February 2016

Appendix B Stormwater Pollutant Control Hydrologic Calculations and Sizing Methods

Table of Contents:

B.1. DCV

B.2. Adjustments to Account for Site Design BMPs

B.3. Harvest and Use BMPs

B.4. Infiltration BMPs

B.5. Biofiltration BMPs

B.6. Flow-Thru Treatment Control BMPs (for use with Alternative Compliance)

B.1 DCV

DCV is defined as the volume of stormwater runoff resulting from the 85th percentile, 24-hr storm event. The following hydrologic method shall be used to calculate the DCV:

$$DCV = C \times d \times A \times 43{,}560\ sf/ac \times 1/12\ in/ft$$

$$DCV = 3{,}630 \times C \times d \times A$$

Where:

DCV = Design Capture Volume in cubic feet

C = Runoff factor (unitless); refer to section B.1.1

d = 85th percentile, 24-hr storm event rainfall depth (inches), refer to section B.1.3

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingles with project runoff and drains to the BMP. Refer to Chapter 3, Section 3.3.3 for additional guidance. Street redevelopment projects consult section 1.4.3.

B.1.1 Runoff Factor

Estimate the area weighted runoff factor for the tributary area to the BMP using runoff factor (from Table B.1-1) and area of each surface type in the tributary area and the following equation:

$$C = \frac{\sum C_x A_x}{\sum A_x}$$

Where:

C_x = Runoff factor for area X

A_x = Tributary area X (acres)

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs[1]	0.90
Concrete or Asphalt[1]	0.90
Unit Pavers (grouted)[1]	0.90
Pervious Pavers (see section B.2.1.3)	0.10
Pervious Pavement (see section B.2.1.3)	0.10
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30

Surface	Runoff Factor
Amended, Mulched Soils or Landscape	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

1. Natural is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.

B.1.2 Offline BMPs

Diversion flow rates for offline BMPs shall be sized to convey the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of every storm event. The following hydrologic method shall be used to calculate the diversion flow rate for off-line BMPs:

$$Q = C \times i \times A$$

Where:

Q = Diversion flow rate in cubic feet per second

C = Runoff factor, area weighted estimate using Table B.1

i = Rainfall intensity of 0.2 in/hr

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drain to the BMP. Refer to Chapter 3, Section 3.3.3 for additional guidance. Street redevelopment projects also consult Section 1.4.3.

B.1.3 85th Percentile, 24-Hour Storm Event

The 85th percentile, 24-hour isopluvial map is provided as Figure B.1-1. The rainfall depth to estimate the DCV shall be determined using Figure B.1-1. The methodology used to develop this map is presented below:

B.1.3.1 Gage data and calculation of 85th percentile

The method of calculating the 85th percentile is to produce a list of values, order them from smallest to largest, and then pick the value that is 85 percent of the way through the list. Only values that are capable of producing run off are of interest for this purpose. Lacking a legislative definition of rainfall values capable of producing runoff, Flood Control staff in San Diego County have observed that the point at which significant runoff begins is rather subjective, and is affected by land use type and soil moisture. In highly-urbanized areas, the soil has a high impermeability and runoff

can begin with as little as 0.02" of rainfall. In rural areas, soil impermeability is significantly lower and even 0.30" of rain on dry soil will frequently not produce significant runoff. For this reason, San Diego County has chosen to use the more objective method of including all non-zero 24-hour rainfall totals when calculating the 85th percentile. To produce a statistically significant number, only stations with 30 years or greater of daily rainfall records are used.

B.1.3.2 Mapping the gage data

A collection of 56 precipitation gage points was developed with 85th percentile precipitation values based on multiple years of gage data. A raster surface (grid of cells with values) was interpolated from that set of points. The surface initially did not cover the County's entire jurisdiction. A total of 13 dummy points were added. Most of those were just outside the County boundary to enable the software to generate a surface that covered the entire County. A handful of points were added to enforce a plausible surface. In particular, one point was added in the desert east of Julian, to enforce a gradient from high precipitation in the mountains to low precipitation in the desert. Three points were added near the northern boundary of the County to adjust the surface to reflect the effect of elevation in areas lacking sufficient operating gages.

Several methods of interpolation were considered. The method chosen is named by Environmental Systems Research Institute as the Natural Neighbor technique. This method produces a surface that is highly empirical, with the value of the surface being a product of the values of the data points nearest each cell. It does not produce peaks or valleys of surface based on larger area trends, and is free of artifacts that appeared with other methods.

B.1.4 BMP Sizing for Standard Projects

City of Encinitas, in addition to requirements for source control and site design BMPs, requires structural BMPs for Standard Projects. Standard projects shall provide natural bioretention BMPs for stormwater pollution control based on the following sizing calculation method or the DCV calculation method described in Chapter 5 and Appendix B. The total surface area shall include new and replaced impervious areas of the proposed project. If it is determined that bioretention BMPs are not feasible, at the discretion of the City Engineer, partial retention BMPs or biofiltration BMPs may be used. The following sizing calculation or the DCV calculation method may be used to size partial retention or biofiltration BMPs. All Standard Projects must also implement source control and site design measures as described in Chapter 4. Consult Chapter 5 for structural BMP design options.

MINIMUM BMP AREA = 0.03 Σ (Surface Type SF X Surface Type Runoff Factor)

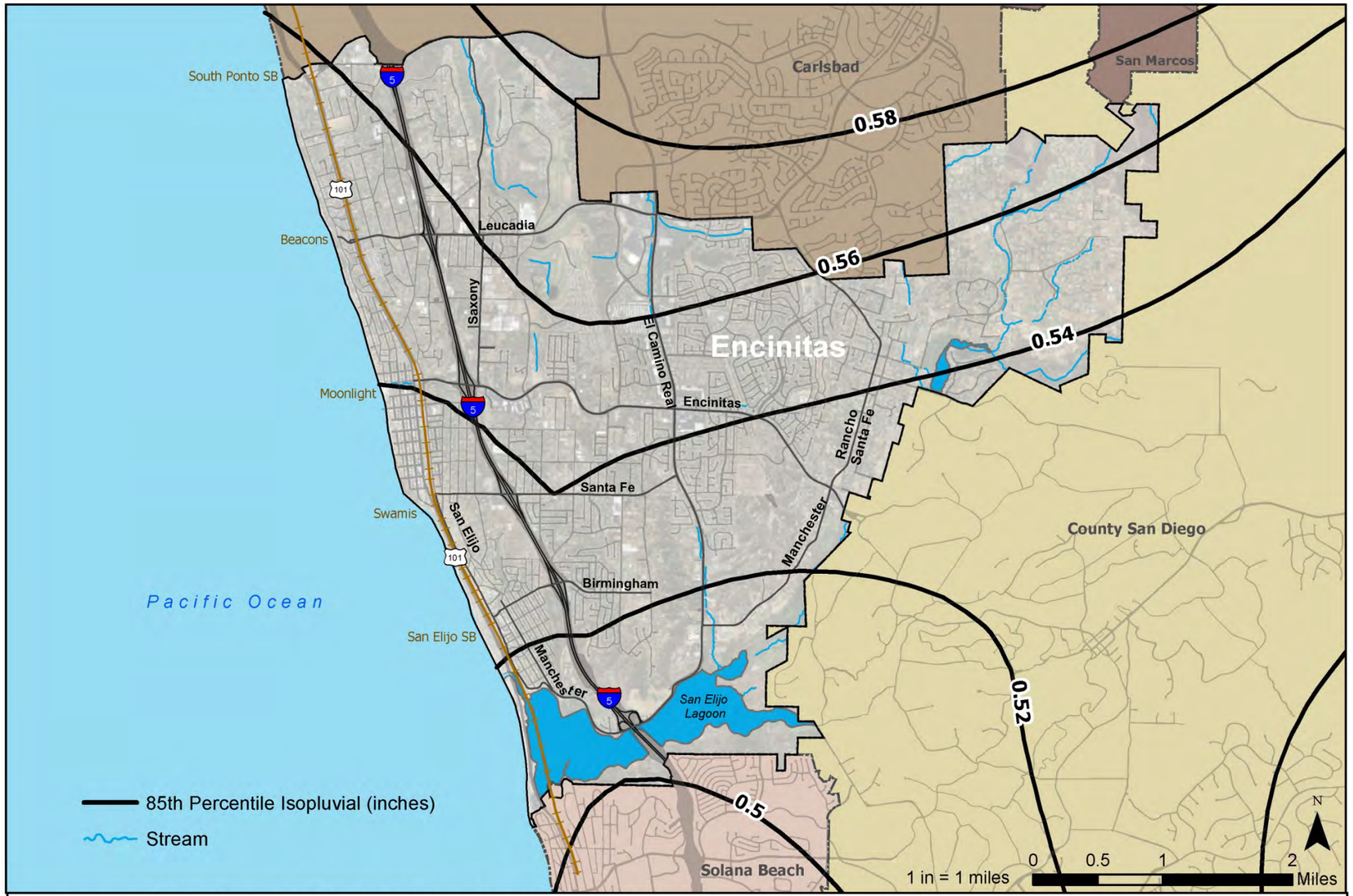


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

B.2 Adjustments to Account for Site Design BMPs

This section provides methods to adjust the DCV (for sizing pollutant control BMPs) as a result of implementing site design BMPs. The adjustments are provided by one of the following two methods:

- Adjustment to impervious runoff factor
- Adjustment to DCV

B.2.1 Adjustment to Impervious Runoff Factor

When one of the following site design BMPs is implemented the runoff factor of 0.9 for impervious surfaces identified in Table B.1-1 should be adjusted using the factors listed below and an adjusted area weighted runoff factor shall be estimated following guidance from Section B.1.1 and used to calculate the DCV.

- SD-5 Impervious area dispersion
- SD-6A Green roofs
- SD-6B Permeable pavement

B.2.1.1 Impervious area dispersion (SD-5)

Dispersion of impervious areas through pervious areas: The following adjustments are allowed to impervious runoff factors when dispersion is implemented in accordance with the SD-5 fact sheet (Appendix E). Adjustments are only credited up to a 4:1 maximum ratio of impervious to pervious areas. In order to adjust the runoff factor, the pervious area shall have a minimum width of 10 feet and a maximum slope of 5%. Based on the ratio of **impervious area to pervious area** and the hydrologic soil group of the pervious area, the adjustment factor from Table B.2-1 shall be multiplied with the unadjusted runoff factor (Table B.1-1) of the impervious area to estimate the adjusted runoff factor for sizing pollutant control BMPs. The adjustment factors in Table B.2-1 are **only** valid for impervious surfaces that have an unadjusted runoff factor of 0.9.

Table B.2-1: Impervious area adjustment factors that accounts for dispersion

Pervious area hydrologic soil group	Ratio = Impervious area/Pervious area			
	<=1	2	3	4
A	0.00	0.00	0.23	0.36
B	0.00	0.27	0.42	0.53
C	0.34	0.56	0.67	0.74
D	0.86	0.93	0.97	1.00

Continuous simulation modeling in accordance with Appendix G is required to develop adjustment factors for surfaces that have an unadjusted runoff factor less than 0.9. Approval of adjustment factors for surfaces that have an unadjusted runoff factor less than 0.9 is at the discretion of the City Engineer.

The adjustment factors in Table B.2-1 were developed by performing continuous simulations in SWMM with default parameters from Appendix G and impervious to pervious area ratios of 1, 2, 3, and 4. When using adjustment factors from Table B.2-1:

- **Linear interpolation** shall be performed if the impervious to pervious area ratio of the site is in between one of ratios for which an adjustment factor was developed;
- Use adjustment factor for a ratio of 1 when the impervious to pervious area ratio is less than 1; and
- Adjustment factor is not allowed when the impervious to pervious area ratio is greater than 4, when the pervious area is designed as a site design BMP.

Example B.2-1: DMA is comprised of one acre of impervious area that drains to a 0.4 acre hydrologic soil group B pervious area and then the pervious area drains to a BMP. Impervious area dispersion is implemented in the DMA in accordance with SD-5 factsheet. Estimate the adjusted runoff factor for the DMA.

- Baseline Runoff Factor per Table B.1-1 = [(1*0.9+0.4*0.14)/1.4] = 0.68.
- Impervious to Pervious Ratio = 1 acre impervious area/ 0.4 acre pervious area = 2.5; since the ratio is 2.5 adjustment can be claimed.
- From Table B.2-1 the adjustment factor for hydrologic soil group B and a ratio of 2 = 0.27; ratio of 3 = 0.42.
- Linear interpolated adjustment factor for a ratio of 2.5 = 0.27 + {[(0.42 -0.27)/(3-2)]*(2.5-2)} = 0.345.
- Adjusted runoff factor for the DMA = [(1*0.9*0.345+0.4*0.14)/1.4] = 0.26.
- Note only the runoff factor for impervious area is adjusted, there is no change made to the pervious area.

B.2.1.2 Green Roofs

When green roofs are implemented in accordance with the SD-6A factsheet the green roof footprint shall be assigned a runoff factor of 0.10 for adjusted runoff factor calculations.

B.2.1.3 Permeable Pavement

When a permeable pavement is implemented in accordance with the SD-6B factsheet and it does not have an impermeable liner and has storage greater than the 85th percentile depth below the underdrain, if an underdrain is present, then the footprint of the permeable pavement shall be

assigned a runoff factor of 0.10 for adjusted runoff factor calculations.

Permeable Pavement can also be designed as a structural BMP to treat run on from adjacent areas. Refer to INF-3 factsheet and Appendix B.4 for additional guidance.

B.2.2 Adjustment to DCV

When the following site design BMPs are implemented the anticipated volume reduction from these BMPs shall be deducted from the DCV to estimate the volume for which the downstream structural BMP should be sized for:

- SD-1: Street trees
- SD-8 Rain barrels

B.2.2.1 Street Trees

Street tree credit volume from tree trenches or boxes (tree BMPs) is a sum of three runoff reduction volumes provided by trees that decrease the required DCV for a tributary area. The following reduction in DCV is allowed per tree based on the mature diameter of the tree canopy, when trees are implemented in accordance with SD-1 factsheet:

Mature Tree Canopy Diameter (ft)	Tree Credit Volume (ft^3/tree)
5	10
10	40
15	100
20	180
25	290
30	420

Basis for the reduction in DCV:

Tree credit volume was estimated based on typical characteristics of street trees as follows:

It is assumed that each tree and associated trench or box is considered a single BMP, with

calculations based on the media storage volume and/or the individual tree within the tree BMP as appropriate. Tree credit volume is calculated as:

$$\boldsymbol{TCV = TIV + TCIV + TETV}$$

Where:

- *TCV* = Tree credit volume (ft^3)
- *TIV* = Total infiltration volume of all storage layers within tree BMPs (ft^3)
- *TCIV* = Total canopy interception volume of all individual trees within tree BMPs (ft^3)
- *TETV* = Total evapotranspiration volume, sums the media evapotranspiration storage within each tree BMP (ft^3)

Total infiltration volume was calculated as the total volume infiltrated within the BMP storage layers. Infiltration volume was assumed to be 20% of the total BMP storage layer volume, the available pore space in the soil volume (porosity – field capacity). Total canopy interception volume was calculated for all street trees within the tributary area as the average interception capacity for the entire mature tree total canopy projection area. Interception capacity was determined to be 0.04 inches for all street tree sizes, an average from the findings published by Breuer et al (2003) for coniferous and deciduous trees. Total evapotranspiration volume is the available evapotranspiration storage volume (field capacity – wilting point) within the BMP storage layer media. TEVT is assumed to be 10% of the minimum soil volume. The minimum soil volume as required by SD-1 fact sheet of 2 cubic feet per unit canopy projection area was assumed for estimating reduction in DCV.

B.2.2.2 Rain Barrels

Rain barrels are containers that can capture rooftop runoff and store it for future use. Credit can be taken for the full rain barrel volume when each barrel volume is smaller than 100 gallons, implemented per SD-8 fact sheet and meet the following criteria:

- Total rain barrel volume is less than 0.25 DCV and
- Landscape areas are greater than 30 percent of the project footprint.

Credit for harvest and use systems that do not meet the above criteria shall be based on the criteria in Appendix B.3 and HU-1 fact sheet.

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=		inches
2	Area tributary to BMP (s)	A=		acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=		unitless
4	Street trees volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=		cubic-feet

B.3 Harvest and Use BMPs

The purpose of this section is to provide guidance for evaluating feasibility of harvest and use BMPs, calculating harvested water demand and sizing harvest and use BMPs.

B.3.1 Planning Level Harvest and Use Feasibility

Harvest and use feasibility should be evaluated at the scale of the entire project, and not limited to a single DMA. For the purpose of initial feasibility screening, it is assumed that harvested water collected from one DMA could be used within another. Types of non-potable water demand that may apply within a project include:

- Toilet and urinal flushing
- Irrigation
- Vehicle washing
- Evaporative cooling
- Dilution water for recycled water systems
- Industrial processes
- Other non-potable uses

Worksheet B.3-1 provides a screening process for determining the preliminary feasibility for harvest and use BMPs. This worksheet should be completed for the overall project.

Worksheet B.3-1. Harvest and Use Feasibility Screening

<table>
<tr><th colspan="2">Harvest and Use Feasibility Screening</th><th>Worksheet B.3-1</th></tr>
<tr><td colspan="3">1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:_____</td></tr>
<tr><td colspan="3">2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.

[Provide a results here]</td></tr>
<tr><td>3a. Is the 36-hour demand greater than or equal to the DCV?
Yes / No ⇨
⇩</td><td>3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?
Yes / No ⇨
⇩</td><td>3c. Is the 36-hour demand less than 0.25DCV?
Yes
⇩</td></tr>
<tr><td>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</td><td>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</td><td>Harvest and use is considered to be infeasible.</td></tr>
</table>

B.3.2 Harvested Water Demand Calculation

The following sections provide technical references and guidance for estimating the harvested water demand of a project. These references are intended to be used for the planning phase of a project for feasibility screening purposes.

B.3.2.1 Toilet and Urinal Flushing Demand Calculations

The following guidelines should be followed for computing harvested water demand from toilet and urinal flushing:

- If reclaimed water is planned for use for toilet and urinal flushing, then the demand for harvested stormwater is equivalent to the total demand minus the reclaimed water supplied, and should be reduced by the amount of reclaimed water that is available during the wet season.
- Demand calculations for toilet and urinal flushing should be based on the average rate of use during the wet season for a typical year.
- Demand calculations should include changes in occupancy over weekends and around holidays and changes in attendance/enrollment over school vacation periods.
- For facilities with generally high demand, but periodic shut downs (e.g., for vacations, maintenance, or other reasons), a project specific analysis should be conducted to determine whether the long term stormwater capture performance of the system can be maintained despite shut downs.
- Such an analysis should consider the statistical distributions of precipitation and demand, most importantly the relationship of demand to the wet seasons of the year.

Table B.3-1 provides planning level demand estimates for toilet and urinal flushing per resident, or employee, for a variety of project types. The per capita use per day is based on daily employee or resident usage. For non-residential types of development, the "visitor factor" and "student factor" (for schools) should be multiplied by the employee use to account for toilet and urinal usage for non-employees using facilities.

Table B.3-1. Toilet and Urinal Water Usage per Resident or Employee

Land Use Type	Toilet User Unit of Normalization	Per Capita Use per Day		Visitor Factor[4]	Water Efficiency Factor	Total Use per Resident or Employee
		Toilet Flushing[1,2]	Urinals[3]			
Residential	Resident	18.5	NA	NA	0.5	9.3
Office	Employee (non-visitor)	9.0	2.27	1.1	0.5	7 (avg)
Retail	Employee (non-visitor)	9.0	2.11	1.4	0.5	
Schools	Employee (non-student)	6.7	3.5	6.4	0.5	33
Various Industrial Uses (excludes process water)	Employee (non-visitor)	9.0	2	1	0.5	5.5

1- Based on American Waterworks Association Research Foundation,1999. Residential End Uses of Water. Denver, CO: AWWARF
2 - Based on use of 3.45 gallons per flush and average number of per employee flushes per subsector, Table D-1 for MWD (Pacific Institute, 2003)
3 - Based on use of 1.6 gallons per flush, Table D-4 and average number of per employee flushes per subsector, Appendix D (Pacific Institute, 2003)
4 - Multiplied by the demand for toilet and urinal flushing for the project to account for visitors. Based on proportion of annual use allocated to visitors and others (includes students for schools; about 5 students per employee) for each subsector in Table D-1 and D-4 (Pacific Institute, 2003)
5 – Accounts for requirements to use ultra low flush toilets in new development projects; assumed that requirements will reduce toilet and urinal flushing demand by half on average compared to literature estimates. Ultra low flush toilets are required in all new construction in California as of January 1, 1992. Ultra low flush toilets must use no more than 1.6 gallons per flush and Ultra low flush urinals must use no more than 1 gallon per flush. Note: If zero flush urinals are being used, adjust accordingly.

B.3.2.2 General Requirements for Irrigation Demand Calculations

The following guidelines should be followed for computing harvested water demand from landscape irrigation:

- If reclaimed water is planned for use for landscape irrigation, then the demand for harvested stormwater should be reduced by the amount of reclaimed water that is available during the wet season.
- Irrigation rates should be based on the irrigation demand exerted by the types of landscaping that are proposed for the project, with consideration for water conservation requirements.
- Irrigation rates should be estimated to reflect the average wet season rates (defined as November through April) accounting for the effect of storm events in offsetting harvested water demand. In the absence of a detailed demand study, it should be assumed that irrigation demand is not present during days with greater than 0.1 inches of rain and the subsequent 3-day period. This irrigation shutdown period is consistent with standard practice in land application of wastewater and is applicable to stormwater to prevent irrigation from resulting in dry weather runoff. Based on a statistical analysis of San Diego

County rainfall patterns, approximately 30 percent of wet season days would not have a demand for irrigation.

- If land application of stormwater is proposed (irrigation in excess of agronomic demand), then this BMP must be considered to be an infiltration BMP and feasibility screening for infiltration must be conducted. In addition, it must be demonstrated that land application would not result in greater quantities of runoff as a result of saturated soils at the beginning of storm events. Agronomic demand refers to the rate at which plants use water.

The following sections describe methods that should be used to calculate harvested water irrigation demand. While these methods are simplified, they provide a reasonable estimate of potential harvested water demand that is appropriate for feasibility analysis and project planning. These methods may be replaced by a more rigorous project-specific analysis that meets the intent of the criteria above.

B.3.2.2.1 Demand Calculation Method

This method is based on the San Diego Municipal Code Land Development Code Landscape Standards Appendix E which includes a formula for estimating a project's annual estimated total water use based on reference evaporation, plant factor, and irrigation efficiency.

For the purpose of calculating harvested water irrigation demand applicable to the sizing of harvest and use systems, the estimated total water use has been modified to reflect typical wet-season irrigation demand. This method assumes that the wet season is defined as November through April. This method further assumes that no irrigation water will be applied during days with precipitation totals greater than 0.1 inches or within the 3 days following such an event. Based on these assumptions and an analysis of Oceanside precipitation patterns, irrigation would not be applied during approximately 30 percent of days from November through April.

The following equation is used to calculate the Modified Estimated Total Water Usage:

$$\text{Modified ETWU} = ETo_{Wet} \times [[\Sigma(PF \times HA)/IE] + SLA] \times 0.015$$

Where:

Modified ETWU = Estimated daily average water usage during wet season
ETo_{Wet} = Average reference evapotranspiration from November through April (use 2.7 inches per month, using CIMS Zone 4 from Table G.1-1)
PF = Plant Factor

Table B.3-2. Planning Level Plant Factor Recommendations

Plant Water Use	Plant Factor	Also Includes
Low	< 0.1 – 0.2	Artificial Turf
Moderate	0.3 – 0.7	
High	0.8 and greater	Water features
Special Landscape Area	1.0	

HA = Hydrozone Area (sq-ft); A section or zone of the landscaped area having plants with similar water needs.
Σ(PF x HA) = The sum of PF x HA for each individual Hydrozone (accounts for different landscaping zones).
IE = Irrigation Efficiency (assume 90 percent for demand calculations)
SLA = Special Landscape Area (sq-ft); Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

In this equation, the coefficient (0.015) accounts for unit conversions and shut down of irrigation during and for the three days following a significant precipitation event:

0.015 = (1 mo/30 days)×(1 ft/12 in)×(7.48 gal/cu-ft)×(approximately 7 out of 10 days with irrigation demand from November through April)

B.3.2.2.2 Planning Level Irrigation Demands

To simplify the planning process, the method described above has been used to develop daily average wet season demands for a one-acre irrigated area based on the plant/landscape type. These demand estimates can be used to calculate the drawdown of harvest and use systems for the purpose of LID BMP sizing calculations.

Table B.3-3. Planning Level Irrigation Demand by Plant Factor and Landscape Type

General Landscape Type	36-Hour Planning Level Irrigation Demand (gallons per irrigated acre per 36 hour period)
Hydrozone – Low Plant Water Use	390
Hydrozone – Moderate Plant Water Use	1,470
Hydrozone – High Plant Water Use	2,640
Special Landscape Area	2,640

B.3.2.3 Calculating Other Harvested Water Demands

Calculations of other harvested water demands should be based on the knowledge of land uses, industrial processes, and other factors that are project-specific. Demand should be calculated based on the following guidelines:

- Demand calculations should represent actual demand that is anticipated during the wet season (November through April).
- Sources of demand should only be included if they are reliably and consistently present during the wet season.
- Where demands are substantial but irregular, a more detailed analysis should be conducted based on a statistical analysis of anticipated demand and precipitation patterns.

B.3.3 Sizing Harvest and Use BMPs

Sizing calculations shall demonstrate that one of two equivalent performance standards is met:

1. Harvest and use BMPs are sized to drain the tank in 36 hours following the end of rainfall. The size of the BMP is dependent on the demand (Section B.3.2) at the site.
2. Harvest and use BMP is designed to capture at least 80 percent of average annual (long term) runoff volume.

It is rare cisterns can be sized to capture the full DCV and use this volume in 36 hours. So when using Worksheet B.3-1 if it is determined that harvest and use BMP is feasible then the BMP should be sized to the estimated 36-hour demand.

B.4 Infiltration BMPs

Sizing calculations shall demonstrate that one of two equivalent performance standards is met:

1. The BMP or series of BMPs captures the DCV and infiltrates this volume fully within 36 hours following the end of precipitation. This can be demonstrated through the Simple Method (Section B.4.1).

2. The BMP or series of BMPs infiltrates at least 80 percent of average annual (long term) runoff volume. This can be demonstrated using the percent capture method (Section B.4.2), through reporting of output from the San Diego Hydrology Model, or through other continuous simulation modeling meeting the criteria in Appendix G, as acceptable to the City Engineer. This method is **not** applicable for sizing biofiltration BMPs.

The methods to show compliance with these standards are provided in the following sections.

B.4.1 Simple Method

Stepwise Instructions:

1. Compute DCV using Worksheet B.4-1
2. Estimate design infiltration rate using Worksheet D.5-1
3. Design BMP(s) to ensure that the DCV is fully retained (i.e., no surface discharge during the design event) and the stored effective depth draws down in no longer than 36 hours.

Worksheet B.4-1: Simple Sizing Method for Infiltration BMPs

Simple Sizing Method for Infiltration BMPs		Worksheet B.4-1		
1	DCV (Worksheet B-2.1)	DCV=		cubic-feet
2	Estimated design infiltration rate (Worksheet D.5-1)	K_{design}=		in/hr
3	Available BMP surface area	A_{BMP}=		sq-ft
4	Average effective depth in the BMP footprint (DCV/A_{BMP})	D_{avg}=		feet
5	Drawdown time, T (D_{avg} *12/K_{design})	T=		hours
6	Provide alternative calculation of drawdown time, if needed.			

Notes:

- Drawdown time must be less than 36 hours. This criterion was set to achieve average annual capture of 80% to account for back to back storms (See rationale in Section B.4.3). In order to use a different drawdown time, BMPs should be sized using the percent capture method (Section B.4.2).
- The average effective depth calculation should account for any aggregate/media in the BMP. For example, 4 feet of stone at a porosity of 0.4 would equate to 1.6 feet of effective depth.
- This method may overestimate drawdown time for BMPs that drain through both the bottom and walls of the system. BMP specific calculations of drawdown time may be provided that account for BMP-specific geometry.

B.4.2 Percent Capture Method

This section describes the recommended method of sizing volume-based BMPs to achieve the 80 percent capture performance criterion. This method has a number of potential applications for sizing BMPs, including:

- Use this method when a BMP can draw down in less than 36 hours and it is desired to demonstrate that 80 percent capture can be achieved using a BMP volume smaller than the DCV.
- Use this method to determine how much volume (greater than the DCV) must be provided to achieve 80 percent capture when the drawdown time of the BMP exceeds 36 hours.
- Use this method to determine how much volume should be provided to achieve 80 percent capture when upstream BMP(s) have achieved some capture, but have not achieved 80 percent capture.

By nature, the percent capture method is an iterative process that requires some initial assumptions about BMP design parameters and subsequent confirmation that these assumptions are valid. For example, sizing calculations depend on the assumed drawdown time, which depends on BMP depth, which may in turn need to be adjusted to provide the required volume within the allowable footprint. In general, the selection of reasonable BMP design parameters in the first iteration will result in minimal required additional iterations. Figure B.4-1 presents the nomograph for use in sizing retention BMPs in San Diego County.

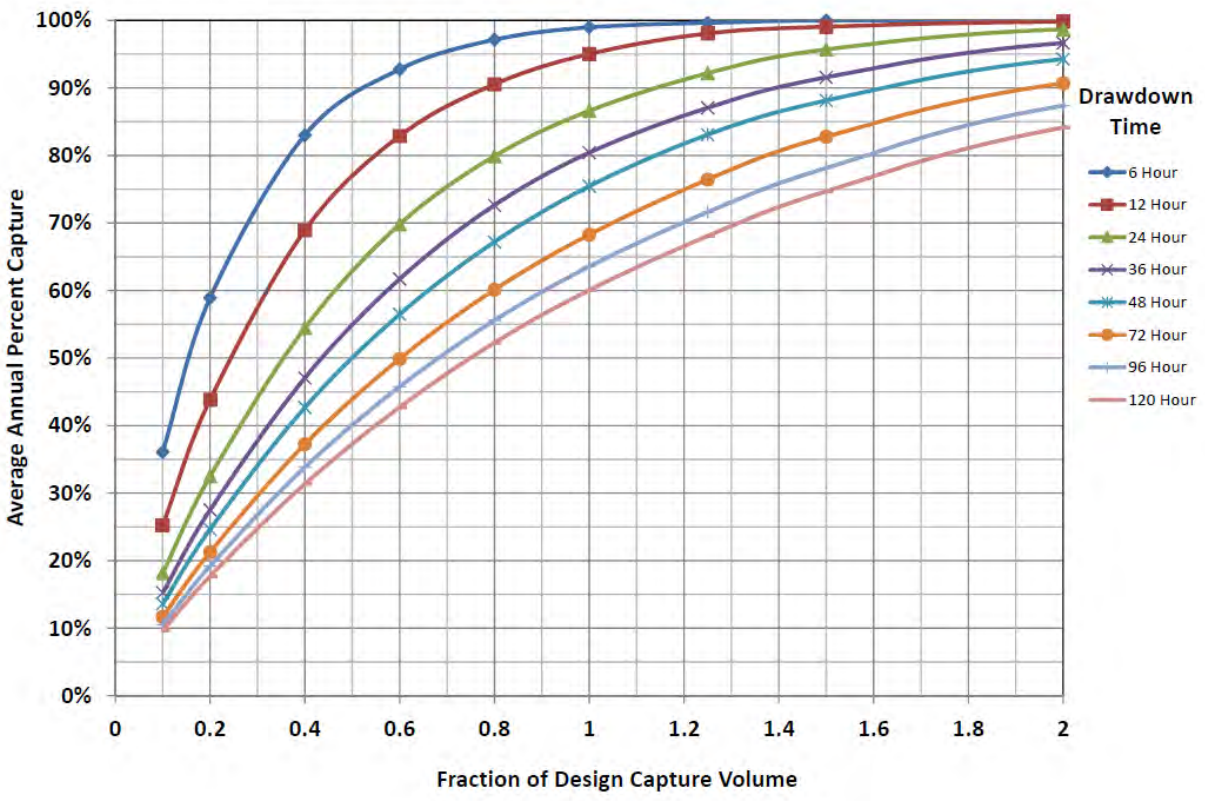


Figure B.4-1: Percent Capture Nomograph

B.4.2.1 Stepwise Instructions for sizing a single BMP:

1. Estimate the drawdown time of the proposed BMP by estimating the design infiltration rate (Worksheet D.5-1) and accounting for BMP dimensions/geometry. See the applicable BMP Fact Sheet for specific guidance on how to convert BMP geometry to estimated drawdown time.
2. Using the estimated drawdown time and the nomograph from Figure B.4-1 locate where the line corresponding to the estimated drawdown time intersects with 80 percent capture. Pivot to the X axis and read the fraction of the DCV that needs to be provided in the BMP to achieve this level of capture.
3. Calculate the DCV using Worksheet B.2-1.
4. Multiply the result of Step 2 by the DCV (Step 3). This is the required BMP design volume.
5. Design the BMP to retain the required volume, and confirm that the drawdown time is no more than 25 percent greater than estimated in Step 1. If the computed drawdown time is greater than 125 percent of the estimated drawdown, then return to Step 1 and revise the initial drawdown time assumption.

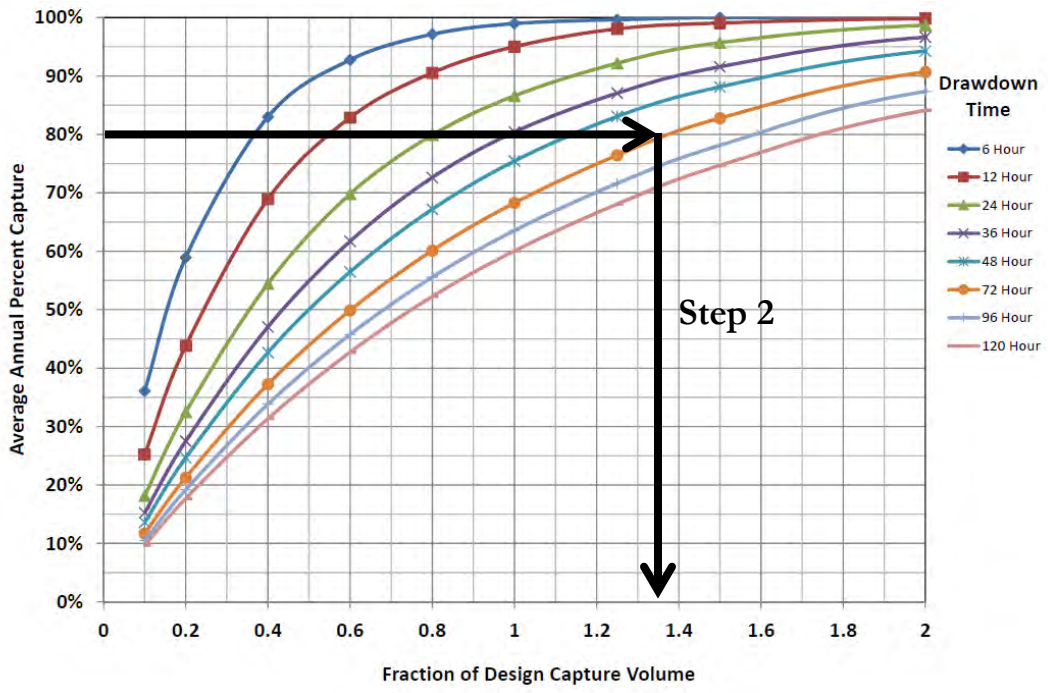
See the respective BMP facts sheets for BMP-specific instructions for the calculation of volume and drawdown time. The above method can also be used to size and/or evaluate the performance of other retention BMPs (evapotranspiration, harvest and use) that have a drawdown rate that can be approximated as constant throughout the year or over the wet season. In order to use this method for other retention BMPs, drawdown time in Step 1 will need to be evaluated using an applicable method for the type of BMP selected. After completing Step 1 continue to Step 2 listed above.

Example B.4.2.1 Percent Capture Method for Sizing a Single BMP:

Given:
• Estimated drawdown time: 72 Hours • DCV: 3000 ft^3
Required:
• Determine the volume required to achieve 80 percent capture.
Solution:
1. Estimated drawdown time = 72 Hours 2. Fraction of DCV required = 1.35 3. DCV = 3000 ft^3 (Given for this example; To be estimated using Worksheet B.2-1) 4. Required BMP volume = 1.35 x 3000 = 4050 ft^3 5. Design BMP and confirm drawdown Time is $\leq$ 90 Hours (72 Hours +25%)

Example B.4.2.1 Continued:

Graphical Operations Supporting Solution:



Percent Capture Nomograph

B.4.2.2 Stepwise Instructions for sizing BMPs in series:

For projects where BMPs in series have to be implemented to meet the performance standard the following stepwise procedure shall be used to size the downstream BMP to achieve the 80 percent capture performance criterion:

1. Using the upstream BMP parameters (volume and drawdown time) estimate the average annual capture efficiency achieved by the upstream BMP using the nomograph.
2. Estimate the drawdown time of the proposed downstream BMP by estimating the design infiltration rate (Worksheet D.5-1) and accounting for BMP dimensions/geometry. See the applicable BMP Fact Sheet for specific guidance on how to convert BMP geometry to estimated drawdown time. Use the nomograph and locate where the line corresponding to the estimated drawdown time intersects with 80 percent capture. Pivot to the horizontal axis and read the fraction of the DCV that needs to be provided in the BMP. This is referred to as X_1.
3. Trace a horizontal line on the nomograph using the capture efficiency of the upstream BMP estimated in Step 1. Find where the line traced intersects with the drawdown time of the downstream BMP (Step 2). Pivot and read down to the horizontal axis to yield the fraction of the DCV already provided by the upstream BMP. This is referred to as X_2.

4. Subtract X_2 (Step 3) from X_1 (Step 2) to determine the fraction of the design volume that must be provided in the downstream BMP to achieve 80 percent capture to meet the performance standard.
5. Multiply the result of Step 4 by the DCV. This is the required downstream BMP design volume.
6. Design the BMP to retain the required volume, and confirm that the drawdown time is no more than 25 percent greater than estimated in Step 2. If the computed drawdown time is greater than 125 percent of the estimated drawdown, then return to Step 2 and revise the initial drawdown time assumption.

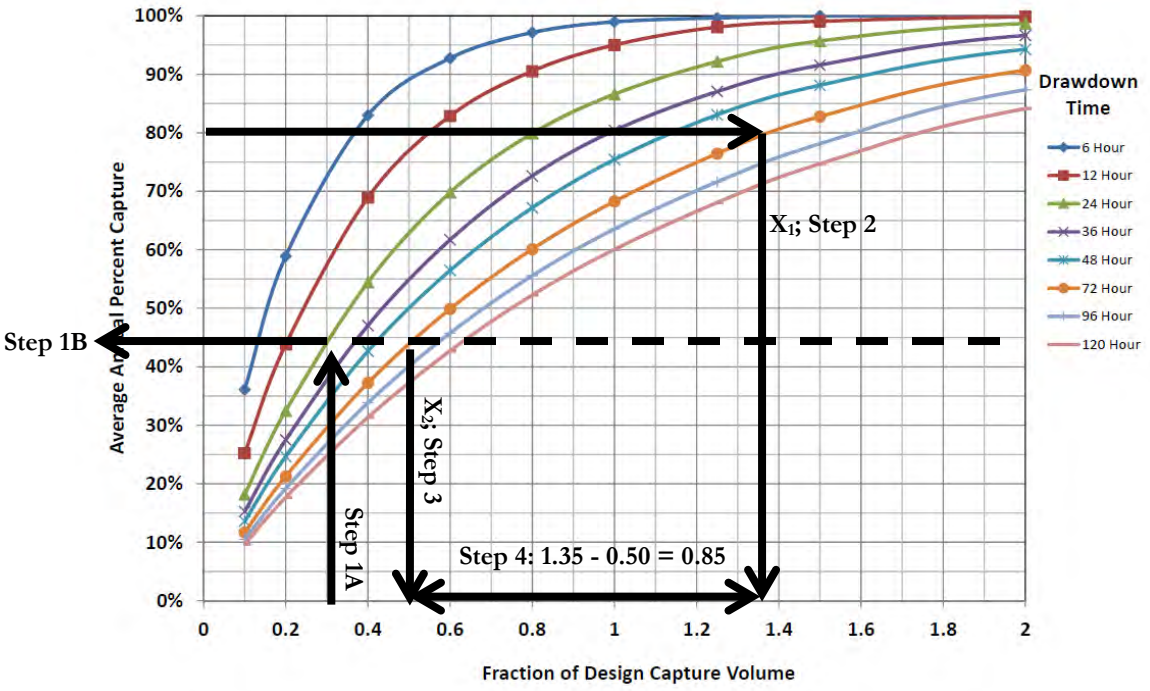
See the respective BMP facts sheets for BMP-specific instructions for the calculation of volume and drawdown time.

Example B.4.2.2 Percent Capture Method for Sizing BMPs in Series:

Given:
• Estimated drawdown time for downstream BMP: 72 Hours • DCV for the area draining to the BMP: 3000 ft^3 • Upstream BMP volume: 900 ft^3 • Upstream BMP drawdown time: 24 Hours
Required:
• Determine the volume required in the downstream BMP to achieve 80 percent capture.
Solution:
1. Step 1A: Upstream BMP Capture Ratio = 900/3000 = 0.3; Step 1B: Average annual capture efficiency achieved by upstream BMP = 44% 2. Downstream BMP drawdown = 72 hours; Fraction of DCV required to achieve 80% capture = 1.35 3. Locate intersection of design capture efficiency and drawdown time for upstream BMP (See Graph); Fraction of DCV already provided (X_2) = 0.50 (See Graph) 4. Fraction of DCV Required by downstream BMP = 1.35-0.50 = 0.85 5. DCV (given) = 3000 ft^3 ; Required downstream BMP volume = 3000 ft^3 x 0.85 = 2,550 ft^3 6. Design BMP and confirm drawdown Time is $\leq$ 90 Hours (72 Hours +25%)

Example B.4.2.2 Continued:

Graphical Operations Supporting Solution:



Percent Capture Nomograph

B.4.3 Technical Basis for Equivalent Sizing Methods

Stormwater BMPs can be conceptualized as having a storage volume and a treatment rate, in various proportions. Both are important in the long-term performance of the BMP under a range of actual storm patterns, depths, and inter-event times. Long-term performance is measured by the operation of a BMP over the course of multiple years, and provides a more complete metric than the performance of a BMP during a single event, which does not take into account antecedent conditions, including multiple storms arriving in short timeframes. A BMP that draws down more quickly would be expected to capture a greater fraction of overall runoff (i.e., long-term runoff) than an identically sized BMP that draws down more slowly. This is because storage is made available more quickly, so subsequent storms are more likely to be captured by the BMP. In contrast a BMP with a long drawdown time would stay mostly full, after initial filling, during periods of sequential storms. The volume in the BMP that draws down more quickly is more "valuable" in terms of long term performance than the volume in the one that draws down more slowly. The MS4 permit definition of the DCV does not specify a drawdown time, therefore the definition is not a complete

indicator of a BMP's level of performance. An accompanying performance-based expression of the BMP sizing standard is essential to ensure uniformity of performance across a broad range of BMPs and helps prevents BMP designs from being used that would not be effective.

An evaluation of the relationships between BMP design parameters and expected long term capture efficiency has been conducted to address the needs identified above. Relationships have been developed through a simplified continuous simulation analysis of precipitation, runoff, and routing, that relate BMP design volume and storage recovery rate (i.e., drawdown time) to an estimated long term level of performance using United States Environmental Protection Agency (USEPA) SWMM and parameters listed in Appendix G for the Oceanside rain gage. Comparison of the relationships developed using the three gages indicated that the differences in relative capture estimates are within the uncertainties in factors used to develop the relationships. For example, the estimated average annual capture for the BMP sized for the DCV and 36 hour drawdown using Lake Wohlford, Lindbergh, and Oceanside are 80%, 76% and 83% respectively. In an effort to reduce the number of curves that are made available, relationships developed using Lake Wohlford are included in this manual for use in the whole San Diego County region.

Figure B.4-1 demonstrated that a BMP sized for the runoff volume from the 85th percentile, 24-hour storm event (i.e., the DCV), which draws down in 36 hours is capable of managing approximately 80 percent of the average annual. There is long precedent for 80 percent capture of average annual runoff as approximately the point at which larger BMPs provide decreasing capture efficiency benefit (also known as the "knee of the curve") for BMP sizing. The characteristic shape of the plot of capture efficiency versus storage volume in Figure B.4-1 illustrates this concept.

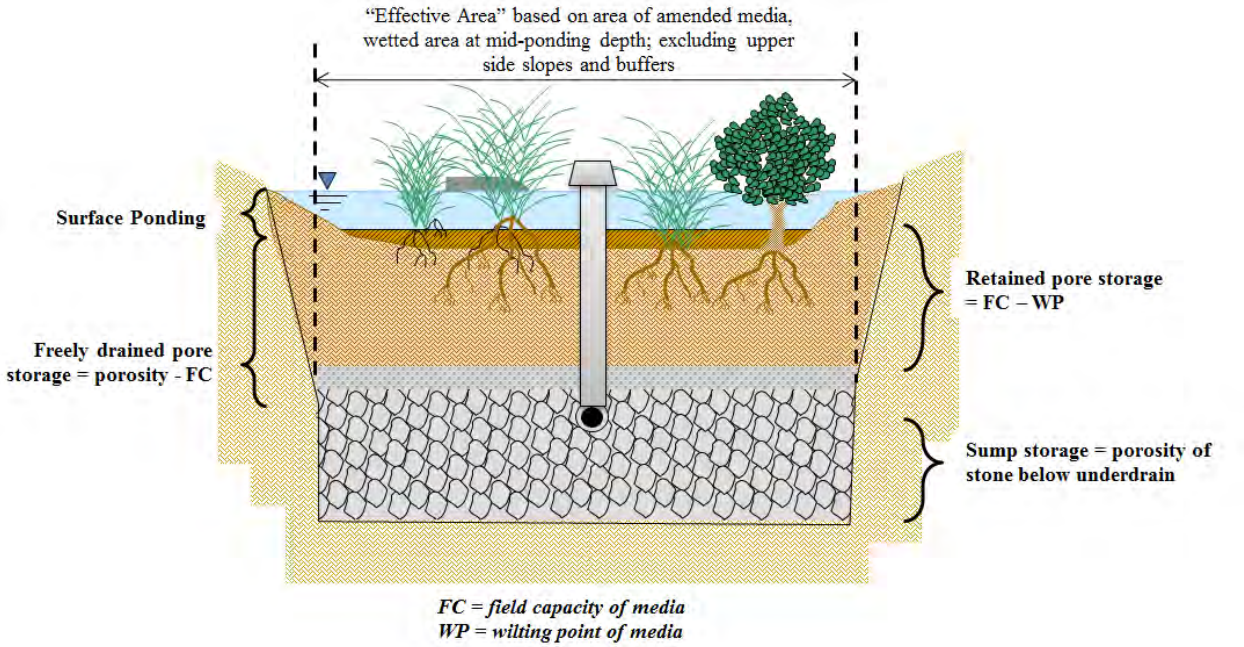
As such, this equivalency (between DCV draw down in 36-hours and 80 percent capture) has been utilized to provide a common currency between volume-based BMPs with a wide range of drawdown rates. This approach allows flexibility in the design of BMPs while ensuring consistent performance.

B.5 Biofiltration BMPs

Biofiltration BMPs shall be sized by one of the following sizing methods:

Option 1: Treat 1.5 times the portion of the DCV not reliably retained onsite, OR

Option 2: Treat 1.0 times the portion of the DCV not reliably retained onsite; and additionally check that the system has a total static (i.e., non-routed) storage volume, including pore spaces and pre-filter detention volume, equal to at least 0.75 times the portion of the DCV not reliably retained onsite.



Explanation of Biofiltration Volume Compartments for Sizing Purposes

Worksheet B.5-1 provides a simple sizing method for sizing biofiltration BMP with partial retention and biofiltration BMP.

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs		cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible		in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]		inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]		inches
7	Assumed surface area of the biofiltration BMP		sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7		cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]		cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]		inches
12	Media Thickness [18 inches minimum]		inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area		inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]		inches
19	Total Depth Treated [Line 17 + Line 18]		inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]		cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12		sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]		cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12		sq-ft
Footprint of the BMP			
24	Area draining to the BMP		sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)		
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]		sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)		sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

B.5.1 Standard Biofiltration BMP Footprint Sizing Factors

Table B.5-1 provides the minimum surface area (percent of contributing impervious area) required to meet the performance standards for Biofiltration BMPs (Fact Sheet BF-1). Parameters used to develop the sizing factors presented in Table B.5-1 are listed below:

- Media filtration rate for sizing = 5.0 in/hr.; Minimum required media filtration rate.
- Routing Period of 6 hours which was based on 50th percentile storm duration for storms similar to 85th percentile rainfall depth. Estimated based on inspection of continuous rainfall data from Lake Wohlford, Lindbergh and Oceanside rain gages.
- 12 inches aggregate storage is assumed for developing the below sizing factors.
- Minimum required surface area of 3% of contributing area times adjusted runoff factor. Refer to Appendix B.5.2 for the basis for establishing this minimum surface area criterion.

Table B.5-1: Minimum Required Surface Area (Percent of contributing area times adjusted runoff factor) for BF-1

85th Percentile Rainfall Depth	Surface Ponding = 6" Media Thickness = 18"	Surface Ponding = 6" Media Thickness = 24"	Surface Ponding = 12" Media Thickness = 18"	Surface Ponding = 12" Media Thickness = 24"
0.55"	3.0%	3.0%	3.0%	3.0%
0.7"	3.0%	3.0%	3.0%	3.0%
0.85"	3.0%	3.0%	3.0%	3.0%
1"	3.2%	3.0%	3.0%	3.0%
1.25"	4.0%	3.8%	3.5%	3.4%
1.55"	4.9%	4.7%	4.4%	4.2%

In order to evaluate the parameters recommended for sizing biofiltration BMPs in Worksheet B.5-1 continuous simulations were performed using USEPA SWMM and default parameters listed in Appendix G for the Oceanside rain gage. Estimated average annual capture for the size of the biofiltration BMPs estimated using Worksheet B.5-1 are presented in the Table B.5-2 below:

Table B.5-2: Average Annual Capture Results for the Oceanside Rain Gage

Rainfall gage	85th Percentile Rainfall Depth)	Biofiltration Footprint for 1 acre impervious catchment =3%; Surface Ponding = 6"; Media Thickness = 18"	Average Annual Capture
Oceanside	0.76"	1,307 sq. ft.	97%

Note: Per Worksheet B.5-1 and the 85th percentile rainfall of the stations analyzed, the minimum biofiltration size criteria is the dominant criteria. Different surface ponding values and/or different 85th percentile storms may lead to higher values than those shown in this table.

B.5.2 Basis for Minimum Sizing Factor for Biofiltration BMPs

B.5.2.1 Introduction

MS4 Permit Provision E.3.c.(1)(a)(i)

The MS4 Permit describes conceptual performance goals for biofiltration BMPs and specifies numeric criteria for sizing biofiltration BMPs (See Section 2.2.1 of this Manual).

However, the MS4 Permit does not define a specific footprint sizing factor or design profile that must be provided for the BMP to be considered "biofiltration." Rather, the MS4 Permit specifies (Footnote 25):

> **As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize stormwater retention and pollutant removal.**

To meet this provision, this manual includes specific criteria for design of biofiltration BMPs. Among other criteria, a minimum footprint sizing factor of 3 percent (BMP footprint area as percent of contributing area times adjusted runoff factor) is specified. The purpose of this section is to provide the technical rationale for this 3 percent minimum sizing factor.

B.5.2.2 Conceptual Need for Minimum Sizing Factor

Under the 2011 Model SUSMP, a sizing factor of 4 percent was used for sizing biofiltration BMPs. This value was derived based on the goal of treating the runoff from a 0.2 inch per hour uniform precipitation intensity at a constant media flow rate of 5 inches per hour. While this method was simple, it was considered to be conservative as it did not account for significant transient storage present in biofiltration BMPs (i.e., volume in surface storage and subsurface storage that would need to fill before overflow occurred). Under this manual, biofiltration BMPs will typically provide subsurface storage to promote infiltration losses; therefore typical BMP profiles will tend to be somewhat deeper than those provided under the 2011 Model SUSMP. A deeper profile will tend to provide more transient storage and allow smaller footprint sizing factors while still providing similar or better treatment capacity and pollutant removal. Therefore a reduction in the minimum sizing factor from the factor used in the 2011 Model SUSMP is supportable. However, as footprint decreases, issues related to potential performance, operations, and/or maintenance can increase for a number of reasons:

1) As the surface area of the media bed decreases, the sediment loading per unit area increases, increasing the risk of clogging. While vigorous plant growth can help maintain permeability

of soil, there is a conceptual limit above which plants may not be able to mitigate for the sediment loading. Scientific knowledge is not conclusive in this area.

2) With smaller surface areas and greater potential for clogging, water may be more likely to bypass the system via overflow before filling up the profile of the BMP.
3) As the footprint of the system decreases, the amount of water that can be infiltrated from subsurface storage layers and evapotranspire from plants and soils tends to decrease.
4) With smaller sizing factors, the hydraulic loading per unit area increases, potentially reducing the average contact time of water in the soil media and diminishing treatment performance.

The MS4 Permit requires that volume and pollutant retention be maximized. Therefore, a minimum sizing factor was determined to be needed. This minimum sizing factor does not replace the need to conduct sizing calculations as described in this manual; rather it establishes a lower limit on required size of biofiltration BMPs as the last step in these calculations. Additionally, it does not apply to alternative biofiltration designs that utilize the checklist in Appendix F (Biofiltration Standard and Checklist). Acceptable alternative designs (such as proprietary systems meeting Appendix F criteria) typically include design features intended to allow acceptable performance with a smaller footprint and have undergone field scale testing to evaluate performance and required O&M frequency.

B.5.2.3 Lines of Evidence to Select Minimum Sizing Factor

Three primary lines of evidence were used to select the minimum sizing factor of 3 percent (BMP footprint area as percent of contributing area times adjusted runoff factor) in this manual:

1. Typical design calculations.
2. Volume reduction performance.
3. Sediment clogging calculations.

These lines of evidence and associated findings are explained below.

Typical Design Calculations

A range of BMP profiles were evaluated for different design rainfall depths and soil conditions. Worksheet B.5-1 was used for each case to compute the required footprint sizing factor. For these calculations, the amount of water filtered during the storm event was determined based on a media filtration rate of 5 inches per hour and a routing time of 6 hours. These input assumptions are considered to be well-supported and consistent with the intent of the MS4 Permit. These calculations generally yielded footprint factors between 1.5 and 4.9 percent. In the interest of establishing a uniform County-wide minimum sizing factor, a 3 percent sizing factor was selected from this range, consistent with other lines of evidence.

Volume Reduction Performance

Consistent with guidance in Fact Sheet PR-1, the amount of retention storage (in gravel sump below

underdrain) that would drain in 36 hours was calculated for a range of soil types. This was used to estimate the volume reduction that would be expected to be achieved. For a sizing factor of 3 percent and a soil filtration rate of 0.20 inches per hour, the average annual volume reduction was estimated to be approximately 40 percent (via percent capture method; see Appendix B.4.2).

In describing the basis for equivalency between retention and biofiltration (1.5 multiplier), the MS4 Permit Fact Sheet referred to analysis prepared in the Ventura County Technical Guidance Manual. The Ventura County analysis considered the pollutant treatment as well as the volume reduction provided by biofiltration in considering equivalency to retention. This analysis assumed an average long term volume reduction of 40 percent based on analysis of data from the International Stormwater BMP Database. The calculations of estimated volume reduction at a 3 percent sizing factor is (previous paragraph) consistent with this value. While estimated volume reduction is sensitive to site-specific factors, this analysis suggests that a sizing factor of approximately 3 percent provides levels of volume reduction that are reasonably consistent with the intent of the MS4 Permit.

Sediment Clogging Calculations

As sediment accumulates in a filter, the permeability of the filter tends to decline. The lifespan of the filter bed can be estimated by determining the rate of sediment loading per unit area of the filter bed. To determine the media bed surface area sizing factor needed to provide a target lifespan, simple sediment loading calculations were conducted based on typical urban conditions. The inputs and results of this calculation are summarized in Table B.5-3.

B.5-3: Inputs and Results of Clogging Calculation

Parameter	Value	Source
Representative TSS Event Mean Concentration, mg/L	100	Approximate average of San Diego Land Use Event Mean Concentrations from San Diego River and San Luis Rey River WQIP
Runoff Coefficient of Impervious Surface	0.90	Table B.1-1
Runoff Coefficient of Pervious Surface	0.10	Table B.1-1 for landscape areas
Imperviousness	40% to 90%	Planning level assumption, covers typical range of single family to commercial land uses
Average Annual Precipitation, inches	11 to 13	Typical range for much of urbanized San Diego County
Load to Initial Maintenance, kg/m^2	10	Pitt, R. and S. Clark, 2010. Evaluation of Biofiltration Media for Engineered Natural Treatment Systems.
Allowable period to initial clogging, yr	10	Planning-level assumption
Estimated BMP Footprint Needed for 10-Year Design Life	2.8 to 3.3%	Calculated

This analysis suggests that a 3 percent sizing factor, coupled with sediment source controls and careful system design, should provide reasonable protection against premature clogging. However, there is substantial uncertainty in sediment loading and the actual load to clog that will be observed under field conditions in the San Diego climate. Additionally this analysis did not account for the effect of plants on maintaining soil permeability. Therefore this line of evidence should be considered provisional, subject to refinement based on field scale experience. As field scale experience is gained about the lifespan of biofiltration BMPs in San Diego and the mitigating effects of plants on long term clogging, it may be possible to justify lower factors of safety and therefore smaller design sizes in some cases. If a longer lifespan is desired and/or greater sediment load is expected, then a larger sizing factor may be justified.

B.5.2.4 Discussion

Generally, the purpose of a minimum sizing factor is to help improve the performance and reliability of standard biofiltration systems and limit the use of sizing methods and assumptions that may lead to designs that are less consistent with the intent of the MS4 Permit.

Ultimately, this factor is a surrogate for a variety of design considerations, including clogging and associated hydraulic capacity, volume reduction potential, and treatment contact time. A prudent design approach should consider each of these factors on a project-specific basis and identify whether site conditions warrant a larger or smaller factor. For example a system treating only rooftop runoff in an area without any allowable infiltration may have negligible clogging risk and negligible volume reduction potential – a smaller sizing factor may not substantially reduce performance in either of these areas. Alternatively, for a site with high sediment load and limited pre-treatment potential, a larger sizing factor may be warranted to help mitigate potential clogging risks. City Engineer has discretion to accept alternative sizing factor(s) based on project-specific or jurisdiction-specific considerations. Additionally, the recommended minimum sizing factor may change over time as more experience with biofiltration is obtained.

B.6 Flow-Thru Treatment Control BMPs (for use with Alternative Compliance)

The following methodology shall be used for selecting and sizing onsite flow-thru treatment control BMPs. These BMPs are to be used only when the project is participating in an alternative compliance program. This methodology consists of three steps:

1) Determine the PDP most significant pollutants of concern (Appendix B.6.1).
2) Select a flow-thru treatment control BMP that treats the PDP most significant pollutants of concern and meets the pollutant control BMP treatment performance standard (Appendix B.6.2).
3) Size the selected flow-thru treatment control BMP (Appendix B.6.3).

B.6.1 PDP Most Significant Pollutants of Concern

The following steps shall be followed to identify the PDP most significant pollutants of concern:

1) Compile the following information for the PDP and receiving water:
    a. Receiving water quality (including pollutants for which receiving waters are listed as impaired under the Clean Water Act section 303(d) List; refer to Section 1.9);
    b. Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the WQIP (refer to Section 1.9);
    c. Land use type(s) proposed by the PDP and the stormwater pollutants associated with the PDP land use(s) (see Table B.6–1).
2) From the list of pollutants identified in Step 1 identify the most significant PDP pollutants of concern. A PDP could have multiple most significant pollutants of concerns and shall include the highest priority water quality condition identified in the watershed WQIP and pollutants expected to be present onsite/generated from land use.

Hypothetical example illustrating the identification of the PDP most significant pollutants of concern is presented as Example B.6-1 below.

TABLE B.6–1: Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories	General Pollutant Categories								
	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >one acre	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Hillside Development >5,000 ft2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists onsite.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

Hypothetical Example B.6-1: Identify the PDP most significant pollutants of concern for a multi-family attached residential development that drains to Forester Creek in the San Diego River watershed. PDP does not have landscaping or uncovered parking lots.

Step 1 Pollutant Identification

Id	Condition of Concern	Value	Explanation
1a	303 (d) list	Bacteria; Selenium; Total Dissolved Solids; pH	For Forester Creek from 303(d) listings
1b	Highest priority water quality condition	Bacteria	Example; From WQIP
1c	Land use type of the project and pollutants associated with that land use type	Land Use: Multi Family Residential Pollutants: Bacteria & Virus	Example; Pollutants based on land use from Table B.6-1 (or a WQIP if there is a land use based pollutants presented in WQIP)

Step 2 Identify Most Significant PDP Pollutants of Concern

Id	Condition of Concern	Value	Explanation
2	Most significant PDP pollutants of concern	Bacteria & Virus	Highest priority water quality condition and/or pollutants expected to be present onsite /generated from land use.

B.6.2 Selection of Flow-Thru Treatment Control BMPs

The following steps shall be followed to select the appropriate flow-thru treatment control BMPs for the PDP:

1) For each PDP most significant pollutant of concern identify the grouping using Table B.6-2.
2) Select the flow-thru treatment control BMP based on the grouping of pollutants of concern that are identified to be most significant in Step 1. This section establishes the pollutant control BMP treatment performance standard to be met for each grouping of pollutants in order to meet the standards required by the MS4 permit and how an applicant can select a non-proprietary or a proprietary BMP that meets the established performance standard. The grouping of pollutants of concern are:
    a. Coarse Sediment and Trash (Appendix B.6.2.1)
    b. Pollutants that tend to associate with fine particles during treatment (Appendix B.6.2.2)
    c. Pollutants that tend to be dissolved following treatment (Appendix B.6.2.3)

TABLE B.6–2: Grouping of Potential Pollutants of Concern

Pollutant	Coarse Sediment and Trash	Suspended Sediment and Particulate-bound Pollutants[1]	Soluble-form Dominated Pollutants[2]
Sediment	X	X	
Nutrients			X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

[1] Pollutants in this category can be addressed to Medium or High effectiveness by effectively removing suspended sediments and associated particulate-bound pollutants. Some soluble forms of these pollutants will exist, however treatment mechanisms to address soluble pollutants are not necessary to remove these pollutants to a Medium or High effectiveness.

[2] Pollutants in this category are not typically addressed to a Medium or High level of effectiveness with particle and particulate-bound pollutant removal alone.

One flow-thru BMP can be used to satisfy the required pollutant control BMP treatment performance standard for the PDP most significant pollutants of concern. In some situations it might be necessary to implement multiple flow-thru BMPs to satisfy the pollutant control BMP

treatment performance standards. For example, a PDP has trash, nutrients and bacteria as the most significant pollutants of concern. If a vegetated filter strip is selected as a flow-thru BMP then it is anticipated to meet the performance standard in Appendix B.6.2.2 and B.6.2.3 but would need a trash removal BMP to meet the pollutant control BMP treatment performance standard in Appendix B.6.2.1 upstream of the vegetated filter strip. This could be achieved by fitting the inlets and/or outlets with racks or screens on to address trash.

B.6.2.1 Coarse Sediment and Trash

If coarse sediment and/or trash and debris are identified as a pollutant of concern for the PDP, then BMPs must be selected to capture and remove these pollutants from runoff. The BMPs described below can be effective in removing coarse sediment and/or trash. These devices must be sized to treat the flow rate estimated using Worksheet B.6-1. Applicant can only select BMPs that have High or Medium effectiveness.

Trash Racks and Screens [Coarse Sediment: Low effectiveness; Trash: Medium to High effectiveness] are simple devices that can prevent large debris and trash from entering storm drain infrastructure and/or ensure that trash and debris are retained with downstream BMPs. Trash racks and screens can be installed at inlets to the storm drain system, at the inflow line to a BMP, and/or on the outflow structure from the BMP. Trash racks and screens are commercially available in many sizes and configurations or can be designed and fabricated to meet specific project needs.

Hydrodynamic Separation Devices [Coarse Sediment: Medium to High effectiveness; Trash: Medium to High effectiveness] are devices that remove coarse sediment, trash, and other debris from incoming flows through a combination of screening, settlement, and centrifugal forces. The design of hydrodynamic devises varies widely, more specific information can be found by contacting individual vendors. A list of hydrodynamic separator products approved by the Washington State Technology Acceptance Protocol-Ecology protocol can be found at:

http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html.

Systems should be rated for "pretreatment" with a General Use Level Designation or provide results of field-scale testing indicating an equivalent level of performance.

Catch Basin Insert Baskets [Coarse Sediment: Low effectiveness; Trash: Medium effectiveness, if appropriately maintained] are manufactured filters, fabrics, or screens that are placed in inlets to remove trash and debris. The shape and configuration of catch basin inserts varies based on inlet type and configuration. Inserts are prone to clogging and bypass if large trash items are accumulated, and therefore require frequent observation and maintenance to remain effective. Systems with screen size small enough to retain coarse sediment will tend to clog rapidly and should be avoided.

Other Manufactured Particle Filtration Devices [Coarse Sediment: Medium to High effectiveness; Trash: Medium to High effectiveness] include a range of products such as cartridge filters, bag filters, and other configurations that address medium to coarse particles. Systems should be rated for "pretreatment" with a General Use Level Designation under the Technology Acceptance Protocol-Ecology program or provide results of field-scale testing indicating an equivalent level of performance.

Note, any BMP that achieves Medium or High performance for suspended solids (See Section B.6.2.2) is also considered to address coarse sediments. However, some BMPs that address suspended solids do not retain trash (for example, swales and detention basins). These types of BMPs could be fitted with racks or screens on inlets or outlets to address trash.

BMP Selection for Pretreatment:

Devices that address both coarse sediment and trash can be used as pretreatment devices for other BMPs, such as infiltration BMPs. However, it is recommended that BMPs that meet the performance standard in Appendix B.6.2.2 be used. A device with a "pretreatment" rating and General Use Level Designation under Technology Acceptance Protocol-Ecology is required for pretreatment upstream of infiltration basins and underground galleries. Pretreatment may also be provided as presettling basins or forebays as part of a pollutant control BMP instead of implementing a specific pretreatment device for systems where maintenance access to the facility surface is possible (to address clogging), expected sediment load is not high, and appropriate factors of safety are included in design.

B.6.2.2 Suspended Sediment and Particulate-Bound Pollutants

Performance Standard

The pollutant treatment performance standard is shown in Table B.6-3. This performance standard is consistent with the Washington State Technology Acceptance Protocol-Ecology Basic Treatment Level, and is also met by technologies receiving Phosphorus Treatment or Enhanced Treatment certification. This standard is based on pollutant removal performance for total suspended solids. Systems that provide effective TSS treatment also typically address trash, debris, and particulate bound pollutants and can serve as pre-treatment for offsite mitigation projects or for onsite infiltration BMPs.

Table B.6-3: Performance Standard for Flow-Thru Treatment Control

Influent Range	Criteria
20 – 100 mg/L TSS	Effluent goal ≤ 20 mg/L TSS
100 – 200 mg/L TSS	≥ 80% TSS removal
>200 mg/L TSS	> 80% TSS removal

Selecting Non-Proprietary BMPs

Table B.6-4 identifies the categories of non-proprietary BMPs that are considered to meet the pollutant treatment performance standard if designed to contemporary design standards[1]. BMP types with an "High" ranking should be considered before those with an "Medium" ranking. Statistical analysis by category from the International Stormwater BMP Database (also presented in Table B.6-4) indicates each of these BMP types (as a categorical group) meets or nearly meets the performance standard. The International Stormwater BMP Database includes historic as well as contemporary BMP studies; contemporary BMP designs in these categories are anticipated to meet or exceed this standard on average.

[1] Contemporary design standards refers to design standards that are reasonably consistent with the current state of practice and are based on desired outcomes that are reasonably consistent with the context of the MS4 Permit and this manual. For example, a detention basin that is designed solely to mitigate peak flow rates would not be considered a contemporary water quality BMP design because it is not consistent with the goal of water quality improvement. Current state of the practice recognizes that a drawdown time of 24 to 72 hours is typically needed to promote settling. For practical purposes, design standards can be considered "contemporary" if they have been published within the last 10 years, preferably in California or Washington State, and are specifically intended for stormwater quality management.

Table B.6-4: Flow-Thru Treatment Control BMPs Meeting Performance Standard

List of Acceptable Flow-Thru Treatment Control BMPs	Statistical Analysis of International Stormwater BMP Database				Evaluation of Conformance to Performance Standard		
	Count In/Out	TSS Mean Influent, mg/L	TSS Mean Effluent[1], mg/L	Average Category Volume Reduct.	Volume-Adjusted Effluent Conc[2], mg/L	Volume-Adjusted Removal Efficiency[2]	Level of Attainment of Performance Standard (with rationale)
Vegetated Filter Strip	361/ 282	69	31	38%	19	72%	Medium, effluent < 20 mg/L after volume adjustment
Vegetated Swale	399/ 346	45	33	48%	17	61%	Medium, effluent < 20 mg/L after volume adjustment
Detention Basin	321/ 346	125	42	33%	28	77%	Medium, percent removal near 80% after volume adjustment
Sand Filter/ Media Bed Filter	381/ 358	95	19	NA[3]	19	80%	High, effluent and % removal meet criteria without adjustment
Lined Porous Pavement[4]	356/ 220	229	46	NA[3,4]	46	80%	High, % removal meets criteria without adjustment
Wet Pond	923/ 933	119	31	NA[3]	31	74%	Medium, percent removal near 80%

Source: 2014 BMP Performance Summaries and Statistical Appendices; 2010 Volume Performance Summary; available at: www.bmpdatabase.org

1 - A statistically significant difference between influent and effluent was detected at a p value of 0.05 for all categories.

2 - Estimates were adjusted to account for category-average volume reduction.

3 - Not Applicable as these BMPs are not designed for volume reduction and are anticipated to have very small incidental volume reduction.

4 - The category presented in this table represents a lined system for flow-thru treatment purposes. Porous pavement for retention purposes is an infiltration BMP, not a flow-thru BMP. This table should not be consulted for porous pavement for infiltration.

Selecting Proprietary BMPs

Proprietary BMPs can be used if the BMP meets each of the following conditions:

(1) The proposed BMP meets the performance standard in Appendix B.6.2.2 as certified through third-party, field scale evaluation. An active General Use Level Designation for Basic Treatment, Phosphorus Treatment or Enhanced Treatment under the Washington State Technology Acceptance Protocol-Ecology program is the preferred method of demonstrating that the performance standard is met. The list of certified technologies is updated as new technologies are approved (link below). Technologies with Pilot Use Level Designation and Conditional Use Level Designations are not acceptable. Refer to:

http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html.
Alternatively, other field scale verification of 80 percent TSS capture, such as through Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing may be acceptable. A list of field-scale verified technologies under Technology Acceptance Reciprocity Partnership Tier II and New Jersey Corporation for Advance Testing can be accessed at: http://www.njcat.org/verification-process/technology-verification-database.html (refer to field verified technologies only).

(2) The proposed BMP is designed and maintained in a manner consistent with its performance certifications (see explanation below). The applicant must demonstrate conclusively that the proposed application of the BMP is consistent with the basis of its certification/verification. Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification. It is common for these approvals to specify the specific model of BMP, design capacity for given unit sizes, type of media that is the basis for approval, and/or other parameters.

(3) The proposed BMP is acceptable at the discretion of the City Engineer. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met. The City Engineer has no obligation to accept any proprietary flow-thru BMP.

B.6.2.3 Soluble-form dominated Pollutants (Nutrients)

If nutrients are identified as a most significant pollutant of concern for the PDP, then BMPs must be selected to meet the performance standard described in Appendix B.6.2.2 **and** must be selected to provide medium or high level of effectiveness for nutrient treatment as described in this section. The most common nutrient of concern in the San Diego region is nitrogen, therefore total nitrogen (TN) was used as the primary indicator of nutrient performance in stormwater BMPs.

Selection of BMPs to address nutrients consists of two steps:

1) Determine if nutrients can be addressed via source control BMPs as described in Appendix E and Chapter 4. After applying source controls, if there are no remaining source areas for soluble nutrients, then this pollutant can be removed from the list of pollutants of concerns for the purpose of selecting flow-thru treatment control BMPs. Particulate nutrients will be addressed by the performance standard in Appendix B.6.2.2.

2) If soluble nutrients cannot be fully addressed with source controls, then select a flow-thru treatment control BMPs that meets the performance criteria in Table B.6-5 or select from the nutrient-specific menu of treatment control BMPs in Table B.6-6.

    a. The performance standard for nitrogen removal (Table B.6-5) has been developed based on evaluation of the relative performance of available categories of non-proprietary BMPs.

    b. For proprietary BMPs, submit third party performance data indicating that the criteria in Table B.6-5 are met. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met. The City Engineer has no obligation to accept any proprietary flow-thru BMP.

Table B.6-5: Performance Standard for Flow-Thru Treatment Control BMPs for Nutrient Treatment

Basis	Criteria
Treatment Basis	Comparison of mean influent and effluent indicates significant concentration reduction of TN approximately 40 percent or higher based on studies with representative influent concentrations
Combined Treatment and Volume Reduction Basis	Combination of concentration reduction and volume reduction yields TN mass removal of approximately 40 percent or higher based on studies with representative influent concentrations

Table B.6-6: Flow-Thru Treatment Control BMPs Meeting Nutrient Treatment Performance Standard

List of Acceptable Flow-Thru Treatment Control BMPs for Nutrients	Statistical Analysis of International Stormwater BMP Database				Evaluation of Conformance to Performance Standard		
	Count In/Out	TN Mean Influent, mg/L	TN Mean Effluent[1], mg/L	Average Category Volume Reduct.	Volume-Adjusted Effluent Conc[2], mg/L	Volume-Adjusted Removal Efficiency[2]	Level of Attainment of Performance Standard (with rationale)
Vegetated Filter Strip	138/ 122	1.53	1.37	38%	0.85	44%	Medium, if designed to include volume reduction processes
Detention Basin	90/ 89	2.34	2.01	33%	1.35	42%	Medium, if designed to include volume reduction processes
Wet Pond	397/ 425	2.12	1.33	NA	1.33	37%	Medium, best concentration reduction among BMP categories, but limited volume reduction

Source: 2014 BMP Performance Summaries and Statistical Appendices; 2010 Volume Performance Summary; available at: www.bmpdatabase.org

1 - A statistically significant difference between influent and effluent was detected at a p value of 0.05 for all categories included.

2 - Estimates were adjusted to account for category-average volume reduction.

B.6.3 Sizing Flow-Thru Treatment Control BMPs:

Flow-thru treatment control BMPs shall be sized to filter or treat the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of every storm event. The required flow-thru treatment rate should be adjusted for the portion of the DCV already retained or biofiltered onsite as described in Worksheet B.6-1. The following hydrologic method shall be used to calculate the flow rate to be filtered or treated:

$$Q = C \times i \times A$$

Where:

Q = Design flow rate in cubic feet per second

C = Runoff factor, area-weighted estimate using Table B.1-1.

i = Rainfall intensity of 0.2 in/hr.

A = Tributary area (acres) which includes the total area draining to the BMP, including any offsite or onsite areas that comingle with project runoff and drain to the BMP. Refer to Section 3.3.3 for additional guidance. Street projects consult Section 1.4.3.

Worksheet B.6-1: Flow-Thru Design Flows

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV		cubic-feet
2	DCV retained	$DCV_{retained}$		cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$		cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow\text{-}thru}$		cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=		unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=		acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=		unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=		cfs

1) Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream of flow-thru BMPs. That is, if the flow-thru BMP is upstream of the project's retention and biofiltration BMPs then the flow-thru BMP shall be sized using an adjustment factor of 1.

2) Volume based (e.g., dry extended detention basin) flow-thru treatment control BMPs shall be sized to the volume in Line 4 and flow based (e.g., vegetated swales) shall be sized to flow rate in Line 9. Sand filter and media filter can be designed either by volume in Line 4 or flow rate in Line 9.

3) Proprietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated flow rate in Line 9; certified treatment capacity per unit shall be consistent with third party certifications.

Appendix

C

Geotechnical and Groundwater Investigation Requirements

February 2016

Appendix C Geotechnical and Groundwater Investigation Requirements

C.1 Purpose and Phasing

Feasibility of stormwater infiltration is dependent on the geotechnical and groundwater conditions at the project site.

This appendix provides guidelines for performing and reporting feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. It provides framework for feasibility analysis at two phases of project development:

- *Planning Phase*: Simpler methods for conducting preliminary screening for feasibility/infeasibility, and
- *Design Phase*: When infiltration is considered potentially feasible, more rigorous analysis is needed to confirm feasibility and to develop design considerations and mitigation measures if required

Planning Phase At this stage of the project, information about the site may be limited, the proposed design features may be conceptual, and there may be an opportunity to adjust project plans to incorporate infiltration into the project layout as it is developed. At this phase, project geotechnical engineers are typically responsible for conducting explorations of geologic conditions, performing preliminary analyses, and identifying particular aspects of design that require more detailed investigation at later phases. As part of this process, the role of a planning- level infiltration feasibility assessment is to help planners reach early tentative conclusions regarding where infiltration is likely feasible, possibly feasible if done carefully, or clearly infeasible. This determination can help guide the design process by influencing project layout, selection of infiltration BMPs, and identifying if more detailed studies are necessary. The goal of the planning and feasibility phase is to identify potential geotechnical and groundwater impacts and to determine which impacts may be considered fatal flaws and which impacts may be possible to mitigate with design features. Determination of acceptable risks and/or mitigation measures may involve discussions with adjacent land owners and/or utility operators, as well as coordination with other projects under planning or design in the project vicinity. Early involvement of potentially impacted parties is critical to avoid late-stage design changes and schedule delays and to reduce potential future liabilities.

Design Phase During this phase, potential geotechnical and groundwater impacts must be fully considered and evaluated and mitigation measures should be incorporated in the BMP design, as appropriate. Mitigation measures refer to design features or assumptions intended to reduce risks

associated with stormwater infiltration. While rules of thumb may be useful, if applied carefully, for the planning level phase, the analyses conducted in the detailed design phase require the involvement of a geotechnical professional familiar with the local conditions. One of the first steps in the design phase should be determination if additional field and/or laboratory investigations are required (e.g., borings, test pits, laboratory or field testing) to further assess the geotechnical impacts of stormwater infiltration. As the design of infiltration systems are highly dependent on the subsurface conditions, coordination with the stormwater design team may be beneficial to limit duplicative efforts and costs.

Worksheet C.4-1 is provided to document infiltration feasibility screening. This worksheet is divided into two parts. Part 1 "Full Infiltration Feasibility Screening Criteria" is used to determine if the full design volume can be infiltrated onsite, whereas Part 2 "Partial Infiltration versus No Infiltration Screening Criteria" is used to determine if any amount of volume can be infiltrated.

Note that it is not necessary to investigate each and every criterion in the worksheet, a single "no" answer in Part 1 and Part 2 controls the feasibility and desirability. If all the answers in Part 1 are "yes" then it is not required to complete Part 2. The same worksheet could be used to document both planning-level categorization and design-level categorization. Note that planning-level categorization, are typically based on initial site assessment results; therefore it is not necessarily conclusive. Categorizations should be confirmed or revised, as necessary, based on more detailed design-level investigation and analysis during BMP design.

C.2 Geotechnical Feasibility Criteria

This section is divided into seven factors that should be considered, as applicable, while assessing the feasibility and desirability of infiltration related to geotechnical conditions. Note that during the planning phase, if one or more of these factors precludes infiltration as an approach, it is not necessary to assess every other factor. However, if proposing infiltration BMPs, then every applicable factor in this section must be addressed.

C.2.1 Soil and Geologic Conditions

Site soils and geologic conditions influence the rate at which water can physically enter the soils. Site assessment approaches for soil and geologic conditions may consist of:

- Review of soil survey maps
- Review of available reports on local geology to identify relevant features, such as depth to bedrock, rock type, lithology, faults, and hydrostratigraphic or confining units
- Review of previous geotechnical investigations of the area
- Site-specific geotechnical and/or geologic investigations (e.g., borings, infiltration tests)

Geologic investigations should also seek to provide an assessment of whether soil infiltration properties are likely to be uniform or variable across the project site. Appendix D provides guidance on determining infiltration rates for planning and design phase.

C.2.2 Settlement and Volume Change

Settlement and volume change limits the amount of infiltration that can be allowed without resulting in adverse impacts that cannot be mitigated. Upon considering the impacts of an infiltration design, the designer must identify areas where soil settlement or heave is likely and whether these conditions would be unfavorable to existing or proposed features. Settlement refers to the condition when soils decrease in volume, and heave refers to expansion of soils or increase in volume.

There are several different mechanisms that can induce volume change due to infiltration that the professional must be aware of and consider while completing the feasibility screening including:

- Hydro collapse and calcareous soils;
- Expansive soils;
- Frost heave;
- Consolidation; and
- Liquefaction.

C.2.3 Slope Stability

Infiltration of water has the potential to result in an increased risk of slope failure of nearby slopes. This should be assessed as part of both the feasibility and design stages of a project. There are many factors that impact the stability of slopes, including, but not limited to, slope inclination, soil and unit weight and seepage forces. Increases in moisture content or rising of the water table in the vicinity of a slope, which may result from stormwater infiltration, have the potential to change the soil strength and unit weight and to add seepage forces to the slope, which in turn, may reduce the factor of safety of the stability of the slope. When evaluating the effect of infiltration on the design of a slope, the designer must consider all types of potential slope failures.

C.2.4 Utility Considerations

Utilities are either public or private infrastructure components that include underground pipelines and vaults (e.g., potable water, sewer, stormwater, gas pipelines), underground wires/conduit (e.g., telephone, cable, electrical) and above ground wiring and associated structures (e.g., electrical distribution and transmission lines). Utility considerations are typically within the purview of a geotechnical site assessment and should be considered in assessing the feasibility of stormwater infiltration. Infiltration has the potential to damage subsurface utilities and/or underground utilities may pose geotechnical hazards in themselves when infiltrated water is introduced. Impacts related to

stormwater infiltration in the vicinity of underground utilities are not likely to cause a fatal flaw in the design, but the designer must be aware of the potential cost impacts to the design during the planning stage.

C.2.5 Groundwater Mounding

Stormwater infiltration and recharge to the underlying groundwater table may create a groundwater mound beneath the infiltration facility. The height and shape of the mound depends on the infiltration system design, the recharge rate, and the hydrogeologic conditions at the site, especially the horizontal hydraulic conductivity and the saturated thickness. Elevated groundwater levels can lead to a number of problems, including flooding and damage to structures and utilities through buoyancy and moisture intrusion, increase in inflow and infiltration into municipal sanitary sewer systems, and flow of water through existing utility trenches, including sewers, potentially leading to formation of sinkholes (Gobel et al. 2004). Mounding shall be considered by the geotechnical professional while performing the infiltration feasibility screening.

C.2.6 Retaining Walls and Foundations

Development projects may include retaining walls or foundations in close proximity to proposed infiltration BMPs. These structures are designed to withstand the forces of the earth they are retaining and other surface loading conditions such as nearby structures. Foundations include shallow foundations (spread and strip footings, mats) and deep foundations (piles, piers) and are designed to support overburden and design loads. All types of retaining walls and foundations can be impacted by increased water infiltration into the subsurface as a result of potential increases in lateral pressures and potential reductions in soil strength. The geotechnical professional should consider these factors while performing the infiltration feasibility screening.

C.2.7 Other Factors

While completing the feasibility screening, other factors determined by the geotechnical professional to influence the feasibility and desirability of infiltration related to geotechnical conditions shall also be considered.

C.3 Groundwater Quality and Water Balance Feasibility Criteria

This section is divided into eight factors that should be considered, to the extent applicable, while assessing the feasibility and desirability of infiltration related to groundwater quality and water balance. Note that during the planning phase, if one or more of these factors precludes infiltration as an approach, it is not necessary to assess every other factor. However, if proposing infiltration

BMPs, then every applicable factor in this section must be addressed.

C.3.1 Soil and Groundwater Contamination

Infiltration shall be avoided in areas with:

- Physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content and infiltration rate) which are not adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses.

- Groundwater contamination and/or soil pollution, if infiltration could contribute to the movement or dispersion of soil or groundwater contamination or adversely affect ongoing clean-up efforts, either onsite or down-gradient of the project.

If infiltration is under consideration for one of the above conditions, a site-specific analysis should be conducted to determine where infiltration-based BMPs can be used without adverse impacts.

C.3.2 Separation to Seasonal High Groundwater

The depth to seasonally high groundwater tables (normal high depth during the wet season) beneath the base of any infiltration BMP must be greater than 10 feet for infiltration BMPs to be allowed. The depth to groundwater requirement can be reduced from 10 feet at the discretion of the approval agency if the underlying groundwater basin does not support beneficial uses and the groundwater quality is maintained at the proposed depth. Depth to seasonally high groundwater levels can be estimated based on well level measurements or redoximorphic methods. For sites with complex groundwater tables, long term studies may be needed to understand how groundwater levels change in wet and dry years.

C.3.3 Wellhead Protection

Wellheads natural and man-made are water resources that may potentially be adversely impacted by stormwater infiltration through the introduction of contaminants or alteration in water supply and levels. It is recommended that the locations of wells and springs be identified early in the design process and site design be developed to avoid infiltration in the vicinity of these resources. Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply well.

C.3.4 Contamination Risks from Land Use Activities

Concentration of stormwater pollutants in runoff is highly dependent on the land uses and activities present in the area tributary to an infiltration BMP. Likewise, the potential for groundwater

contamination due to the infiltration BMP is a function of pollutant abundance, concentration of pollutants in soluble forms, and the mobility of the pollutant in the subsurface soils. Hence infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration.

C.3.5 Consultation with Applicable Groundwater Agencies

Infiltration activities should be coordinated with the applicable groundwater management agency, such as groundwater providers and/or resource protection agencies, to ensure groundwater quality is protected. It is recommended that coordination be initiated as early as possible during the planning process to determine whether specific site assessment activities apply or whether these agencies have data available that may support the planning and design process.

C.3.6 Water Balance Impacts on Stream Flow

Use of infiltration systems to reduce surface water discharge volumes may result in additional volume of deeper infiltration compared to natural conditions, which may result in impacts to receiving channels associated with change in dry weather flow regimes. A relatively simple survey of hydrogeologic data (piezometer measurements, boring logs, regional groundwater maps) and downstream receiving water characteristics is generally adequate to determine whether there is potential for impacts and whether a more rigorous assessment is needed.

Where water balance conditions appear to be sensitive to development impacts and there is an elevated risk of impacts, a computational analysis may be warranted to evaluate the feasibility/desirability of infiltration. Such an analysis should account for precipitation, runoff, irrigation inputs, soil moisture retention, evapotranspiration, baseflow, and change in groundwater recharge on a long term basis. Because water balance calculations are sensitive to the timing of precipitation versus evapotranspiration, it is most appropriate to utilize a continuous model simulation rather than basing calculations on average annual or monthly normal conditions.

C.3.7 Downstream Water Rights

While water rights cases are not believed to be common, there may be cases in which infiltration of water from area that was previously allowed to drain freely to downstream water bodies would not be legal from a water rights perspective. Site-specific evaluation of water rights laws should be conducted if this is believed to be a potential issue in the project location.

C.3.8 Other Factors

While completing the feasibility screening, other factors determined by the geotechnical professional to influence the feasibility and desirability of infiltration related to groundwater quality and water balance shall also be considered.

C.4 Geotechnical and Groundwater Investigation Report Requirements

The geotechnical and groundwater investigation report(s) addressing onsite stormwater infiltration shall include the following elements, as applicable. These reports may need to be completed by multiple professional disciplines, depending on the issues that need be addressed for a given site. It may also be necessary to prepare separate report(s) at the planning phase and design phase of a project if the methods and timing of analyses differ.

C.4.1 Site Evaluation

Site evaluation shall identify the following:

- Areas of contaminated soil or contaminated groundwater within the site;
- "Brown fields" adjacent to the site;
- Mapped soil type(s);
- Historic high groundwater level;
- Slopes steeper than 25 percent; and
- Location of water supply wells, septic systems (and expansion area), or underground storage tanks, or permitted gray water systems within 100 feet of a proposed infiltration/ percolation BMP.

C.4.2 Field Investigation

Where the site evaluation indicates potential feasibility for onsite stormwater infiltration BMPs, the following field investigations will be necessary to demonstrate suitability and to provide design recommendations.

C.4.2.1 Subsurface Exploration

Subsurface exploration and testing for stormwater infiltration BMPs shall include:

- A minimum of two exploratory excavations shall be conducted within 50-feet of each proposed stormwater infiltration BMP. The excavations shall extend at least 10 feet below the lowest elevation of the base of the proposed infiltration BMP.
- Soils shall be logged in detail with emphasis on describing the soil profile.
- Identify low permeability or impermeable materials.
- Indicate any evidence of soil contamination.

C.4.2.2 Material Testing and Infiltration/Percolation Testing

Various material testing and in situ infiltration/percolation testing methods and guidance for appropriate factor of safety are discussed in detail in Appendix D. Infiltration testing methods described in Appendix D include surface and shallow excavation methods and deeper subsurface tests.

C.4.2.3 Evaluation of Depth to Groundwater

An evaluation of the depth to groundwater is required to confirm the feasibility of infiltration. Infiltration BMPs may not be feasible in high groundwater conditions (within 10 feet of the base of infiltration/ percolation BMP) unless an exemption is granted by the approval agency.

C.4.3 Reporting Requirements by Geotechnical Engineer

The geotechnical and groundwater investigation report shall address the following key elements, and where appropriate, mitigation recommendations shall be provided.

- Identify areas of the project site where infiltration is likely to be feasible and provide justifications for selection of those areas based on soil types, slopes, proximity to existing features, etc. Include completed and signed Worksheet C.4-1.
- Investigate, evaluate and estimate the vertical infiltration rates and capacities in accordance with the guidance provided in Appendix D which describes infiltration testing and appropriate factor of safety to be applied for infiltration testing results. The site may be broken into sub-basins, each of which has different infiltration rates or capacities.
- Describe the infiltration/ percolation test results and correlation with published infiltration/ percolation rates based on soil parameters or classification. Recommend providing design infiltration/percolation rate(s) at the sub-basins. Use Worksheet D.5-1.
- Investigate the subsurface geological conditions and geotechnical conditions that would affect infiltration or migration of water toward structures, slopes, utilities, or other features. Describe the anticipated flow path of infiltrated water. Indicate if the water will flow into pavement sections, utility trench bedding, wall drains, foundation drains, or other permeable improvements.

- Investigate depth to groundwater and the nature of the groundwater. Include an estimate of the high seasonal groundwater elevations.
- Evaluate proposed use of the site (industrial use, residential use, etc.), soil and groundwater data and provide a concluding opinion whether proposed stormwater infiltration could cause adverse impacts to groundwater quality and if it does cause impacts whether the impacts could be reasonably mitigated or not.
- Estimate the maximum allowable infiltration rates and volumes that could occur at the site that would avoid damage to existing and proposed structures, utilities, slopes, or other features. In addition the report must indicate if the recommended infiltration rate is appropriate based on the conditions exposed during construction.
- Provide a concluding opinion regarding whether or not the proposed onsite stormwater infiltration/percolation BMP will result in soil piping, daylight water seepage, slope instability, or ground settlement.
- Recommend measures to substantially mitigate or avoid any potentially detrimental effects of the stormwater infiltration BMPs or associated soil response on existing or proposed improvements or structures, utilities, slopes or other features within and adjacent to the site. For example, minimize soil compaction.
- Provide guidance for the selection and location of infiltration BMPs, including the minimum separations between such infiltration BMPs and structures, streets, utilities, manufactured and existing slopes, engineered fills, utilities or other features. Include guidance for measures that could be used to reduce the minimum separations or to mitigate the potential impacts of infiltration BMPs.
- Provide a concluding opinion whether or not proposed infiltration BMPs are in conformance with the following design criteria:
    - Runoff will undergo pretreatment such as sedimentation or filtration prior to infiltration;
    - Pollution prevention and source control BMPs are implemented at a level appropriate to protect groundwater quality for areas draining to infiltration BMPs;
    - The vertical distance from the base of the infiltration BMPs to the seasonal high groundwater mark is greater than 10 feet. This vertical distance may be reduced when the groundwater basin does not support beneficial uses and the groundwater quality is maintained;
    - The soil through which infiltration is to occur has physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses; and
    - Infiltration BMPs are located a minimum of 100 feet horizontally from any water supply wells.

C.4.4 Reporting Requirements by the Project Design Engineer

Project design engineer has the following responsibilities:

- Complete criteria 4 and 8 in Worksheet C.4-1; and
- In the SWQMP provide a concluding opinion whether or not proposed infiltration BMPs will affect seasonality of ephemeral streams.

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		**Worksheet C.4-1**	
Part 1 - Full Infiltration Feasibility Screening Criteria **Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, stormwater pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-1 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, stormwater pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

C.5 Feasibility Screening Exhibits

Table C.5-1 lists the feasibility screening exhibits that were generated using readily available GIS data sets to assist the project applicant to screen the project site for feasibility.

Table C.5-1: Feasibility Screening Exhibits

Figures	Layer	Intent/Rationale	Data Sources
C.1 Soils	Hydrologic Soil Group – A, B, C, D	Hydrologic Soil Group will aid in determining areas of potential infiltration	SanGIS http://www.sangis.org/
	Hydric Soils	Hydric soils will indicate layers of intermittent saturation that may function like a D soil and should be avoided for infiltration	USDA Web Soil Survey. Hydric soils, (ratings of 100) were classified as hydric. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
C.2: Slopes and Geologic Hazards	Slopes >25%	BMPs are hard to construct on slopes >25% and can potentially cause slope instability	SanGIS http://www.sangis.org/
	Liquefaction Potential	BMPs (particularly infiltration BMPs) must not be sited in areas with high potential for liquefaction or landslides to minimize earthquake/landslide risks	SanGIS http://www.sangis.org/
	Landslide Potential		SanGIS Geologic Hazards layer. Subset of polygons with hazard codes related to landslides was selected. This data is limited to the City of San Diego Boundary. http://www.sangis.org/
C.3: Groundwater Table Elevations	Groundwater Depths	Infiltration BMPs will need to be sited in areas with adequate distance (>10 ft) from the groundwater table	GeoTracker. Data downloaded for San Diego county from 2014 and 2013. In cases where there were multiple measurements made at the same well, the average was taken over that year. http://geotracker.waterboards.ca.gov/data_download_by_county.asp
C.4: Contaminated Sites	Contaminated soils and/or groundwater sites	Infiltration must limited in areas of contaminated soil/groundwater	GeoTracker. Data downloaded for San Diego county and limited to active cleanup sites http://geotracker.waterboards.ca.gov/

County of San Diego

Miles
0 2.5 5 10

Figure C.1
Soils
San Diego County, California

Legend
Hydric Soils
Hydrologic Soils Group
A B C D

County of San Diego

Miles
0 2.5 5 10

Figure C.2
Slopes and Geologic Hazards
San Diego County, California

Legend

- Landslide Data Extent
- Potential Landslide Areas
- Slopes >25%
- Potential Liquefaction Areas

County of San Diego

Miles
0 2.5 5 10

Figure C.3
Groundwater Table Elevation
San Diego County, California

Legend
Average Depth to Groundwater

- <5 ft
- 5 - 9 ft
- 10 - 14ft
- >15 ft

County of San Diego

Miles
0 2.5 5 10

Figure C.4
Contaminated Sites
San Diego County, California

Legend

- Contaminated Sites

Appendix

D

Approved Infiltration Rate Assessment Methods for Selection of Stormwater BMPs

February 2016

Appendix D Approved Infiltration Rate Assessment Methods for Selection and Design of Stormwater BMPs

D.1 Introduction

Characterization of potential infiltration rates is a critical step in evaluating the degree to which infiltration can be used to reduce stormwater runoff volume. This appendix is intended to provide guidance to help answer the following questions:

1. *How and where does infiltration testing fit into the project development process?*

   Section D.2 discusses the role of infiltration testing in different stage of project development and how to plan a phased investigation approach.

2. *What infiltration rate assessment methods are acceptable?*

   Section D.3 describes the infiltration rate assessment methods that are acceptable.

3. *What factors should be considered in selecting the most appropriate testing method for a project?*

   Section D.4 provides guidance on site-specific considerations that influence which assessment methods are most appropriate.

4. *How should factors of safety be selected and applied to, for BMP selection and design?*

   Section D.5 provides guidance for selecting a safety factor.

Note, that this appendix does not consider other feasibility criteria that may make infiltration infeasible, such as groundwater contamination and geotechnical considerations (these are covered in Appendix C). In general, infiltration testing should only be conducted after other feasibility criteria specified in this manual have been evaluated and cleared.

D.2 Role of Infiltration Testing in Different Stages of Project Development

In the process of planning and designing infiltration facilities, there are a number of ways that infiltration testing or estimation factors into project development, as summarized in Table D.2-1. As part of selecting infiltration testing methods, the geotechnical engineer shall select methods that are applicable to the phase of the project and the associated burden of proof.

Table D.2-1: Role of Infiltration Testing

Project Phase	Key Questions/Burden of Proof	General Assessment Strategies
Site Planning Phase	• Where within the project area is infiltration potentially feasible? • What volume reduction approaches are potentially suitable for my project?	• Use existing data and maps to the extent possible • Use less expensive methods to allow a broader area to be investigated more rapidly • Reach tentative conclusions that are subject to confirmation/refinement at the design phase
BMP Design Phase	• What infiltration rates should be used to design infiltration and biofiltration facilities? • What factor of safety should be applied?	• Use more rigorous testing methods at specific BMP locations • Support or modify preliminary feasibility findings • Estimate design infiltration rates with appropriate factors of safety

D.3 Guidance for Selecting Infiltration Testing Methods

The geotechnical engineer shall select appropriate testing methods for the site conditions, subject to the engineer's discretion and approval of the City Engineer, that are adequate to meet the burden of proof that is applicable at each phase of the project design (See Table D.3-1):

- At the planning phase, testing/evaluation method must be selected to provide a reliable estimate of the locations where infiltration is feasible and allow a reasonably confident determination of infiltration feasibilility to support the selection between full infiltration, partial infiltration, and no infiltration BMPs.

- At the design phase, the testing method must be selected to provide a reliable infiltration rate to be used in design. The degree of certainty provided by the selected test should be considered

Table D.3-1 provides a matrix comparison of these methods. Sections D.3.1 to D.3.3 provide a summary of each method. This appendix is not intended to be an exhaustive reference on infiltration testing at this time. It does not attempt to discuss every method for testing, nor is it intended to provide step-by-step procedures for each method. The user is directed to supplemental resources (referenced in this appendix) or other appropriate references for more specific information. **Alternative testing methods are allowed with appropriate rationales, subject to**

the discretion of the City Engineer.

In order to select an infiltration testing method, it is important to understand how each test is applied and what specific physical properties the test is designed to measure. Infiltration testing methods vary considerably in these regards. For example, a borehole percolation test is conducted by drilling a borehole, filling a portion of the hole with water, and monitoring the rate of fall of the water. This test directly measures the three dimensional flux of water into the walls and bottom of the borehole. An approximate correction is applied to indirectly estimate the vertical hydraulic conductivity from the results of the borehole test. In contrast, a double-ring infiltrometer test is conducted from the ground surface and is intended to provide a direct estimate of vertical (one-dimensional) infiltration rate at this point. Both of these methods are applicable under different conditions.

Table D.3-1: Comparision of Infiltration Rate Estimation and Testing Methods

Test	Suitability at Planning Level Screening Phase	Suitability at BMP Design Phase
NRCS Soil Survey Maps	Yes, but mapped soil types must be confirmed with site observations. Regional soil maps are known to contain inaccuracies at the scale of typical development sites.	No, unless a strong correlation is developed between soil types and infiltration rates in the direct vicinity of the site and an elevated factor of safety is used.
Grain Size Analysis	Not preferred. Should only be used if a strong correlation has been developed between grain size analysis and measured infiltration rates testing results of site soils.	No
Cone Penetrometer Testing	Not preferred. Should only be used if a strong correlation has been developed between CPT results and measured infiltration rates testing results of site soils.	No
Simple Open Pit Test	Yes	Yes, with appropriate correction for infiltration into side walls and elevated factor of safety.
Open Pit Falling Head Test	Yes	Yes, with appropriate correction for infiltration into side walls and elevated factor of safety.
Double Ring Infiltrometer Test (ASTM 3385)	Yes	Yes
Single Ring Infiltrometer Test	Yes	Yes

Test	Suitability at Planning Level Screening Phase	Suitability at BMP Design Phase
Large-scale Pilot Infiltration Test	Yes, but generally cost prohibitive and too water-intensive for preliminary screening of a large area.	Yes, but should consider relatively large water demand associated with this test.
Smaller-scale Pilot Infiltration Test	Yes	Yes
Well Permeameter Method (USBR 7300-89)	Yes; reliability of this test can be improved by obtaining a continuous core where tests are conducted.	Yes in areas of proposed cut where other tests are not possible; a continuous boring log should be recorded and used to interpret test; should be confirmed with a more direct measurement following excavation.
Borehole Percolation Tests (various methods)	Yes; reliability of this test can be improved by obtaining a continuous core where tests are conducted.	Yes in areas of proposed cut where other tests are not possible; a continuous boring log should be recorded and used to interpret test; should be confirmed with a more direct measurement following excavation.
Laboratory Permeability Tests (e.g., ASTM D2434)	Yes, only suitable for evaluating potential infiltration rates in proposed fill areas. For sites with proposed cut, it is preferred to do a borehole percolation test at the proposed grade instead of analyzing samples in the lab. A combination of both tests may improve reliability.	No. However, may be part of a line of evidence for estimating the design infiltration of partial infiltration BMPs constructed in future compacted fill.

D.3.1 Desktop Approaches and Data Correlation Methods

This section reviews common methods used to evaluate infiltration characteristics based on desktop-available information, such as GIS data. This section also introduces methods for estimating infiltration properties via correlations with other measurements.

D.3.1.1 NRCS Soil Survey Maps

NRCS Soil Survey maps (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm) can be used to estimate preliminary feasibility conditions, specifically by mapping hydrologic soil groups, soil texture classes, and presence of hydric soils relative to the site layout. For feasibility determinations, mapped conditions must be supplemented with available data from the site (e.g., soil borings, observed soil textures, biological indicators). The presence of D soils, if confirmed by available data, provides a reasonable basis to determine that full infiltration is not feasible for a given DMA.

D.3.1.2 Grain Size Analysis Testing and Correlations to Infiltration Rate

Hydraulic conductivity can be estimated indirectly from correlations with soil grain-size

distributions. While this method is approximate, correlations have been relatively well established for some soil conditions. One of the most commonly used correlations between grain size parameters and hydraulic conductivity is the Hazen (1892, 1911) empirical formula (Philips and Kitch, 2011), but a variety of others have been developed. Correlations must be developed based on testing of site-specific soils.

D.3.1.3 Cone Penetrometer Testing and Correlations to Infiltration Rate

Hydraulic conductivity can also be estimated indirectly from cone penetrometer testing (CPT). A cone penetrometer test involves advancing a small probe into the soil and measuring the relative resistance encountered by the probe as it is advanced. The signal returned from this test can be interpreted to yield estimated soil types and the location of key transitions between soil layers. If this method is used, correlations must be developed based on testing of site-specific soils.

D.3.2 Surface and Shallow Excavation Methods

This section describes tests that are conducted at the ground surface or within shallow excavations close to the ground surface. These tests are generally applicable for cases where the bottom of the infiltration system will be near the existing ground surface. They can also be conducted to confirm the results of borehole methods after excavation/site grading has been completed.

D.3.2.1 Simple Open Pit Test

The Simple Open Pit Test is most appropriate for planning level screening of infiltration feasibility. Although it is similar to Open Pit Falling Head tests used for establishing a design infiltration rate (see below), the Simple Open Pit Test is less rigorous and is generally conducted to a lower standard of care. This test can be conducted by a nonprofessional as part of planning level screening phase.

The Simple Open Pit Test is a falling head test in which a hole at least two feet in diameter is filled with water to a level of 6" above the bottom. Water level is checked and recorded regularly until either an hour has passed or the entire volume has infiltrated. The test is repeated two more times in succession and the rate at which the water level falls in the third test is used as the infiltration rate.

This test has the advantage of being inexpensive to conduct. Yet it is believed to be fairly reliable for screening as the dimensions of the test are similar, proportionally, to the dimensions of a typical BMP. The key limitations of this test are that it measures a relatively small area, does not necessarily result in a precise measurement, and may not be uniformly implemented.

Source: City of Portland, 2008. Stormwater Management Manual

D.3.2.2 Open Pit Falling Head Test

This test is similar to the Simple Open Pit Test, but covers a larger footprint, includes more specific instructions, returns more precise measurements, and generally should be overseen by a geotechnical professional. Nonetheless, it remains a relatively simple test.

To perform this test, a hole is excavated at least 2 feet wide by 4 feet long (larger is preferred) and to a depth of at least 12 inches. The bottom of the hole should be approximately at the depth of the proposed infiltrating surface of the BMP. The hole is pre-soaked by filling it with water at least a foot above the soil to be tested and leaving it at least 4 hours (or overnight if clays are present). After pre-soaking, the hole is refilled to a depth of 12 inches and allow it to drain for one hour (2 hours for slower soils), measuring the rate at which the water level drops. The test is then repeated until successive trials yield a result with less than 10 percent change.

In comparison to a double-ring infiltrometer, this test has the advantage of measuring infiltration over a larger area and better resembles the dimensionality of a typical small scale BMP. Because it includes both vertical and lateral infiltration, it should be adjusted to estimate design rates for larger scale BMPs.

D.3.2.3 Double Ring Infiltrometer Test (ASTM 3385)

The Double Ring Infiltrometer was originally developed to estimate the saturated hydraulic conductivity of low permeability materials, such as clay liners for ponds, but has seen significant use in stormwater applications. The most recent revision of this method from 2009 is known as ASTM 3385-09. The testing apparatus is designed with concentric rings that form an inner ring and an annulus between the inner and outer rings. Infiltration from the annulus between the two rings is intended to saturate the soil outside of the inner ring such that infiltration from the inner ring is restricted primarily to the vertical direction.

To conduct this test, both the center ring and annulus between the rings are filled with water. There is no pre-wetting of the soil in this test. However, a constant head of 1 to 6 inches is maintained for 6 hours, or until a constant flow rate is established. Both the inner flow rate and annular flow rate are recorded, but if they are different, the inner flow rate should be used. There are a variety of approaches that are used to maintain a constant head on the system, including use of a Mariotte tube, constant level float valves, or manual observation and filling. This test must be conducted at the elevation of the proposed infiltrating surface; therefore application of this test is limited in cases where the infiltration surface is a significant distance below existing grade at the time of testing.

This test is generally considered to provide a direct estimate of vertical infiltration rate for the specific point tested and is highly replicable. However, given the small diameter of the inner ring (standard diameter is 12 inches, but it can be larger), this test only measures infiltration rate in a small area. Additionally, given the small quantity of water used in this test compared to larger scale

tests, this test may be biased high in cases where the long term infiltration rate is governed by groundwater mounding and the rate at which mounding dissipates (i.e., the capacity of the infiltration receptor). Finally, the added effort and cost of isolating vertical infiltration rate may not necessarily be warranted considering that BMPs typically have a lateral component of infiltration as well. Therefore, while this method has the advantages of being technical rigorous and well standardized, it should not necessarily be assumed to be the most representative test for estimating full-scale infiltration rates. Source: American Society for Testing and Materials (ASTM) International (2009)

D.3.2.4 Single Ring Infiltrometer Test

The single ring infiltrometer test is not a standardized ASTM test, however it is a relatively well-controlled test and shares many similarities with the ASTM standard double ring infiltrometer test (ASTM 3385-09). This test is a constant head test using a large ring (preferably greater than 40 inches in diameter) usually driven 12 inches into the soil. Water is ponded above the surface. The rate of water addition is recorded and infiltration rate is determined after the flow rate has stabilized. Water can be added either manually or automatically.

The single ring used in this test tends to be larger than the inner ring used in the double ring test. Driving the ring into the ground limits lateral infiltration; however some lateral infiltration is generally considered to occur. Experience in Riverside County (CA) has shown that this test gives results that are close to full-scale infiltration facilities. The primary advantages of this test are that it is relatively simple to conduct and has a larger footprint (compared to the double-ring method) and restricts horizontal infiltration and is more standardized (compared to open pit methods). However, it is still a relatively small scale test and can only be reasonably conducted near the existing ground surface.

D.3.2.5 Large-scale Pilot Infiltration Test

As its name implies, this test is closer in scale to a full-scale infiltration facility. This test was developed by Washington State Department of Ecology specifically for stormwater applications.

To perform this test, a test pit is excavated with a horizontal surface area of roughly 100 square feet to a depth that allows 3 to 4 feet of ponding above the expected bottom of the infiltration facility. Water is continually pumped into the system to maintain a constant water level (between 3 and 4 feet about the bottom of the pit, but not more than the estimated water depth in the proposed facility) and the flow rate is recorded. The test is continued until the flow rate stabilizes. Infiltration rate is calculated by dividing the flow rate by the surface area of the pit. Similar to other open pit test, this test is known to result in a slight bias high because infiltration also moves laterally through the walls of the pit during the test. Washington State Department of Ecology requires a correction factor of 0.75 (factor of safety of 1.33) be applied to results.

This test has the advantage of being more resistant to bias from localized soil variability and being more similar to the dimensionality and scale of full scale BMPs. It is also more likely to detect long term decline in infiltration rates associated with groundwater mounding. As such, it remains the preferred test for establishing design infiltration rates in Western Washington (Washington State Department of Ecology, 2012). In a comparative evaluation of test methods, this method was found to provide a more reliable estimate of full-scale infiltration rate than double ring infiltrometer and borehole percolation tests (Philips and Kitch 2011).

The difficulty encountered in this method is that it requires a larger area be excavated than the other methods, and this in turn requires larger equipment for excavation and a greater supply of water. However, this method should be strongly considered when less information is known about spatial variability of soils and/or a higher degree of certainty in estimated infiltration rates is desired.

Source: Washington State Department of Ecology, 2012.

D.3.2.6 Smaller-scale Pilot Infiltration Test

The smaller-scale PIT is conducted similarly to the large-scale PIT but involves a smaller excavation, ranging from 20 to 32 square feet instead of 100 square feet for the large-scale PIT, with similar depths. The primary advantage of this test compared to the full-scale PIT is that it requires less excavation volume and less water. It may be more suitable for small-scale distributed infiltration controls where the need to conduct a greater number of tests outweighs the accuracy that must be obtained in each test, and where groundwater mounding is not as likely to be an issue. Washington State Department of Ecology establishes a correction factor of 0.5 (factor of safety of 2.0) for this test in comparison to 0.75 (factor of safety of 1.33) for the large-scale PIT to account for a greater fraction of water infiltrating through the walls of the excavation and lower degree of certainty related to spatial variability of soils.

D.3.3 Deeper Subsurface Tests

D.3.3.1 Well Permeameter Method (USBR 7300-89)

Well permeameter methods were originally developed for purposes of assessing aquifer permeability and associated yield of drinking water wells. This family of tests is most applicable in situations in which infiltration facilities will be placed substantially below existing grade, which limits the use of surface testing methods.

In general, this test involves drilling a 6 inch to 8 inch test well to the depth of interest and maintaining a constant head until a constant flow rate has been achieved. Water level is maintained with down-hole floats. The Porchet method or the nomographs provided in the USBR Drainage Manual (United States Department of the Interior, Bureau of Reclamation, 1993) are used to convert

the measured rate of percolation to an estimate of vertical hydraulic conductivity. A smaller diameter boring may be adequate, however this then requires a different correction factor to account for the increased variability expected.

While these tests have applicability in screening level analysis, considerable uncertainty is introduced in the step of converting direct percolation measurements to estimates of vertical infiltration. Additionally, this testing method is prone to yielding erroneous results cases where the vertical horizon of the test intersects with minor lenses of sandy soils that allow water to dissipate laterally at a much greater rate than would be expected in a full-scale facility. To improve the interpretation of this test method, a continuous bore log should be inspected to determine whether thin lenses of material may be biasing results at the strata where testing is conducted. Consult USBR procedure 7300-89 for more details.

Source: (United States Department of the Interior, Bureau of Reclamation, 1990, 1993)

D.3.3.2 Borehole Percolation Tests (various methods)

Borehole percolation tests were originally developed as empirical tests to estimate the capacity of onsite sewage disposal systems (septic system leach fields), but have more recently been adopted into use for evaluating stormwater infiltration. Similar to the well permeameter method, borehole percolation methods primarily measure lateral infiltration into the walls of the boring and are designed for situations in which infiltration facilities will be placed well below current grade. The percolation rate obtained in this test should be converted to an infiltration rate using a technique such as the Porchet method.

This test is generally implemented similarly to the USBR Well Permeameter Method. Per the Riverside County Borehole Percolation method, a hole is bored to a depth at least 5 times the borehole radius. The hole is presoaked for 24 hours (or at least 2 hours if sandy soils with no clay). The hole is filled to approximately the anticipated top of the proposed infiltration basin. Rates of fall are measured for six hours, refilling each half hour (or 10 minutes for sand). Tests are generally repeated until consistent results are obtained.

The same limitations described for the well permeameter method apply to borehole percolation tests, and their applicability is generally limited to initial screening. To improve the interpretation of this test method, a continuous soil core can be extracted from the hole and below the test depth, following testing, to determine whether thin lenses of material may be biasing results at the strata where testing is conducted.

Sources: Riverside County Percolation Test (2011), California Test 750 (Caltrans, 1986), San Bernardino County Percolation Test (1992); USEPA Falling Head Test (USEPA, 1980).

D.4 Specific Considerations for Infiltration Testing

The following subsections are intended to address specific topics that commonly arise in characterizing infiltration rates.

D.4.1 Hydraulic Conductivity versus Infiltration Rate versus Percolation Rate

A common misunderstanding is that the "percolation rate" obtained from a percolation test is equivalent to the "infiltration rate" obtained from tests such as a single or double ring infiltrometer test which is equivalent to the "saturated hydraulic conductivity". In fact, these terms have different meanings. Saturated hydraulic conductivity is an intrinsic property of a specific soil sample under a given degree of compaction. It is a coefficient in Darcy's equation (Darcy 1856) that characterizes the flux of water that will occur under a given gradient. The measurement of saturated hydraulic conductivity in a laboratory test is typically referred to as "permeability", which is a function of the density, structure, stratification, fines, and discontinuities of a given sample under given controlled conditions. In contrast, infiltration rate is an empirical observation of the rate of flux of water into a given soil structure under long term ponding conditions. Similarly to permeability, infiltration rate can be limited by a number of factors including the layering of soil, density, discontinuities, and initial moisture content. These factors control how quickly water can move through a soil. However, infiltration rate can also be influenced by mounding of groundwater, and the rate at which water dissipates horizontally below a BMP – both of which describe the "capacity" of the "infiltration receptor" to accept this water over an extended period. For this reason, an infiltration test should ideally be conducted for a relatively long duration resembling a series of storm events so that the capacity of the infiltration receptor is evaluated as well as the rate at which water can enter the system. Infiltration rates are generally tested with larger diameter holes, pits, or apparatuses intended to enforce a primarily vertical direction of flux.

In contrast, percolation is tested with small diameter holes, and it is mostly a lateral phenomenon. The direct measurement yielded by a percolation test tends to overestimate the infiltration rate, except perhaps in cases in which a BMP has similar dimensionality to the borehole, such as a dry well. Adjustment of percolation rates may be made to an infiltration rate using a technique such as the Porchet Method.

D.4.2 Cut and Fill Conditions

Cut Conditions: Where the proposed infiltration BMP is to be located in a cut condition, the infiltration surface level at the bottom of the BMP might be far below the existing grade. For example, if the infiltration surface of a proposed BMP is to be located at an elevation that is currently beneath 15 feet of planned cut, *how can the proposed infiltration surface be tested to establish a design*

infiltration rate prior to beginning excavation? The question can be addressed in two ways: First, one of the deeper subsurface tests described above can be used to provide a planning level screening of potential rates at the elevation of the proposed infiltrating surface. These tests can be conducted at depths exceeding 100 feet, therefore are applicable in most cut conditions. Second, the project can commit to further testing using more reliable methods following bulk excavation to refine or adjust infiltration rates, and/or apply higher factors of safety to borehole methods to account for the inherent uncertainty in these measurements and conversions.

Fill Conditions: There are two types of fills – those that are engineered or documented, and those that are undocumented. Undocumented fills are fills placed without engineering controls or construction quality assurance and are subject to great uncertainty. Engineered fills are generally placed using construction quality assurance procedures and may have criteria for grain-size and fines content, and the properties can be very well understood. However, for engineered fills, infiltration rates may still be quite uncertain due to layering and heterogeneities introduced as part of construction that cannot be precisely controlled.

If the bottom of a BMP (infiltration surface) is proposed to be located in a fill location, the infiltration surface may not exist prior to grading. How then can the infiltration rate be determined? For example, if a proposed infiltration BMP is to be located with its bottom elevation in 10 feet of fill, how could one reasonably establish an infiltration rate prior to the fill being placed?

Where possible, infiltration BMPs on fill material should be designed such that their infiltrating surface extends into native soils. Additionally, for shallow fill depths, fill material can be selectively graded (i.e., high permeability granular material placed below proposed BMPs) to provide reliable infiltration properties until the infiltrating water reaches native soils. In some cases, due to considerable fill depth, the extension of the BMP down to natural soil and/or selective grading of fill material may prove infeasible. In additional, fill material will result in some compaction of now buried native soils potentially reducing their ability to infiltrate. In these cases, because of the uncertainty of fill parameters as described above as well as potential compaction of the native soils, an infiltration BMP may not be feasible.

If the source of fill material is defined and this material is known to be of a granular nature and that the native soils below is permeable and will not be highly compacted, infiltration through compacted fill materials may still be feasible. In this case, a project phasing approach could be used including the following general steps, (1) collect samples from areas expected to be used as borrow sites for fill activities, (2) remold samples to approximately the proposed degree of compaction and measure the saturated hydraulic conductivity of remolded samples using laboratory methods, (3) if infiltration rates appear adequate for infiltration, then apply an appropriate factor of safety and use the initial rates for preliminary design, (4) following placement of fill, conduct in-situ testing to refine design infiltration rates and adjust the design as needed; the infiltration rate of native soil below the fill should also be tested at this time to determine if compaction as a result of fill placement has

significantly reduced its infiltration rate. The project geotechnical engineer should be involved in decision making whenever infiltration is proposed in the vicinity of engineered fill structures so that potential impacts of infiltration on the strength and stability of fills and pavement structures can be evaluated.

D.4.3 Effects of Direct and Incidental Compaction

It is widely recognized that compaction of soil has a major influence on infiltration rates (Pitt et al. 2008). However, direct (intentional) compaction is an essential aspect of project construction and indirect compaction (such as by movement of machinery, placement of fill, stockpiling of materials, and foot traffic) can be difficult to avoid in some parts of the project site. Infiltration testing strategies should attempt to measure soils at a degree of compaction that resembles anticipated post-construction conditions.

Ideally, infiltration systems should be located outside of areas where direct compaction will be required and should be staked off to minimize incidental compaction from vehicles and stockpiling. For these conditions, no adjustment of test results is needed.

However, in some cases, infiltration BMPs will be constructed in areas to be compacted. For these areas, it may be appropriate to include field compaction tests or prepare laboratory samples and conducting infiltration testing to approximate the degree of compaction that will occur in post-construction conditions. Alternatively, testing could be conducted on undisturbed soil, and an additional factor of safety could be applied to account for anticipated infiltration after compaction. To develop a factor of safety associated with incidental compaction, samples could compacted to various degrees of compaction, their hydraulic conductivity measured, and a "response curve" developed to relate the degree of compaction to the hydraulic conductivity of the material.

D.4.4 Temperature Effects on Infiltration Rate

The rate of infiltration through soil is affected by the viscosity of water, which in turn is affected by the temperature of water. As such, infiltration rate is strongly dependent on the temperature of the infiltrating water (Cedergren, 1997). For example, Emerson (2008) found that wintertime infiltration rates below a BMP in Pennsylvania were approximately half their peak summertime rates. As such, it is important to consider the effects of temperature when planning tests and interpreting results.

If possible, testing should be conducted at a temperature that approximates the typical runoff temperatures for the site during the times when rainfall occurs. If this is not possible, then the results of infiltration tests should be adjusted to account for the difference between the temperature at the time of testing and the typical temperature of runoff when rainfall occurs. The measured infiltration can be adjusted by the ratio of the viscosity at the test temperature versus the typical temperature when rainfall occurs (Cedergren, 1997), per the following formula:

$$K_{Typical} = K_{Test} \times \left(\frac{\mu_{Test}}{\mu_{Typical}} \right)$$

Where:

$K_{Typical}$ = the typical infiltration rate expected at typical temperatures when rainfall occurs

K_{Test} = the infiltration rate measured or estimated under the conditions of the test

$\mu_{Typical}$ = the viscosity of water at the typical temperature expected when rainfall occurs

μ_{Test} = the viscosity of water at the temperature at which the test was conducted

D.4.5 Number of Infiltration Tests Needed

The heterogeneity inherent in soils implies that all but the smallest proposed infiltration facilities would benefit from infiltration tests in multiple locations. The following requirements apply for in situ infiltration/percolation testing:

- In situ infiltration/ percolation testing shall be conducted at a minimum of two locations within 50-feet of each proposed stormwater infiltration/ percolation BMP.
- In situ infiltration/percolation testing shall be conducted using an approved method listed in Table D.3-1
- Testing shall be conducted at approximately the same depth and in the same material as the base of the proposed stormwater BMP.

D.5 Selecting a Safety Factor

Should I use a factor of safety for design infiltration rate?

Monitoring of actual facility performance has shown that the full-scale infiltration rate can be much lower than the rate measured by small-scale testing (King County Department of Natural Resources and Parks, 2009). Factors such as soil variability and groundwater mounding may be responsible for much of this difference. Additionally, the infiltration rate of BMPs naturally declines between maintenance cycles as the BMP surface becomes occluded and particulates accumulate in the infiltrative layer.

In the past, infiltration structures have been shown to have a relatively short lifespan. Over 50 percent of infiltration systems either partially or completely failed within the first 5 years of operation (United States EPA. 1999). In a Maryland study on infiltration trenches (Lindsey et al. 1991), 53 percent were not operating as designed, 36 percent were clogged, and 22 percent showed reduced filtration. In a study of 12 infiltration basins (Galli 1992), none of which had built-in pretreatment systems, all had failed within the first two years of operation.

Given the known potential for infiltration BMPs to degrade or fail over time, an appropriate factor of safety applied to infiltration testing results is strongly recommended. This section presents a recommended thought process for selecting a safety factor. This method considers factor of safety

to be a function of:

- Site suitability considerations, and
- Design-related considerations.

These factors and the method for using them to compute a safety factor are discussed below. Importantly, this method encourages rigorous site investigation, good pretreatment, and commitments to routine maintenance to provide technically-sound justification for using a lower factor of safety.

D.5.1 Determining Factor of Safety

Worksheet D.5-1, at the end of this section can be used in conjunction with Tables D.5-1 and D.5-2 to determine an appropriate safety factor. Tables D.5-1 and D.5-2 assign point values to design considerations; the values are entered into Worksheet D.5-1, which assign a weighting factor for each design consideration.

The following procedure can be used to estimate an appropriate factor of safety to be applied to the infiltration testing results. When assigning a factor of safety, care should be taken to understand what other factors of safety are implicit in other aspects of the design to avoid incorporating compounding factors of safety that may result in significant over-design.

1. For each consideration shown above, determine whether the consideration is a high, medium, or low concern.
2. For all high concerns in Table D.5-1, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
3. Multiply each of the factors in Table D.5-1 by 0.25 and then add them together. This should yield a number between 1 and 3.
4. For all high concerns in Table D.5-2, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
5. Multiply each of the factors in Table D.5-2 by 0.5 and then add them together. This should yield a number between 1 and 3.
6. Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then 2 should be used as the safety factor.
7. Divide the tested infiltration rate by the combined safety factor to obtain the adjusted design infiltration rate for use in sizing the infiltration facility.

Note: The minimum combined adjustment factor should not be less than 2.0 and the maximum combined adjustment factor should not exceed 9.0.

D.5.2 Site Suitability Considerations for Selection of an Infiltration Factor of Safety

Considerations related to site suitability include:

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can influence the potential for clogging. Finer grained soils may be more susceptible to clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties for resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

These considerations are summarized in Table D.5-1 below, in addition to presenting classification of concern.

Table D.5-1: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern – 3 points	Medium Concern – 2 points	Low Concern – 1 point
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates Use of well permeameter or borehole methods without accompanying continuous boring log Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log Direct measurement of infiltration area with localized infiltration measurement methods (e.g., infiltrometer) Moderate spatial resolution	Direct measurement with localized (i.e., small-scale) infiltration testing methods at relatively high resolution[1] or Use of extensive test pit infiltration measurement methods[2]
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment, or Unknown variability	Soil borings/test pits indicate moderately homogeneous soils	Soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-15 ft below facility bottom	>15 below facility bottom

1 - Localized (i.e., small scale) testing refers to methods such as the double-ring infiltrometer and borehole tests)

2 - Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. The excavation should be to the depth of the proposed infiltration surface and ideally be at least 30 to 100 square feet.

D.5.3 Design Related Considerations for Selection of an Infiltration Factor of Safety

Design related considerations include:

- Level of pretreatment and expected influent sediment loads – credit should be given for good pretreatment to account for the reduced probability of clogging from high sediment loading. Appendix B.6 describes performance criteria for "flow-thru treatment" based 80 percent capture of total suspended solids, which provides excellent levels of pretreatment. Additionally, the Washington State Technology Acceptance Protocol-Ecology provides a certification for "pre-treatment" based on 50 percent removal of TSS, which provides moderate levels of treatment. Current approved technologies are listed at: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html. Use of certified

technologies can allow a lower factor of safety. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore may be designed with lower safety factors. Finally, the amount of landscaped area and its vegetation coverage characteristics should be considered. For example in arid areas with more soils exposed, open areas draining to infiltration systems may contribute excessive sediments.

- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not impacted by significant incidental compaction. Facilities that use proper construction practices and oversight need less restrictive safety factors.

Table D.5-2: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern – 3 points	Medium Concern – 2 points	Low Concern – 1 point
Level of pretreatment/ expected influent sediment loads	Limited pretreatment using gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, road sanding, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be moderate (e.g., low traffic, mild slopes, stabilized pervious areas, etc.). Performance of pretreatment consistent with "pretreatment BMP performance criteria" (50% TSS removal) in Appendix B.6	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops/non-sanded road surfaces. Performance of pretreatment consistent with "flow-thru treatment control BMP performance criteria" (i.e., 80% TSS removal) in Appendix B.6
Redundancy/ resiliency	No "backup" system is provided; the system design does not allow infiltration rates to be restored relatively easily with maintenance	The system has a backup pathway for treated water to discharge if clogging occurs or infiltration rates can be restored via maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs and infiltration rates can be relatively easily restored via maintenance.
Compaction during construction	Construction of facility on a compacted site or increased probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Equipment traffic is effectively restricted from infiltration areas during construction and there is low probability of unintended/ indirect compaction.

D.5.4 Implications of a Factor of Safety in BMP Feasibility and Design

The above method will provide safety factors in the range of 2 to 9. From a simplified practical perspective, this means that the size of the facility will need to increase in area from 2 to 9 times relative to that which might be used without a safety factor. Clearly, numbers toward the upper end of this range will make all but the best locations prohibitive in land area and cost.

In order to make BMPs more feasible and cost effective, steps should be taken to plan and execute the implementation of infiltration BMPs in a way that will reduce the safety factors needed for those projects. A commitment to effective site design and source control thorough site investigation, use of effective pretreatment controls, good construction practices, and restoration of the infiltration rates of soils that are damaged by prior compaction should lower the safety factor that should be applied, to help improve the long term reliability of the system and reduce BMP construction cost. While these practices decrease the recommended safety factor, they do not totally mitigate the need to apply a factor of safety. The minimum recommended safety factor of 2.0 is intended to account for the remaining uncertainty and long-term deterioration that cannot be technically mitigated.

Because there is potential for an applicant to "exaggerate" factor of safety to artificially prove infeasibility, an upper cap on the factor of safety is proposed for feasibility screening. A maximum factor of safety of 2.0 is recommended for infiltration feasibility screening such that an artificially high factor of safety cannot be used to inappropriately rule out infiltration, unless justified. If the site passes the feasibility analysis at a factor of safety of 2.0, then infiltration must investigated, but a higher factor of safety may be selected at the discretion of the design engineer.

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			**Worksheet D.5-1**		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

Appendix

E

BMP Design Fact Sheets

Appendix E BMP Design Fact Sheets

The following fact sheets were developed to assist the project applicants with designing BMPs to meet the stormwater obligations:

MS4 Category	Manual Category	Design Fact Sheet
Source Control	Source Control	SC: Source Control BMP Requirements
Site Design	Site Design	SD-1: Street Trees SD-5: Impervious Area Dispersion SD-6A: Green Roofs SD-6B: Permeable Pavement (Site Design BMP) SD-8: Rain Barrels
Retention	Harvest and Use	HU-1: Cistern
	Infiltration	INF-1: Infiltration Basins INF-2: Bioretention INF-3: Permeable Pavement (Pollutant Control)
	Partial Retention	PR-1: Biofiltration with Partial Retention
Biofiltration	Biofiltration	BF-1: Biofiltration BF-2: Nutrient Sensitive Media Design BF-3: Proprietary Biofiltration
Flow-thru Treatment Control	Flow-thru Treatment Control with Alternative Compliance	FT-1: Vegetated Swales FT-2: Media Filters FT-3: Sand Filters FT-4: Dry Extended Detention Basin FT-5: Proprietary Flow-thru Treatment Control
		PL: Plant List

E.1 Source Control BMP Requirements

Worksheet E.1-1: Source Control BMP Requirements

How to comply: Projects shall comply with this requirement by implementing all source control BMPs listed in this section that are applicable to their project. Applicability shall be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E.1 provides guidance for identifying source control BMPs applicable to a project. Checklist I.4 in Appendix I shall be used to document compliance with source control BMP requirements.

How to use this worksheet:

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your project site plan.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your project-specific stormwater management report. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

If These Sources Will Be on the Project Site …	… Then Your SWQMP Shall Consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **A.** Onsite storm drain inlets ❑ Not Applicable	❑ Locations of inlets.	❑ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	❑ Maintain and periodically repaint or replace inlet markings. ❑ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **B.** Interior floor drains and elevator shaft sump pumps ❑ Not Applicable		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages ❑ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D1.** Need for future indoor & structural pest control ❑ Not Applicable		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **D2.** Landscape/ Outdoor Pesticide Use ❑ Not Applicable	❑ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show stormwater treatment facilities.	State that final landscape plans will accomplish all of the following. ❑ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ❑ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of periodic saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ❑ Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features. ❑ Not Applicable	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
❑ **F.** Food service ❑ Not Applicable	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **G.** Refuse areas ❑ Not Applicable	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run- on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative** **Table and Narrative**
❑ **H.** Industrial processes. ❑ Not Applicable	❑ Show process area.	❑ If industrial processes are to be located onsite, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ❑ Not Applicable	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **J.** Vehicle and Equipment Cleaning ❑ Not Applicable	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited onsite and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance ❑ Not Applicable	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the report, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **L.** Fuel Dispensing Areas ❑ Not Applicable	❑ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of stormwater to the MEP. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

1. The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
M. Loading Docks ❑ Not Applicable	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **N.** Fire Sprinkler Test Water ❑ Not Applicable		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim ❑ Not Applicable		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps onsite shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
❑ **P.** Plazas, sidewalks, and parking lots. ❑ Not Applicable			❑ Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

E.2 SD-1 Street Trees

MS4 Permit Category
Site Design
Manual Category
Site Design
Applicable Performance Standard
Site Design
Primary Benefits
Volume Reduction

Street Trees (Source: County of San Diego LID Manual – EOA, Inc.)

Description

Trees planted in the right-of-way can be used as stormwater management tools in addition to other typical benefits associated with trees, including energy conservation, air quality improvement, and aesthetic enhancement. Typical stormwater management benefits associated with trees include:

- **Interception of rainfall** – tree surfaces (roots, foliage, bark, and branches) intercept, evaporate, store, or convey precipitation to the soil before it reaches surrounding impervious surfaces
- **Reduced erosion** – trees protect denuded area by intercepting or reducing the velocity of rain drops as they fall through the tree canopy
- **Increased infiltration** – soil conditions created by roots and fallen leaves promote infiltration
- **Treatment of stormwater** – trees provide treatment through uptake of nutrients and other stormwater pollutants (phytoremediation) and support of other biological processes that break down pollutants

Typical street tree system components include:

- Trees of the appropriate species for site conditions and constraints
- Available growing space based on tree species, soil type, water availability, surrounding land uses, and project goals
- Optional suspended pavement design to provide structural support for adjacent pavement

without requiring compaction of underlying layers

- Optional root barrier devices as needed; a root barrier is a device installed in the ground, between a tree and the sidewalk, intended to guide roots down and away from the sidewalk in order to prevent sidewalk lifting from tree roots.
- Optional tree grates; to be considered to maximize available space for pedestrian circulation and to protect tree roots from compaction related to pedestrian circulation; tree grates are typically made up of porous material that will allow the runoff to soak through.
- Optional shallow surface depression for ponding of excess runoff
- Optional planter box drain

Design Adaptations for Project Goals

Site design BMP to provide incidental treatment. Street trees primarily functions as site design BMPs for incidental treatment. Benefits from street trees are accounted for by adjustment factors presented in Appendix B.2. This credit can apply to non-street trees as well (that meet the same criteria).

Design Criteria and Considerations

Street Trees must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	**Tree species** is appropriately chosen for the development (private or public). For public rights-of-ways, local planning guidelines and zoning provisions for the permissible species and placement of trees are consulted. A list of trees appropriate for site design that can be used by all county municipalities are provided in Appendix E.20	Proper tree placement and species selection minimizes problems such as pavement damage by surface roots and poor growth.

Siting and Design	*Intent/Rationale*
☐ **Location of trees** planted along public streets follows local requirements and guidelines. Vehicle and pedestrian line of sight are considered in tree selection and placement. Unless exemption is granted by the City Engineer the following minimum tree separation distance is followed <table><tr><th>Improvement</th><th>Minimum distance to Street Tree</th></tr><tr><td>Traffic Signal, Stop sign</td><td>20 feet</td></tr><tr><td>Underground Utility lines (except sewer)</td><td>5 feet</td></tr><tr><td>Sewer Lines</td><td>10 feet</td></tr><tr><td>Above ground utility structures (Transformers, Hydrants, Utility poles, etc.)</td><td>10 feet</td></tr><tr><td>Driveways</td><td>10 feet</td></tr><tr><td>Intersections (intersecting curb lines of two streets)</td><td>25 feet</td></tr></table>	Roadway safety for both vehicular and pedestrian traffic is a key consideration for placement along public streets.
☐ **Underground utilities and overhead wires** are considered in the design and avoided or circumvented. Underground utilities are routed around or through the planter in suspended pavement applications. All underground utilities are protected from water and root penetration.	Tree growth can damage utilities and overhead wires resulting in service interruptions. Protecting utilities routed through the planter prevents damage and service interruptions.
☐ **Suspended pavement** design was developed where appropriate to minimize soil compaction and improve infiltration and filtration capabilities. Suspended pavement was constructed with an approved structural cell.	Suspended pavement designs provide structural support without compaction of the underlying layers, thereby promoting tree growth. Recommended structural cells include poured in place concrete columns, Silva Cells manufactured by Deeproot Green Infrastructures and Stratacell and Stratavault systems manufactured by Citygreen Systems.

Siting and Design		*Intent/Rationale*
☐	A minimum soil volume of 2 cubic feet per square foot of canopy projection volume is provided for each tree. Canopy projection area is the ground area beneath the tree, measured at the drip line.	The minimum soil volume ensures that there is adequate storage volume to allow for unrestricted evapotranspiration.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where street trees can be used in the site design to achieve incidental treatment. Street trees reduce runoff volumes from the site. Refer to Appendix B.2.

E.3 SD-5 Impervious Area Dispersion

MS4 Permit Category
Site Design

Manual Category
Site Design

Applicable Performance Criteria
Site Design

Primary Benefits
Volume Reduction
Peak Flow Attenuation

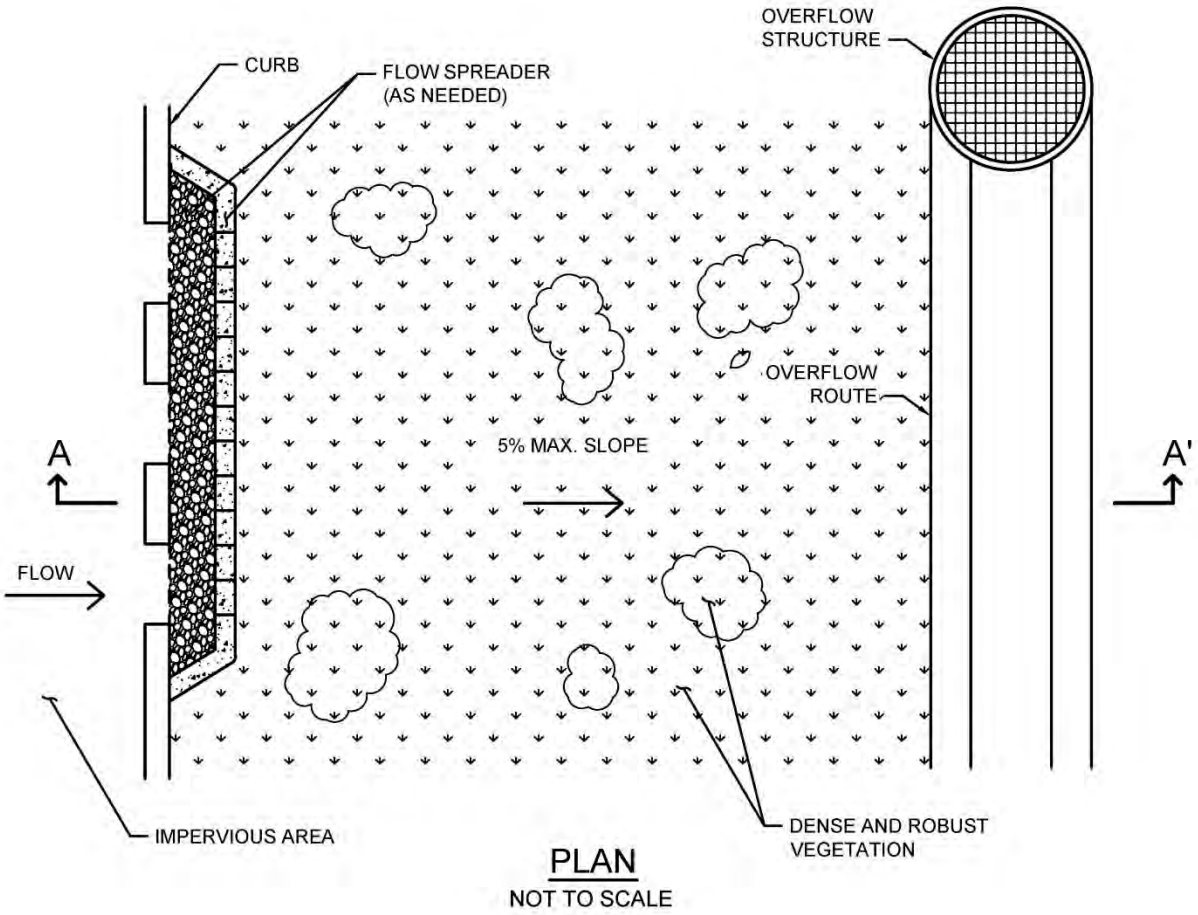
Photo Credit: Orange County Technical Guidance Document

Description

Impervious area dispersion (dispersion) refers to the practice of effectively disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops (through downspout disconnection), walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes. Dispersion with partial or full infiltration results in significant volume reduction by means of infiltration and evapotranspiration.

Typical dispersion components include:

- An impervious surface from which runoff flows will be routed with minimal piping to limit concentrated inflows
- Splash blocks, flow spreaders, or other means of dispersing concentrated flows and providing energy dissipation as needed
- Dedicated pervious area, typically vegetated, with in-situ soil infiltration capacity for partial or full infiltration
- Optional soil amendments to improve vegetation support, maintain infiltration rates and enhance treatment of routed flows
- Overflow route for excess flows to be conveyed from dispersion area to the storm drain system or discharge point



Typical plan and section view of an Impervious Area Dispersion BMP

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. Impervious area dispersion primarily functions as a site design BMP for reducing the effective imperviousness of a site by providing partial or full infiltration of the flows that are routed to pervious dispersion areas and otherwise slowing down excess flows that eventually reach the storm drain system. This can significantly reduce the DCV for the site.

Design Criteria and Considerations

Dispersion must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Dispersion is over areas with soil types capable of supporting or being amended (e.g., with sand or compost) to support vegetation. Media amendments must be tested to verify that they are not a source of pollutants.	Soil must have long-term infiltration capacity for partial or full infiltration and be able to support vegetation to provide runoff treatment. Amendments to improve plant growth must not have negative impact on water quality.
☐	Dispersion has vegetated sheet flow over a relatively large distance (minimum 10 feet) from inflow to overflow route.	Full or partial infiltration requires relatively large areas to be effective depending on the permeability of the underlying soils.
☐	Pervious areas should be flat (with less than 5% slopes) and vegetated.	Flat slopes facilitate sheet flows and minimize velocities, thereby improving treatment and reducing the likelihood of erosion.
Inflow velocities		
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
Dedication		
☐	Dispersion areas must be owned by the project owner and be dedicated for the purposes of dispersion to the exclusion of other future uses that might reduce the effectiveness of the dispersion area.	Dedicated dispersion areas prevent future conversion to alternate uses and facilitate continued full and partial infiltration benefits.

Siting and Design		*Intent/Rationale*
Vegetation		
☐	Dispersion typically requires dense and robust vegetation for proper function. Drought tolerant species should be selected to minimize irrigation needs. A plant list to aid in selection can be found in Appendix E.20.	Vegetation improves resistance to erosion and aids in runoff treatment.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where dispersion can be used in the site design to reduce the DCV for pollutant control sizing.
2. Calculate the DCV for stormwater pollutant control per Appendix B.2, taking into account reduced runoff from dispersion.
3. Determine if a DMA is considered "Self-retaining" if the impervious to pervious ratio is:
    a. 2:1 when the pervious area is composed of Hydrologic Soil Group A
    b. 1:1 when the pervious area is composed of Hydrologic Soil Group B

E.4 SD-6A: Green Roofs

MS4 Permit Category
Site Design

Manual Category
Site Design

Applicable Performance Standard
Site Design

Primary Benefits
Volume Reduction
Peak Flow Attenuation

Location: County of San Diego Operations Center, San Diego, California

Description

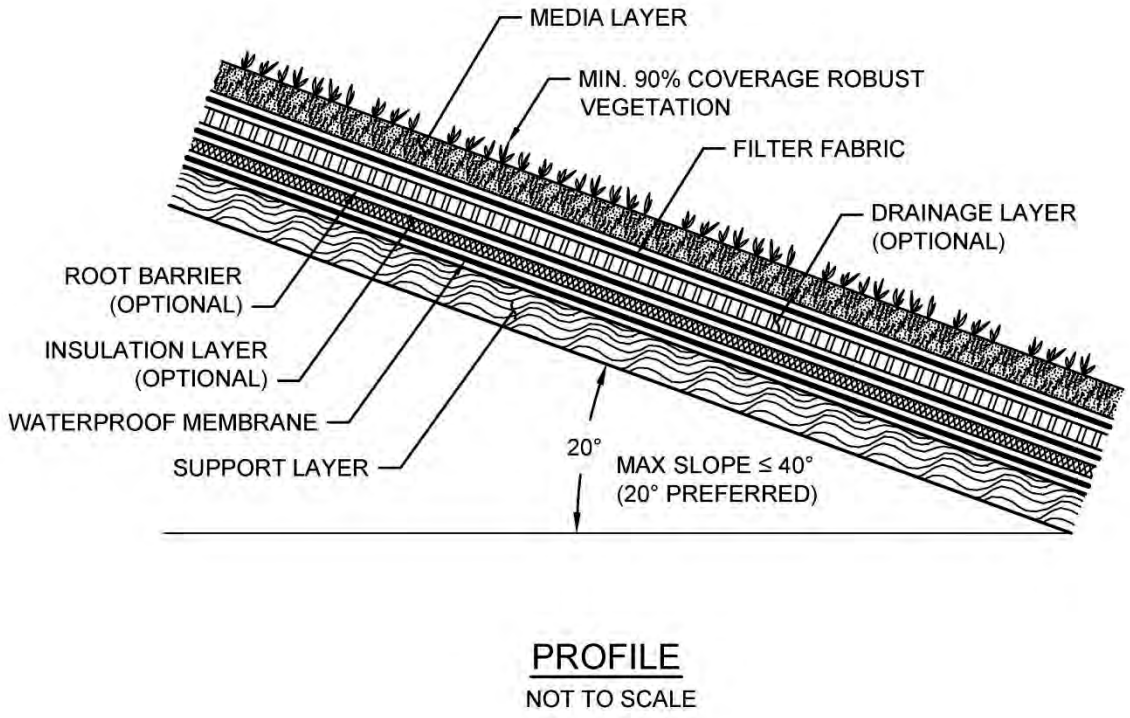
Green roofs are vegetated rooftop systems that reduce runoff volumes and rates, treat stormwater pollutants through filtration and plant uptake, provide additional landscape amenity, and create wildlife habitat. Additionally, green roofs reduce the heat island effect and provide acoustical control, air filtration and oxygen production. In terms of building design, they can protect against ultraviolet rays and extend the roof lifetime, as well as increase the building insulation, thereby decreasing heating and cooling costs. There are two primary types of green roofs:

- **Extensive** – lightweight, low maintenance system with low-profile, drought tolerant type groundcover in shallow growing medium (6 inches or less)
- **Intensive** – heavyweight, high maintenance system with a more garden-like configuration and diverse plantings that may include shrubs or trees in a thicker growing medium (greater than 6 inches)

Typical green roof components include, from top to bottom:

- Vegetation that is appropriate to the type of green roof system, climate, and watering conditions
- Media layer (planting mix or engineered media) capable of supporting vegetation growth

- Filter fabric to prevent migration of fines (soils) into the drainage layer
- Optional drainage layer to convey excess runoff
- Optional root barrier
- Optional insulation layer
- Waterproof membrane
- Structural roof support capable of withstanding the additional weight of a green roof



Typical profile of a Green Roof BMP

Design Adaptations for Project Goals

Site design BMP to provide incidental treatment. Green roofs can be used as a site design feature to reduce the impervious area of the site through replacing conventional roofing. This can reduce the DCV and flow control requirements for the site.

Design Criteria and Considerations

Green roofs must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Roof slope is ≤ 40% (Roofs that are ≤ 20% are preferred).	Steep roof slopes increases project complexity and requires supplemental anchoring.
☐	Structural roof capacity design supports the calculated additional load (lbs/sq. ft) of the vegetation growing medium and additional drainage and barrier layers.	Inadequate structural capacity increases the risk for roof failure and harm to the building and occupants.
☐	Design and construction is planned to be completed by an experienced green roof specialist.	A green roof specialist will minimize complications in implementation and potential structural issues that are critical to green roof success.
☐	Green roof location and extent must meet fire safety provisions.	Green roof design must not negatively impact fire safety.
☐	Maintenance access is included in the green roof design.	Maintenance will facilitate proper functioning of drainage and irrigation components and allow for removal of undesirable vegetation and soil testing, as needed.
Vegetation		
☐	Vegetation is suitable for the green roof type, climate and expected watering conditions. Perennial, self-sowing plants that are drought-tolerant (e.g., sedums, succulents) and require little to no fertilizer, pesticides or herbicides are recommended. Vegetation pre-grown at grade may allow plants to establish prior to facing harsh roof conditions.	Plants suited to the design and expected growing environment are more likely to survive.
☐	Vegetation is capable of covering ≥ 90% the roof surface.	Benefits of green roofs are greater with more surface vegetation.
☐	Vegetation is robust and erosion-resistant in order to withstand the anticipated rooftop environment (e.g., heat, cold, high winds).	Weak plants will not survive in extreme rooftop environments.
☐	Vegetation is fire resistant.	Vegetation that will not burn easily decreases the chance for fire and harm to the building and occupants.
☐	Vegetation considers roof sun exposure and shaded areas based on roof slope and	The amount of sunlight the vegetation receives can inhibit growth therefore the beneficial

Siting and Design		*Intent/Rationale*
	location.	effects of a vegetated roof.
☐	An irrigation system (e.g., drip irrigation system) is included as necessary to maintain vegetation.	Proper watering will increase plant survival, especially for new plantings.
☐	Media is well-drained and is the appropriate depth required for the green roof type and vegetation supported.	Unnecessary water retention increases structural loading. An adequate media depth increases plant survival.
☐	A filter fabric is used to prevent migration of media fines through the system.	Migration of media can cause clogging of the drainage layer.
☐	A drainage layer is provided if needed to convey runoff safely from the roof. The drainage layer can be comprised of gravel, perforated sheeting, or other drainage materials.	Inadequate drainage increases structural loading and the risk of harm to the building and occupants.
☐	A root barrier comprised of dense material to inhibit root penetration is used if the waterproof membrane will not provide root penetration protection.	Root penetration can decrease the integrity of the underlying structural roof components and increase the risk of harm to the building and occupants.
☐	An insulation layer is included as needed to protect against the water in the drainage layer from extracting building heat in the winter and cool air in the summer.	Regulating thermal impacts of green roofs will aid in controlling building heating and cooling costs.
☐	A waterproof membrane is used to prevent the roof runoff from vertically migrating and damaging the roofing material. A root barrier may be required to prevent roots from compromising the integrity of the membrane.	Water-damaged roof materials increase the risk of harm to the building and occupants.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where green roofs can be used in the site design to replace conventional roofing to reduce the DCV. These green roof areas can be credited toward reducing runoff generated through representation in stormwater calculations as pervious, not impervious, areas but are not credited for stormwater pollutant control.
2. Calculate the DCV per Appendix B.2.

E.5 SD-6B Permeable Pavement (Site Design BMP)

Photo Credit: San Diego Low Impact Development Design Manual

Description

Permeable pavement is pavement that allows for percolation through void spaces in the pavement surface into subsurface layers. Permeable pavements reduce runoff volumes and rates and can provide pollutant control via infiltration, filtration, sorption, sedimentation, and biodegradation processes. When used as a site design BMP, the subsurface layers are designed to provide storage of stormwater runoff so that outflow rates can be controlled via infiltration into subgrade soils. Varying levels of stormwater treatment and flow control can be provided depending on the size of the permeable pavement system relative to its drainage area and the underlying infiltration rates. As a site design BMP permeable pavement areas are designed to be self-retaining and are designed primarily for direct rainfall. Self-retaining permeable pavement areas have a ratio of total drainage area (including permeable pavement) to area of permeable pavement of 1.5:1 or less. Permeable pavement surfaces can be constructed from modular paver units or paver blocks, pervious concrete, porous asphalt, and turf pavers. Sites designed with permeable pavements can significantly reduce the impervious area of the project. Reduction in impervious surfaces decreases the DCV and can reduce the footprint of treatment control and flow control BMPs.

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. Permeable pavement without an underdrain can be used as a site design feature to reduce the impervious area of the site by replacing traditional pavements, including roadways, parking lots, emergency access lanes, sidewalks, trails and driveways.

Typical Permeable Pavement Components (Top to Bottom)
Permeable surface layer
Bedding layer for permeable surface
Aggregate storage layer with optional underdrain(s)
Optional final filter course layer over uncompacted existing subgrade

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where permeable pavements can be used in the site design to replace conventional pavements to reduce the DCV. These areas can be credited toward reducing runoff generated through representation in stormwater calculations as pervious, not impervious, areas but are not credited for stormwater pollutant control.
2. Calculate the DCV per Appendix B.2, taking into account reduced runoff from permeable pavement areas.

E.6 SD-8 Rain Barrels

Photo Credit: San Diego Low Impact Development Design Manual

Description

Rain barrels are containers that can capture rooftop runoff and store it for future use. With controlled timing and volume release, the captured rainwater can be used for irrigation or alternative grey water between storm events, thereby reducing runoff volumes and associated pollutants to downstream waterbodies. Rain barrels tend to be smaller systems, less than 100 gallons. Treatment can be achieved when rain barrels are used as part of a treatment train along with other BMPs that use captured flows in applications that do not result in discharges into the storm drain system. Rooftops are the ideal tributary areas for rain barrels.

Design Adaptations for Project Goals

Site design BMP to reduce effective impervious area and DCV. Barrels can be used as a site design feature to reduce the effective impervious area of the site by removing roof runoff from the site discharge. This can reduce the DCV and flow control requirements for the site.

Typical Rain Barrel Components
Storage container, barrel or tank for holding captured flows
Inlet and associated valves and piping
Outlet and associated valves and piping
Overflow outlet
Optional pump
Optional first flush diverters
Optional roof, supports, foundation, level indicator, and other accessories

Important Considerations

Maintenance: Rain barrels require regular monitoring and cleaning to ensure that they do not become clogged with leaves or other debris.
Economics: Rain barrels have low installation costs.
Limitations: Due to San Diego's arid climate, some rain barrels may fill only a few times each year.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where rain barrels can be used in the site design to capture roof runoff to reduce the DCV. Rain barrels reduce the effective impervious area of the site by removing roof runoff from the site discharge.
2. Calculate the DCV per Appendix B.2, taking into account reduced runoff from permeable pavement areas.

E.7 HU-1 Cistern

MS4 Permit Category

Retention

Manual Category

Harvest and Use

Applicable Performance Standards

Pollutant Control

Flow Control

Primary Benefits

Volume Reduction

Peak Flow Attenuation

Photo Credit: Water Environment Research Foundation: WERF.org

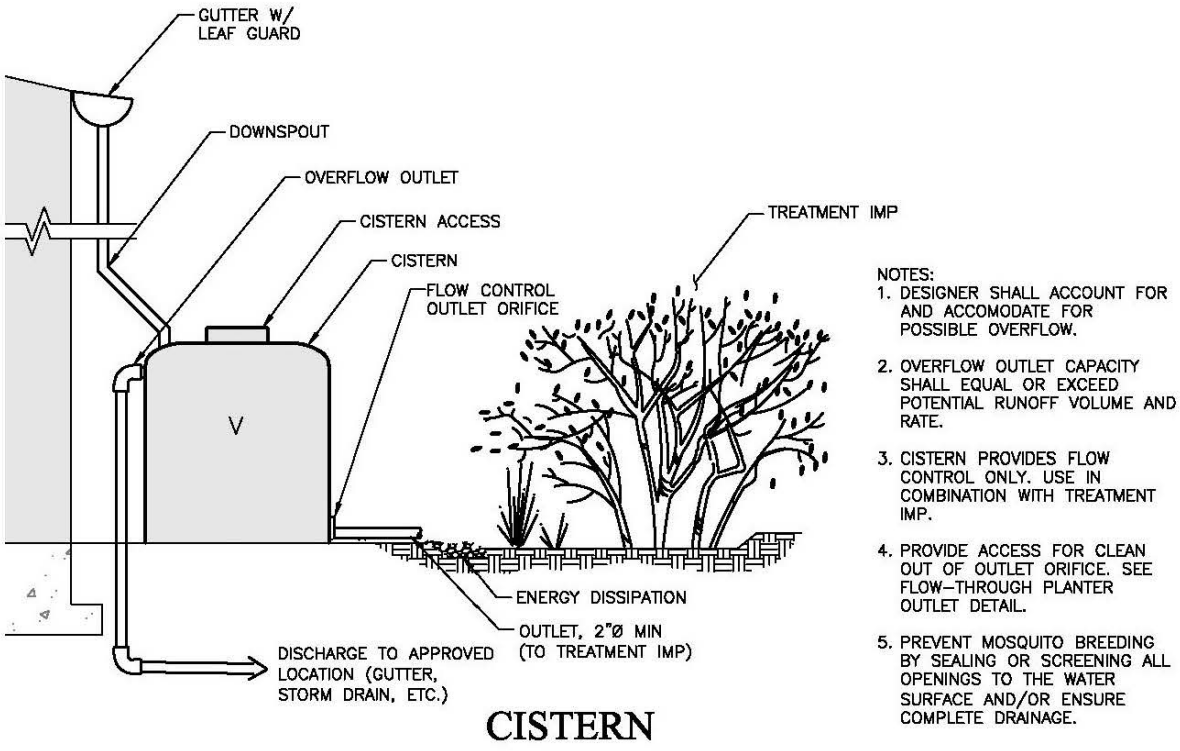
Description

Cisterns are containers that can capture rooftop runoff and store it for future use. With controlled timing and volume release, the captured rainwater can be used for irrigation or alternative grey water between storm events, thereby reducing runoff volumes and associated pollutants to downstream water bodies. Cisterns are larger systems (generally>100 gallons) that can be self-contained aboveground or below ground systems. Treatment can be achieved when cisterns are used as part of a treatment train along with other BMPs that use captured flows in applications that do not result in discharges into the storm drain system. Rooftops are the ideal tributary areas for cisterns.

Typical cistern components include:

- Storage container, barrel or tank for holding captured flows
- Inlet and associated valves and piping
- Outlet and associated valves and piping
- Overflow outlet

- Optional pump
- Optional first flush diverters
- Optional roof, supports, foundation, level indicator, and other accessories



Source: City of San Diego Stormwater Standards

Design Adaptations for Project Goals

Site design BMP to reduce effective impervious area and DCV. Cisterns can be used as a site design feature to reduce the effective impervious area of the site by removing roof runoff from the site discharge. This can reduce the DCV and flow control requirements for the site.

Harvest and use for stormwater pollutant control. Typical uses for captured flows include irrigation, toilet flushing, cooling system makeup, and vehicle and equipment washing.

Integrated stormwater flow control and pollutant control configuration. Cisterns provide flow control in the form of volume reduction and/or peak flow attenuation and stormwater treatment through elimination of discharges of pollutants. Additional flow control can be achieved by sizing

the cistern to include additional detention storage and/or real-time automated flow release controls.

Design Criteria and Considerations

Cisterns must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Cisterns are sized to detain the full DCV of contributing area and empty within 36 hours.	Draining the cistern makes the storage volume available to capture the next storm. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method in Appendix B.4.2.
☐	Cisterns are fitted with a flow control device such as an orifice or a valve to limit outflow in accordance with drawdown time requirements.	Flow control provides flow attenuation benefits and limits cistern discharge to downstream facilities during storm events.
☐	Cisterns are designed to drain completely, leaving no standing water, and all entry points are fitted with traps or screens, or sealed.	Complete drainage and restricted entry prevents mosquito habitat.
☐	Leaf guards and/or screens are provided to prevent debris from accumulating in the cistern.	Leaves and organic debris can clog the outlet of the cistern.
☐	Access is provided for maintenance and the cistern outlets are accessible and designed to allow easy cleaning.	Properly functioning outlets are needed to maintain proper flow control in accordance with drawdown time requirements.
☐	Cisterns must be designed and sited such that overflow will be conveyed safely overland to the storm drain system or discharge point.	Safe overflow conveyance prevents flooding and damage of property.

Conceptual Design and Sizing Approach for Site Design and Stormwater Pollutant Control

1. Calculate the DCV for site design per Appendix B.
2. Determine the locations on the site where cisterns can be located to capture and detain the DCV from roof areas without subsequent discharge to the storm drain system. Cisterns are best located in close proximity to building and other roofed structures to minimize piping. Cisterns can also be used as part of a treatment train upstream by increasing pollutant control through delayed runoff to infiltration BMPs such as bioretention without underdrain

facilities.

3. Use the sizing worksheet in Appendix B.3 to determine if full or partial capture of the DCV is achievable.
4. The remaining DCV to be treated should be calculated for use in sizing downstream BMP(s).

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or duration will typically require significant cistern volumes, and therefore the following steps should be taken prior to determination of site design and stormwater pollutant control. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that cistern siting and design criteria have been met. Design for flow control can be achieved using various design configurations, shapes, and quantities of cisterns.
2. Iteratively determine the cistern storage volume required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control valve operation.
3. Verify that the cistern is drawdown within 36 hours. The drawdown time can be estimated by dividing the storage volume by the rate of use of harvested water.
4. If the cistern cannot fully provide the flow rate and duration control required by this manual, a downstream structure with additional storage volume or infiltration capacity such as a biofiltration can be used to provide remaining flow control.

E.8 INF-1 Infiltration Basin

MS4 Permit Category
Retention

Manual Category
Infiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Volume Reduction
Peak Flow Attenuation

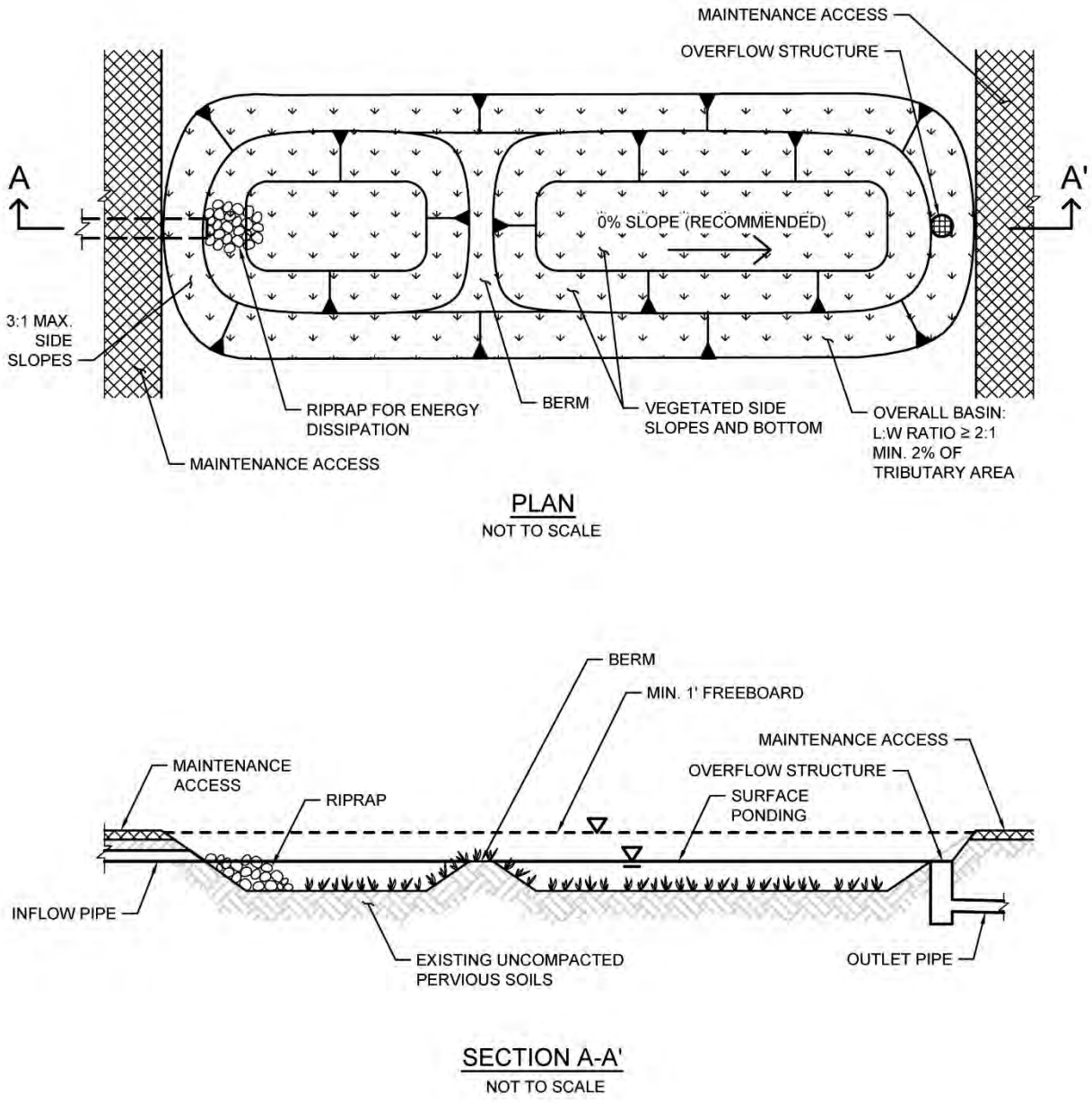
Photo Credit: http://www.stormwaterpartners.com/facilities/basin.html

Description

An infiltration basin typically consists of an earthen basin with a flat bottom constructed in naturally pervious soils. An infiltration basin retains stormwater and allows it to evaporate and/or percolate into the underlying soils. The bottom of an infiltration basin is typically vegetated with native grasses or turf grass; however other types of vegetation can be used if they can survive periodic inundation and long inter-event dry periods. Treatment is achieved primarily through infiltration, filtration, sedimentation, biochemical processes and plant uptake. Infiltration basins can be constructed as linear **trenches** or as **underground infiltration galleries**.

Typical infiltration basin components include:

- Inflow distribution mechanisms (e.g., perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Forebay to provide pretreatment surface ponding for captured flows
- Vegetation selected based on basin use, climate, and ponding depth
- Uncompacted native soils at the bottom of the facility
- Overflow structure



Typical plan and section view of an Infiltration BMP

Design Adaptations for Project Goals

Full infiltration BMP for stormwater pollutant control. Infiltration basins can be used as a pollutant control BMP, designed to infiltrate runoff from direct rainfall as well as runoff from adjacent areas that are tributary to the BMP. Infiltration basins must be designed with an infiltration storage volume (a function of the surface ponding volume) equal to the full DCV and able to meet drawdown time limitations.

Integrated stormwater flow control and pollutant control configuration. Infiltration basins can

also be designed for flow rate and duration control by providing additional infiltration storage through increasing the surface ponding volume.

Design Criteria and Considerations

Infiltration basins must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a full infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Finish grade of the facility is ≤ 2% (0% recommended).	Flatter surfaces reduce erosion and channelization with the facility.
☐	Settling forebay has a volume ≥ 25% of facility volume below the forebay overflow.	A forebay to trap sediment can decrease frequency of required maintenance.
☐	Infiltration of surface ponding is limited to a 36-hour drawdown time.	Prolonged surface ponding reduce volume available to capture subsequent storms. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method in Appendix B.4.2.
☐	Minimum freeboard provided is ≥1 foot.	Freeboard minimizes risk of uncontrolled surface discharge.
☐	Side slopes are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
	Inflow and Overflow Structures	
☐	Inflow and outflow structures are accessible by required equipment (e.g.,	Maintenance will prevent clogging and ensure proper operation of the flow control

Siting and Design		*Intent/Rationale*
	vactor truck) for inspection and maintenance.	structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control

To design infiltration basins for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement and basin area requirements, forebay volume, and maximum slopes for basin sides and bottom.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet (Appendix B.4) to determine if full infiltration of the DCV is achievable based on the infiltration storage volume calculated from the surface ponding area and depth for a maximum 36-hour drawdown time. The drawdown time can be estimated by dividing the average depth of the basin by the design infiltration rate. Appendix D provides guidance on evaluating a site's infiltration rate.

Conceptual Design and Sizing Approach for Stormwater Pollutant Treatment and Flow Control

Control of flow rates and/or durations will typically require significant surface ponding volume, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement and basin area requirements, forebay volume, and maximum slopes for basin sides and bottom.
2. Iteratively determine the surface ponding required to provide infiltration storage to reduce flow rates and durations to allowable limits while adhering to the maximum 36-hour

drawdown time. Flow rates and durations can be controlled using flow splitters that route the appropriate inflow amounts to the infiltration basin and bypass excess flows to the downstream storm drain system or discharge point.

3. If an infiltration basin cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide additional control.
4. After the infiltration basin has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.9 INF-2 Bioretention

MS4 Permit Category
Retention

Manual Category
Infiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Hydromodification Management Potential
Volume Reduction
Treatment
Peak Flow Attenuation

Photo Credit: Ventura County Technical Guidance Document

Description

Bioretention (bioretention without underdrain) facilities are vegetated surface water systems that filter water through vegetation and soil, or engineered media prior to infiltrating into native soils. These facilities are designed to infiltrate the full DCV. Bioretention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed inground or partially aboveground, such as planter boxes with open bottoms (no impermeable liner at the bottom) to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

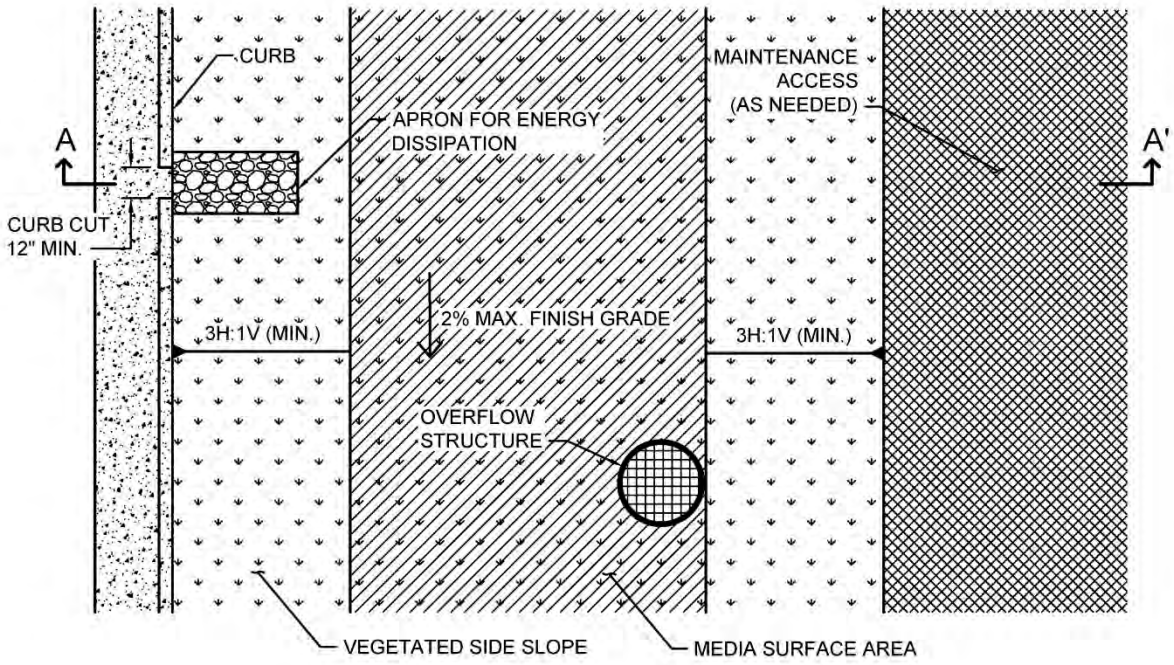
Typical bioretention without underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer (optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth

- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Optional aggregate storage layer for additional infiltration storage
- Uncompacted native soils at the bottom of the facility
- Overflow structure

Design Adaptations for Project Goals

- **Full infiltration BMP for stormwater pollutant control.** Bioretention can be used as a pollutant control BMP designed to infiltrate runoff from direct rainfall as well as runoff from adjacent tributary areas. Bioretention facilities must be designed with an infiltration storage volume (a function of the ponding, media and aggregate storage volumes) equal to the full DCV and able to meet drawdown time limitations.
- **Integrated stormwater flow control and pollutant control configuration.** Bioretention facilities can be designed to provide flow rate and duration control. This may be accomplished by providing greater infiltration storage with increased surface ponding and/or aggregate storage volume for stormwater flow control.



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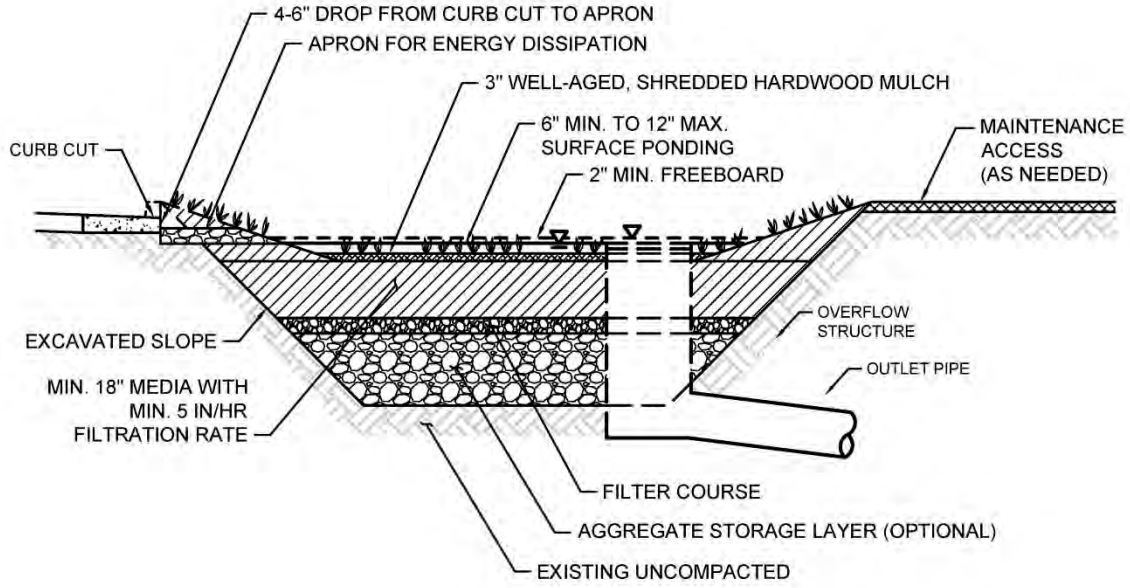


SECTION A-A'
NOT TO SCALE

Typical plan and section view of a Bioretention BMP

Design Criteria and Considerations

Bioretention must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of BMP is based on infiltration feasibility criteria and appropriate design infiltration rate presented in Appendix C and D.	Must operate as a full infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Contributing tributary area is ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the [City Engineer} if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%. In long bioretention facilities where the potential for internal erosion and channelization exists, the use of check dams is required.	Flatter surfaces reduce erosion and channelization within the facility. Internal check dams reduce velocity and dissipate energy.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	24-hour drawdown time is recommended for plant health.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or

Siting and Design		*Intent/Rationale*
		surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are ≥ 3H: 1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply is provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional or Mandatory – Dependent on jurisdiction)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. A minimum initial filtration rate of 10 in/hr is recommended.	A high filtration rate through the soil mix minimizes clogging potential and allows flows to quickly enter the aggregate storage layer, thereby minimizing bypass.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications:	A deep media layer provides additional filtration and supports plants with deeper

Siting and Design		*Intent/Rationale*
	City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition).	roots. Standard specifications shall be followed.
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater.	Greater surface area to tributary area ratios decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
Filter Course Layer (Optional)		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.

Siting and Design		*Intent/Rationale*
Aggregate Storage Layer (Optional)		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	Maximum aggregate storage layer depth is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A maximum drawdown time to facilitate provision of adequate stormwater storage for the next storm event.
Inflow and Overflow Structures		
☐	Inflow and overflow structures are accessible for inspection and maintenance. Overflow structures must be connected to downstream storm drain system or appropriate discharge point.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design bioretention for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement and basin area requirements, maximum side and finish grade slope, and the recommended media surface area tributary ratio.

2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine if full infiltration of the DCV is achievable based on the available infiltration storage volume calculated from the bioretention without underdrain footprint area, effective depths for surface ponding, media and aggregate storage layers, and in-situ soil design infiltration rate for a maximum 36-hour drawdown time for the aggregate storage layer, with surface ponding no greater than a maximum 24-hour drawdown. The drawdown time can be estimated by dividing the average depth of the basin by the design infiltration rate of the underlying soil. Appendix D provides guidance on evaluating a site's infiltration rate. A generic sizing worksheet is provided in Appendix B.4.
4. Where the DCV cannot be fully infiltrated based on the site or bioretention constraints, an underdrain can be added to the design (use biofiltration with partial retention factsheet).

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations shall be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, maximum side and finish grade slopes, and the recommended media surface area tributary area ratio. Design for flow control can be achieved using various design configurations.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide infiltration storage to reduce flow rates and durations to allowable limits while adhering to the maximum drawdown times for surface ponding and aggregate storage. Flow rates and durations can be controlled using flow splitters that route the appropriate inflow amounts to the bioretention facility and bypass excess flows to the downstream storm drain system or discharge point.
3. If bioretention without underdrain facility cannot fully provide the flow rate and duration control required by the MS4 permit, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide additional control.
4. After bioretention without underdrain BMPs have been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.10 INF-3 Permeable Pavement (Pollutant Control)

Location: Kellogg Park, San Diego, California

MS4 Permit Category

Retention
Flow-thru Treatment Control

Manual Category

Infiltration
Flow-thru Treatment Control

Applicable Performance Standard

Pollutant Control
Flow Control

Primary Benefits

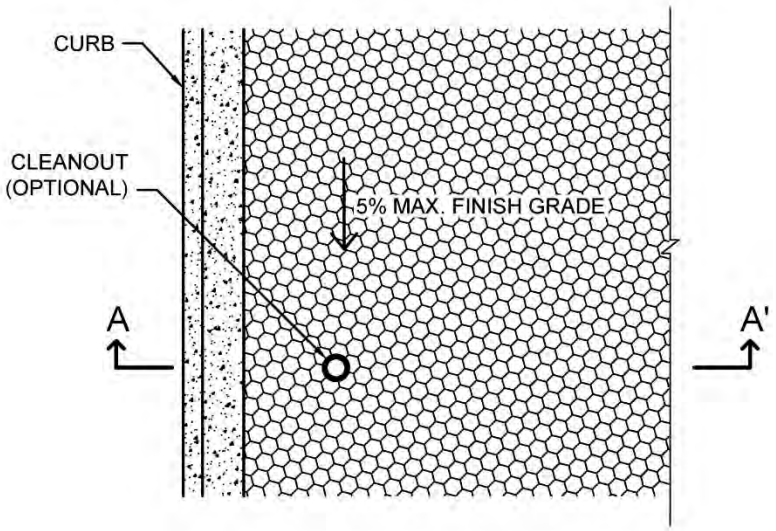
Volume Reduction
Peak Flow Attenuation

Description

Permeable pavement is pavement that allows for percolation through void spaces in the pavement surface into subsurface layers. The subsurface layers are designed to provide storage of stormwater runoff so that outflows, primarily via infiltration into subgrade soils or release to the downstream conveyance system, can be at controlled rates. Varying levels of stormwater treatment and flow control can be provided depending on the size of the permeable pavement system relative to its drainage area, the underlying infiltration rates, and the configuration of outflow controls. Pollutant control permeable pavement is designed to receive runoff from a larger tributary area than site design permeable pavement (see SD-6B). Pollutant control is provided via infiltration, filtration, sorption, sedimentation, and biodegradation processes.

Typical permeable pavement components include, from top to bottom:

- Permeable surface layer
- Bedding layer for permeable surface
- Aggregate storage layer with optional underdrain(s)
- Optional final filter course layer over uncompacted existing subgrade



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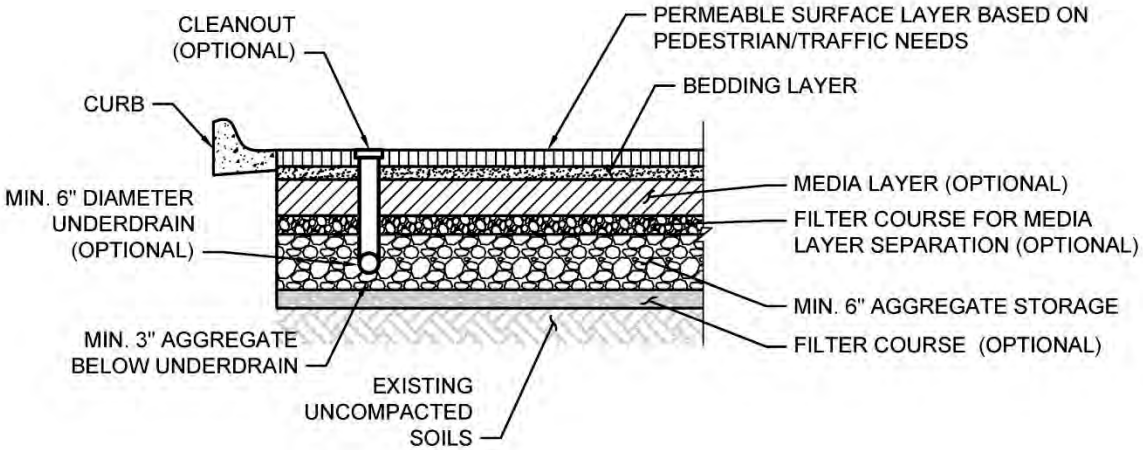


SECTION A-A'
NOT TO SCALE

Typical plan and Section view of a Permeable Pavement BMP

Subcategories of permeable pavement include modular paver units or paver blocks, pervious

concrete, porous asphalt, and turf pavers. These subcategory variations differ in the material used for the permeable surface layer but have similar functions and characteristics below this layer.

Design Adaptations for Project Goals

Site design BMP to reduce impervious area and DCV. See site design option SD-6B.

Full infiltration BMP for stormwater pollutant control. Permeable pavement without an underdrain and without impermeable liners can be used as a pollutant control BMP, designed to infiltrate runoff from direct rainfall as well as runoff from adjacent areas that are tributary to the pavement. The system must be designed with an infiltration storage volume (a function of the aggregate storage volume) equal to the full DCV and able to meet drawdown time limitations.

Partial infiltration BMP with flow-thru treatment for stormwater pollutant control. Permeable pavement can be designed so that a portion of the DCV is infiltrated by providing an underdrain with infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered flow-thru treatment and is not considered biofiltration treatment. Storage provided above the underdrain invert is included in the flow-thru treatment volume.

Flow-thru treatment BMP for stormwater pollutant control. The system may be lined and/or installed over impermeable native soils with an underdrain provided at the bottom to carry away filtered runoff. Water quality treatment is provided via unit treatment processes other than infiltration. This configuration is considered to provide flow-thru treatment, not biofiltration treatment. Significant aggregate storage provided above the underdrain invert can provide detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain. **PDPs have the option to add saturated storage to the flow-thru configuration in order to reduce the DCV that the BMP is required to treat.** Saturated storage can be added to this design by including an upturned elbow installed at the downstream end of the underdrain or via an internal weir structure designed to maintain a specific water level elevation. The DCV can be reduced by the amount of saturated storage provided.

Integrated stormwater flow control and pollutant control configuration. With any of the above configurations, the system can be designed to provide flow rate and duration control. This may include having a deeper aggregate storage layer that allows for significant detention storage above the underdrain, which can be further controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Permeable pavements must meet the following design criteria. Deviations from the below criteria

may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection must be based on infiltration feasibility criteria.	Full or partial infiltration designs must be supported by drainage area feasibility findings.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration should not be allowed.	Lining prevents stormwater from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Permeable pavement is not placed in an area with significant overhanging trees or other vegetation.	Leaves and organic debris can clog the pavement surface.
☐	For pollutant control permeable pavement, the ratio of the total drainage area (including the permeable pavement) to the permeable pavement should not exceed 4:1.	Higher ratios increase the potential for clogging but may be acceptable for relatively clean tributary areas.
☐	Finish grade of the permeable pavement has a slope ≤ 5%.	Flatter surfaces facilitate increased runoff capture.
☐	Minimum depth to groundwater and bedrock ≥ 10 ft.	A minimum separation facilitates infiltration and lessens the risk of negative groundwater impacts.
☐	Contributing tributary area includes effective sediment source control and/or pretreatment measures such as raised curbed or grass filter strips.	Sediment can clog the pavement surface.
☐	Direct discharges to permeable pavement are only from downspouts carrying "clean" roof runoff that are equipped with filters to remove gross solids.	Roof runoff typically carries less sediment than runoff from other impervious surfaces and is less likely to clog the pavement surface.

Siting and Design		*Intent/Rationale*
Permeable Surface Layer		
☐	Permeable surface layer type is appropriately chosen based on pavement use and expected vehicular loading.	Pavement may wear more quickly if not durable for expected loads or frequencies.
☐	Permeable surface layer type is appropriate for expected pedestrian traffic.	Expected demographic and accessibility needs (e.g., adults, children, seniors, runners, high-heeled shoes, wheelchairs, strollers, bikes) requires selection of appropriate surface layer type that will not impede pedestrian needs.
Bedding Layer for Permeable Surface		
☐	Bedding thickness and material is appropriate for the chosen permeable surface layer type.	Porous asphalt requires a 2- to 4-inch layer of asphalt and a 1- to 2-inch layer of choker course (single-sized crushed aggregate, one-half inch) to stabilize the surface. Pervious concrete also requires an aggregate course of clean gravel or crushed stone with a minimum amount of fines. Permeable Interlocking Concrete Paver requires 1 or 2 inches of sand or No. 8 aggregate to allow for leveling of the paver blocks. Similar to Permeable Interlocking Concrete Paver, plastic grid systems also require a 1- to 2-inch bedding course of either gravel or sand. For Permeable Interlocking Concrete Paver and plastic grid systems, if sand is used, a geotextile should be used between the sand course and the reservoir media to prevent the sand from migrating into the stone media.
☐	Aggregate used for bedding layer is washed prior to placement.	Washing aggregate will help eliminate fines that could clog the permeable pavement system aggregate storage layer

Siting and Design		*Intent/Rationale*
		void spaces or underdrain.
Media Layer (Optional) –used between bedding layer and aggregate storage layer to provide pollutant treatment control		
☐	The pollutant removal performance of the media layer is documented by the applicant.	Media used for BMP design should be shown via research or testing to be appropriate for expected pollutants of concern and flow rates.
☐	A filter course is provided to separate the media layer from the aggregate storage layer.	Migration of media can cause clogging of the aggregate storage layer void spaces or underdrain.
☐	If a filter course is used, calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
☐	Consult permeable pavement manufacturer to verify that media layer provides required structural support.	Media must not compromise the structural integrity or intended uses of the permeable pavement surface.
Aggregate Storage Layer		
☐	Aggregate used for the aggregate storage layer is washed and free of fines.	Washing aggregate will help eliminate fines that could clog aggregate storage layer void spaces or underdrain.
☐	Minimum layer depth is 6 inches and for infiltration designs, the maximum depth is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A minimum depth of aggregate provides structural stability for expected pavement loads.
Underdrain and Outflow Structures		
☐	Underdrains and outflow structures, if used, are accessible for inspection and maintenance.	Maintenance will improve the performance and extend the life of the permeable pavement system.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.

Siting and Design		*Intent/Rationale*
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
Filter Course (Optional)		
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog subgrade and impede infiltration.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where permeable pavement can be used in the site design to replace traditional pavement to reduce the impervious area and DCV. These permeable pavement areas can be credited toward reducing runoff generated through representation in stormwater calculations as pervious, not impervious, areas but are not credited for stormwater pollutant control. These permeable pavement areas should be designed as self-retaining with the appropriate tributary area ratio identified in the design criteria.
2. Calculate the DCV per Appendix B, taking into account reduced runoff from self-retaining permeable pavement areas.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design permeable pavement for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, maximum finish grade slope, and the recommended tributary area ratio for non-self-retaining permeable pavement. If infiltration is infeasible, the permeable pavement can be designed as flow-thru treatment per the sizing worksheet. If infiltration is feasible, calculations should follow the remaining design steps.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine if full or partial infiltration of the DCV is achievable based on the available infiltration storage volume calculated from the permeable pavement footprint, aggregate storage layer depth, and in-situ soil design infiltration rate for a maximum 36-hour drawdown time. The applicant has an option to use a different drawdown time up to 96 hours if the volume of the facility is adjusted using the percent capture method

in Appendix B.4.2.

4. Where the DCV cannot be fully infiltrated based on the site or permeable pavement constraints, an underdrain must be incorporated above the infiltration storage to carry away runoff that exceeds the infiltration storage capacity.
5. The remaining DCV to be treated should be calculated for use in sizing downstream BMP(s).

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant aggregate storage volumes, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, maximum finish grade slope, and the recommended tributary area ratio for non-self-retaining permeable pavement. Design for flow control can be achieving using various design configurations, but a flow-thru treatment design will typically require a greater aggregate storage layer volume than designs which allow for full or partial infiltration of the DCV.
2. Iteratively determine the area and aggregate storage layer depth required to provide infiltration and/or detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If the permeable pavement system cannot fully provide the flow rate and duration control required by this manual, a downstream structure with sufficient storage volume such as an underground vault can be used to provide remaining controls.
4. After permeable pavement has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.11 PR-1 Biofiltration with Partial Retention

Location: 805 and Bonita Road, Chula vista, CA.

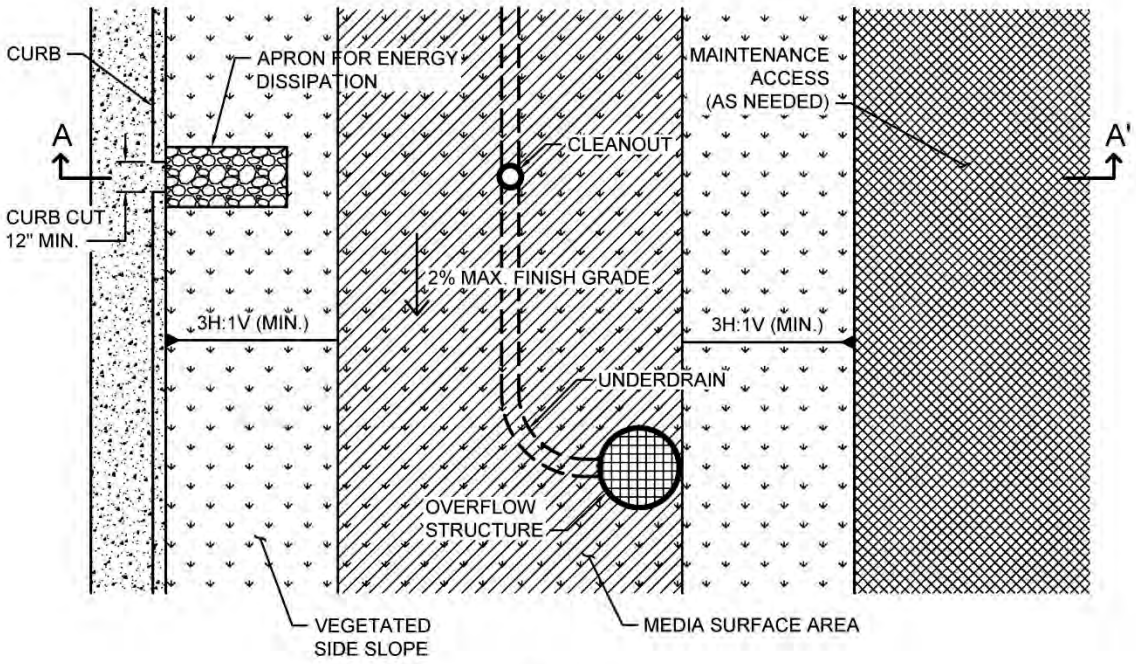
MS4 Permit Category
NA
Manual Category
Partial Retention
Applicable Performance Standard
Pollutant Control Flow Control
Primary Benefits
Volume Reduction Treatment Peak Flow Attenuation

Description

Biofiltration with partial retention (partial infiltration and biofiltration) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. Where feasible, these BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Biofiltration with partial retention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed in ground or partially aboveground, such as planter boxes with open bottoms to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

Typical biofiltration with partial retention components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side Slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Uncompacted native soils at the bottom of the facility
- Overflow structure



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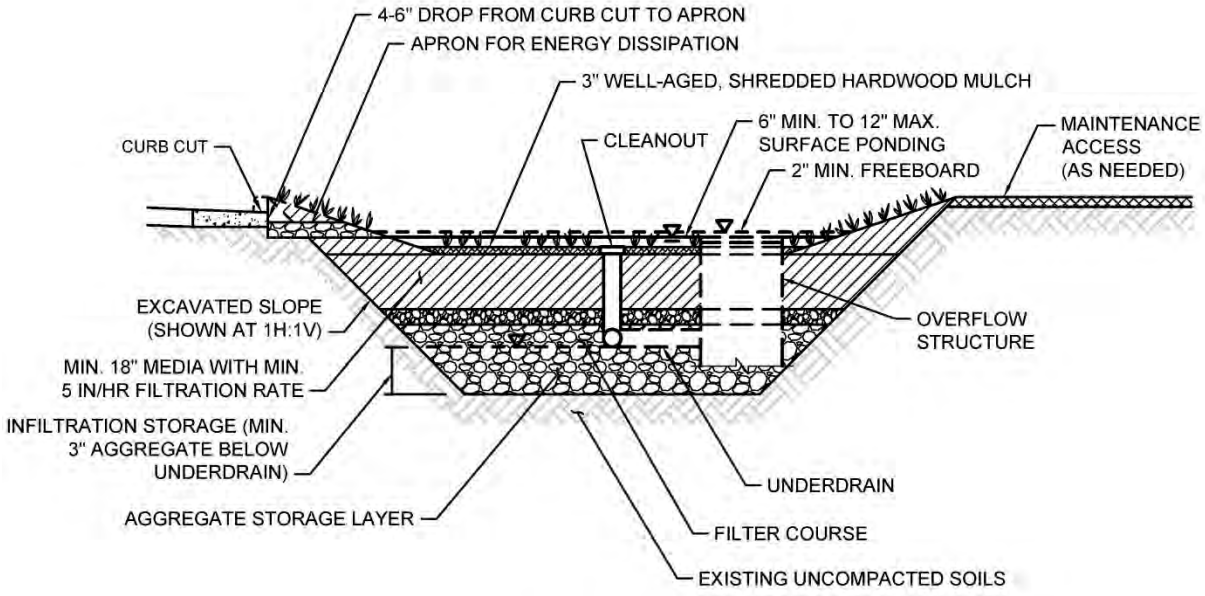


SECTION A-A'
NOT TO SCALE

Typical plan and Section view of a Biofiltration with Partial Retention BMP

Design Adaptations for Project Goals

Partial infiltration BMP with biofiltration treatment for stormwater pollutant control. Biofiltration with partial retention can be designed so that a portion of the DCV is infiltrated by providing infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered biofiltration treatment. Storage provided above the underdrain within surface ponding, media, and aggregate storage is included in the biofiltration treatment volume.

Integrated stormwater flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer. This will allow for significant detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Biofiltration with partial retention must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a partial infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the [City Engineer} if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design

Siting and Design		*Intent/Rationale*
		features requested by the City Engineer for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.

Siting and Design		*Intent/Rationale*
Mulch (Optional or Mandatory – Dependent on jurisdiction)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events, and allows flows to relatively quickly enter the aggregate storage layer, thereby minimizing bypass. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot

Siting and Design		*Intent/Rationale*
		and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	Maximum aggregate storage layer depth below the underdrain invert is determined based on the infiltration storage volume that will infiltrate within a 48-hour drawdown time.	A maximum drawdown time is needed for vector control and to facilitate providing stormwater storage for the next storm event.

Siting and Design		*Intent/Rationale*
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Nutrient Sensitive Media Design

To design biofiltration with partial retention with underdrain for stormwater pollutant control only (no flow control required), the following steps should be taken:

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design biofiltration with partial retention and an underdrain for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Generalized sizing procedure is presented in Appendix B.5. The surface ponding should be verified to have a maximum 24-hour drawdown time.

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention and/or infiltration storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If biofiltration with partial retention cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After biofiltration with partial retention has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.12 BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

MS4 Permit Category
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

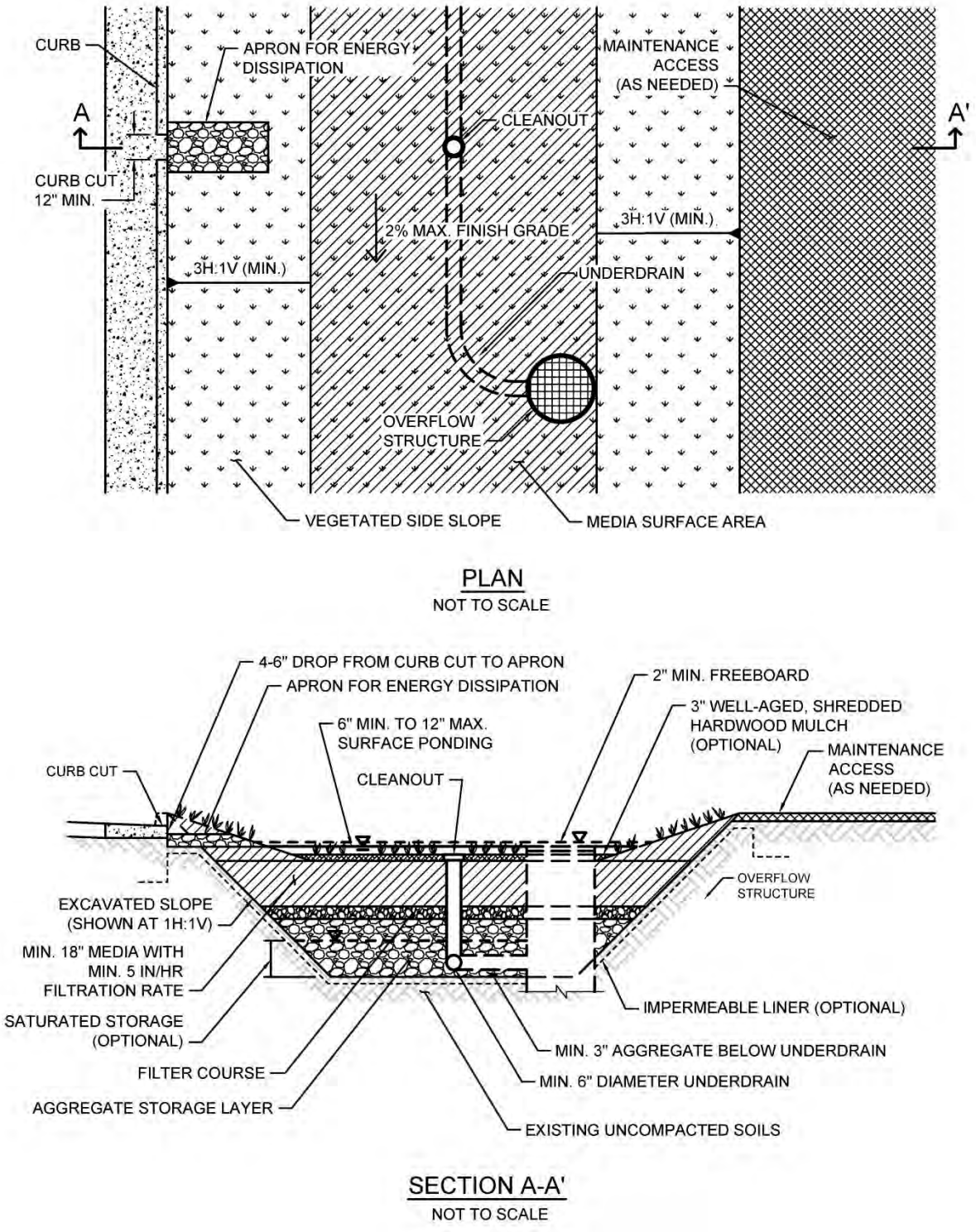
Description

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical bioretention with underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility

- Overflow structure



Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for stormwater pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated stormwater flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Bioretention with underdrain must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents stormwater from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the City Engineer if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to

Siting and Design		*Intent/Rationale*
		minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hour for plant health.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.

Siting and Design		*Intent/Rationale*
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Optional or Mandatory – Dependent on jurisdiction)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels,

Siting and Design		*Intent/Rationale*
		impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow

Siting and Design		*Intent/Rationale*
		control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design bioretention with underdrain for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.

3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.13 BF-2 Nutrient Sensitive Media Design

Some studies of bioretention with underdrains have observed export of nutrients, particularly inorganic nitrogen (nitrate and nitrite) and dissolved phosphorus. This has been observed to be a short-lived phenomenon in some studies or a long term issue in some studies. The composition of the soil media, including the chemistry of individual elements is believed to be an important factor in the potential for nutrient export. Organic amendments, often compost, have been identified as the most likely source of nutrient export. The quality and stability of organic amendments can vary widely.

The biofiltration media specifications contained in the County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition) and the City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) were developed with consideration of the potential for nutrient export. These specifications include criteria for individual component characteristics and quality in order to control the overall quality of the blended mixes. As of the publication of this manual, the June 2014 County of San Diego specifications provide more detail regarding mix design and quality control.

The City and County specifications noted above were developed for general purposes to meet permeability and treatment goals. In cases where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the biofiltration media should be designed with the specific goal of minimizing the potential for export of nutrients from the media. Therefore, in addition to adhering to the City or County media specifications, the following guidelines should be followed:

1. Select plant palette to minimize plant nutrient needs

A landscape architect or agronomist should be consulted to select a plant palette that minimizes nutrient needs. Utilizing plants with low nutrient needs results in less need to enrich the biofiltration soil mix. If nutrient quantity is then tailored to plants with lower nutrient needs, these plants will generally have less competition from weeds, which typically need higher nutrient content. The following practices are recommended to minimize nutrient needs of the plant palette:

- **Utilize native, drought-tolerant plants and grasses where possible.** Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils.

- **Start plants from smaller starts or seed.** Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Given the lower cost of smaller plants, the project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.

2. Minimize excess nutrients in media mix

Once the low-nutrient plant palette is established (item 1), the landscape architect and/or agronomist should be consulted to assist in the design of a biofiltration media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient export. The following guidelines should be followed:

- **The mix should not exceed the nutrient needs of plants.** In conventional landscape design, the nutrient needs of plants are often exceeded intentionally in order to provide a factor of safety for plant survival. This practice must be avoided in biofiltration media as excess nutrients will increase the chance of export. The mix designer should keep in mind that nutrients can be added later (through mulching, tilling of amendments into the surface), but it is not possible to remove nutrients, once added.

- **The actual nutrient content and organic content of the selected organic amendment source should be determined when specifying mix proportions.** Nutrient content (i.e., C:N ratio; plant extractable nutrients) and organic content (i.e, % organic material) are relatively inexpensive to measure via standard agronomic methods and can provide important information about mix design. If mix design relies on approximate assumption about nutrient/organic content and this is not confirmed with testing (or the results of prior representative testing), it is possible that the mix could contain much more nutrient than intended.

- **Nutrients are better retained in soils with higher cation exchange capacity.** Cation exchange capacity can be increased through selection of organic material with naturally high cation exchange capacity, such as peat or coconut coir pith, and/or selection of inorganic material with high cation exchange capacity such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher cation exchange capacity materials would tend to reduce the net export of nutrients. Natural silty materials also provide cation exchange capacity; however potential impacts to permeability need to be considered.

- **Focus on soil structure as well as nutrient content.** Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of organic amendment, plants survivability should still be provided. While soil structure generally develops with time, biofiltration media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high humus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of organic material with a distribution of particle sizes (i.e., a more heterogeneous mix).

- **Consider alternatives to compost.** Compost, by nature, is a material that is continually evolving and decaying. It can be challenging to determine whether tests previously done on a given compost stock are still representative. It can also be challenging to determine how the

properties of the compost will change once placed in the media bed. More stable materials such as aged coco coir pith, peat, biochar, shredded bark, and/or other amendments should be considered.

With these considerations, it is anticipated that less than 10 percent organic amendment by volume could be used, while still balancing plant survivability and water retention. If compost is used, designers should strongly consider utilizing less than 10 percent by volume.

3. Design with partial retention and/or internal water storage

An internal water storage zone, as described in Fact Sheet PR-1 is believed to improve retention of nutrients. For lined systems, an internal water storage zone worked by providing a zone that fluctuates between aerobic and anaerobic conditions, resulting in nitrification/denitrification. In soils that will allow infiltration, a partial retention design (PR-1) allows significant volume reduction and can also promote nitrification/denitrification.

Acknowledgment: This fact sheet has been adapted from the Orange County Technical Guidance Document (May 2011). It was originally developed based on input from: Deborah Deets, City of Los Angeles Bureau of Sanitation, Drew Ready, Center for Watershed Health, Rick Fisher, ASLA, City of Los Angeles Bureau of Engineering, Dr. Garn Wallace, Wallace Laboratories, Glen Dake, GDML, and Jason Schmidt, Tree People. The guidance provided herein does not reflect the individual opinions of any individual listed above and should not be cited or otherwise attributed to those listed.

E.14 BF-3 Proprietary Biofiltration Systems

The purpose of this fact sheet is to help explain the potential role of proprietary BMPs in meeting biofiltration requirements, when full retention of the DCV is not feasible. The fact sheet does not describe design criteria like the other fact sheets in this appendix because this information varies by BMP product model.

Criteria for Use of a Proprietary BMP as a Biofiltration BMP

A proprietary BMP may be acceptable as a "biofiltration BMP" under the following conditions:

(1) The BMP meets the minimum design criteria listed in Appendix F, including the pollutant treatment performance standard in Appendix F.1;

(2) The BMP is designed and maintained in a manner consistent with its performance certifications (See explanation in Appendix F.2); and

(3) The BMP is acceptable at the discretion of the City Engineer. The City Engineer has no obligation to accept any proprietary biofiltration BMP.

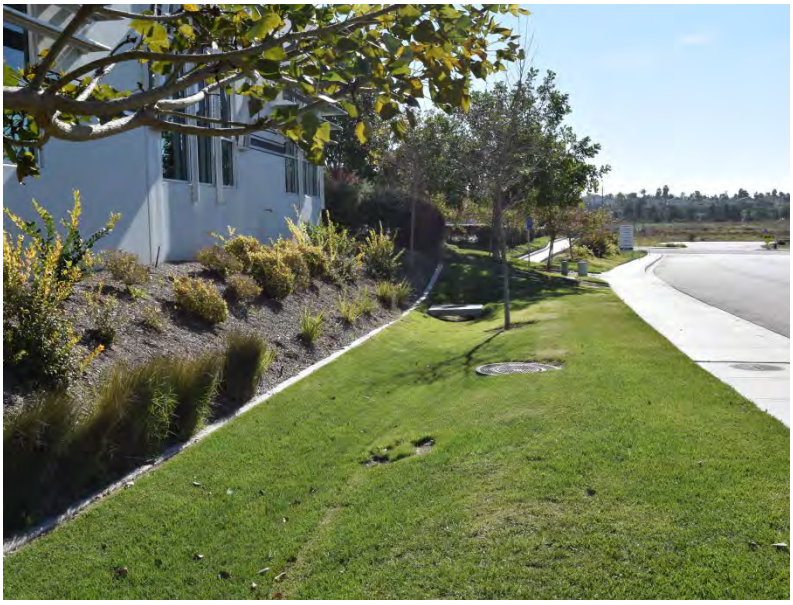
Guidance for Sizing a Proprietary BMP as a Biofiltration BMP

Proprietary biofiltration BMPs must meet the same sizing guidance as non-proprietary BMPs. Sizing is typically based on capturing and treating 1.50 times the DCV not reliably retained. Guidance for sizing biofiltration BMPs to comply with requirements of this manual is provided in Appendix F.2.

Jurisdiction-specific Guidance and Criteria

Insert any jurisdiction-specific guidance and criteria for proprietary Biofiltration BMPs.

E.15 FT-1 Vegetated Swales



MS4 Permit Category
Flow-thru Treatment Control

Manual Category
Flow-thru Treatment Control

Applicable Performance Standard
Pollutant Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation

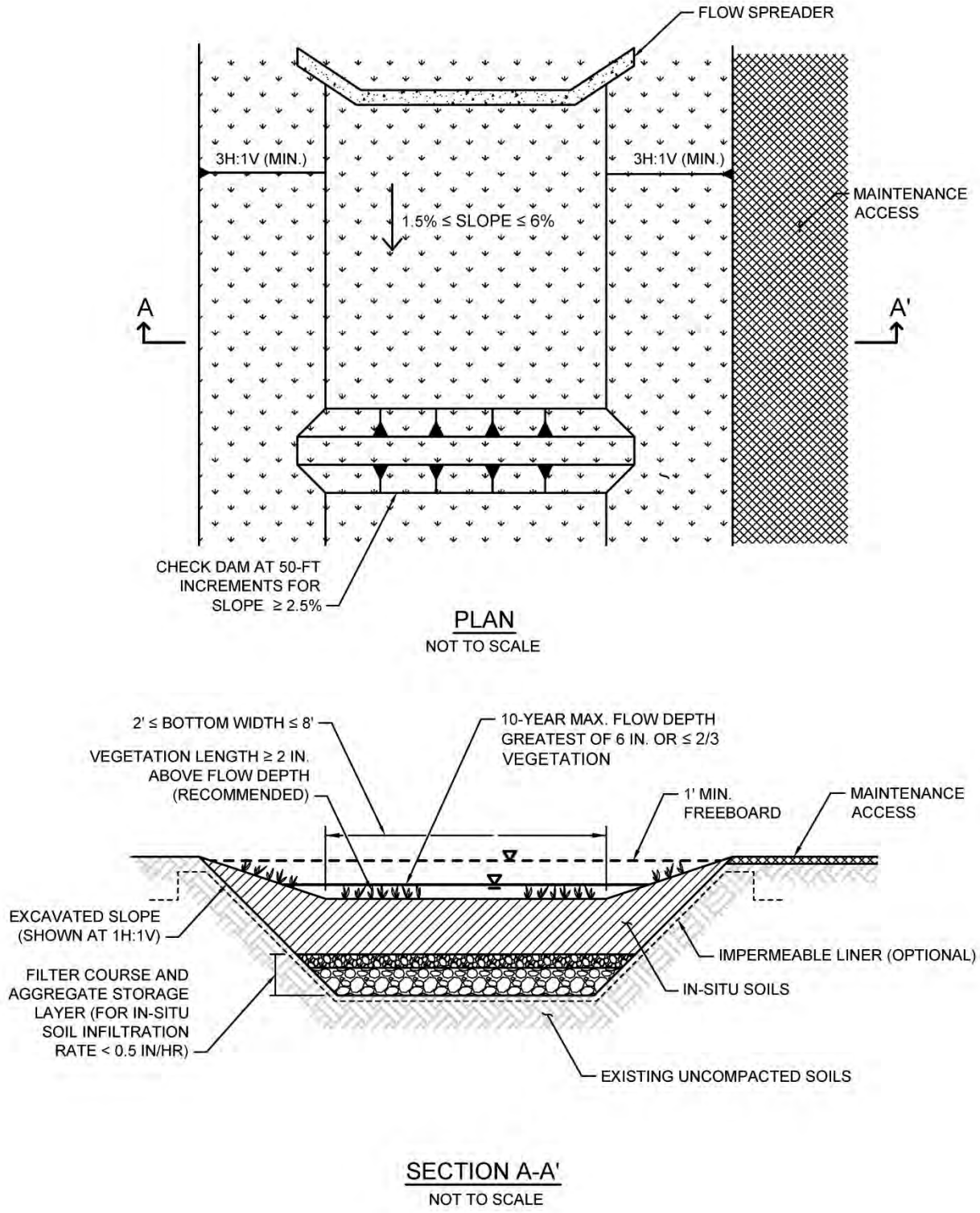
Location: Eastlake Business Center, Chula Vista, California; Photo Credit: Eric Mosolgo

Description

Vegetated swales are shallow, open channels that are designed to remove stormwater pollutants by physically straining/filtering runoff through vegetation in the channel. Swales can be used in place of traditional curbs and gutters and are well-suited for use in linear transportation corridors to provide both conveyance and treatment via filtration. An effectively designed vegetated swale achieves uniform sheet flow through densely vegetated areas. When soil conditions allow, infiltration and volume reduction are enhanced by adding a gravel drainage layer underneath the swale. Vegetated swales with a subsurface media layer can provide enhanced infiltration, water retention, and pollutant-removal capabilities. Pollutant removal effectiveness can also be maximized by increasing the hydraulic residence time of water in swale using weirs or check dams.

Typical vegetated swale components include:

- Inflow distribution mechanisms (e.g., flow spreader)
- Surface flow
- Vegetated surface layer
- Check dams (if required)
- Optional aggregate storage layer with underdrain(s)



Typical plan and Section view of a Vegetated Swale BMP

Design Adaptations for Project Goals

Site design BMP to reduce runoff volumes and storm peaks. Swales without underdrains are an alternative to lined channels and pipes and can provide volume reduction through infiltration. Swales can also reduce the peak runoff discharge rate by increasing the time of concentration of the site and decreasing runoff volumes and velocities.

Flow-thru treatment BMP for stormwater pollutant control. The system is lined or un-lined to provide incidental infiltration with an underdrain and designed to provide pollutant removal through settling and filtration in the channel vegetation (usually grasses). This configuration is considered to provide flow-thru treatment via horizontal surface flow through the swale. Sizing for flow-thru treatment control is based on the surface flow rate through the swale that meets water quality treatment performance objectives.

Design Criteria and Considerations

Vegetated swales must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents stormwater from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area ≤ 2 acres.	Higher ratios increase the potential for clogging but may be acceptable for relatively clean tributary areas.
☐	Longitudinal slope is ≥ 1.5% and ≤ 6%.	Flatter swales facilitate increased water quality treatment while minimum slopes prevent ponding.
☐	For site design goal, in-situ soil infiltration rate ≥ 0.5 in/hr (if < 0.5 in/hr, an underdrain is required and design goal is for pollutant control only).	Well-drained soils provide volume reduction and treatment. An underdrain should only be provided when soil infiltration rates are low or per geotechnical or groundwater concerns.

Siting and Design		*Intent/Rationale*
Surface Flow		
☐	Maximum flow depth is ≤ 6 inches or ≤ $^2/_3$ the vegetation length, whichever is greater. Ideally, flow depth will be ≥ 2 inches below shortest plant species.	Flow depth must fall within the height range of the vegetation for effective water quality treatment via filtering.
	A minimum of 1 foot of freeboard is provided.	Freeboard minimizes risk of uncontrolled surface discharge.
☐	Cross sectional shape is trapezoidal or parabolic with side slopes ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐	Bottom width is ≥ 2 feet and ≤ 8 feet.	A minimum of 2 feet minimizes erosion. A maximum of 8 feet prevents channel braiding.
☐	Minimum hydraulic residence time ≥ 10 minutes.	Longer hydraulic residence time increases pollutant removal.
☐	Swale is designed to safely convey the 10-yr storm event unless a flow splitter is included to allow only the water quality event.	Planning for larger storm events lessens the risk of property damage due to flooding.
☐	Flow velocity is ≤ 1 ft/s for water quality event. Flow velocity for 10-yr storm event is ≤ 3 ft/s.	Lower flow velocities provide increased pollutant removal via filtration and minimize erosion.
Vegetated Surface Layer (amendment with media is Optional)		
☐	Soil is amended with 2 inches of media mixed into the top 6 inches of in-situ soils, as needed, to promote plant growth (optional). For enhanced pollutant control, 2 feet of media can be used in place of in-situ soils. Media meets either of these two media specifications: City of San Diego Low Impact Development Design Manual, July 2011 (page B-18); Or County of San Diego Low Impact Development Handbook, June 2014: Appendix G -Bioretention Soil Specification.	Amended soils aid in plant establishment and growth. Media replacement for in-situ soils can improve water quality treatment and site design volume reduction.

Siting and Design		*Intent/Rationale*
☐	Vegetation is appropriately selected low-growing, erosion-resistant plant species that effectively bind the soil, thrive under site-specific climatic conditions and require little or no irrigation.	Plants suited to the climate and expected flow conditions are more likely to survive.
Check Dams		
☐	Check dams are provided at 50-foot increments for slopes ≥ 2.5%.	Check dams prevent erosion and increase the hydraulic residence time by lowering flow velocities and providing ponding opportunities.
Filter Course Layer (For Underdrain Design)		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer (For Underdrain Design)		
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
☐	Aggregate used for the aggregate storage layer is washed and free of fines.	Washing aggregate will help eliminate fines that could clog aggregate storage layer void spaces or underdrain.
Inflow and Underdrain Structures		
☐	Inflow and underdrains are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic

Siting and Design		*Intent/Rationale*
	elevation of the aggregate storage layer.	performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.

Conceptual Design and Sizing Approach for Site Design

1. Determine the areas where vegetated swales can be used in the site design to replace traditional curb and gutter facilities and provide volume reduction through infiltration.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design vegetated swales for stormwater pollutant control only, the following steps should be taken:

1. Verify that siting and design criteria have been met, including bottom width and longitudinal and side slope requirements.
2. Calculate the design flow rate per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-thru treatment sizing of the vegetated swale and if flow velocity, flow depth, and hydraulic residence time meet required criteria. Swale configuration should be adjusted as necessary to meet design requirements.

E.16 FT-2 Media Filters

MS4 Permit Category
Flow-thru Treatment Control

Manual Category
Flow-thru Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Peak Flow Attenuation (Optional)

Photo Credit: Contech Stormwater Solutions

Description

Media filters are manufactured devices that consist of a series of modular filters packed with engineered media that can be contained in a catch basin, manhole, or vault that provide treatment through filtration and sedimentation. The manhole or vault may be divided into multiple chambers where the first chamber acts as a presettling basin for removal of coarse sediment while the next chamber acts as the filter bay and houses the filter cartridges. A variety of media types are available from various manufacturers that can target pollutants of concern via primarily filtration, sorption, ion exchange, and precipitation. **Specific products must be selected to meet the flow-thru BMP selection requirements described in Appendix B.6**. Treatment effectiveness is contingent upon proper maintenance of filter units.

Typical media filter components include:

- Vault for flow storage and media housing
- Inlet and outlet
- Media filters

Design Adaptations for Project Goals

Flow-thru treatment BMP for stormwater pollutant control. Water quality treatment is provided through filtration. This configuration is considered to provide flow-thru treatment, not biofiltration treatment. Storage provided within the vault restricted by an outlet is considered detention storage and is included in calculations for the flow-thru treatment volume.

Integrated stormwater flow control and pollutant control configuration. Media filters can also be designed for flow rate and duration control via additional detention storage. The vault storage can be designed to accommodate higher volumes than the stormwater pollutant control volume and can utilize multi-stage outlets to mitigate both the duration and rate of flows within a prescribed range.

Design Criteria and Considerations

Media filters must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Recommended for tributary areas with limited available surface area or where surface BMPs would restrict uses.	Maintenance needs may be more labor intensive for media filters than surface BMPs. Lack of surface visibility creates additional risk that maintenance needs may not be completed in a timely manner.
☐	Vault storage drawdown time ≤96 hours.	Provides vector control.
☐	Vault storage drawdown time ≤36 hours if the vault is used for equalization of flows for pollutant treatment.	Provides required capacity to treat back to back storms. Exception to the 36 hour drawdown criteria is allowed if additional vault storage is provided using the curves in Appendix B.4.2.
Inflow and Outflow Structures		
☐	Inflow and outflow structures are accessible by required equipment (e.g., vactor truck) for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design a media filter for stormwater pollutant control only (no flow control required), the following steps should be taken

1. Verify that the selected BMP complies with BMP selection requirements in Appendix B.6.
2. Verify that placement and tributary area requirements have been met.
3. Calculate the required DCV and/or flow rate per Appendix B.6.3 based on expected site design runoff for tributary areas.
4. Media filter can be designed either for DCV or flow rate. To estimate the drawdown time, divide the vault storage by the treatment rate of media filters.

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant vault storage volume, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that placement and tributary area requirements have been met.
2. Iteratively determine the vault storage volume required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows to MS4.
3. If a media filter cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide remaining controls.
4. After the media filter has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.
5. Verify that the vault drawdown time is 96 hours or less. To estimate the drawdown time:
    a. Divide the vault volume by the filter surface area.
    b. Divide the result (a) by the design filter rate.

E.17 FT-3 Sand Filters

MS4 Permit Category
Flow-thru Treatment Control

Manual Category
Flow-thru Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

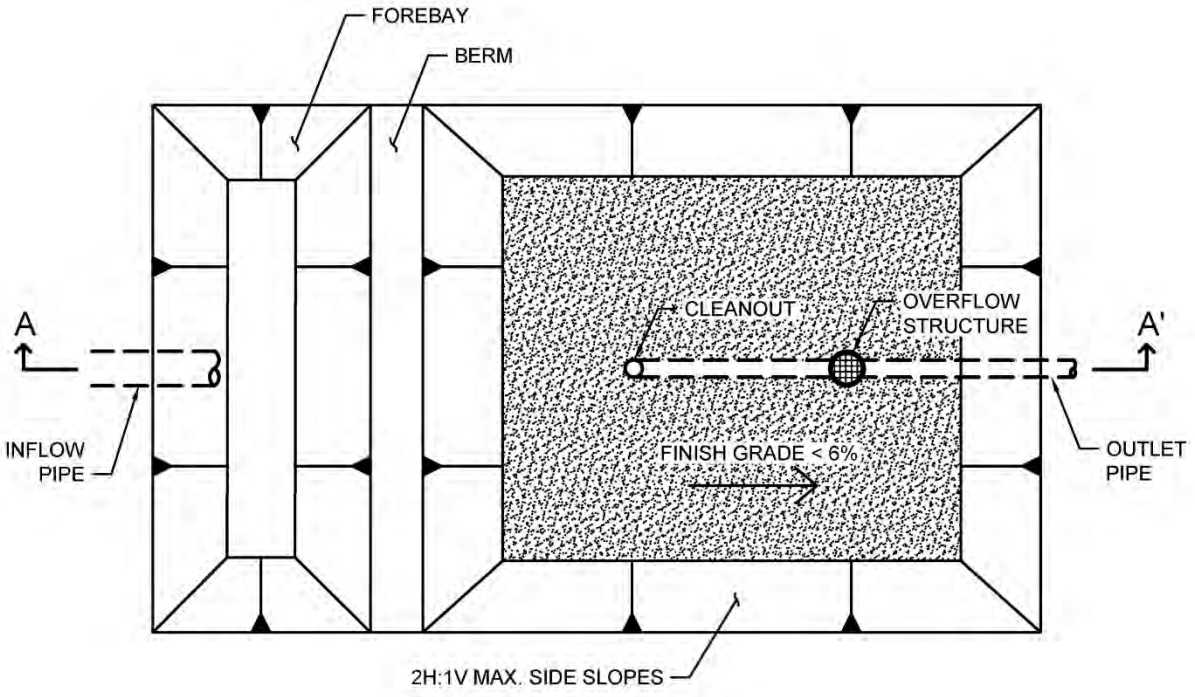
Photo Credit: City of San Diego LID Manual

Description

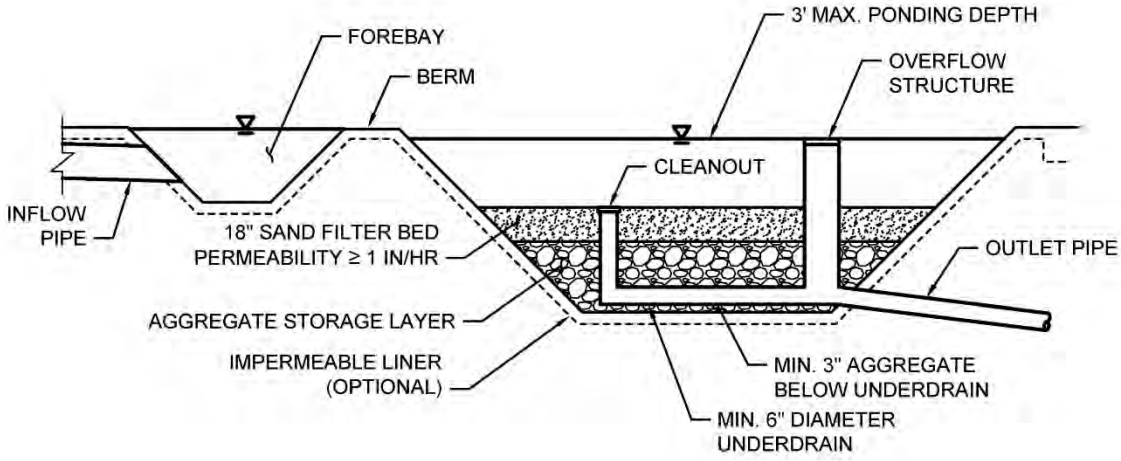
Sand filters operate by filtering stormwater through a constructed sand bed with an underdrain system. Runoff enters the filter and spreads over the surface. Sand filter beds can be enclosed within concrete structures or within earthen containment. As flows increase, water backs up on the surface of the filter where it is held until it can percolate through the sand. The treatment pathway is downward (vertical) through the media to an underdrain system that is connected to the downstream storm drain system. As stormwater passes through the sand, pollutants are trapped on the surface of the filter, in the small pore spaces between sand grains or are adsorbed to the sand surface. The high filtration rates of sand filters, which allow a large runoff volume to pass through the media in a short amount of time, can provide efficient treatment for stormwater runoff.

Typical sand filter components include:

- Forebay for pretreatment/energy dissipation
- Surface ponding for captured flows
- Sand filter bed
- Aggregate storage layer with underdrain(s)
- Overflow structure



PLAN
NOT TO SCALE



SECTION A-A'
NOT TO SCALE

Typical plan and Section view of a Sand Filter BMP

Design Adaptations for Project Goals

Flow-thru treatment BMP for stormwater pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide flow-thru treatment via vertical flow through the sand filter bed. Storage provided above the underdrain within surface ponding, the sand filter bed, and aggregate storage is considered included in the flow-thru treatment volume. Saturated storage within the aggregate storage layer can be added to this design by including an upturned elbow installed at the downstream end of the underdrain or via an internal weir structure designed to maintain a specific water level elevation.

Integrated stormwater flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Sand filters must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents stormwater from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area (≤ 5 acres).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the [City Engineer} if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the

Siting and Design	*Intent/Rationale*
	City Engineer for proper performance of the regional BMP.
☐ Finish grade of facility is < 6%.	Flatter surfaces reduce erosion and channelization within the facility.
☐ Earthen side slopes are ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
☐ Surface ponding is limited to a 36-hour drawdown time.	Provides required capacity to treat back to back storms. Exception to the 36 hour drawdown criteria is allowed if additional surface storage is provided using the curves in Appendix B.4.2.
☐ Surface ponding is limited to a 96-hour drawdown time.	Prolonged surface ponding can create a vector hazard.
☐ Maximum ponding depth does not exceed 3 feet.	Surface ponding capacity lowers subsurface storage requirements and results in lower cost facilities. Deep surface ponding raises safety concerns.
☐ Sand filter bed consists of clean washed concrete or masonry sand (passing ¼ inch sieve) or sand similar to the ASTM C33 gradation.	Washing sand will help eliminate fines that could clog the void spaces of the aggregate storage layer.
☐ Sand filter bed permeability is at least 1 in/hr.	A high filtration rate through the media allows flows to quickly enter the aggregate storage layer, thereby minimizing bypass.
☐ Sand filter bed depth is at least 18 inches deep.	Different pollutants are removed in various zones of the media using several mechanisms. Some pollutants bound to sediment, such as metals, are typically removed within 18 inches of the media.
☐ Aggregate storage should be washed, bank-run gravel.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐ The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.

Siting and Design		*Intent/Rationale*
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow must be non-erosive sheet flow (≤ 3 ft/s) unless an energy-dissipation device, flow diversion/splitter or forebay is installed.	Concentrated flow and/or excessive volumes can cause erosion in a sand filter and can be detrimental to the treatment capacity of the system.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains should be made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design a sand filter for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, and maximum finish grade slope.
2. Calculate the required DCV and/or flow rate per Appendix B.6.3 based on expected site design runoff for tributary areas.
3. Sand filter can be designed either for DCV or flow rate. To estimate the drawdown time, divide the average ponding depth by the permeability of the filter sand.

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or

aggregate storage volumes, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the Manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, and maximum finish grade slope.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If a sand filter cannot fully provide the flow rate and duration control required by the MS4 permit, an upstream or downstream structure with appropriate storage volume such as an underground vault can be used to provide remaining controls.
4. After the sand filter has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.18 FT-4 Dry Extended Detention Basin

MS4 Permit Category
Flow-thru Treatment Control

Manual Category
Flow-thru Treatment Control

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation

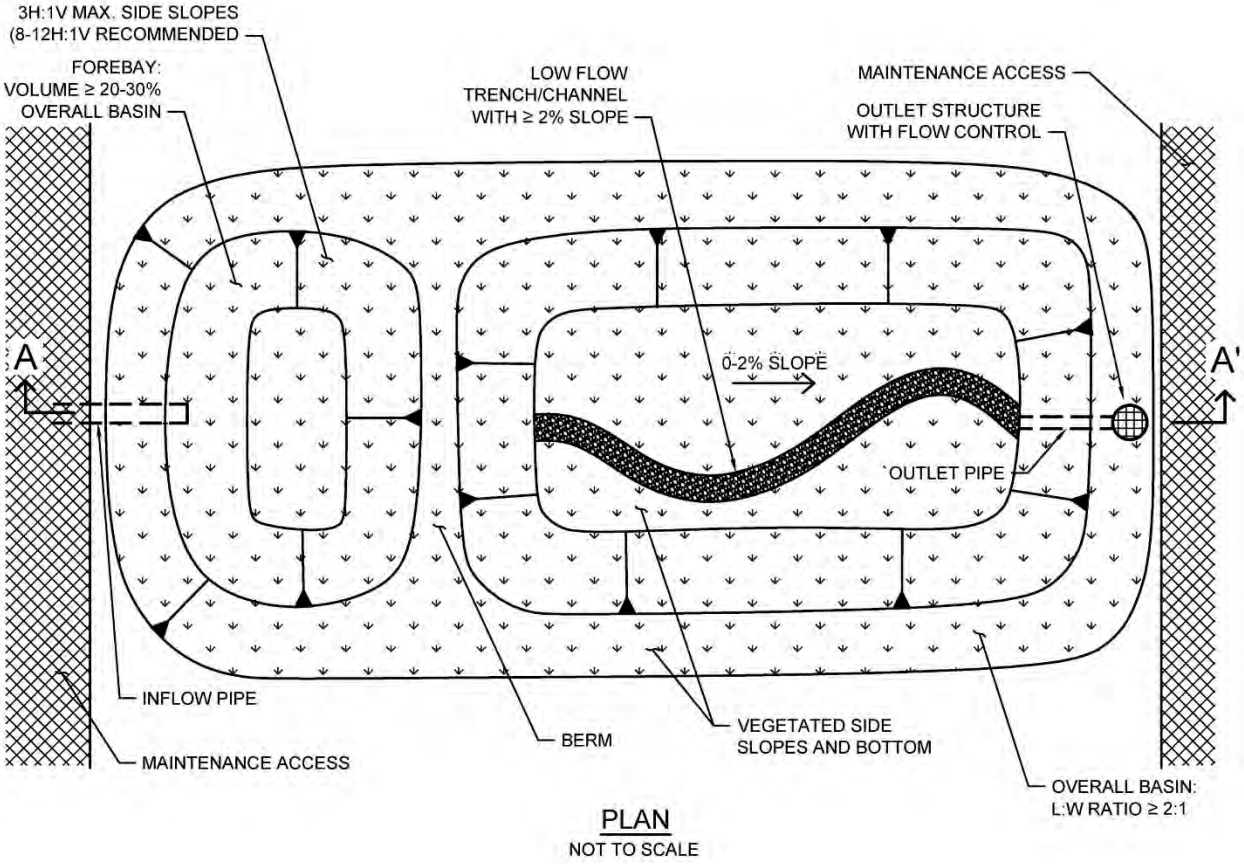
Location: Rolling Hills Ranch, Chula Vista, California; Photo Credit: Eric Mosolgo

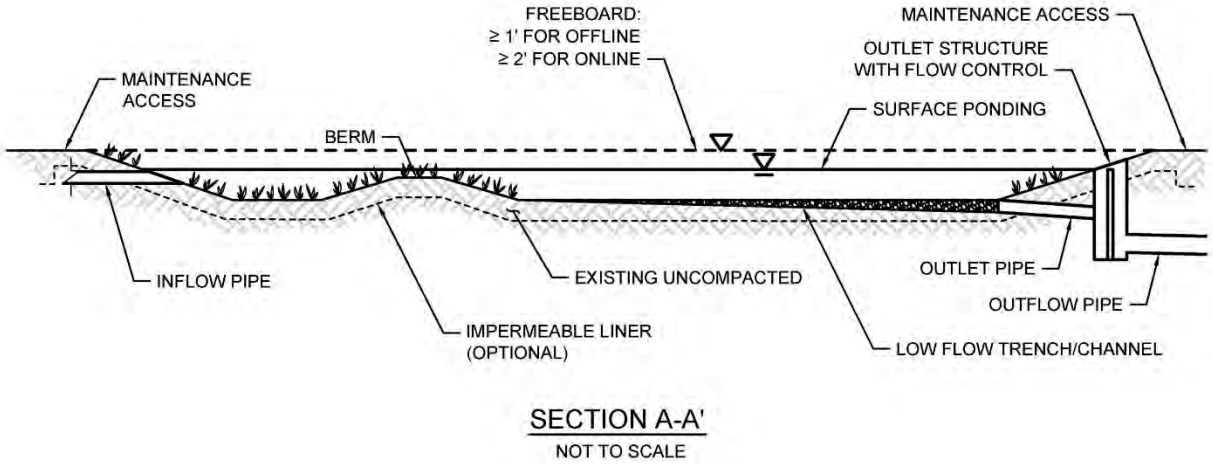
Description

Dry extended detention basins are basins that have been designed to detain stormwater for an extended period to allow sedimentation and typically drain completely between storm events. A portion of the dissolved pollutant load may also be removed by filtration, uptake by vegetation, and/or through infiltration. The slopes, bottom, and forebay of dry extended detention basins are typically vegetated. Considerable stormwater volume reduction can occur in dry extended detention basins when they are located in permeable soils and are not lined with an impermeable barrier. dry extended detention basins are generally appropriate for developments of ten acres or larger, and have the potential for multiple uses including parks, playing fields, tennis courts, open space, and overflow parking lots. They can also be used to provide flow control by modifying the outlet control structure and providing additional detention storage.

Typical dry extended detention basins components include:

- Forebay for pretreatment
- Surface ponding for captured flows
- Vegetation selected based on basin use, climate, and ponding depth
- Low flow channel, outlet, and overflow device
- Impermeable liner or uncompacted native soils at the bottom of the facility





Typical plan and Section view of a Dry Extended Detention Basin BMP

Design Adaptations for Project Goals

Flow-thru treatment BMP for stormwater pollutant control. The system is lined or un-lined to provide incidental infiltration and designed to detain stormwater to allow particulates and associated pollutants to settle out. This configuration is considered to provide flow-thru treatment, not biofiltration treatment. Storage provided as surface ponding above a restricted outlet invert is considered detention storage and is included in calculations for the flow-thru treatment volume.

Integrated stormwater flow control and pollutant control configuration. Dry extended detention basins can also be designed for flow control. The surface ponding can be designed to accommodate higher volumes than the stormwater pollutant control volume and can utilize multi-stage outlets to mitigate both the duration and rate of flows within a prescribed range.

Design Criteria and Considerations

Dry extended detention basins must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, and liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents stormwater from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area is large (typically ≥ 10 acres).	Dry extended detention basins require significant space and are more cost-effective for treating larger drainage areas.
☐	Longitudinal basin bottom slope is 0 - 2%.	Flatter slopes promote ponding and settling of particles.
☐	Basin length to width ratio is ≥ 2:1 (L:W).	A larger length to width ratio provides a longer flow path to promote settling.
☐	Forebay is included that encompasses 20 - 30% of the basin volume.	A forebay to trap sediment can decrease frequency of required maintenance.
☐	Side slopes are ≥ 3H:1V.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more

Siting and Design		*Intent/Rationale*
		quickly and easier to maintain.
☐	Surface ponding drawdown time is between 24 and 96 hours.	Minimum drawdown time of 24 hours allows for adequate settling time and maximizes pollutant removal. Maximum drawdown time of 96 hours provides vector control.
☐	Minimum freeboard provided is ≥1 foot for offline facilities and ≥2 feet for online facilities.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Inflow and outflow structures are accessible by required equipment (e.g., vactor truck) for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	A low flow channel or trench with a ≥ 2% slope is provided. A gravel infiltration trench is provided where infiltration is allowable.	Aids in draining or infiltrating dry weather flows.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow.	Planning for overflow lessens the risk of property damage due to flooding.
☐	The maximum rate at which runoff is discharged is set below the erosive threshold for the site.	Extended low flows can have erosive effects.

Conceptual Design and Sizing Approach for Stormwater Pollutant Control Only

To design dry extended detention basins for stormwater pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and criteria have been met, including placement requirements, contributing tributary area, forebay volume, and maximum slopes for basin sides and bottom.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet to determine flow-thru treatment sizing of the surface ponding of the dry extended detention basin, which includes calculations for a maximum 96-hour drawdown time.

Conceptual Design and Sizing Approach when Stormwater Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding volume, and therefore the following steps should be taken prior to determination of stormwater pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and criteria have been met, including placement requirements, tributary area, and maximum slopes for basin sides and bottom.
2. Iteratively determine the surface ponding required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If a dry extended detention basin cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with appropriate storage volume such as an additional basin or underground vault can be used to provide remaining controls.
4. After the dry extended detention basin has been designed to meet flow control requirements, calculations must be completed to verify if stormwater pollutant control requirements to treat the DCV have been met.

E.19 FT-5 Proprietary Flow-Thru Treatment Control BMPs

The purpose of this fact sheet is to help explain the potential role of proprietary BMPs in meeting flow thru treatment control BMP requirements. The fact sheet does not describe design criteria like the other fact sheets in this appendix because this information varies by BMP product model.

Criteria for Use of a Proprietary BMP as a Flow-Thru Treatment Control BMP

A proprietary BMP may be acceptable as a "flow-thru treatment control BMP" under the following conditions:

(1) The BMP is selected and sized consistent with the method and criteria described in Appendix B.6;

(2) The BMP is designed and maintained in a manner consistent with its performance certifications (See explanation in Appendix B.6); and

(3) The BMP is acceptable at the discretion of the City Engineer. The City Engineer has no obligation to accept any proprietary flow-thru treatment control BMP.

Guidance for Sizing Proprietary BMPs

Proprietary flow-thru BMPs must meet the same sizing guidance as other flow-thru treatment control BMPs. Guidance for sizing flow-thru BMPs to comply with requirements of this manual is provided in Appendix B.6.

Jurisdiction-specific Guidance and Criteria

Insert any jurisdiction-specific guidance and criteria for proprietary flow-thru treatment control BMPs.

E.20 PL Plant List

Plant Name		Irrigation Requirements		Preferred Location in Basin		Applicable Bioretention Sections (Un-Lined Facilities)				Applicability to Flow-Through Planter? (Lined Facility)	
Latin Name	Common Name	Temporary Irrigation during Plant Establishment Period	Permanent Irrigation (Drip / Spray)[1]	Basin Bottom	Basin Side Slopes	Section A Treatment-Only Bioretention in Hydrologic Soil Group A or B Soils	Section B Treatment-Only Bioretention in Hydrologic Soil Group C or D soils	Section C Treatment Plus Flow Control Bioretention in Hydrologic Soil Group A or B Soils	Section D Treatment Plus Flow Control Bioretention in Hydrologic Soil Group C or D Soils	**NO** Applicable to Un-lined Facilities Only (Bioretention Only)	**YES** Can Use in Lined or Un-Lined Facility (Flow-Through Planter OR Bioretention)
TREES[2]											
Alnus rhombifolia	White Alder	X		X	X	X	X	X	X	X	
Platanus racemosa	California Sycamore	X		X	X	X	X	X	X	X	
Salix lasiolepsis	Arroyo Willow	X			X	X	X	X	X	X	
Salix lucida	Lance-Leaf Willow	X			X	X	X	X	X	X	
Sambucus mexicana	Blue Elderberry	X			X	X	X	X	X	X	
SHRUBS / GROUNDCOVER											
Achillea millefolium	Yarrow	X			X	X	X				X
Agrostis palens	Thingrass	X			X	X	X	X	X		X
Anemopsis californica	Yerba Manza	X			X	X	X	X	X		X
Baccharis douglasii	Marsh Baccahris	X	X	X		X	X	X	X		X
Carex praegracillis	California Field Sedge	X	X	X		X	X	X	X		X
Carex spissa	San Diego Sedge	X	X	X		X	X	X	X		X
Carex subfusca	Rusty Sedge	X	X	X	X	X	X	X	X		X
Distichlis spicata	Salt Grass	X	X	X		X	X	X	X		X
Eleocharis macrostachya	Pale Spike Rush	X	X	X		X	X	X	X		X
Festuca rubra	Red Fescue	X	X	X	X	X	X				X
Festuca californica	California Fescue	X	X		X	X	X				X
Iva hayesiana	Hayes Iva	X			X	X	X				X
Juncus Mexicana	Mexican Rush	X	X	X	X	X	X	X	X		X
Jucus patens	California Gray Rush	X	X	X	X	X	X	X	X		X
Leymus condensatus ‘Canyon Prince’	Canyon Prince Wild Rye	X	X	X	X	X	X	X	X		X
Mahonia nevinii	Nevin’s Barberry	X			X	X	X	X	X		X
Muhlenburgia rigens	Deergrass	X	X	X	X	X	X	X	X		X
Mimulus cardinalis	Scarlet Monkeyflower	X		X	X	X	X				X
Ribes speciosum	Fushia Flowering Goose.	X			X	X	X				X
Rosa californica	California Wild Rose	X	X		X	X	X				X
Scirpus cenuus	Low Bullrush	X	X	X		X	X	X	X		X
Sisyrinchium bellum	Blue-eyed Grass	X			X	X	X				X

1. All plants will benefit from some supplemental irrigation during hot dry summer months, particularly those on basin side slopes and further inland.
2. All trees should be planted a min. of 10’ away from any drain pipes or structures.

Appendix

F

Biofiltration Standard and Checklist

Appendix F Biofiltration Standard and Checklist

Introduction

The MS4 Permit and this manual define a specific category of stormwater pollutant treatment BMPs called "biofiltration BMPs." The MS4 Permit (Section E.3.c.1) states:

Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize stormwater retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:

a) **Treat 1.5 times the DCV not reliably retained onsite, OR**

b) **Treat the DCV not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite.**

A project applicant must be able to affirmatively demonstrate that a given BMP is designed and sized in a manner consistent with this definition to be considered as a "biofiltration BMP" as part of a compliant stormwater management plan. Retention is defined in the MS4 Permit as evapotranspiration, infiltration, and harvest and use of stormwater vs. discharge to a surface water system.

Contents and Intended Uses

This appendix contains a checklist of the key underlying criteria that must be met for a BMP to be considered a biofiltration BMP. The purpose of this checklist is to facilitate consistent review and approval of biofiltration BMPs that meet the "biofiltration standard" defined by the MS4 Permit.

This checklist includes specific design criteria that are essential to defining a system as a biofiltration BMP; however it does not present a complete design basis. This checklist was used to develop BMP Fact Sheets for PR-1 biofiltration with partial retention and BF-1 biofiltration, which do present a complete design basis. Therefore, biofiltration BMPs that substantially meet all aspects of the Fact sheets PR-1 or BF-1 should be able to complete this checklist without additional documentation beyond what would already be required for a project submittal.

Other biofiltration BMP designs[2] (including both non-proprietary and proprietary designs) may also meet the underlying MS4 Permit requirements to be considered biofiltration BMPs. These BMPs may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in this appendix, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with their performance certifications (See explanation in Appendix F.2), if applicable, and (3) are acceptable at the discretion of the City Engineer. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met.

Organization

The checklist in this appendix is organized into the seven (7) main objectives associated with biofiltration BMP design. It describes the associated minimum criteria that must be met in order to qualify a biofiltration BMP as meeting the biofiltration standard. The seven main objectives are listed below. Specific design criteria and associated manual references associated with each of these objectives is provided in the checklist in the following section.

1. Biofiltration BMPs shall be allowed only as described in the BMP selection process in this manual (i.e., retention feasibility hierarchy).

2. Biofiltration BMPs must be sized using acceptable sizing methods described in this manual.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control/sequestration processes, and minimize potential for pollutant washout.

5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.

6. Biofiltration BMPs must be designed to prevent erosion, scour, and channeling within the BMP.

[2] Defined as biofiltration designs that do not conform to the specific design criteria described in Fact Sheets PR-1 or BF-1. This category includes proprietary BMPs that are sold by a vendor as well as non-proprietary BMPs that are designed and constructed of primarily of more elementary construction materials.

7. Biofiltration BMP must include operations and maintenance design features and planning considerations to provide for continued effectiveness of pollutant and flow control functions.

Biofiltration Criteria Checklist

The applicant shall provide documentation of compliance with each criterion in this checklist as part of the project submittal. The right column of this checklist identifies the submittal information that is recommended to document compliance with each criterion. Biofiltration BMPs that substantially meet all aspects of Fact Sheets PR-1 or BF-1 should still use this checklist; however additional documentation (beyond what is already required for project submittal) should not be required.

1. Biofiltration BMPs shall be allowed to be used only as described in the BMP selection process based on a documented feasibility analysis.

Intent: This manual defines a specific prioritization of pollutant treatment BMPs, where BMPs that retain water (retained includes evapotranspired, infiltrated, and/or harvested and used) must be used before considering BMPs that have a biofiltered discharge to the MS4 or surface waters. Use of a biofiltration BMP in a manner in conflict with this prioritization (i.e., without a feasibility analysis justifying its use) is not permitted, regardless of the adequacy of the sizing and design of the system.

☐	The project applicant has demonstrated that it is not technically feasible to retain the full DCV onsite.	Document feasibility analysis and findings in project submittal per Appendix C.

2. Biofiltration BMPs must be sized using acceptable sizing methods.

Intent: The MS4 Permit and this manual defines specific sizing methods that must be used to size biofiltration BMPs. Sizing of biofiltration BMPs is a fundamental factor in the amount of stormwater that can be treated and also influences volume and pollutant retention processes.

☐	The project applicant has demonstrated that biofiltration BMPs are sized to meet one of the biofiltration sizing options available (Appendix B).	Submit sizing worksheets (Appendix B) or other equivalent documentation with project submittal.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

Intent: Various decisions about BMP placement and design influence how much water is retained via infiltration and evapotranspiration. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention (evapotranspiration and infiltration) of stormwater volume.

☐	The biofiltration BMP is sited to allow for maximum infiltration of runoff volume based on the feasibility factors considered in site planning efforts. It is also designed to maximize evapotranspiration through the use of amended media and plants (biofiltration designs without amended media and plants may be permissible; see Item 5).	Document site planning and feasibility analyses in project submittal per Section 5.4.
☐	For biofiltration BMPs categorized as "Partial Infiltration Feasible," the infiltration storage depth in the biofiltration design has been selected to drain in 36 hours (+/-25%) or an alternative value shown to maximize infiltration on the site.	Included documentation of estimated infiltration rate per Appendix D; provide calculations using Appendix B.4 and B.5 to show that the infiltration storage depth meets this criterion. Note, depths that are too shallow or too deep may not be acceptable.
☐	For biofiltration BMP locations categorized as "Partial Infiltration Feasible," the infiltration storage is over the entire bottom of the biofiltration BMP footprint.	Document on plans that the infiltration storage covers the entire bottom of the BMP (i.e., not just underdrain trenches); or an equivalent footprint elsewhere on the site.
☐	For biofiltration BMP locations categorized as "Partial Infiltration Feasible," the sizing factor used for the infiltration storage area is not less than the minimum biofiltration BMP sizing factors shown in Appendix B.5.1.	Provide a table that compares the minimum sizing factor per Appendix B.5.1 to the provided sizing factor. Note: The infiltration storage area could be a separate storage feature located downstream of the biofiltration BMP, not necessarily within the same footprint.
☐	An impermeable liner or other hydraulic restriction layer is only used when needed to avoid geotechnical and/or subsurface contamination issues in locations identified as "Infiltration Not Feasible."	If using an impermeable liner or hydraulic restriction layer, provide documentation of feasibility findings per Appendix C that recommend the use of this feature.

☐	The use of "compact" biofiltration BMP design[3] is permitted only in conditions identified as "Infiltration Not Feasible" and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible.	Provide documentation of feasibility findings that recommend no infiltration is feasible. Provide site-specific information to demonstrate that a larger footprint biofiltration BMP would not be feasible.
	4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control processes, and minimize potential for pollutant washout. Intent: Various decisions about biofiltration BMP design influence the degree to which pollutants are retained. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention of stormwater pollutants.	
☐	Media selected for the biofiltration BMP meets minimum quality and material specifications per City or County LID Manual, including the maximum allowable design filtration rate and minimum thickness of media. **OR**	Provide documentation that media meets the specifications in City or County LID Manual.
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below.	Provide documentation of performance information as described in Section F.1.
☐	To the extent practicable, filtration rates are outlet controlled (e.g., via an underdrain and orifice/weir) instead of controlled by the infiltration rate of the media.	Include outlet control in designs or provide documentation of why outlet control is not practicable.

[3] Compact biofiltration BMPs are defined as features with infiltration storage footprint less than the minimum sizing factors in Appendix B.5.1. Note that if a biofiltration BMP is accompanied by an infiltrating area downstream that has a footprint equal to at least the minimum sizing factors in Appendix B.5.1, then it is not considered to be a compact biofiltration BMP for the purpose of Item 4 of the checklist. For potential configurations with a higher rate biofiltration BMP upstream of an larger footprint infiltration area, the BMP would still need to comply with Item 5 of this checklist for pollutant treatment effectiveness.

☐	The water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure.	Include calculations to demonstrate that drawdown rate is adequate.
☐	If nutrients are a pollutant of concern, design of the biofiltration BMP follows nutrient-sensitive design criteria.	Follow specifications for nutrient sensitive design in Fact Sheet BF-2. Or provide alternative documentation that nutrient treatment is addressed and potential for nutrient release is minimized.
☐	Media gradation calculations or geotextile selection calculations demonstrate that migration of media between layers will be prevented and permeability will be preserved.	Follow specification for choking layer or geotextile in Fact Sheet PR-1 or BF-1. Or include calculations to demonstrate that choking layer is appropriately specified.
	5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes. Intent: Biological processes are an important element of biofiltration performance and longevity.	
☐	Plants have been selected to be tolerant of project climate, design ponding depths and the treatment media composition.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	Plants have been selected to minimize irrigation requirements.	Provide documentation describing irrigation requirements for establishment and long term operation.
☐	Plant location and growth will not impede expected long-term media filtration rates and will enhance long term infiltration rates to the extent possible.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	If plants are not applicable to the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland).	For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained.
	6. Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP. Intent: Erosion, scour, and/or channeling can disrupt treatment processes and reduce biofiltration effectiveness.	
☐	Scour protection has been provided for both sheet flow and pipe inflows to the BMP, where needed.	Provide documentation of scour protection as described in Fact Sheets PR-1 or BF-1 or approved equivalent.

☐	Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities.	Provide documentation of design checks for erosive velocities as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	For proprietary BMPs, the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification[4] (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).	Provide copy of manufacturer recommendations and conditions of third-party certification.

7. Biofiltration BMP must include operations and maintenance design features and planning considerations for continued effectiveness of pollutant and flow control functions.

Intent: Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore plans must be in place to correct issues if they arise.

☐	The biofiltration BMP O&M plan describes specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures.	Include O&M plan with project submittal as described in Chapter 7.
☐	Adequate site area and features have been provided for BMP inspection and maintenance access.	Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans.
☐	For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies).	Provide copy of manufacturer recommendations and conditions of third-party certification.

[4] Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the New Jersey Corporation for Advanced Technology programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification

F.1 Pollutant Treatment Performance Standard

Standard biofiltration BMPs that are designed following the criteria in Fact Sheets PR-1 and BF-1 are presumed to the meet the pollutant treatment performance standard associated with biofiltration BMPs. This presumption is based on the MS4 Permit Fact Sheet which cites analyses of standard biofiltration BMPs conducted in the Ventura County Technical Guidance Manual (July 2011).

For BMPs that do not meet the biofiltration media specification and/or the range of acceptable media filtration rates described in Fact Sheet, PR-1 and BF-1, additional documentation must be provided to demonstrate that adequate pollutant treatment performance is provided to be considered a biofiltration BMP. Project applicants have three options for documenting compliance:

1) Project applicants may provide documentation to substantiate that the minor modifications to the design is expected to provide equal or better pollutant removal performance for the project pollutants of concern than would be provided by a biofiltration design that complies with the criteria in Fact Sheets PR-1 and BF-1. Minor modifications are design elements that deviate only slightly from standard design criteria and are expected to either not impact performance or to improve performance compared to standard biofiltration designs. The reviewing agency has the discretion to accept or reject this documentation and/or request additional documentation to substantiate equivalent or better performance to BF-1 or PR-1, as applicable. Examples of minor deviations include:

    - Different particle size distribution of aggregate, with documentation that system filtration rate will meet specifications.

    - Alternative source of organic components, with documentation of material suitability and stability from appropriate testing agency.

    - Specialized amendments to provide additional treatment mechanisms, and which have negligible potential to upset other treatment mechanisms or otherwise deteriorate performances.

2) For proprietary BMPs, project applicants may provide evidence that the BMP has been certified for use as part of the Washington State Technology Assessment Protocol-Ecology certification program and meets each of the following requirements:

    a. The applicant must demonstrate (using the checklist in this Appendix) that the BMP meets all other conditions to be considered as a biofiltration BMP. For example, a cartridge media filter or hydrodynamic separator would not meet biofiltration BMP design criteria regardless of Technology Acceptance Protocol-Ecology certification because they do not support effective biological processes.

b. The applicant must select BMPs that have an active Technology Acceptance Protocol-Ecology certification, with General Use Level Designation for the appropriate project pollutants of concern as identified in Table F.1-1. The list of certified technologies is updated as new technologies are approved (link below). Technologies with Pilot Use Level Designation and Conditional Use Level Designations are not acceptable. Refer to: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html.

c. The applicant must demonstrate that BMP is being used in a manner consistent with all conditions of the Technology Acceptance Protocol-Ecology certification while meeting the flow rate or volume design criteria that is required for biofiltration BMPs under this manual. Conditions of Technology Acceptance Protocol-Ecology certification are available by clicking on the technology name at the website listed in bullet b. Additional discussion about sizing of proprietary biofiltration BMPs to comply with applicable sizing standards is provided below in Section F.2.

3) For BMPs that do not fall into optoins 1 or 2 above, the City Engineer may allow the applicant to submit alternative third-party documentation that the pollutant treatment performance of the system is consistent with the performance levels associated with the necessary Technology Acceptance Protocol-Ecology certifications. Table F.1-1 describes the required levels of certification and Table F.l-2 describes the pollutant treatment performance levels associated with each level of certification. Acceptance of this approach is at the sole discretion of the City Engineer. If Technology Acceptance Protocol-Ecology certifications are not available, preference shall be given to:

a. Verified third-party, field-scale testing performance under the Technology Acceptance Reciprocity Partnership Tier II Protocol. This protocol is no longer operated, however this is considered to be a valid protocol and historic verifications are considered to be representative provided that product models being proposed are consistent with those that were tested. Technology Acceptance Reciprocity Partnership verifications were conducted under New Jersey Corporation for Advance Testing and are archived at the website linked below. Note that Technology Acceptance Reciprocity Partnership verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol-Ecology certification in Table F.1-1.

b. Verified third-party, field-scale testing performance under the New Jersey Corporation for Advance Testing protocol. Note that New Jersey Corporation for Advance Testing verifications must be matched to pollutant treatment standards in Table F.1-2 then matched to an equivalent Technology Acceptance Protocol-

Ecology certification in Table F.1-1.

A list of field-scale verified technologies under Technology Acceptance Reciprocity Partnership Tier II and New Jersey Corporation for Advance Testing can be accessed at: http://www.njcat.org/verification-process/technology-verification-database.html (refer to field verified technologies only).

Table F.1-1: Required Technology Acceptance Protocol-Ecology Certifications for Polltuants of Concern for Biofiltration Performance Standard

Project Pollutant of Concern	Required Technology Acceptance Protocol-Ecology Certification for Biofiltration Performance Standard
Trash	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Sediments	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Oil and Grease	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Nutrients	Phosphorus Treatment[1]
Metals	Enhanced Treatment
Pesticides	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Organics	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Bacteria and Viruses	Basic Treatment (including bacteria removal processes)[3] , Phosphorus Treatment, Enhanced Treatment
Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment

1 – There is no Technology Acceptance Protocol-Ecology equivalent for nitrogen compounds; however systems that are designed to retain phosphorus (as well as meet basic treatment designation), generally also provide treatment of nitrogen compounds. Where nitrogen is a pollutant of concern, relative performance of available certified systems for nitrogen removal should be considered in BMP selection.

2 – Pesticides, organics, and oxygen demanding substances are typically addressed by particle filtration consistent with the level of treatment required to achieve Basic treatment certification; if a system with Basic treatment certification does not provide filtration, it is not acceptable for pesticides, organics or oxygen demanding substances.

3 – There is no Technology Acceptance Protocol-Ecology equivalent for pathogens (viruses and bacteria), and testing data are limited because of typical sample hold times. Systems with Technology Acceptance Protocol-Ecology Basic Treatment must be include one or more significant bacteria removal process such as media filtration, physical sorption,

predation, reduced redox conditions, and/or solar inactivation. Where design options are available to enhance pathogen removal (i.e., pathogen-specific media mix offered by vendor), this design variation should be used.

Table F.1-2: Performance Standards for Technology Acceptance Protocol-Ecology Certification

Performance Goal	Influent Range	Criteria
Basic Treatment	20 – 100 mg/L TSS	Effluent goal ≤ 20 mg/L TSS
	100 – 200 mg/L TSS	≥ 80% TSS removal
	>200 mg/L TSS	> 80% TSS removal
Enhanced (Dissolved Metals) Treatment	Dissolved copper 0.005 – 0.02 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >30% dissolved copper removal
	Dissolved zinc 0.02 – 0.3 mg/L	Must meet basic treatment goal and better than basic treatment currently defined as >60% dissolved zinc removal
Phosphorous Treatment	Total phosphorous 0.1 – 0.5 mg/L	Must meet basic treatment goal and exhibit ≥50% total phosphorous removal
Oil Treatment	Total petroleum hydrocarbon > 10 mg/L	No ongoing or recurring visible sheen in effluent Daily average effluent Total petroleum hydrocarbon concentration < 10 mg/L Maximum effluent Total petroleum hydrocarbon concentration for a 15 mg/L for a discrete (grab) sample
Pretreatment	50 – 100 mg/L TSS	≤ 50 mg/L TSS
	≥ 200 mg/L TSS	≥ 50% TSS removal

F.2 Guidance on Sizing and Design of Non-Standard Biofiltration BMPs

This section explains the general process for design and sizing of non-standard biofiltration BMPs. This section assumes that the BMPs have been selected based on the criteria in Section F.1.

F.2.1 Guidance on Design per Conditions of Certification/Verification

The biofiltration standard and checklist in this appendix requires that "the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification." Practically, what this means is that the BMP is used in the same way in which it was tested and certified. For

example, it is not acceptable for a BMP of a given size to be certified/verified with a 100 gallon per minute treatment rate and be applied at a 150 gallon per minute treatment rate in a design.
Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the Technology Acceptance Reciprocity Partnership or New Jersey Corporation for Advance Testing programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification. It is common for these approvals to specify the specific model of BMP, design capacity for given unit sizes, type of media that is the basis for approval, and/or other parameter. The applicant must demonstrate conclusively that the proposed application of the BMP is consistent with these criteria.

For alternate non-proprietary systems that do not have a Technology Acceptance Protocol-Ecology / Technology Acceptance Reciprocity Partnership / New Jersey Corporation for Advance Testing certification (but which still must provide quantitative data per Appendix F.1), it must be demonstrate that the configuration and design proposed for the project is reasonably consistent with the configuration and design under which the BMP was tested to demonstrate compliance with Appendix F.1.

F.2.2 Sizing of Flow-Based Biofiltration BMP

This sizing method is only available when the BMP meets the pollutant treatment performance standard in Appendix F.1.

Proprietary biofiltration BMPs are typically designed as a flow-based BMPs (i.e., a constant treatment capacity with negligible storage volume). Additionally, proprietary biofiltration is only acceptable if no infiltration is feasible and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible. The applicable sizing method for biofiltration is therefore reduced to: Treat 1.5 times the DCV.

The following steps should be followed to demonstrate that the system is sized to treat 1.5 times the DCV.

1. Calculate the flow rate required to meet the pollutant treatment performance standard without scaling for the 1.5 factor. Options include either:
    - Calculate the runoff flow rate from a 0.2 inch per hour uniform intensity precipitation event (See methodology Appendix B.6.3), or
    - Conduct a continuous simulation analysis to compute the size required to capture and treat 80 percent of average annual runoff; for small catchments, 5-minute precipitation data should be used to account for short time of concentration. Nearest rain gage with 5-minute precipitation data is allowed for this analysis.
2. Multiply the flow rate from Step 1 by 1.5 to compute the design flow rate for the biofiltration system.
3. Based on the conditions of certification/verification (discussed above), establish the design capacity, as a flow rate, of a given sized unit.

4. Demonstrates that an appropriate unit size and number of units is provided to provide a flow rate that meets the required flow rate from Step 2.

Appendix

G

Guidance for Continuous Simulation and Hydromodification Management Sizing Factors

February 2016

Appendix G Guidance for Continuous Simulation and Hydromodification Management Sizing Factors

G.1 Guidance for Continuous Simulation Hydrologic Modeling for Hydromodification Management Studies in San Diego County Region 9

G.1.1 Introduction

Continuous simulation hydrologic modeling is used to demonstrate compliance with the performance standards for hydromodification management in San Diego. There are several available hydrologic models that can perform continuous simulation analyses. Each has different methods and parameters for determining the amount of rainfall that becomes runoff, and for representing the hydraulic operations of certain structural BMPs such as biofiltration with partial retention or biofiltration. This Appendix is intended to:

- Identify acceptable models for continuous simulation hydrologic analyses for hydromodification management;
- Provide guidance for selecting climatology input to the models;
- Provide standards for rainfall loss parameters to be used in the models;
- Provide standards for defining physical characteristics of LID components; and
- Provide guidance for demonstrating compliance with performance standards for hydromodification management.

This Appendix is not a user's manual for any of the acceptable models, nor a comprehensive manual for preparing a hydrologic model. This Appendix provides guidance for selecting model input parameters for the specific purpose of hydromodification management studies. The model preparer must be familiar with the user's manual for the selected software to determine how the parameters are entered to the model.

G.1.2 Software for Continuous Simulation Hydrologic Modeling

The following software models may be used for hydromodification management studies in San Diego:

- HSPF – Hydrologic Simulation Program-FORTRAN, distributed by USEPA, public domain.
- SDHM – San Diego Hydrology Model, distributed by Clear Creek Solutions, Inc. This is an HSPF-based model with a proprietary interface that has been customized for use in San Diego for hydromodification management studies.
- SWMM – Stormwater Management Model, distributed by USEPA, public domain.

Third-party and proprietary software, such as XPSWMM or PCSWMM, may be used for hydromodification management studies in San Diego, provided that:

- Input and output data from the software can interface with public domain software such as SWMM. In other words, input files from the third party software should have sufficient functionality to allow export to public domain software for independent validation.
- The software's hydromodification control processes are substantiated.

G.1.3 Climatology Parameters

G.1.3.1 Rainfall

In all software applications for preparation of hydromodification management studies in San Diego, rainfall data must be selected from approved data sets that have been prepared for this purpose. As part of the development of the March 2011 Final HMP, long-term hourly rainfall records were prepared for public use. The rainfall record files are provided on the Project Clean Water website. The rainfall station map is provided in the March 2011 Final HMP and is included in this Appendix as Figure G.1-1.

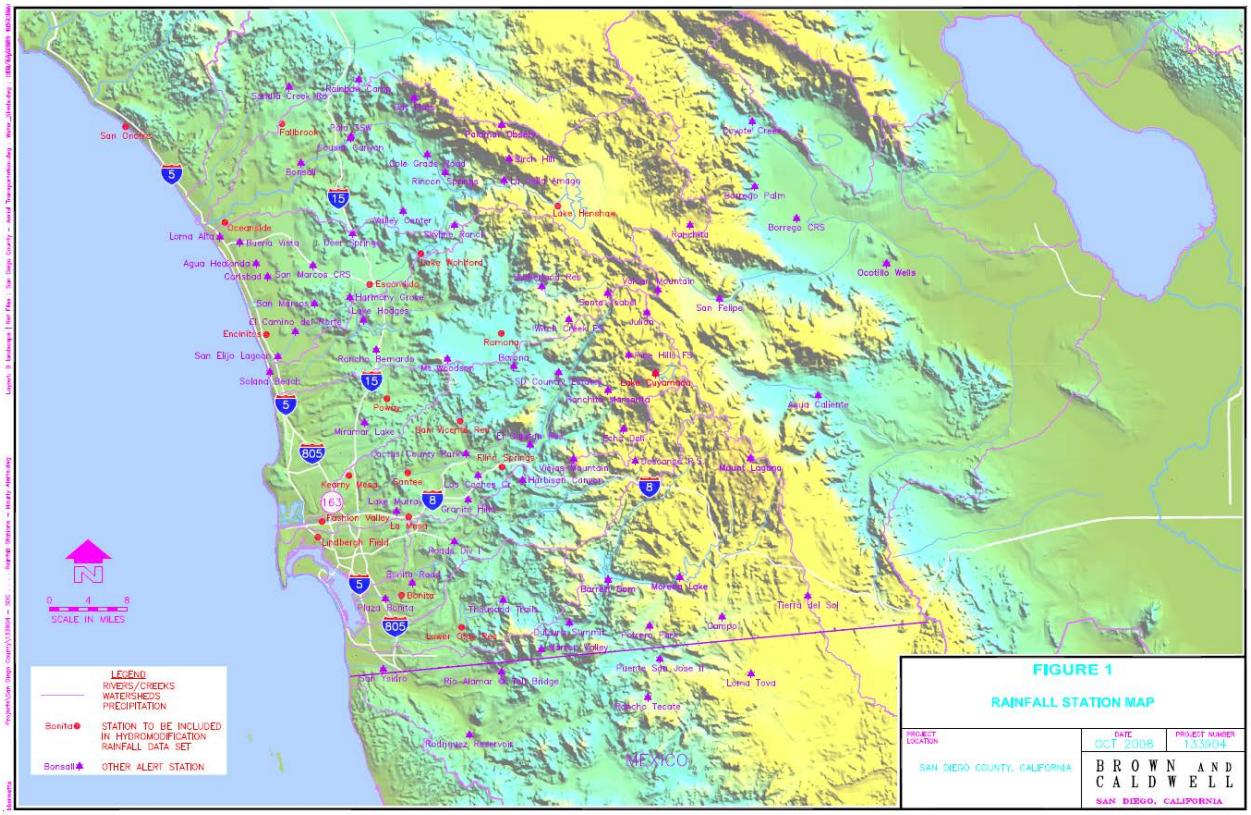


Figure G.1-1: Rainfall Station Map

Project applicants preparing continuous simulation models shall select the most appropriate rainfall data set from the rainfall record files provided on the Project Clean Water website. For a given project location, the following factors should be considered in the selection of the appropriate rainfall data set:

- In most cases, the rainfall data set in closest proximity to the project site will be the appropriate choice (refer to the rainfall station map).
- In some cases, the rainfall data set in closest proximity to the project site may not be the most applicable data set. Such a scenario could involve a data set with an elevation significantly different from the project site. In addition to a simple elevation comparison, the project proponent may also consult with the San Diego County's average annual precipitation isopluvial map, which is provided in the San Diego County Hydrology Manual (2003). Review of this map could provide an initial estimate as to whether the project site is in a similar rainfall zone as compared to the rainfall stations. Generally, precipitation totals in San Diego County increase with increasing elevation.
- Where possible, rainfall data sets should be chosen so that the data set and the project location are both located in the same topographic zone (coastal, foothill, mountain) and

major watershed unit (Upper San Luis Rey, Lower San Luis Rey, Upper San Diego River, Lower San Diego River, etc.).

For SDHM users, the approved rainfall data sets are pre-loaded into the software package. SDHM users may select the appropriate rainfall gage within the SDHM program. HSPF or SWMM users shall download the appropriate rainfall record from the Project Clean Water website and load it into the software program.

Both the pre-development and post-project model simulation period shall encompass the entire rainfall record provided in the approved rainfall data set. Scaling the rainfall data is not permitted.

G.1.3.2 Potential Evapotranspiration

Project applicants preparing continuous simulation models shall select a data set from the sources described below to represent potential evapotranspiration.

For HSPF users, this parameter may be entered as an hourly time series. The hourly time series that was used to develop the BMP Sizing Calculator parameters is provided on the project clean water website and may be used for hydromodification management studies in San Diego. For SDHM users, the hourly evaporation data set is pre-loaded into the program. HSPF users may download the evaporation record from the Project Clean Water website and load it into the software program.

For HSPF or SWMM users, this parameter may be entered as monthly values in inches per month or inches per day. Monthly values may be obtained from the California Irrigation Management Information System "Reference Evapotranspiration Zones" brochure and map (herein "CIMIS ETo Zone Map"), prepared by California Department of Water Resources, dated January 2012. The CIMIS ETo Zone Map is available from www.cimis.gov, and is provided in this Appendix as Figure G.1-2. Determine the appropriate reference evapotranspiration zone for the project from the CIMIS ETo Zone Map. The monthly average reference evapotranspiration values are provided below in Table G.1-1.

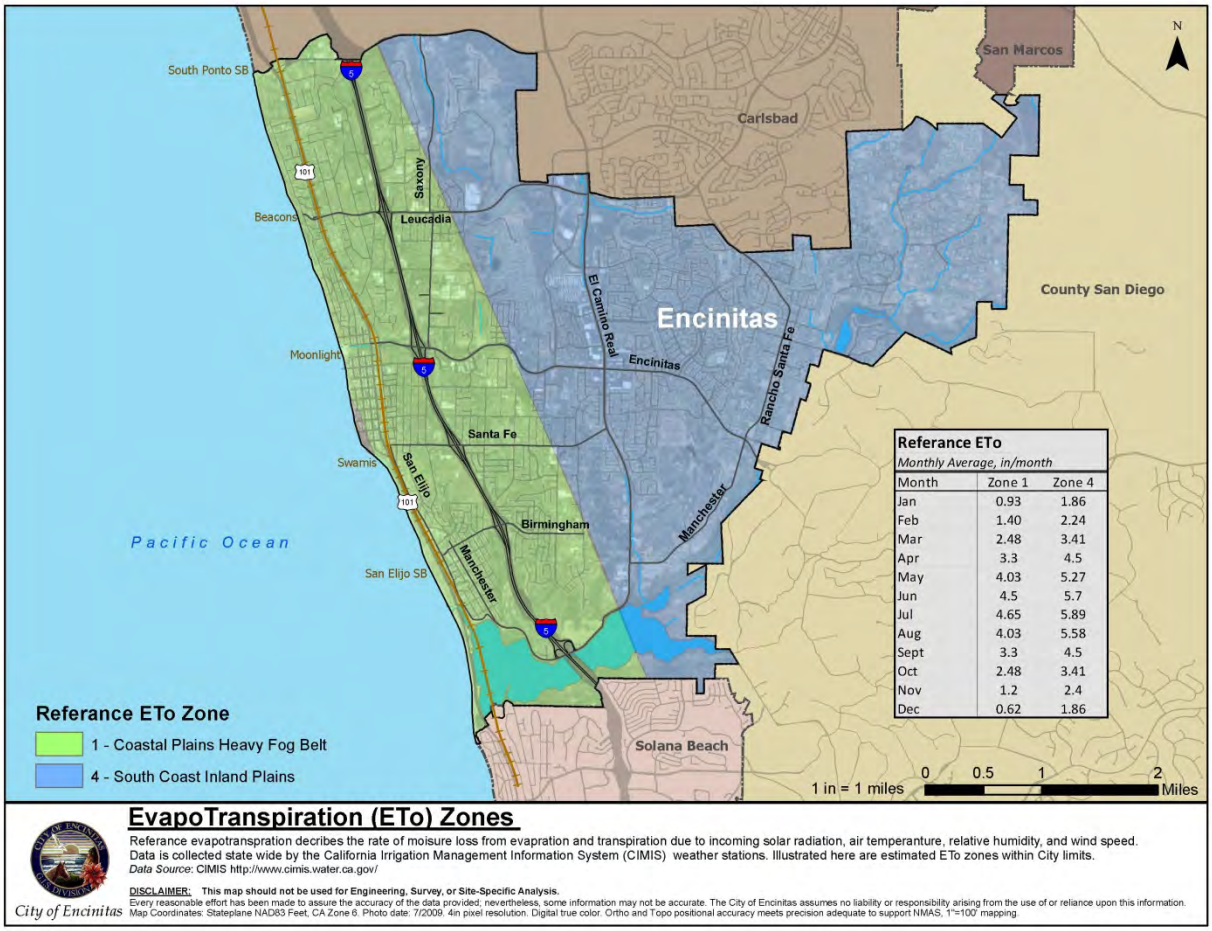


Figure G.1-2: California Irrigation Management Information System "Reference Evapotranspiration Zones"

Table G.1-1: Monthly Average Reference Evapotranspiration by ETo Zone (inches/month and inches/day) for use in SWMM Models for Hydromodification Management Studies in San Diego County CIMIS Zones 1, 4, 6, 9, and 16 (See CIMIS ETo Zone Map)

	January	February	March	April	May	June	July	August	September	October	November	December
Zone	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month
1	0.93	1.4	2.48	3.3	4.03	4.5	4.65	4.03	3.3	2.48	1.2	0.62
4	1.86	2.24	3.41	4.5	5.27	5.7	5.89	5.58	4.5	3.41	2.4	1.86
6	1.86	2.24	3.41	4.8	5.58	6.3	6.51	6.2	4.8	3.72	2.4	1.86
9	2.17	2.8	4.03	5.1	5.89	6.6	7.44	6.82	5.7	4.03	2.7	1.86
16	1.55	2.52	4.03	5.7	7.75	8.7	9.3	8.37	6.3	4.34	2.4	1.55
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Days	31	28	31	30	31	30	31	31	30	31	30	31
Zone	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day	in/day
1	0.030	0.050	0.080	0.110	0.130	0.150	0.150	0.130	0.110	0.080	0.040	0.020
4	0.060	0.080	0.110	0.150	0.170	0.190	0.190	0.180	0.150	0.110	0.080	0.060
6	0.060	0.080	0.110	0.160	0.180	0.210	0.210	0.200	0.160	0.120	0.080	0.060
9	0.070	0.100	0.130	0.170	0.190	0.220	0.240	0.220	0.190	0.130	0.090	0.060
16	0.050	0.090	0.130	0.190	0.250	0.290	0.300	0.270	0.210	0.140	0.080	0.050

G.1.4 LAND CHARACTERISTICS AND LOSS PARAMETERS

In all software applications for preparation of hydromodification management studies in San Diego, rainfall loss parameters must be consistent with this Appendix unless the preparer can provide documentation to substantiate use of other parameters, subject to local jurisdiction approval. HSPF and SWMM use different processes and different sets of parameters. SDHM is based on HSPF, therefore parameters for SDHM and HSPF are presented together in Section G.1.4.1. Parameters that have been pre-loaded into SDHM may be used for other HSPF hydromodification management studies outside of SDHM. Parameters for SWMM are presented separately in Section G.1.4.2.

G.1.4.1 Rainfall Loss Parameters for HSPF and SDHM

Rainfall losses in HSPF are characterized by PERLND/PWATER parameters and IMPLND parameters, which describe processes occurring when rainfall lands on pervious lands and impervious lands, respectively. "BASINS Technical Notice 6, Estimating Hydrology and Hydraulic Parameters for HSPF," prepared by the USEPA, dated July 2000, provides details regarding these parameters and summary tables of possible ranges of these parameters. Table G.1-2, excerpted from the above-mentioned document, presents the ranges of these parameters.

For HSPF studies for hydromodification management in San Diego, PERLND/PWATER parameters and IMPLND parameters shall fall within the "possible" range provided in EPA Technical Note 6. To select specific parameters, HSPF users may use the parameters established for development of the San Diego BMP Sizing Calculator, and/or the parameters that have been established for SDHM. Parameters for the San Diego BMP Sizing Calculator and SDHM are based on research conducted specifically for HSPF modeling in San Diego.

Documentation of parameters selected for the San Diego BMP Sizing Calculator is presented in the document titled, San Diego BMP Sizing Calculator Methodology, prepared by Brown and Caldwell, dated January 2012 (herein "BMP Sizing Calculator Methodology"). The PERLND/PWATER parameters selected for development of the San Diego BMP Sizing Calculator represent a single composite pervious land cover that is representative of most pre-development conditions for sites that would commonly be managed by the BMP Sizing Calculator. The parameters shown below in Table G.1-3 are excerpted from the BMP Sizing Calculator Methodology.

Table G.1-2: HSPF PERLND/PWATER and IMPLND Parameters from EPA Technical Note 6

			Range of Values					
Name	**Definition**	**Units**	**Typical**		**Possible**		**Function of ...**	**Comment**
			Min	**Max**	**Min**	**Max**		
PWAT – PARM2								
FOREST	Fraction forest cover	none	0.0	0.50	0.0	0.95	Forest cover	Only impact when SNOW is active
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	2.0	15.0	Soils, climate	**Calibration**
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.001	0.50	Soils, land use	**Calibration**, divides surface and subsurface flow
LSUR	Length of overland flow	feet	200	500	100	700	Topography	Estimate from high resolution topo maps or GIS
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.15	0.001	0.30	Topography	Estimate from high resolution topo maps or GIS
KVARY	Variable groundwater recession	1/inches	0.0	3.0	0.0	5.0	Baseflow recession variation	Used when recession rate varies with GW levels
AGWRC	Base groundwater recession	none	0.92	0.99	0.85	0.999	Baseflow recession	**Calibration**
PWAT – PARM3								
PETMAX	Temp below which ET is reduced	deg. F	35.0	45.0	32.0	48.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
PETMIN	Temp below which ET is set to zero	deg. F	30.0	35.0	30.0	40.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
INFEXP	Exponent in infiltration equation	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
INFILD	Ratio of max/mean infiltration capacities	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
DEEPFR	Fraction of GW inflow to deep recharge	none	0.0	0.20	0.0	0.50	Geology, GW recharge	Accounts for subsurface losses
BASETP	Fraction of remaining ET from baseflow	none	0.0	0.05	0.0	0.20	Riparian vegetation	Direct ET from riparian vegetation
AGWETP	Fraction of remaining ET from active GW	none	0.0	0.05	0.0	0.20	Marsh/wetlands extent	Direct ET from shallow GW
PWAT – PARM4								
CEPSC	Interception storage capacity	inches	0.03	0.20	0.01	0.40	Vegetation type/density, land use	Monthly values usually used
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.05	2.0	Surface soil conditions, land use	Accounts for near surface retention
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.05	0.50	Surface conditions, residue, etc.	Monthly values often used for croplands
INTFW	Interflow inflow parameter	none	1.0	3.0	1.0	10.0	Soils, topography, land use	**Calibration**, based on hydrograph separation
IRC	Interflow recession parameter	none	0.5	0.70	0.30	0.85	Soils, topography, land use	Often start with a value of 0.7, and then adjust
LZETP	Lower zone ET parameter	none	0.2	0.70	0.1	0.9	Vegetation type/density, root depth	**Calibration**
IWAT – PARM2								
LSUR	Length of overland flow	feet	50	150	50	250	Topography, drainage system	Estimate from maps, GIS, or field survey
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.05	0.001	0.15	Topography, drainage	Estimate from maps, GIS, or field survey
NSUR	Manning's n (roughness) for overland flow	none	0.03	0.10	0.01	0.15	Impervious surface conditions	Typical range is 0.05 to 0.10 for roads/parking lots
RETSC	Retention storage capacity	inches	0.03	0.10	0.01	0.30	Impervious surface conditions	Typical range is 0.03 to 0.10 for roads/parking lots
IWAT – PARM3 (PETMAX and PETMIN, same values as shown for PWAT – PARM3)								

Table G.1-3: HSPF PERLND/PWATER Parameters from BMP Sizing Calculator Methodology

		Hydrologic Soil Group A			Hydrologic Soil Group B			Hydrologic Soil Group C			Hydrologic Soil Group D		
	Slope	5%	10%	15%	5%	10%	15%	5%	10%	15%	5%	10%	15%
PWAT_PARM2	Units												
FOREST	None	0	0	0	0	0	0	0	0	0	0	0	0
LZSN	inches	5.2	4.8	4.5	5.0	4.7	4.4	4.8	4.5	4.2	4.8	4.5	4.2
INFILT	in/hr	0.090	0.070	0.045	0.070	0.055	0.040	0.050	0.040	0.032	0.040	0.030	0.020
LSUR	Feet	200	200	200	200	200	200	200	200	200	200	200	200
SLSUR	ft/ft	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15
KVARY	1/inches	3	3	3	3	3	3	3	3	3	3	3	3
AGWRC	None	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PWAT_PARM3													
PETMAX (F)	F	35	35	35	35	35	35	35	35	35	35	35	35
PETMIN (F)	F	30	30	30	30	30	30	30	30	30	30	30	30
INFEXP	None	2	2	2	2	2	2	2	2	2	2	2	2
INFILD	None	2	2	2	2	2	2	2	2	2	2	2	2
DEEPFR	None	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
BASETP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
AGEWTP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PWAT_PARM4													
CEPSC	inches	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UZSN	inches	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
NSUR	None	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTFW	None	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
IRC	None	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
LZETP	None	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Parameters within SDHM are documented in "San Diego Hydrology Model User Manual," prepared by Clear Creek Solutions, Inc. (as of the development of the Manual, the current version of the SDHM User Manual is dated January 2012). Parameters established for SDHM represent "grass" (non-turf grasslands), "dirt," "gravel," and "urban" cover. The documented PERLND and IMPLND parameters for the various land covers and soil types have been pre-loaded into SDHM. SDHM users shall use the parameters that have been pre-loaded into the program without modification unless the preparer can provide documentation to substantiate use of other parameters.

G.1.4.2 Rainfall Loss Parameters for SWMM

In SWMM, rainfall loss parameters (parameters that describe processes occurring when rainfall lands on pervious lands and impervious lands) are entered in the "subcatchment" module. In addition to specifying parameters, the SWMM user must also select an infiltration model.

The SWMM Manual provides details regarding the subcatchment parameters and summary tables of possible ranges of these parameters. For SWMM studies for hydromodification management in San Diego, subcatchment parameters shall fall within the range provided in the SWMM Manual. Some of the parameters depend on the selection of the infiltration model. For consistency across the San Diego region, SWMM users shall use the Green-Ampt infiltration model for hydromodification management studies. Table G.1-4 presents SWMM subcatchment parameters for use in hydromodification management studies in the San Diego region.

Table G.1-4: Subcatchment Parameters for SWMM Studies for Hydromodification Management in San Diego

SWMM Parameter Name	Unit	Range	Use in San Diego
Name X-Coordinate Y-Coordinate Description Tag Rain Gage Outlet	N/A	N/A – project-specific	Project-specific
Area	acres (ac)	Project-specific	Project-specific
Width	feet (ft)	Project-specific	Project-specific
% Slope	percent (%)	Project-specific	Project-specific
% Imperv	percent (%)	Project-specific	Project-specific
N-imperv	--	0.011 – 0.024 presented in Table A.6 of SWMM Manual	default use 0.012 for smooth concrete, otherwise provide documentation of other surface consistent with Table A.6 of SWMM Manual
N-Perv	--	0.05 – 0.80 presented in Table A.6 of SWMM Manual	default use 0.15 for short prairie grass, otherwise provide documentation of other surface consistent with Table A.6 of SWMM Manual
Dstore-Imperv	inches	0.05 – 0.10 inches presented in Table A.5 of SWMM Manual	0.05
Dstore-Perv	inches	0.10 – 0.30 inches presented in Table A.5 of SWMM Manual	0.10
%ZeroImperv	percent (%)	0% – 100%	25%
Subarea routing	--	OUTLET IMPERVIOUS PERVIOUS	Project-specific, typically OUTLET
Percent Routed	%	0% – 100%	Project-specific, typically 100%
Infiltration	Method	HORTON GREEN_AMPT CURVE_NUMBER	GREEN_AMPT

SWMM Parameter Name	Unit	Range	Use in San Diego
Suction Head (Green-Ampt)	Inches	1.93 – 12.60 presented in Table A.2 of SWMM Manual	Hydrologic Soil Group A: 1.5 Hydrologic Soil Group B: 3.0 Hydrologic Soil Group C: 6.0 Hydrologic Soil Group D: 9.0
Conductivity (Green-Ampt)	Inches per hour	0.01 – 4.74 presented in Table A.2 of SWMM Manual by soil texture class 0.00 – ≥0.45 presented in Table A.3 of SWMM Manual by hydrologic soil group	Hydrologic Soil Group A: 0.3 Hydrologic Soil Group B: 0.2 Hydrologic Soil Group C: 0.1 Hydrologic Soil Group D: 0.025 Note: reduce conductivity by 25% in the post-project condition when native soils will be compacted. For fill soils in post-project condition, see Section G.1.4.3.
Initial Deficit (Green-Ampt)		The difference between soil porosity and initial moisture content. Based on the values provided in Table A.2 of SWMM Manual, the range for completely dry soil would be 0.097 to 0.375	Hydrologic Soil Group A: 0.30 Hydrologic Soil Group B: 0.31 Hydrologic Soil Group C: 0.32 Hydrologic Soil Group D: 0.33 Note: in long-term continuous simulation, this value is not important as the soil will reach equilibrium after a few storm events regardless of the initial moisture content specified.
Groundwater	yes/no	yes/no	NO
LID Controls			Project Specific
Snow Pack Land Uses Initial Buildup Curb Length			Not applicable to hydromodification management studies

G.1.4.3 Pervious Area Rainfall Loss Parameters in Post-Project Condition (HSPF, SDHM, and SWMM)

The following guidance applies to HSPF, SDHM, and SWMM. When modeling pervious areas in the post-project condition, fill soils shall be modeled as hydrologic soil group Type D soils, or the

project applicant may provide an actual expected infiltration rate for the fill soil based on testing (must be approved by the City Engineer for use in the model). Where landscaped areas on fill soils will be re-tilled and/or amended in the post-project condition, the landscaped areas may be modeled as Type C soils. Areas to be re-tilled and/or amended in the post-project condition must be shown on the project plans. For undisturbed pervious areas (i.e., native soils, no fill), use the actual hydrologic soil group, the same as in the pre-development condition.

G.1.5 MODELING STRUCTURAL BMPS (PONDS AND LID FEATURES)

There are many ways to model structural BMPs. There are standard modules for several pond or LID elements included in SDHM and SWMM. Users may also set up project-specific stage-storage-discharge relationships representing structural BMPs. Regardless of the modeling method, certain characteristics of the structural BMP, including infiltration of water from the bottom of the structural BMP into native soils, porosity of bioretention soils and/or gravel sublayers, and other program-specific parameters must be consistent with those presented below, unless the preparer can provide documentation to substantiate use of other parameters, subject to local jurisdiction approval. The geometry of structural BMPs is project-specific and shall match the project plans.

G.1.5.1 Infiltration into Native Soils Below Structural BMPs

Infiltration into native soils below structural BMPs may be modeled as a constant outflow rate equal to the project site-specific design infiltration rate (Worksheet D.5-1) multiplied by the area of the infiltrating surface (and converted to cubic feet per second). This infiltration rate is not the same as an infiltration parameter used in the calculation of rainfall losses, such as the HSPF INFILT parameter or the Green-Ampt conductivity parameter in the SWMM subcatchment module. It must be site-specific and must be determined based on the methods presented in Appendix D of this manual.

For preliminary analysis when site-specific geotechnical investigation has not been completed, project applicants proposing infiltration into native soils as part of the structural BMP design shall prepare a sensitivity analysis to determine a potential range for the structural BMP size based on a range of potential infiltration rates. As shown in Appendices C and D of this manual, many factors influence the ability to infiltrate stormwater. Therefore even when soils types A and B are present, which are generally expected to infiltrate stormwater, the possibility that a very low infiltration rate could be determined at design level must be considered. The range of potential infiltration rates for preliminary analysis is shown below in Table G.1-5.

Table G.1-5: Range of Potential Infiltration Rates to be Studied for Sensitivity Analysis when Native Infiltration is Proposed but Site-Specific Geotechnical Investigation has not been Completed

Hydrologic Soil Group at Location of Proposed Structural BMP	Low Infiltration Rate for Preliminary Study (inches/hour)	High Infiltration Rate for Preliminary Study (inches/hour)
A	0.02	2.4
B	0.02	0.52
C	0	0.08
D	0	0.02

The infiltration rates shown above are for preliminary investigation only. Final design of a structural BMP must be based on the project site-specific design infiltration rate (Worksheet D.5-1).

G.1.5.2 Structural BMPs That Do Not Include Sub-Layers (Ponds)

To model a pond, basin, or other depressed area that does not include processing runoff through sublayers of amended soil and/or gravel, create a stage storage discharge relationship for the pond, and supply the information to the model according to the program requirements. For HSPF users, the stage-storage-discharge relationship is provided in FTABLES. SDHM users may use the TRAPEZOIDAL POND element for a trapezoidal pond or IRREGULAR POND element to request the program to create the stage-storage-discharge relationship, use the SSD TABLE element to supply a user-created stage-storage-discharge relationship, or use other available modules such as TANK or VAULT. For SWMM users, the stage-storage relationship is supplied in the storage unit module, and the stage-discharge relationship may be represented by various other modules such as the orifice, weir, or outlet modules. Stage-storage and stage-discharge curves for structural BMPs must be fully documented in the project-specific HMP report and must be consistent with the structural BMP(s) shown on project plans.

For user-created stage-discharge relationships, refer to local drainage manual criteria for equations representing hydraulic behavior of outlet structures. Users relying on the software to develop the stage-discharge relationship may use the equations built into the program. This manual does not recommend that all program modules calculating stage-discharge relationships must be uniform because the flows to be controlled for hydromodification management are low flows, calculated differently from the single-storm event peak flows studied for flood control purposes, and hydromodification management performance standards do not represent any performance standard for flood control drainage design. Note that for design of emergency outlet structures, and any calculations related to single-storm event routing for flood control drainage design, stage-discharge calculations must be consistent with the local drainage design requirements. This may require separate calculations for stage-discharge relationship pursuant to local manuals. The HMP flow rates shall not be used for flood control calculations.

G.1.5.3 Structural BMPs That Include Sub-Layers (Bioretention and Other LID)

G.1.5.3.1 Characteristics of Engineered Soil Media

The engineered soil media used in bioretention, biofiltration with partial retention, and biofiltration structural BMPs is a sandy loam. The following parameters presented in Table G.1-6 are characteristics of a sandy loam for use in continuous simulation models.

Table G.1-6: Characteristics of Sandy Loam to Represent Engineered Soil Media in Continuous Simulation for Hydromodification Management Studies in San Diego

Soil Texture	Porosity	Field Capacity	Wilting Point	Conductivity	Suction Head
Sandy Loam	0.4	0.2	0.1	5 inches/hour	1.5 inches

- Porosity is the volume of pore space (voids) relative to the total volume of soil (as a fraction).
- Field Capacity is the volume of pore water relative to total volume after the soil has been allowed to drain fully (as a fraction). Below this level, vertical drainage of water through the soil layer does not occur.
- Wilting point is the volume of pore water relative to total volume for a well dried soil where only bound water remains (as a fraction). The moisture content of the soil cannot fall below this limit.
- Conductivity is the hydraulic conductivity for the fully saturated soil (in/hr or mm/hr).
- Suction head is the average value of soil capillary suction along the wetting front (inches or mm).

Figures G.1-3 and G.1-4, from http://www.stevenswater.com/articles/irrigationscheduling.aspx, illustrate unsaturated soil and soil saturation, field capacity, and wilting point.

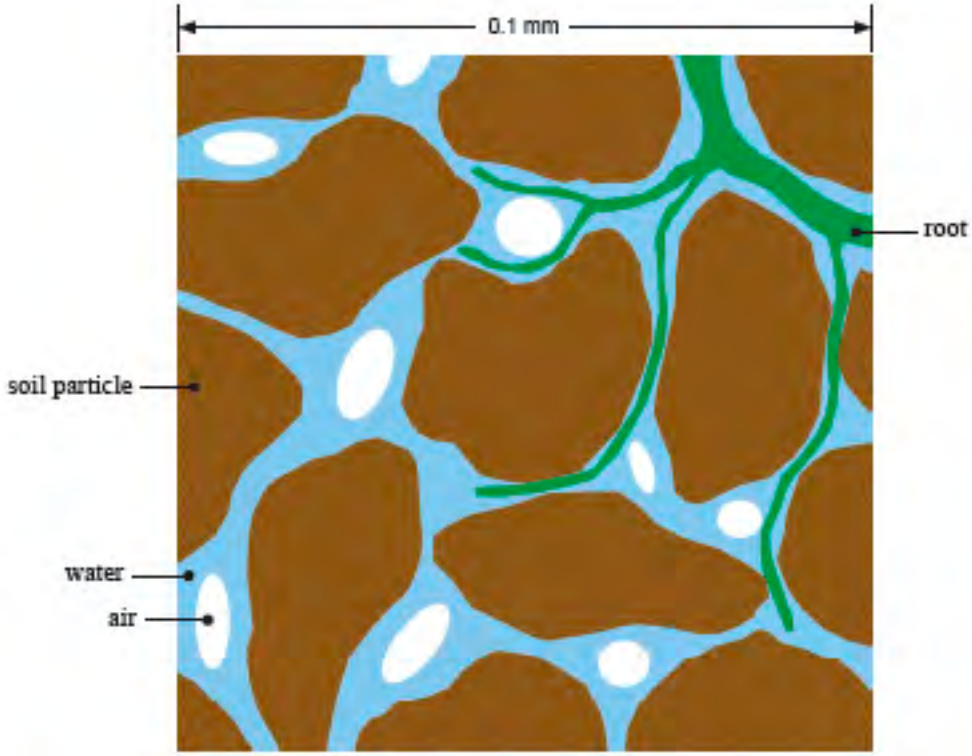


Figure G.1-3: Unsaturated Soil Composition

Unsaturated soil is composed of solid particles, organic material and pores. The pore space will contain air and water.

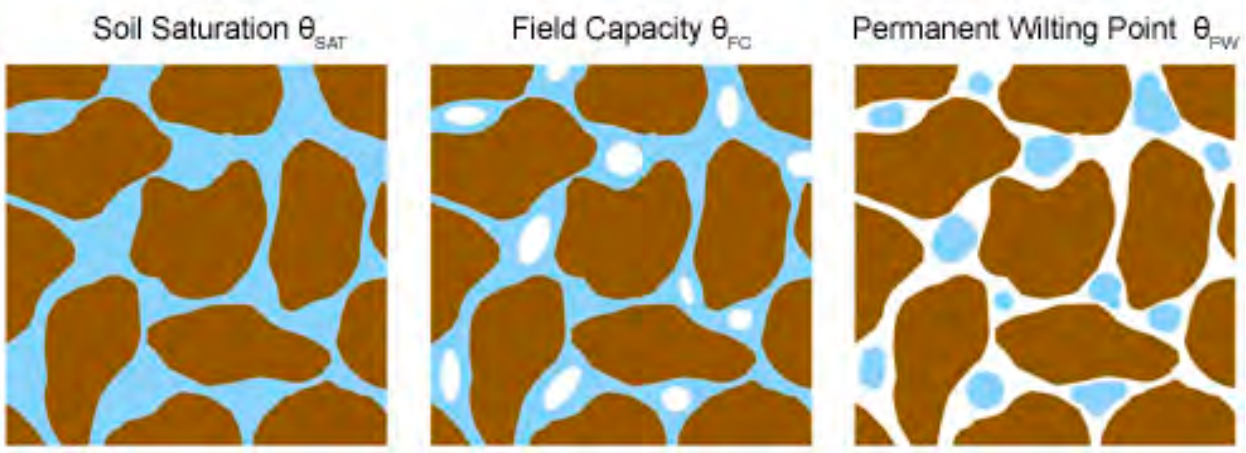


Figure G.1-4: Soil saturation, field capacity, and wilting point

G.1.5.3.2 Characteristics of Gravel

For the purpose of hydromodification management studies, it may be assumed that water moves freely through gravel, not limited by hydraulic properties of the gravel. For the purpose of calculating available volume, use porosity of 0.4, or void ratio of 0.67. Porosity is equal to void ratio divided by (1 + void ratio).

G.1.5.3.3 Additional Guidance for SDHM Users

The module titled "bioretention/rain garden element" may be used to represent bioretention or biofiltration BMPs. SDHM users using the available "bioretention/rain garden element" shall customize the soil media characteristics to use the parameters from Table G.1-6 above, and select "gravel" for gravel sublayers. All other input variables are project-specific. "Native infiltration" refers to infiltration from the bottom of the structural BMP into the native soil. This variable is project-specific, see Section G.1.5.1.

G.1.5.3.4 Additional Guidance for SWMM Users

The "bio-retention cell" LID control may be used to represent bioretention or biofiltration BMPs. Table G.1-7 provides parameters required for the standard "bio-retention cell" available in SWMM. The parameters are entered in the LID Control Editor.

Table G.1-7: Parameters for SWMM "Bio-Retention Cell" Module for Hydromodification Management Studies in San Diego

SWMM Parameter Name	Unit	Use in San Diego
Surface		
Berm Height also known as Storage Depth	inches	Project-specific
Vegetative Volume Fraction also known as Vegetative Cover Fraction	---	0
Surface Roughness	---	0 (this parameter is not applicable to bio-retention cell)
Surface Slope	---	0 (this parameter is not applicable to bio-retention cell)
Soil		
Thickness	inches	project-specific
Porosity	---	0.40
Field Capacity	---	0.2

SWMM Parameter Name	Unit	Use in San Diego
Wilting Point	---	0.1
Conductivity	Inches/hour	5
Conductivity Slope	---	5
Suction Head	inches	1.5
Storage		
Thickness also known as Height	inches	Project-specific
Void Ratio	---	0.67
Seepage Rate also known as Conductivity	Inches/hour	Conductivity from the storage layer refers to infiltration from the bottom of the structural BMP into the native soil. This variable is project-specific, see Section G.5.1. Use 0 if the bio-retention cell includes an impermeable liner
Clogging Factor	---	0
Underdrain		
Flow Coefficient Also known as Drain Coefficient	---	Project-specific
Flow Exponent Also known as Drain Exponent	---	Project-specific, typically 0.5
Offset Height Also known as Drain Offset Height	Inches	Project-specific

G.1.6 FLOW FREQUENCY AND DURATION

The continuous simulation model will generate an hourly flow record as its output. This hourly flow record must then be processed to determine pre-development and post-project flow rates and durations. Compliance with hydromodification management requirements of this manual is achieved when results for flow frequency and duration meet the performance standards. The performance standards are as follows (also presented in Chapter 6 of this manual):

1. For flow rates ranging from 10 percent, 30 percent or 50 percent of the pre-development 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) to the pre-development 10-year runoff event (Q_{10}), the post-project discharge rates and durations shall not deviate above the pre-development rates and durations by more than 10 percent over and more than 10 percent of

the length of the flow duration curve. The specific lower flow threshold will depend on the erosion susceptibility of the receiving stream for the project site (see Section 6.3.4).

2. For flow rates ranging from the lower flow threshold to Q_5, the post-project peak flows shall not exceed pre-development peak flows. For flow rates from Q_5 to Q_{10}, post-project peak flows may exceed pre-development flows by up to 10 percent for a 1-year frequency interval. For example, post-project flows could exceed pre-development flows by up to 10 percent for the interval from Q_9 to Q_{10} or from $Q_{5.5}$ to $Q_{6.5}$, but not from Q_8 to Q_{10}.

To demonstrate that a flow control facility meets hydromodification management performance standards, peak flow frequency curves and flow duration summary must be generated and compared for pre-development and post-project conditions. The following guidelines shall be used for determining flow rates and durations.

G.1.6.1 Determining Flow Rates from Continuous Hourly Flow Output

Flow rates for hydromodification management studies in San Diego must be based on partial duration series analysis of the continuous hourly flow output. Partial duration series frequency calculations consider multiple storm events in a given year. To construct the partial duration series:

1. Parse the continuous hourly flow data into discrete runoff events. The following separation criteria may be used for separation of flow events: a new discrete event is designated when the flow falls below an artificially low flow value based on a fraction of the contributing watershed area (e.g., 0.002 to 0.005 cfs/acre) for a time period of 24 hours. Project applicants may consider other separation criteria provided the separation interval is not more than 24 hours and the criteria is clearly described in the submittal document.
2. Rank the peak flows from each discrete flow event, and compute the return interval or plotting position for each event.

Readers who are unfamiliar with how to compute the partial-duration series should consult reference books or online resources for additional information. For example, Hydrology for Engineers, by Linsley et all, 1982, discusses partial-duration series on pages 373-374 and computing recurrence intervals or plotting positions on page 359. Handbook of Applied Hydrology, by Chow, 1964, contains a detailed discussion of flow frequency analysis, including Annual Exceedance, Partial-Duration and Extreme Value series methods, in Chapter 8. The US Geological Survey (USGS) has several hydrologic study reports available online that use partial duration series statistics (see http://water.usgs.gov/ and http://water.usgs.gov/osw/bulletin17b/AGU_Langbein_1949.pdf).

Pre-development Q_2 and Q_{10} shall be determined from the partial duration analysis for the pre-development hourly flow record. Pre-development Q_{10} is the upper threshold of flow rates to be controlled in the post-project condition. The lower flow threshold is a fraction of the pre-development Q_2 determined based on the erosion susceptibility of the receiving stream. Simply multiply the pre-development Q_2 by the appropriate fraction (e.g., $0.1Q_2$) to determine the lower

flow threshold.

To prepare the peak flow frequency curves, use the return interval on the x-axis and the flow rate on the y-axis. Compare the post-project peak flow frequency curve to the pre-development peak flow frequency curve to determine if it meets performance criteria for post-project peak flows (criteria number 2 presented under Section G.1.6).

G.1.6.2 Determining Flow Durations from Continuous Hourly Flow Output

Flow durations must also be summarized within the range of flows to control. Flow duration statistics provide a simple summary of how often a particular flow rate is exceeded. To prepare this summary:

1. Rank the entire hourly runoff time series output.
2. Extract the portion of the ranked hourly time series output from the lower flow threshold to the upper flow threshold – this is the portion of the record to be summarized.
3. Divide the applicable portion of the record into 100 equal flow bins (compute the difference between the upper flow threshold (cfs) and lower flow threshold (cfs) and divide this value by 99 to establish the flow bin size).
4. Count the number of hours of flow that fall into each flow bin.

Both pre-development and post-project flow duration summary must be based on the entire length of the flow record. Compare the post-project flow duration summary to the pre-development flow duration summary to determine if it meets performance criteria for post-project flow rates and durations (criteria number 1 presented under Section G.1.6).

G.2 Sizing Factors for Hydromodification Management BMPs

This section presents sizing factors for design of flow control structural BMPs based on the sizing factor method identified in Chapter 6.3.5.1. The sizing factors are re-printed from the "San Diego BMP Sizing Calculator Methodology," dated January 2012, prepared by Brown and Caldwell (herein "BMP Sizing Calculator Methodology"). The sizing factors are linked to the specific details and descriptions that were presented in the BMP Sizing Calculator Methodology, with limited options for modifications. The sizing factors were developed based on the 2007 MS4 Permit. Some of the original sizing factors developed based on the 2007 MS4 Permit and presented in the BMP Sizing Calculator Methodology are not compatible with new requirements of the 2013 MS4 Permit, and therefore are not included in this manual. The sizing factor method is intended for simple studies that do not include diversion, do not include significant offsite area draining through the project from upstream, and do not include offsite area downstream of the project area. Use of the sizing factors is limited to the specific structural BMPs described in this Appendix. Sizing factors are available for the following specific structural BMPs:

- Full infiltration condition:
    - **Infiltration**: sizing factors available for A and B soils represent a below-ground structure (dry well)
    - **Bioretention**: sizing factors available for A and B soils represent a bioretention area with engineered soil media and gravel storage layer, with no underdrain and no impermeable liner
- Partial infiltration condition:
    - **Biofiltration with partial retention**: sizing factors available for C and D soils represent a bioretention area with engineered soil media and gravel storage layer, with an underdrain, with gravel storage below the underdrain, with no impermeable liner
- No infiltration condition:
    - **Biofiltration**: sizing factors available for C and D soils represent a bioretention area with engineered soil media and gravel storage layer, with an underdrain, without gravel storage below the underdrain, with no impermeable liner
    - **Biofiltration (formerly known as "flow-through planter") with impermeable liner**: sizing factors available for C and D soils represent a biofiltration system with engineered soil media and gravel storage layer, with an underdrain, with or without gravel storage below the underdrain, with an impermeable liner

- Other:
    - **Cistern**: sizing factors available for A, B, C, or D soils represent a vessel with a low flow orifice outlet to meet the hydromodification management performance standard.

Sizing factors were created based on the Oceanside rainfall basin.

The following information is needed to use the sizing factors:

- In Encinitas, use the Oceanside rainfall basin data
- Hydrologic soil group at the project site (use available information pertaining to existing underlying soil type such as soil maps published by the Natural Resources Conservation Service)
- Pre-development and post-project slope categories (low = 0% – 5%, moderate = 5% – 15%, steep = >15%)
- Area tributary to the structural BMP
- Area weighted runoff factor (C) for the area draining to the BMP from Table G.2-1. Note: runoff coefficients and adjustments presented in Appendices B.1 and B.2 are for pollutant control only and are not applicable for hydromodification management studies
- Fraction of Q2 to control (see Chapter 6.3.4)

When using the sizing factor method, Worksheet G.2-1 may be used to present the calculations of the required minimum areas and/or volumes of BMPs as applicable.

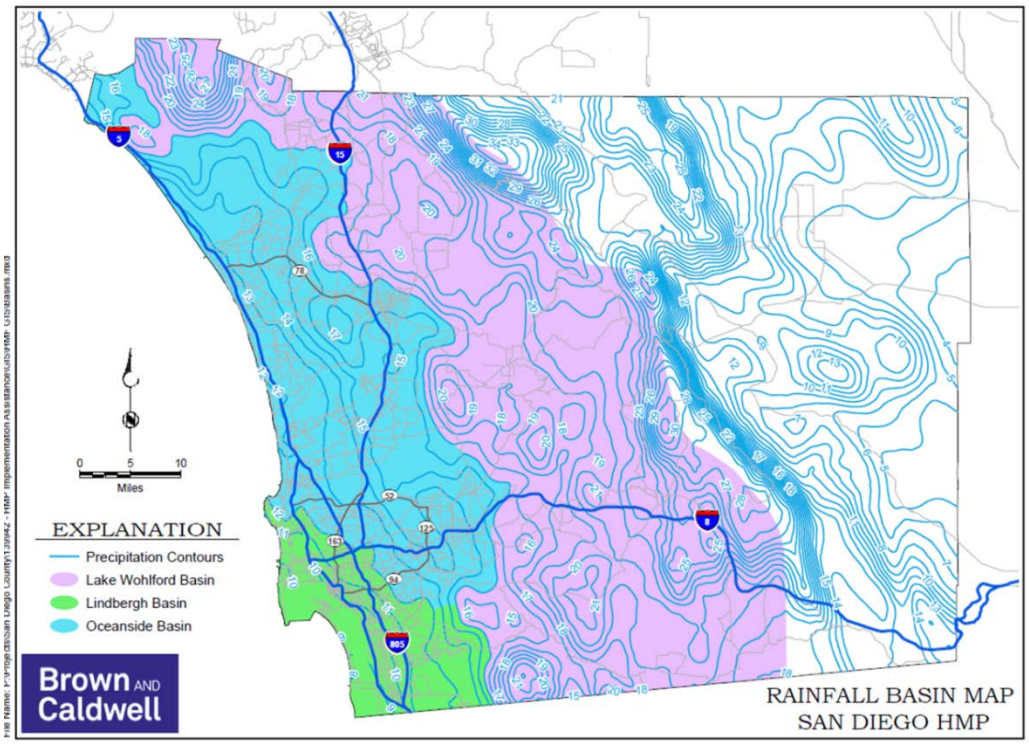


Figure G.2-1: Appropriate Rain Gauge for Project Sites

Table G.2-1: Runoff factors for surfaces draining to BMPs for Hydromodification Sizing Factor Method

Surface	Runoff Factor
Roofs	1.0
Concrete	1.0
Pervious Concrete	0.10
Porous Asphalt	0.10
Grouted Unit Pavers	1.0
Solid Unit Pavers on granular base, min. 3/16 inch joint space	0.20
Crushed Aggregate	0.10
Turf block	0.10
Amended, mulched soils	0.10
Landscape	0.10

Worksheet G.2-1: Sizing Factor Worksheet

Site Information			
Project Name:		Hydrologic Unit	
Project Applicant:		Rain: Gauge:	
Jurisdiction:		Total Project Area:	
Assessor's Parcel Number :		Low Flow Threshold:	
BMP Name:		BMP Type:	

Areas Draining to BMP						Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (From Table G.2-1)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (cf)	Subsurface Volume (cf)
Total DMA Area								Minimum BMP Size*			
								Proposed BMP Size*			

*Minimum BMP Size = Total of rows above.

*Proposed BMP Size ≥ Minimum BMP size.

G.2.1 Unit Runoff Ratios

Table G.2-2 presents unit runoff ratios for calculating pre-development Q_2, to be used when applicable to determine the lower flow threshold for low flow orifice sizing for biofiltration with partial retention, biofiltration, biofiltration with impermeable liner, or cistern BMPs. There is no low flow orifice in the infiltration BMP or bioretention BMP. The unit runoff ratios are re-printed from the BMP Sizing Calculator methodology. Unit runoff ratios for "urban" and "impervious" cover categories were not transferred to this manual due to the requirement to control runoff to pre-development condition (see Chapter 6.3.3).

How to use the unit runoff ratios:

Obtain unit runoff ratio from Table G.2-2 based on the project's rainfall basin, hydrologic soil group, and pre-development slope (for redevelopment projects, pre-development slope may be considered if historic topographic information is available, otherwise use pre-project slope). Multiply the area tributary to the structural BMP (A, acres) by the unit runoff ratio (Q2, cfs/acre) to determine the pre-development Q2 to determine the lower flow threshold, to use for low flow orifice sizing.

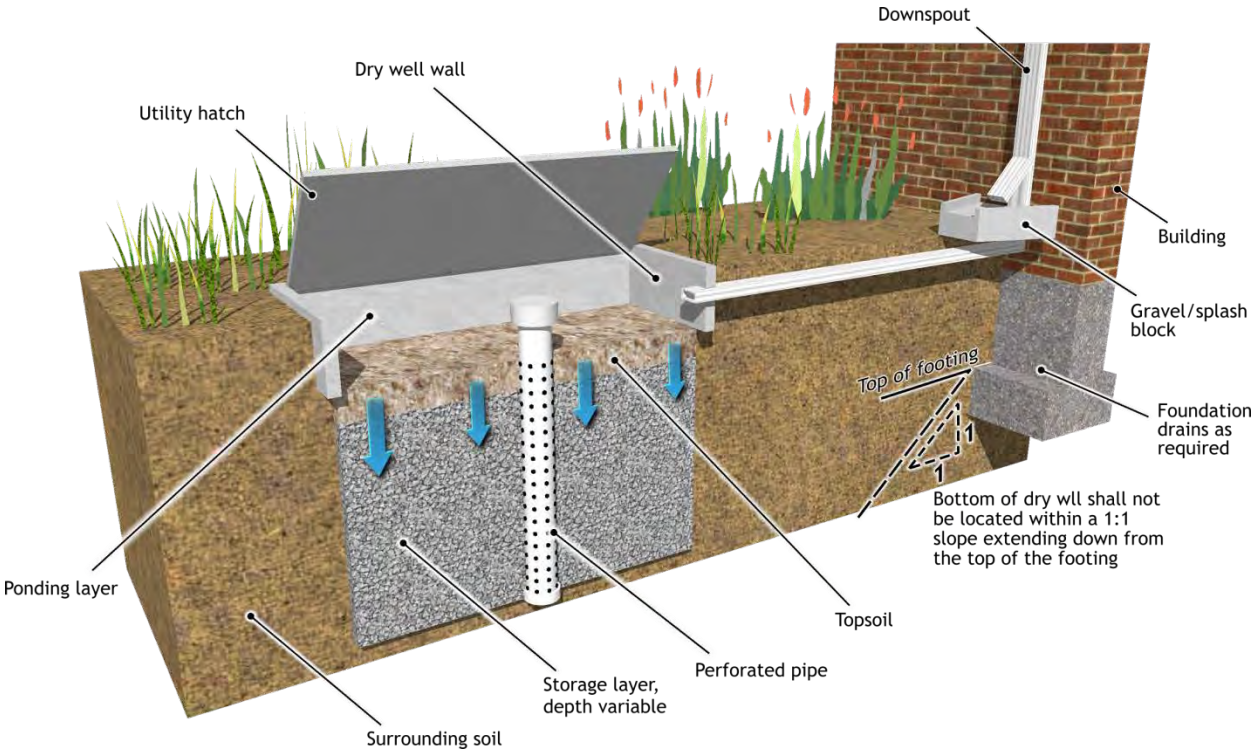
Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Unit Runoff Ratios for Sizing Factor Method					
Rain Gauge	**Soil**	**Cover**	**Slope**	**Q_2 (cfs/acre)**	**Q_{10} (cfs/ac)**
Oceanside	A	Scrub	Low	0.035	0.32
Oceanside	A	Scrub	Moderate	0.093	0.367
Oceanside	A	Scrub	Steep	0.163	0.42
Oceanside	B	Scrub	Low	0.08	0.365
Oceanside	B	Scrub	Moderate	0.134	0.4
Oceanside	B	Scrub	Steep	0.181	0.433
Oceanside	C	Scrub	Low	0.146	0.411
Oceanside	C	Scrub	Moderate	0.185	0.433
Oceanside	C	Scrub	Steep	0.217	0.458
Oceanside	D	Scrub	Low	0.175	0.434
Oceanside	D	Scrub	Moderate	0.212	0.455
Oceanside	D	Scrub	Steep	0.244	0.571

G.2.2 Sizing Factors for "Infiltration" BMP

Table G.2-3 presents sizing factors for calculating the required surface area (A) and volume (V1) for an infiltration BMP. There is no underdrain and therefore no low flow orifice in the infiltration BMP. Sizing factors were developed for hydrologic soil groups A and B only. This BMP is not applicable in hydrologic soil groups C and D. The infiltration BMP is a below-ground structure (dry well) that consists of three layers:

- Ponding layer: a nominal 6-inch ponding layer should be included below the access hatch to allow for water spreading and infiltration during intense storms.
- Soil layer [topsoil layer]: 12 inches of soil should be included to remove pollutants.
- Free draining layer [storage layer]: The drywell is sized assuming a 6-foot deep free draining layer. However, designers could use shallower facility depths [provided the minimum volume and surface area are met].



Infiltration Facility BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-3 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet) and volume (V1, cubic feet) for the infiltration BMP. The civil engineer shall provide the necessary volume and surface area of the BMP on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors, then refer to Appendix B.4 to check whether the BMP meets performance standards for infiltration for pollutant control. If necessary, increase the surface area to meet the drawdown requirement for pollutant control.

Table G.2-3: Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.5Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.5Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.5Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.3Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.3Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.3Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.3Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Oceanside	0.045	0.1170	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.045	0.1170	N/A
$0.1Q_2$	A	Steep	Oceanside	0.040	0.1040	N/A
$0.1Q_2$	B	Flat	Oceanside	0.065	0.1690	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.065	0.1690	N/A
$0.1Q_2$	B	Steep	Oceanside	0.060	0.1560	N/A
$0.1Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	N/A	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Infiltration volume sizing factor for flow control

Definitions for "N/A"

- Soil groups A and B: N/A in column V2 means there is no V2 element in this infiltration BMP for soil groups A and B
- Soil groups C and D: N/A across all elements (A, V1, V2) means sizing factors were not developed for an infiltration BMP for soil groups C and D

G.2.3 Sizing Factors for Bioretention

Table G.2-4 presents sizing factors for calculating the required surface area (A) and surface volume (V1) for the bioretention BMP. The bioretention BMP consists of two layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]

This BMP is applicable in soil groups A and B. This BMP does not include an underdrain or a low flow orifice. This BMP does not include an impermeable layer at the bottom of the facility to prevent infiltration into underlying soils, regardless of hydrologic soil group. If a facility is to be lined, the designer must use the sizing factors for biofiltration with impermeable layer (formerly known as "flow-through planter").

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-4 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet) and surface volume (V1, cubic feet). Note the surface volume is the ponding layer. The BMP must also include 18 inches of bioretention soil media which does not contribute to V1. The civil engineer shall provide the necessary volume and surface area of the BMP on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors, then refer to Appendix B.4 to check whether the BMP meets performance standards for infiltration for pollutant control. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards.

Table G.2-4: Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.5Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A

Sizing Factors for Hydromodification Flow Control Bioretention BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.5Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.3Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.3Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.3Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.1Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.1Q_2$	B	Flat	Oceanside	0.103	0.0854	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.1Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.1Q_2$	C	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	N/A	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Surface volume sizing factor for flow control

Definitions for "N/A"

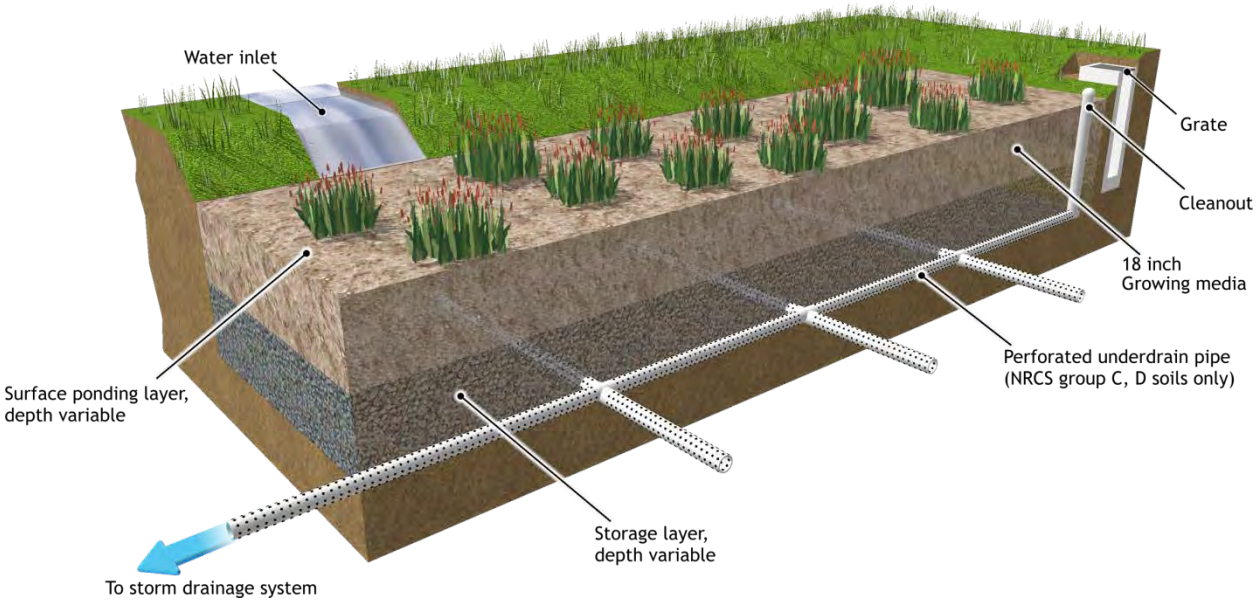
- Soil groups A and B: N/A in column V2 means there is no V2 element in this bioretention BMP for soil groups A and B
- Soil groups C and D: N/A in all elements (A, V1, V2) for soil groups C and D means sizing factors developed for "bioretention" in soil groups C and D under the 2007 MS4 Permit are not applicable in the "bioretention" category under the 2013 MS4 Permit because they were developed with the assumption that an underdrain is operating. Refer to Appendix G.2.4, Sizing Factors for Biofiltration with Partial Retention and Biofiltration

G.2.4 Sizing Factors for Biofiltration with Partial Retention and Biofiltration

Table G.2-5 presents sizing factors for calculating the required surface area (A), surface volume (V1), and sub-surface volume (V2) for a biofiltration with partial retention and biofiltration BMP. The BMPs consist of three layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]
- Storage layer: 30-inches of gravel at 40 percent porosity [18 inches active storage above underdrain is required, additional dead storage depth below underdrain is optional and can vary]

This BMP is applicable in soil groups C and D. This BMP includes an underdrain with a low flow orifice 18 inches (1.5 feet) below the bottom of the growing medium. This BMP can include additional dead storage below the underdrain. This BMP does not include an impermeable layer at the bottom of the facility to prevent infiltration into underlying soils, regardless of hydrologic soil group. If a facility is to be lined, the designer must use the sizing factors for biofiltration with impermeable liner (formerly known as "flow-through planter").



Biofiltration BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-5 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet), surface volume (V1, cubic feet), and sub-surface volume (V2, cubic feet). Select a low flow orifice for the underdrain that will discharge the lower flow threshold flow when there is 1.5 feet of head over the underdrain orifice. The civil engineer shall provide the necessary volume and surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size of the BMP using the sizing factors. For BMPs without dead storage below the underdrain, then refer to Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards. For BMPs with dead storage below the underdrain, refer to Appendix B.4 to determine the portion of the DCV to be infiltrated for pollutant control, then Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control for the balance of the DCV. If necessary, adjust the surface area, depth of storage layer, or depth of growing medium as needed to meet pollutant control standards.

Table G.2-5: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.060	0.0500	0.0360
$0.5Q_2$	D	Flat	Oceanside	0.065	0.0542	0.0390

Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention and Biofiltration BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	D	Moderate	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Moderate	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Steep	Oceanside	0.080	0.0667	0.0480
$0.3Q_2$	D	Flat	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Moderate	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Steep	Oceanside	0.110	0.0917	0.0660
$0.1Q_2$	D	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Surface volume sizing factor for flow control

V_2 = Subsurface volume sizing factor for flow control

Definitions for "N/A"

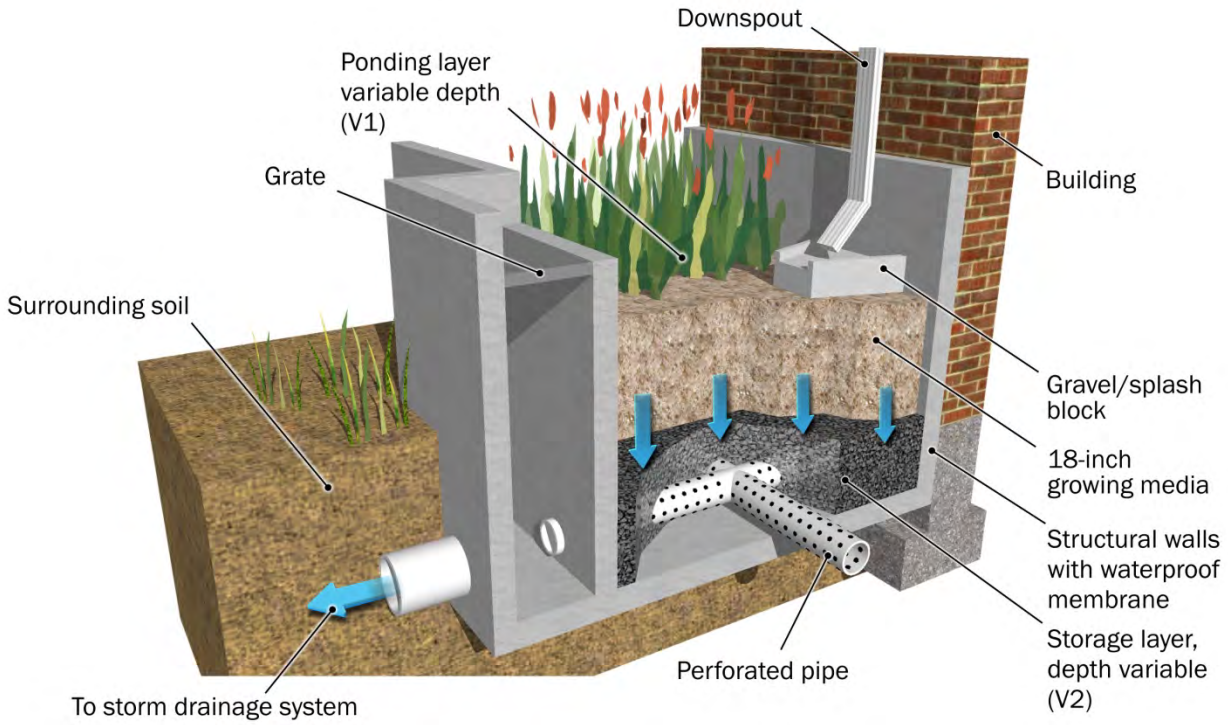
- Soil groups A and B: N/A in all elements (A, V1, V2) for soil groups A and B means sizing factors were not developed for biofiltration (i.e., with an underdrain) for soil groups A and B. If no underdrain is proposed, refer to Appendix G.2.3, Sizing Factors for Bioretention. If an underdrain is proposed, use project-specific continuous simulation modeling.

G.2.5 Sizing Factors for Biofiltration with Impermeable Liner

Table G.2-6 presents sizing factors for calculating the required surface area (A), surface volume (V1), and sub-surface volume (V2) for a biofiltration BMP with impermeable liner (formerly known as flow-through planter). The BMP consists of three layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]
- Storage layer: 30-inches of gravel at 40 percent porosity [18 inches active storage above underdrain is required, additional dead storage depth below underdrain is optional and can vary]

This BMP includes an underdrain with a low flow orifice 18 inches (1.5 feet) below the bottom of the growing medium. This BMP includes an impermeable liner to prevent infiltration into underlying soils.



Biofiltration with impermeable liner BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-6 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet), surface volume (V1, cubic feet), and sub-surface volume (V2, cubic feet). Select a low flow orifice for the underdrain that will discharge the lower flow threshold flow when there is 1.5 feet of head over the underdrain orifice. The civil engineer shall provide the necessary volume and surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size using the sizing factors, then refer to Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control. If necessary, adjust the surface area, depth of growing medium, or depth of storage layer as needed to meet pollutant control standards.

Table G.2-6: Sizing Factors for Hydromodification Flow Control Biofiltration BMPs (formerly known as Flow-Through Planters) Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Flat	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Moderate	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.3Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Moderate	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Steep	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Flat	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Moderate	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Steep	Oceanside	0.070	0.0583	0.0420
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Moderate	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Steep	Oceanside	0.140	0.1167	0.0840
$0.1Q_2$	D	Flat	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Moderate	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Steep	Oceanside	0.105	0.0875	0.0630

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area sizing factor for flow control

V_1 = Surface volume sizing factor for flow control

V_2 = Subsurface volume sizing factor for flow control

Definitions for "N/A"

- Soil groups A and B: N/A in all elements (A, V1, V2) for soil groups A and B means sizing factors were not developed for biofiltration (i.e., with an underdrain) for soil groups A and B. If no underdrain is proposed, refer to Appendix G.2.3, Sizing Factors for Bioretention. If an underdrain is proposed, use project-specific continuous simulation modeling.

G.2.6 Sizing Factors for "Cistern" BMP

Table G.2-7 presents sizing factors for calculating the required volume (V1) for a cistern BMP. In this context, a "cistern" is a detention facility that stores runoff and releases it at a controlled rate. A cistern can be a component of a harvest and use system, however the sizing factor method will not account for any retention occurring in the system. The sizing factors were developed assuming runoff is released from the cistern. The sizing factors presented in this section are to meet the hydromodification management performance standard only. The cistern BMP is based on the following assumptions:

- Cistern configuration: The cistern is modeled as a 4-foot tall vessel. However, designers could use other configurations (different cistern heights), as long as the lower outlet orifice is sized to properly restrict outflows and the minimum required volume is provided.
- Cistern upper outlet: The upper outlet from the cistern would consist of a weir or other flow control structure with the overflow invert set at an elevation of 7/8 of the water height associated with the required volume of the cistern – V1. For the assumed 4-foot water depth in the cistern associated with the sizing factor analysis, the overflow invert is assumed to be located at an elevation of 3.5 feet above the bottom of the cistern. The overflow weir would be sized to pass the peak design flow based on the tributary drainage area.

How to use the sizing factors:

Obtain sizing factors from Table G.2-7 based on the project's lower flow threshold fraction of Q_2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required volume (V_1, cubic feet). Select a low flow orifice that will discharge the lower flow threshold flow when there is 4 feet of head over the lower outlet orifice (or adjusted head as appropriate if the cistern configuration is not 4 feet tall). The civil engineer shall provide the necessary volume of the BMP and the lower outlet orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

A cistern could be a component of a full retention, partial retention, or no retention BMP depending on how the outflow is disposed. However use of the sizing factor method for design of the cistern in a combined pollutant control and flow control system is not recommended. The sizing factor method for designing a cistern does not account for any retention or storage occurring in BMPs combined with the cistern (i.e., cistern sized using sizing factors may be larger than necessary because sizing factor method does not recognize volume losses occurring in other elements of a combined system). Furthermore when the cistern is designed using the sizing factor method, the cistern outflow must be set to the low flow threshold flow for the drainage area, which may be inconsistent with requirements for other elements of a combined system. To optimize a system in

which a cistern provides temporary storage for runoff to be either used onsite (harvest and use), infiltrated, or biofiltered, project-specific continuous simulation modeling is recommended. Refer to Sections 5.6 and 6.3.6.

Table G.2-7: Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.5Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	B	Flat	Oceanside	N/A	0.1900	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	0.1600	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Flat	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Moderate	Oceanside	N/A	0.1400	N/A
$0.5Q_2$	C	Steep	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Flat	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Moderate	Oceanside	N/A	0.1200	N/A
$0.5Q_2$	D	Steep	Oceanside	N/A	0.1000	N/A
$0.3Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	0.2200	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	0.1800	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Flat	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Moderate	Oceanside	N/A	0.1600	N/A
$0.3Q_2$	C	Steep	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Flat	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Moderate	Oceanside	N/A	0.1400	N/A
$0.3Q_2$	D	Steep	Oceanside	N/A	0.1200	N/A
$0.1Q_2$	A	Flat	Oceanside	N/A	0.1600	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	0.1400	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	0.1200	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	0.5100	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	0.3400	N/A

Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method						
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**	**V_1**	**V_2**
$0.1Q_2$	B	Steep	Oceanside	N/A	0.2400	N/A
$0.1Q_2$	C	Flat	Oceanside	N/A	0.2600	N/A
$0.1Q_2$	C	Moderate	Oceanside	N/A	0.2600	N/A
$0.1Q_2$	C	Steep	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Flat	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Moderate	Oceanside	N/A	0.2000	N/A
$0.1Q_2$	D	Steep	Oceanside	N/A	0.1800	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Bioretention surface area sizing factor (not applicable under this manual standards – use methods presented in Chapter 5 and Appendix B or Appendix F to size bioretention or biofiltration facility for pollutant control)
V_1 = Cistern volume sizing factor

Definitions for "N/A"

- Column V2: N/A in column V2 means there is no V2 element in the cistern BMP
- Column A: N/A in column A means there is no A element in the cistern BMP. Note sizing factors previously created for sizing a bioretention or biofiltration facility downstream of a cistern under the 2007 MS4 Permit are not applicable under the MS4 Permit.

Appendix

H

Guidance for Investigating Potential Critical Coarse Sediment Yield Areas

February 2016

Appendix H Guidance for Investigating Potential Critical Coarse Sediment Yield Areas

Introduction

Identification of potential critical coarse sediment yield areas for San Diego County has been prepared based on GLU analysis. Criteria for the GLU analysis were developed and documented in the "San Diego County Regional WMAA" (herein "Regional WMAA"). Regional-level mapping of potential critical coarse sediment yield areas was prepared using regional data sets and included in the Regional WMAA. The original Regional WMAA document can be found on the Project Clean Water website at the following address:

http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=75&Itemid=99

The regional-level mapping was distributed to WQIP preparers to incorporate into the WMAA attachment to the WQIP for all watersheds in San Diego County. The regional-level mapping is based on the following sources:

Dataset	Source	Year	Description
Elevation	USGS	2013	1/3rd Arc Second (~10 meter cells) digital elevation model for San Diego County
Land Cover	SanGIS	2013	Ecology-Vegetation layer for San Diego County downloaded from SanGIS
Geology	Kennedy, M.P., and Tan, S.S.	2002	Geologic Map of the Oceanside 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 2, 1:100,000 scale.
	Kennedy, M.P., and Tan, S.S.	2008	Geologic Map of the San Diego 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 3, 1:100,000 scale.
	Todd, V.R.	2004	Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, Southern California, United States Geological Survey, Southern California Areal Mapping Project, Open File Report 2004-1361, 1:100,000 scale.
	Jennings et al.	2010	"Geologic Map of California," California Geological Survey, Map No. 2 – Geologic Map of California, 1:750,000 scale

The regional data set is a function of the inherent data resolution of the macro-level data sets and may not conform to all site conditions, or does not reflect changes to particular areas that have occurred since the underlying data was developed. This means slopes, geology, or land cover at the project site can be mischaracterized in the regional data set. This appendix presents criteria for the GLU analysis, excerpted from the Regional WMAA, to be used when detailed project-level investigation of GLUs onsite is needed.

The City of Encinitas has made the regional data set for Potential Critical Coarse Sediment Yield Areas available on the myEncinitas mapping application. A project applicant should first check the myEncinitas app to determine if potential critical coarse sediment yield areas may exist within the project drainage boundaries (i.e., within or draining through the project). To do this, use the following procedure:

1. Open the City website: www.cityofencinitas.org
2. Type in the address of the project and click "View Property Info"
3. Once in the mapping application, click on the arrow at the left, then click on "Legend"
4. Open the layer group called "Site Profiler Service" by clicking on the adjacent plus sign
5. Open the layer group called "Stormwater" by clicking on the adjacent plus sign
6. Turn on the "Potential Critical Coarse Sediment Yield Areas" layer by clicking in the box adjacent to the layer so that a check mark appears in the box. Also turn on the Stormwater and the Site Profiler Service layer groups in the same away
7. The Potential Critical Coarse Sediment Yield Areas layer will appear as the orange areas on the map.

Alternatively, a project applicant may use the map in Figure H-1 to view the location of Potential Critical Coarse Sediment Yield Areas throughout Encinitas.

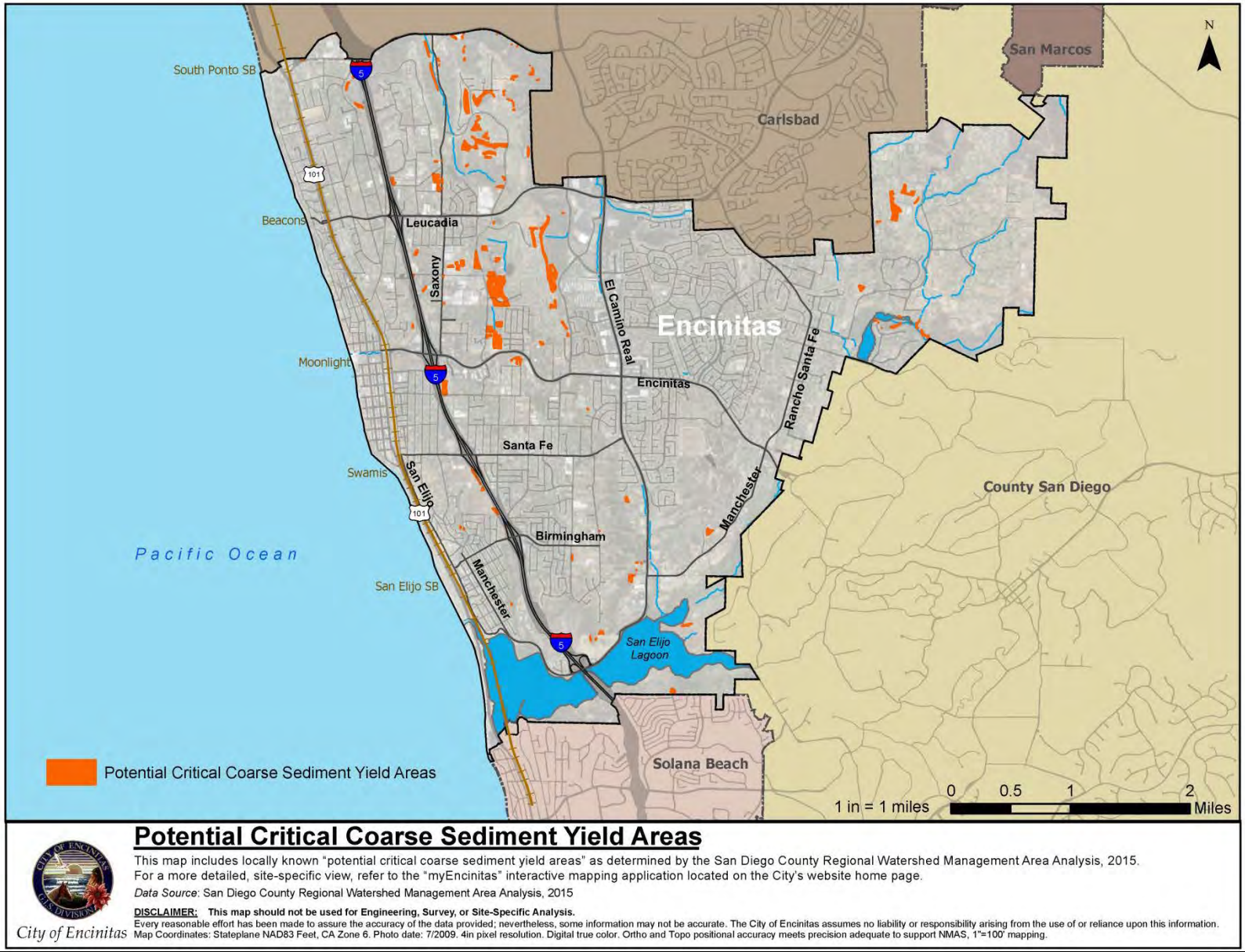
Generally, if the map does not indicate potential critical coarse sediment yield areas may exist within the project drainage boundaries, no further analysis is necessary. However, the City Engineer has the discretion to require additional project-level investigation even when the WMAA map does not indicate the presence of potential critical coarse sediment yield areas within the project site.

If the project is shown to impact potential critical coarse sediment yield areas based on the WMAA map, or if the City Engineer requires, project-level GLU analysis can be performed (see Section 6.2.1). Project-level GLU analysis will either confirm or invalidate the finding of the Regional WMAA maps. For project-level GLU analysis, the civil engineer shall determine slopes, geology, and land cover categories existing at the project site, and intersect this data to determine GLUs existing at the project site. The data provided in H.1 will assist the civil engineer to characterize the site.

When it has been determined based on the GLU analysis that potential critical coarse sediment yield

areas are present within the project boundary, and it has been determined that downstream systems require protection (see Section 6.2.2), additional analysis may be performed that may refine the extents of actual critical coarse sediment yield areas to be protected onsite (see Section 6.2.3). Procedures for additional analysis are provided in H.2.

Figure H-1: Potential Critical Coarse Sediment Yield Areas within the City of Encinitas



H.1 Criteria for GLU Analysis

There are four slope categories in the GLU analysis. Category numbers shown (1 to 4) were assigned for the purpose of GIS processing.

- 0% to 10% (1)
- 10% to 20% (2)
- 20% to 40% (3)
- >40% (4)

There are seven geology categories in the GLU analysis:

- Coarse bedrock (CB)
- Coarse sedimentary impermeable (CSI)
- Coarse sedimentary permeable (CSP)
- Fine bedrock (FB)
- Fine sedimentary impermeable (FSI)
- Fine sedimentary permeable (FSP)
- Other (O)

There are six land cover categories in the GLU analysis:

- Agriculture/grass
- Forest
- Developed
- Scrub/shrub
- Other
- Unknown

Project site slopes shall be classified into the categories based on project-level topography. Project site geology may be determined from geologic maps (may be the same as regional-level information) or classified in the field by a qualified geologist. Table H-1.1 provides information to classify geologic map units into each geology category. Project site land cover shall be determined from aerial photography and/or field visit. For reference, Table H-1.2 provides information to classify land cover categories from the SanGIS Ecology-Vegetation data set into land cover categories. The civil engineer shall not rely on the SanGIS Ecology-Vegetation data set to identify actual land cover at the project site (for project-level investigation land cover must be confirmed by aerial photo or field visit). Intersect the geologic categories, land cover categories, and slope categories within the project boundary to create GLUs. The GLUs listed in Table H-1.3 (also shown in Table 6-1) are considered to be potential critical coarse sediment yield areas. The GLU nomenclature is presented in the following format: Geology–Land Cover–Slope Category (e.g., "CB-Agricultural/ Grass-3", a GLU consisting of coarse bedrock geology, agricultural/grass land cover, and 20% to 40% slope).

Table H.1-1: Geologic Grouping for Different Map Units

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
gr-m	Jennings; CA	Coarse	Bedrock	Impermeable	CB
grMz	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Jcr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jhc	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jsp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ka	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcc	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kdl	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgbf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgdf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgh	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm1	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm2	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm3	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm4	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgu	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB
Khg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ki	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kis	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kjd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
KJem	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
KJld	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kjv	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Klb	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Klh	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Klp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Km	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmgp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kpa	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kpv	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kqbd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Krm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Krr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kt	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ktr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kvc	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwsr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
m	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Mzd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzq	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzs	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
sch	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Kp	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ql	El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
QTf	El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Ec	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI
K	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI
Kccg	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Kcs	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Kl	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Ku	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI
Qvof	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop8a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop9a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmsc	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmss	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tp	San Diego & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tpm	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsc	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tscu	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsd	San Diego & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsdcg	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsdss	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsm	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tso	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tst	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tt	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tta	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmv	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsi	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa11	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa12	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa13	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoc	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop1	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Qvop10	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop10a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop11	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop11a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop12	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop13	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop2	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop3	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop4	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop5	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop6	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop7	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop8	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop9	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsa	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qof	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qof1	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qof2	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Q	Jennings; CA	Coarse	Sedimentary	Permeable	CSP
Qa	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qd	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qf	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qmb	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qw	San Diego & Oceanside	Coarse	Sedimentary	Permeable	CSP

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
	30' x 60'				
Qyf	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qt	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa1-2	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa2-6	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa5	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa6	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa7	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoc	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop1	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qc	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qu	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop2-4	San Diego 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop3	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop4	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop6	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop7	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qya	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qyc	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Mzu	San Diego & Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
gb	Jennings; CA	Fine	Bedrock	Impermeable	FB
JTRm	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kat	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Kc	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kgb	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
KJvs	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kmv	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Ksp	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kvsp	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Kwmt	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Qv	Jennings; CA	Fine	Bedrock	Impermeable	FB
Tba	San Diego 30' x 60'	Fine	Bedrock	Impermeable	FB
Tda	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Tv	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Tvsr	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Kgdfg	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Ta	San Diego 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tcs	Oceanside 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Td	San Diego & Oceanside 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Td+Tf	San Diego 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Qls	San Diego, Oceanside & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tm	Oceanside 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tf	San Diego, Oceanside & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tfr	El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
To	San Diego & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Qpe	San Diego & Oceanside 30' x 60'	Fine	Sedimentary	Permeable	FSP
Mexico	San Diego 30' x 60'	NA	NA	Permeable	Other
Kuo	San Diego 30' x 60'	NA (Offshore)	NA	Permeable	Other
Teo	San Diego & Oceanside 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
Tmo	Oceanside 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
Qmo	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
QTso	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
af	San Diego & Oceanside 30' x 60'	Variable, dependent on source material	Sedimentary		Other

Table H.1-2: Land Cover Grouping for SanGIS Ecology-Vegetation Data Set

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
1	42000 Valley and Foothill Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass
2	42100 Native Grassland		Agricultural/Grass
3	42110 Valley Needlegrass Grassland		Agricultural/Grass
4	42120 Valley Sacaton Grassland		Agricultural/Grass
5	42200 Non-Native Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass
6	42300 Wildflower Field		Agriculture/Grass
7	42400 Foothill/Mountain Perennial Grassland		Agriculture/Grass
8	42470 Transmontane Dropseed Grassland		Agriculture/Grass
9	45000 Meadow and Seep		Agriculture/Grass
10	45100 Montane Meadow		Agriculture/Grass
11	45110 Wet Montane Meadow		Agriculture/Grass
12	45120 Dry Montane Meadows		Agriculture/Grass
13	45300 Alkali Meadows and Seeps		Agriculture/Grass
14	45320 Alkali Seep		Agriculture/Grass
15	45400 Freshwater Seep		Agriculture/Grass
16	46000 Alkali Playa Community		Agriculture/Grass
17	46100 Badlands/Mudhill Forbs		Agriculture/Grass
18	Non-Native Grassland		Agriculture/Grass
19	18000 General Agriculture	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Agriculture/Grass
20	18100 Orchards and Vineyards		Agriculture/Grass
21	18200 Intensive Agriculture		Agriculture/Grass
22	18200 Intensive Agriculture - Dairies, Nurseries, Chicken Ranches		Agriculture/Grass
23	18300 Extensive Agriculture - Field/Pasture, Row Crops		Agriculture/Grass
24	18310 Field/Pasture		Agriculture/Grass
25	18310 Pasture		Agriculture/Grass
26	18320 Row Crops		Agriculture/Grass
27	12000 Urban/Developed		Developed
28	12000 Urban/Develpoed		Developed
29	81100 Mixed Evergreen Forest	Forest	Forest
30	81300 Oak Forest		Forest
31	81310 Coast Live Oak Forest		Forest
32	81320 Canyon Live Oak Forest		Forest
33	81340 Black Oak Forest		Forest

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
34	83140 Torrey Pine Forest		Forest
35	83230 Southern Interior Cypress Forest		Forest
36	84000 Lower Montane Coniferous Forest		Forest
37	84100 Coast Range, Klamath and Peninsular Coniferous Forest		Forest
38	84140 Coulter Pine Forest	Forest	Forest
39	84150 Bigcone Spruce (Bigcone Douglas Fir)-Canyon Oak Forest		Forest
40	84230 Sierran Mixed Coniferous Forest		Forest
41	84500 Mixed Oak/Coniferous/Bigcone/Coulter		Forest
42	85100 Jeffrey Pine Forest		Forest
43	11100 Eucalyptus Woodland	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Forest
44	60000 RIPARIAN AND BOTTOMLAND HABITAT	Riparian and Bottomland Habitat	Forest
45	61000 Riparian Forests		Forest
46	61300 Southern Riparian Forest		Forest
47	61310 Southern Coast Live Oak Riparian Forest		Forest
48	61320 Southern Arroyo Willow Riparian Forest		Forest
49	61330 Southern Cottonwood-willow Riparian Forest		Forest
50	61510 White Alder Riparian Forest		Forest
51	61810 Sonoran Cottonwood-willow Riparian Forest		Forest
52	61820 Mesquite Bosque		Forest
53	62000 Riparian Woodlands		Forest
54	62200 Desert Dry Wash Woodland		Forest
55	62300 Desert Fan Palm Oasis Woodland		Forest
56	62400 Southern Sycamore-alder Riparian Woodland		Forest
57	70000 WOODLAND	Woodland	Forest
58	71000 Cismontane Woodland		Forest

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
59	71100 Oak Woodland		Forest
60	71120 Black Oak Woodland		Forest
61	71160 Coast Live Oak Woodland		Forest
62	71161 Open Coast Live Oak Woodland		Forest
63	71162 Dense Coast Live Oak Woodland		Forest
64	71162 Dense Coast Love Oak Woodland		Forest
65	71180 Engelmann Oak Woodland		Forest
66	71181 Open Engelmann Oak Woodland		Forest
67	71182 Dense Engelmann Oak Woodland		Forest
68	72300 Peninsular Pinon and Juniper Woodlands		Forest
69	72310 Peninsular Pinon Woodland		Forest
70	72320 Peninsular Juniper Woodland and Scrub	Woodland	Forest
71	75100 Elephant Tree Woodland		Forest
72	77000 Mixed Oak Woodland		Forest
73	78000 Undifferentiated Open Woodland		Forest
74	79000 Undifferentiated Dense Woodland		Forest
75	Engelmann Oak Woodland		Forest
76	52120 Southern Coastal Salt Marsh		Other
77	52300 Alkali Marsh		Other
78	52310 Cismontane Alkali Marsh		Other
79	52400 Freshwater Marsh		Other
80	52410 Coastal and Valley Freshwater Marsh	Bog and Marsh	Other
81	52420 Transmontane Freshwater Marsh		Other
82	52440 Emergent Wetland		Other
83	44000 Vernal Pool		Other
84	44320 San Diego Mesa Vernal Pool	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Other
85	44322 San Diego Mesa Claypan Vernal Pool (southern mesas)		Other
86	13100 Open Water	Non-Native Vegetation,	Other

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
87	13110 Marine	Developed Areas, or Unvegetated Habitat	Other
88	13111 Subtidal		Other
89	13112 Intertidal		Other
90	13121 Deep Bay		Other
91	13122 Intermediate Bay		Other
92	13123 Shallow Bay		Other
93	13130 Estuarine		Other
94	13131 Subtidal		Other
95	13133 Brackishwater		Other
96	13140 Freshwater	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Other
97	13200 Non-Vegetated Channel, Floodway, Lakeshore Fringe		Other
98	13300 Saltpan/Mudflats		Other
99	13400 Beach		Other
100	21230 Southern Foredunes	Dune Community	Scrub/Shrub
101	22100 Active Desert Dunes		Scrub/Shrub
102	22300 Stabilized and Partially-Stabilized Desert Sand Field		Scrub/Shrub
103	24000 Stabilized Alkaline Dunes		Scrub/Shrub
104	29000 ACACIA SCRUB		Scrub/Shrub
105	63000 Riparian Scrubs	Riparian and Bottomland Habitat	Scrub/Shrub
106	63300 Southern Riparian Scrub		Scrub/Shrub
107	63310 Mule Fat Scrub		Scrub/Shrub
108	63310 Mulefat Scrub		Scrub/Shrub
109	63320 Southern Willow Scrub		Scrub/Shrub
110	63321 Arundo donnax Dominant/Southern Willow Scrub		Scrub/Shrub
111	63330 Southern Riparian Scrub		Scrub/Shrub
112	63400 Great Valley Scrub		Scrub/Shrub
113	63410 Great Valley Willow Scrub		Scrub/Shrub
114	63800 Colorado Riparian Scrub		Scrub/Shrub
115	63810 Tamarisk Scrub		Scrub/Shrub
116	63820 Arrowweed Scrub		Scrub/Shrub
117	31200 Southern Coastal Bluff Scrub	Scrub and Chaparral	Scrub/Shrub
118	32000 Coastal Scrub		Scrub/Shrub
119	32400 Maritime Succulent Scrub		Scrub/Shrub
120	32500 Diegan Coastal Sage Scrub		Scrub/Shrub

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
121	32510 Coastal form		Scrub/Shrub
122	32520 Inland form (> 1,000 ft. elevation)		Scrub/Shrub
123	32700 Riversidian Sage Scrub		Scrub/Shrub
124	32710 Riversidian Upland Sage Scrub		Scrub/Shrub
125	32720 Alluvial Fan Scrub		Scrub/Shrub
126	33000 Sonoran Desert Scrub		Scrub/Shrub
127	33100 Sonoran Creosote Bush Scrub		Scrub/Shrub
128	33200 Sonoran Desert Mixed Scrub		Scrub/Shrub
129	33210 Sonoran Mixed Woody Scrub		Scrub/Shrub
130	33220 Sonoran Mixed Woody and Succulent Scrub	Scrub and Chaparral	Scrub/Shrub
131	33230 Sonoran Wash Scrub		Scrub/Shrub
132	33300 Colorado Desert Wash Scrub		Scrub/Shrub
133	33600 Encelia Scrub		Scrub/Shrub
134	34000 Mojavean Desert Scrub		Scrub/Shrub
135	34300 Blackbush Scrub		Scrub/Shrub
136	35000 Great Basin Scrub		Scrub/Shrub
137	35200 Sagebrush Scrub		Scrub/Shrub
138	35210 Big Sagebrush Scrub		Scrub/Shrub
139	35210 Sagebrush Scrub		Scrub/Shrub
140	36110 Desert Saltbush Scrub		Scrub/Shrub
141	36120 Desert Sink Scrub		Scrub/Shrub
142	37000 Chaparral		Scrub/Shrub
143	37120 Southern Mixed Chaparral		Scrub/Shrub
144	37120 Southern Mixed Chapparal		Scrub/Shrub
145	37121 Granitic Southern Mixed Chaparral		Scrub/Shrub
146	37121 Southern Mixed Chaparral		Scrub/Shrub
147	37122 Mafic Southern Mixed Chaparral		Scrub/Shrub
148	37130 Northern Mixed Chaparral		Scrub/Shrub
149	37131 Granitic Northern Mixed Chaparral		Scrub/Shrub
150	37132 Mafic Northern Mixed Chaparral		Scrub/Shrub
151	37200 Chamise Chaparral		Scrub/Shrub
152	37210 Granitic Chamise Chaparral		Scrub/Shrub
153	37220 Mafic Chamise Chaparral		Scrub/Shrub
154	37300 Red Shank Chaparral		Scrub/Shrub

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
155	37400 Semi-Desert Chaparral		Scrub/Shrub
156	37500 Montane Chaparral		Scrub/Shrub
157	37510 Mixed Montane Chaparral		Scrub/Shrub
158	37520 Montane Manzanita Chaparral		Scrub/Shrub
159	37530 Montane Ceanothus Chaparral		Scrub/Shrub
160	37540 Montane Scrub Oak Chaparral		Scrub/Shrub
161	37800 Upper Sonoran Ceanothus Chaparral		Scrub/Shrub
162	37830 Ceanothus crassifolius Chaparral		Scrub/Shrub
163	37900 Scrub Oak Chaparral		Scrub/Shrub
164	37A00 Interior Live Oak Chaparral		Scrub/Shrub
165	37C30 Southern Maritime Chaparral	Scrub and Chaparral	Scrub/Shrub
166	37G00 Coastal Sage-Chaparral Scrub		Scrub/Shrub
167	37K00 Flat-topped Buckwheat		Scrub/Shrub
168	39000 Upper Sonoran Subshrub Scrub		Scrub/Shrub
169	Diegan Coastal Sage Scrub		Scrub/Shrub
170	Granitic Northern Mixed Chaparral		Scrub/Shrub
171	Southern Mixed Chaparral		Scrub/Shrub
172	11000 Non-Native Vegetation	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Unknown
173	11000 Non-Native VegetionVegetation		Unknown
174	11200 Disturbed Wetland		Unknown
175	11300 Disturbed Habitat		Unknown
176	13000 Unvegetated Habitat		Unknown
177	Disturbed Habitat		Unknown

Table H.1-3: Potential Critical Coarse Sediment Yield Areas

GLU	Geology	Land Cover	Slope (%)
CB-Agricultural/Grass-3	Coarse Bedrock	Agricultural/Grass	20% - 40%
CB-Agricultural/Grass-4	Coarse Bedrock	Agricultural/Grass	>40%
CB-Forest-2	Coarse Bedrock	Forest	10 – 20%
CB-Forest-3	Coarse Bedrock	Forest	20% - 40%
CB-Forest-4	Coarse Bedrock	Forest	>40%
CB-Scrub/Shrub-4	Coarse Bedrock	Scrub/Shrub	>40%
CB-Unknown-4	Coarse Bedrock	Unknown	>40%
CSI-Agricultural/Grass-2	Coarse Sedimentary Impermeable	Agricultural/Grass	10 – 20%
CSI-Agricultural/Grass-3	Coarse Sedimentary Impermeable	Agricultural/Grass	20% - 40%
CSI-Agricultural/Grass-4	Coarse Sedimentary Impermeable	Agricultural/Grass	>40%
CSP-Agricultural/Grass-4	Coarse Sedimentary Permeable	Agricultural/Grass	>40%
CSP-Forest-3	Coarse Sedimentary Permeable	Forest	20% - 40%
CSP-Forest-4	Coarse Sedimentary Permeable	Forest	>40%
CSP-Scrub/Shrub-4	Coarse Sedimentary Permeable	Scrub/Shrub	>40%

H.2 Optional Additional Analysis When Potential Critical Coarse Sediment Yield Areas are Present Onsite

(Adapted from "Step 1" of Section 2.3.i of "Santa Margarita Region HMP," dated May 2014)

As stated in Chapter 6.2.3 of this manual, when it has been determined based on a GLU analysis that potential critical coarse sediment yield areas are present within the project boundary, and it has been determined that downstream systems require protection, additional analysis may be performed that may refine the extents of actual critical coarse sediment yield areas to be protected onsite. The following text, adapted from Chapter 2 of the Santa Margarita Region HMP dated May 2014, describes the process.

Step 1: Determine whether the Portion of the Project Site is a Significant Source of Bed Sediment Supply to the Channel Receiving Runoff

A triad approach will be completed to determine whether the project site is a Significant Source of Bed Sediment Supply to the channel receiving runoff and includes the following components:

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the receiving channel and the onsite channel;

B. Determination of the capability of the channels on the project site to deliver the site Bed Sediment (if present) to the receiving channel; and

C. Present and potential future condition of the receiving channel.

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the channel receiving runoff and the onsite channels

A geotechnical and sieve analysis is the first piece of information to be used in a triad approach to determine if the project site is a Significant Source of Bed Sediment Supply to the assessment channel. An investigation must be completed of the assessment channel to complete a sieve analysis of the Bed Sediment. Two samples will be taken of the assessment channel using the "reach" approach (TS13A, 2007 [United States Army Corps of Engineers. 2007. Guidelines for Sampling Bed Material, Technical Supplement 13A, Part 654 of National Engineering Handbook, New England District. August]). Samples in each of the two locations should be taken using the surface and subsurface bulk sample technique (TS13A, 2007) for a total of four samples. Pebble counts may be required for some channels.

A similar sampling assessment should be conducted on the project site. First-order and greater channels that may be impacted by the PDP (drainage area changed, stabilized, lined or replaced with underground conduits) will be analyzed in each subwatershed. First-order channels are identified as the unbranched channels that drain from headwater areas and develop in the uppermost topographic depressions, where two or more contour crenulations (notches or indentations) align and point upslope (National Engineering Handbook, 2007). First-order channels may, in fact, be field ditches, gullies, or ephemeral gullies (National Engineering Handbook, 2007). One channel per subwatershed that may be impacted on the project site must be assessed. A subwatershed is defined as tributary to a single discharge point at the project site boundary.

The sieve analysis should report the coarsest 90% (by weight) of the sediment for comparison

between the site and the assessment channel. The User should render an opinion if the Bed Sediment found on the site is of similar gradation to the Bed Sediment found in the receiving channel. The opinion will be based on the following information:

- Sieve analysis results
- Soil erodibility (K) factor
- Topographic relief of the project area
- Lithology of the soils on the project site

The User should rate the similarity of onsite Bed Sediment and Bed Sediment collected in the receiving channel as high, medium, or low.

This site soil assessment serves as the first piece of information for the triad approach.

B. Determination of the capability of the onsite channels to deliver Bed Sediment Supply (if present) to the channel receiving runoff from the project site.

The second piece of information is to qualitatively assess the sediment delivery potential of the channels on the project site to deliver the Bed Sediment Supply to the channel receiving runoff from the project site, or the Bed Sediment delivery potential or ratio. There are few documented procedures to estimate the Bed Sediment delivery ratio (see: Williams, J. R., 1977: Sediment delivery ratios determined with sediment and runoff models. IAHS Publication (122): 168-179, as an example); it is affected by a number of factors, including the sediment source, proximity to the receiving channel, onsite channel density, project sub-watershed area, slope, length, land use and land cover, and rainfall intensity. The User will qualitatively assess the Bed Sediment delivery potential and rate the potential as high, medium, or low.

C. Present and potential future condition of the channel receiving runoff from the project site.

The final piece of information is the present and potential future condition of the channel receiving runoff from the project site. The User should assess the receiving channel for the following:

- Bank stability – Receiving channels with unstable banks may be more sensitive to changes in Bed Sediment Load.
- Degree of incision – Receiving channels with moderate to high incision may be more sensitive to changes in Bed Sediment Load.
- Bed Sediment gradation – Receiving channels with more coarse Bed Sediment (such as gravel) are better able to buffer change in Bed Sediment Load as compared to beds with finer gradation of Bed Sediment (sand).
- Transport vs. supply limited channels. Receiving channels that are transport limited may be better able to buffer changes in Bed Sediment Load as compared to channels that are supply

limited.

The User will qualitatively assess the channel receiving runoff from the project site using the gathered observations and rate the potential for adverse response based on a change in Bed Sediment Load as high, medium, or low.

[Interpreting the results of A, B, and C]

The User should use the triad assessment approach, weighting each of the components based on professional judgment to determine if the project site provides a Significant Source of Bed Sediment Supply to the receiving channel, and the impact the PDP would have on the receiving channel. The final assessment and recommendation must be documented in the HMP portion of the [SWQMP].

The recommendation may be any of the following:

- Site is a Significant Source of Bed Sediment Supply – all channels on the project site must be preserved or by-passed within the site plan.
- Site is a source of Bed Sediment Supply – some of the channels on the project site must be preserved (with identified channels noted).
- Site is not a Significant Source of Bed Sediment Supply.

The final recommendation will be guided by the triad assessment. Projects with predominantly "high" values for each of the three assessment areas would indicate preservation of channels on the project site. Sites with predominantly "medium" values may warrant preservation of some of the channels on the project site, and sites with generally "low" values would not require site design considerations for Bed Sediment Load.

Appendix

I

Forms and Checklists

Appendix I Forms and Checklists

The following Forms/Checklists/Worksheets were developed for use by the project applicant to document the stormwater management design:

- I-1: Applicability of Permanent, Post-Construction Stormwater BMP Requirements
- I-2: Project Type Determination Checklist (Standard Project or PDP)
- I-3A: Site Information Checklist for Standard Projects
- I-3B: Site Information Checklist for PDPs
- I-4: Source Control BMP Checklist for All Development Projects
- I-5: Site Design BMP Checklist for All Development Projects
- I-6: Summary of PDP Structural BMPs
- I-7: Harvest and Use Feasibility Screening Checklist
- I-8: Categorization of Infiltration Feasibility Condition
- I-9: Factor of Safety and Design Infiltration Rate
- I-10: Determination of Downstream Systems Requirements for Preservation of Coarse Sediment Supply

Applicability of Permanent, Post-Construction Stormwater BMP Requirements **(Stormwater Intake Form for all Development Permit Applications)**	**Form I-1**

Project Identification

Project Name:	
Permit Application Number:	Date:

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".
Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual for guidance.	☐ Yes	Go to Step 2.
	☐ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or exception to PDP definitions? To answer this item, see Section 1.4 of the manual *in its entirety* for guidance, AND complete Form I-2, Project Type Determination.	☐ Standard Project	Stop. Standard Project requirements apply, including Standard Project SWQMP.
	☐ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ Exception to PDP definitions	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	☐ No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (*not required if prior lawful approval does not apply*):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual for guidance.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply:		

Project Type Determination Checklist			Form I-2
Project Information			
Project Name:			
Permit Application Number:			
Project Type Determination: Standard Project or PDP			
The project is (select one): ☐ New Development ☐ Redevelopment			
The total proposed newly created and/or replaced impervious area is: _____ ft² (_____) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☐	(c)	New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (v) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption SIC code 5812). (vi) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (vii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (viii) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Form I-2 Page 2 of 2			
Yes ☐	No ☐	(d)	New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.
Yes ☐	No ☐	(e)	New development projects that support one or more of the following uses: (v) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (vi) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes ☐	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

☐ No – the project is not a PDP (Standard Project).

☐ Yes – the project is a PDP.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: _____ ft² (A)

The total proposed newly created or replaced impervious area is: _____ ft² (B)

Percent impervious surface created or replaced (A/B)*100: _____%

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

☐ greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For Standard Projects	Form I-3A (Standard Projects)
Project Summary Information	
Project Name	
Project Address	
Assessor's Parcel Number(s)	
Permit Application Number	
Project Watershed (Hydrologic Unit)	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☐ Carlsbad 904 ☐ San Dieguito 905 ☐ Penasquitos 906 ☐ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	_____ Acres (_____ Square Feet)
Area to be disturbed by the project (Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Pervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Form I-3A Page 2 of 4
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply) ☐ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information
Existing Land Cover Includes (select all that apply) ☐ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☐ Impervious Areas Description / Additional Information
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☐ NRCS Type D
Existing Natural Hydrologic Features (select all that apply) ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☐ None Description / Additional Information
Description of Existing Site Drainage [How is stormwater runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed stormwater conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe.]

Form I-3A Page 3 of 4
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities
List proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features)
List proposed pervious features of the project (e.g., landscape areas)
Does the project include grading and changes to site topography? ☐ Yes ☐ No Description / Additional Information
Does the project include changes to site drainage (e.g., installation of new stormwater conveyance systems)? ☐ Yes ☐ No Description / Additional Information

Form I-3A Page 4 of 4
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply) ☐ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☐ Need for future indoor & structural pest control ☐ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☐ Fire sprinkler test water ☐ Miscellaneous drain or wash water ☐ Plazas, sidewalks, and parking lots

Site Information Checklist For PDPs	Form I-3B (PDPs)
Project Summary Information	
Project Name	
Project Address	
Assessor's Parcel Number(s)	
Permit Application Number	
Project Watershed (Hydrologic Unit)	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☐ Carlsbad 904 ☐ San Dieguito 905 ☐ Penasquitos 906 ☐ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	_____ Acres (_____ Square Feet)
Area to be disturbed by the project (Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Project Proposed Pervious Area (subset of Project Area)	_____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Form I-3B Page 2 of 9
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☐ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information:
Existing Land Cover Includes (select all that apply): ☐ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☐ Impervious Areas Description / Additional Information:
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☐ NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☐ 10 feet < Groundwater Depth < 20 feet ☐ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☐ None Description / Additional Information:

Form I-3B Page 3 of 9
Description of Existing Site Topography and Drainage [How is stormwater runoff conveyed from the site? At a minimum, this description should answer (1) whether existing drainage conveyance is natural or urban; (2) describe existing constructed stormwater conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe]:

Form I-3B Page 4 of 9
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities:
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
List/describe proposed pervious features of the project (e.g., landscape areas):
Does the project include grading and changes to site topography? ☐ Yes ☐ No Description / Additional Information:
Does the project include changes to site drainage (e.g., installation of new stormwater conveyance systems)? ☐ Yes ☐ No Description / Additional Information:

Form I-3B Page 5 of 9
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☐ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☐ Need for future indoor & structural pest control ☐ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☐ Fire sprinkler test water ☐ Miscellaneous drain or wash water ☐ Plazas, sidewalks, and parking lots

Form I-3B Page 6 of 9		
Identification of Receiving Water Pollutants of Concern		
Describe path of stormwater from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):		
List any 303(d) impaired water bodies within the path of stormwater from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs for the impaired water bodies:		
303(d) Impaired Water Body	**Pollutant(s)/Stressor(s)**	**TMDLs**
Identification of Project Site Pollutants* ***Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)**		
Identify pollutants expected from the project site based on all proposed use(s) of the site (see manual Appendix B.6):		

Pollutant	Not Applicable to the Project Site	Expected from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

Form I-3B Page 7 of 9

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the manual)?

- ☐ Yes, hydromodification management flow control structural BMPs required.
- ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

- ☐ Yes
- ☐ No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?

- ☐ 6.2.1 Verification of GLUs Onsite
- ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
- ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
- ☐ No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

- ☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.
- ☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.
- ☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Form I-3B Page 8 of 9
Flow Control for Post-Project Runoff*   ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.
Has a geomorphic assessment been performed for the receiving channel(s)?   ☐ No, the low flow threshold is 0.1Q2 (default low flow threshold)   ☐ Yes, the result is the low flow threshold is 0.1Q2   ☐ Yes, the result is the low flow threshold is 0.3Q2   ☐ Yes, the result is the low flow threshold is 0.5Q2   If a geomorphic assessment has been performed, provide title, date, and preparer: Discussion / Additional Information: (optional)

Form I-3B Page 9 of 9
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence stormwater management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Source Control BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form I-4

Project Identification

Project Name

Permit Application Number

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-4 not implemented:			

Form I-4 Page 2 of 2			
Source Control Requirement	**Applied?**		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐ Onsite storm drain inlets	☐ Yes	☐ No	☐ N/A
☐ Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☐ N/A
☐ Interior parking garages	☐ Yes	☐ No	☐ N/A
☐ Need for future indoor & structural pest control	☐ Yes	☐ No	☐ N/A
☐ Landscape/outdoor pesticide use	☐ Yes	☐ No	☐ N/A
☐ Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☐ N/A
☐ Food service	☐ Yes	☐ No	☐ N/A
☐ Refuse areas	☐ Yes	☐ No	☐ N/A
☐ Industrial processes	☐ Yes	☐ No	☐ N/A
☐ Outdoor storage of equipment or materials	☐ Yes	☐ No	☐ N/A
☐ Vehicle and equipment cleaning	☐ Yes	☐ No	☐ N/A
☐ Vehicle/equipment repair and maintenance	☐ Yes	☐ No	☐ N/A
☐ Fuel dispensing areas	☐ Yes	☐ No	☐ N/A
☐ Loading docks	☐ Yes	☐ No	☐ N/A
☐ Fire sprinkler test water	☐ Yes	☐ No	☐ N/A
☐ Miscellaneous drain or wash water	☐ Yes	☐ No	☐ N/A
☐ Plazas, sidewalks, and parking lots	☐ Yes	☐ No	☐ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form I-5

Project Identification

Project Name
Permit Application Number

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			
SD-3 Minimize Impervious Area	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			

Form I-5 Page 2 of 2			
Site Design Requirement	**Applied?**		
SD-5 Impervious Area Dispersion	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	☐ N/A
Discussion / justification if SD-8 not implemented:			

Summary of PDP Structural BMPs	Form I-6 (PDPs)
Project Identification	
Project Name	
Permit Application Number	
PDP Structural BMPs	
All PDPs must implement structural BMPs for stormwater pollutant control (see Chapter 5 of the manual). Selection of PDP structural BMPs for stormwater pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the manual). Both stormwater pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing stormwater pollutant control BMPs presented in Section 5.1 of the manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. (Continue on page 2 as necessary.)	

Form I-6 Page 2 of 3
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No.	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms if required by the City Engineer (See Section 1.12 of the manual)	
Who will be the final owner of this BMP?	
Who will maintain this BMP into perpetuity?	
What is the funding mechanism for maintenance?	
Discussion (as needed):	

Harvest and Use Feasibility Checklist	Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]

3. Calculate the DCV using worksheet B-2.1.

DCV = _____ (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☐ No ⇨ ⇩	☐ Yes / ☐ No ⇨ ⇩	☐ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.

☐ No, select alternate BMPs.

Categorization of Infiltration Feasibility Condition	Form I-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, stormwater pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, stormwater pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet			Form I-9		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

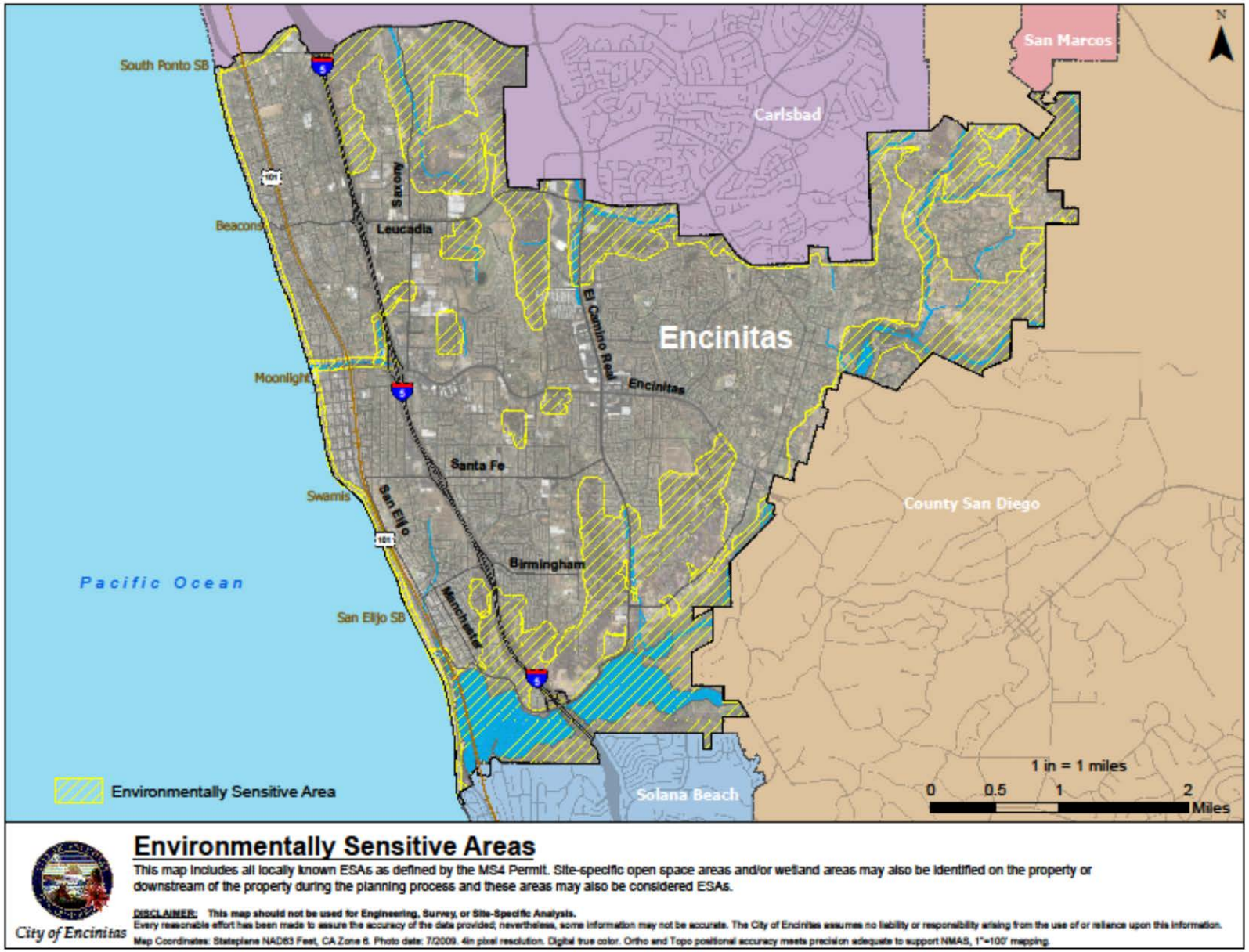
Downstream Systems Requirements for Preservation of Coarse Sediment Supply		Form I-10	
When it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Use this form to document the evaluation of downstream systems requirements for preservation of coarse sediment supply.			
Project Name:			
Project Tracking Number / Permit Application Number:			
1	Will the project discharge runoff to a hardened MS4 system (pipe or lined channel) or an un-lined channel?	☐ Hardened MS4 system	Go to 2
		☐ Un-lined channel	Go to 4
2	Will the hardened MS4 system convey sediment (e.g., a concrete-lined channel with steep slope and cleansing velocity) or sink sediment (e.g., flat slopes, constrictions, treatment BMPs, or ponds with restricted outlets within the system will trap sediment and not allow conveyance of coarse sediment from the project site to an un-lined system).	☐ Convey	Go to 3
		☐ Sink	Go to 7
3	What kind of receiving water will the hardened MS4 system convey the sediment to?	☐ Un-lined channel	Go to 4
		☐ Lake ☐ Reservoir ☐ Bay	Go to 7
		☐ Lagoon ☐ Ocean	Go to 6
4	Is the un-lined channel impacted by deposition of sediment? This condition must be documented by the local agency.	☐ Yes	Go to 7
		☐ No	Go to 5

Form I-10 Page 2 of 2	
5	End – Preserve coarse sediment supply to protect un-lined channels from accelerated erosion due to reduction of coarse sediment yield from the project site unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply) (see Section 6.2.3 and Appendix H.2 of the manual).
6	End – Provide management measures for preservation of coarse sediment supply (protect beach sand supply).
7	End – Downstream system does not warrant preservation of coarse sediment supply, no measures for protection of critical coarse sediment yield areas onsite are necessary. Use the space below to describe the basis for this finding for the project.

Appendix

J

Environmentally Sensitive Areas Map


South Ponto SB
Carlsbad
San Marcos
N
Saxony
Leucadia
Beacons
El Camino Real
Encinitas
Moonlight
Encinitas
Santa Fe
Swamis
San Elijo
County San Diego
Birmingham
Pacific Ocean
Manchester
San Elijo SB
Solana Beach
1 in = 1 miles
0 0.5 1 2
Miles
Environmentally Sensitive Area
Environmentally Sensitive Areas
This map includes all locally known ESAs as defined by the MS4 Permit. Site-specific open space areas and/or wetland areas may also be identified on the property or downstream of the property during the planning process and these areas may also be considered ESAs.
DISCLAIMER: This map should not be used for Engineering, Survey, or Site-Specific Analysis.
Every reasonable effort has been made to assure the accuracy of the data provided; nevertheless, some information may not be accurate. The City of Encinitas assumes no liability or responsibility arising from the use of or reliance upon this information.
Map Coordinates: Stateplane NAD83 Feet, CA Zone 6. Photo date: 7/2009. 4in pixel resolution. Digital true color. Ortho and Topo positional accuracy meets precision adequate to support NMAS, 1"=100' mapping.
City of Encinitas

Glossary of Key Terms

50% Rule	Refers to an MS4 Permit standard for redevelopment PDPs (PDPs on previously developed sites) that defines whether the redevelopment PDP must meet stormwater management requirements for the entire development or only for the newly created or replaced impervious surface. Refer to **Section 1.7**.
Aggregate	Hard, durable material of mineral origin typically consisting of gravel, crushed stone, crushed quarry or mine rock. Gradation varies depending on application within a BMP as bedding, filter course, or storage.
Aggregate Storage Layer	Layer within a BMP that serves to provide a conduit for conveyance, detention storage, infiltration storage, saturated storage, or a combination thereof.
Alternative Compliance Programs	A program that allows PDPs to participate in an offsite mitigation project in lieu of implementing the onsite structural BMP performance requirements required under the MS4 Permit. Refer to **Section 1.8** for more information on alternative compliance programs.
Bed Sediment	The part of the sediment load in channel flow that moves along the bed by sliding or saltation, and part of the suspended sediment load, that principally constitutes the channel bed.
Bedding	Aggregate used to establish a foundation for structures such as pipes, manholes, and pavement.
Biodegradation	Decomposition of pollutants by biological means.
Biofiltration BMPs	Biofiltration BMPs are shallow basins filled with treatment media and drainage rock that treat stormwater runoff by capturing and detaining inflows prior to controlled release through minimal incidental infiltration, evapotranspiration, or discharge via underdrain or surface outlet structure. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and/or vegetative uptake. These BMPs must be sized to:[a] Treat 1.5 times the DCV not reliably retained onsite, OR[b] Treat the DCV not reliably retained

	onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite. (See **Section 5.5.3** and **Appendix B.5** for illustration and additional information).
Biofiltration Treatment	Treatment from a BMP meeting the biofiltration standard.
Biofiltration with Partial Retention BMPs	Biofiltration with partial retention BMPs are shallow basins filled with treatment media and drainage rock that manage stormwater runoff through infiltration, evapotranspiration, and biofiltration. Partial retention is characterized by a subsurface stone infiltration storage zone in the bottom of the BMP below the elevation of the discharge from the underdrains. The discharge of biofiltered water from the underdrain occurs when the water level in the infiltration storage zone exceeds the elevation of the underdrain outlet. (See **Section 5.5.2.1** for illustration and additional information).
Bioretention BMPs	Vegetated surface water systems that filter water through vegetation and soil, or engineered media prior to infiltrating into native soils. Bioretention BMPs in this manual retain the entire DCV prior to overflow to the downstream conveyance system. (See **Section 5.5.1.2** for illustration and additional information).
BMP	A procedure or device designed to minimize the quantity of runoff pollutants and / or volumes that flow to downstream receiving water bodies. Refer to **Section 2.2.2.1**.
BMP Sizing Calculator	An on-line tool that was developed under the 2007 MS4 Permit to facilitate the sizing factor method for designing flow control BMPs for hydromodification management. The BMP Sizing Calculator has been discontinued as of June 30, 2014.
Cistern	A vessel for storing water. In this manual, a cistern is typically a rain barrel, tank, vault, or other artificial reservoir.
Coarse Sediment Yield Area	A GLU with coarse-grained geologic material (material that is expected to produce greater than 50% sand when weathered). See the following terms modifying coarse sediment yield area: critical, potential critical.
Compact Biofiltration BMP	A biofiltration BMP, either proprietary or non-proprietary in origin, that is designed to provide stormwater pollutant control within a smaller footprint than a typical biofiltration BMP, usually through use

of specialized media that is able to efficiently treat high stormwater inflow rates.

Conditions of Approval

Requirements a jurisdiction may adopt for a project in connection with a discretionary action (e.g., issuance of a use permit). COAs may include features to be incorporated into the final plans for the project and may also specify uses, activities, and operational measures that must be observed over the life of the project.

Contemporary Design Standards

This term refers to design standards that are reasonably consistent with the current state of practice and are based on desired outcomes that are reasonably consistent with the context of the MS4 Permit and Model BMP Design Manual. For example, a detention basin that is designed solely to mitigate peak flow rates would not be considered a contemporary water quality BMP design because it is not consistent with the goal of water quality improvement. Current state of the practice recognizes that a drawdown time of 24 to 72 hour is typically needed to promote settling. For practical purposes, design standards can be considered "contemporary" if they have been published within the last 10 years, preferably in California or Washington State, and are specifically intended for stormwater quality management.

Continuous Simulation Modeling

A method of hydrological analysis in which a set of rainfall data (typically hourly for 30 years or more) is used as input, and a continuous runoff hydrograph is calculated over the same time period. Continuous simulation models typical track dynamic soil and storage conditions during and between storm events. The output is then analyzed statistically for the purposes of comparing runoff patterns under different conditions (for example, pre- and post-development-project).

Copermittees

See Jurisdiction.

Critical Channel Flow (Qc)

The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Critical Coarse Sediment Yield Areas

A GLU with coarse-grained geologic material and high relative sediment production, where the sediment produced is critical to the receiving stream (a source of bed material to the receiving stream). See

	also: potential critical coarse sediment yield area.
Critical Shear Stress	The shear stress that initiates channel bed movement or that erodes the toe of channel banks. See also critical channel flow.
DCV	A volume of stormwater runoff produced from the 85th percentile, 24-hour storm event. See **Section 2.2.2.2**.
De Minimis DMA	De minimis DMAs are very small areas that are not considered to be significant contributors of pollutants, and are considered not practicable to drain to a BMP. See **Section 5.2.2**.
Depth	The distance from the top, or surface, to the bottom of a BMP component.
Detention	Temporarily holding back stormwater runoff via a designed outlet (e.g., underdrain, orifice) to provide flow rate and duration control.
Detention Storage	Storage that provides detention as the outflow mechanism.
Development Footprint	The limits of all grading and ground disturbance, including landscaping, associated with a project.
Development Project	Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects. Includes both new development and redevelopment. Also includes whole of the action as defined by CEQA. See **Section 1.3.**
Direct Discharge	The connection of project site runoff to an exempt receiving water body, which could include an exempt river reach, reservoir or lagoon. To qualify as a direct discharge, the discharge elevation from the project site outfall must be at or below either the normal operating water surface elevation or the reservoir spillway elevation, and properly designed energy dissipation must be provided. "Direct discharge" may be more specifically defined by each municipality.
Direct Infiltration	Infiltration via methods or devices, such as dry wells or infiltration trenches, designed to bypass the mantle of surface soils that is unsaturated and more organically active and transmit runoff directly to deeper subsurface soils.
DMAs	See **Section 3.3.3**.

Drawdown Time	The time required for a stormwater detention or infiltration facility to drain and return to the dry-weather condition. For detention facilities, drawdown time is a function of basin volume and outlet orifice size. For infiltration facilities, drawdown time is a function of basin volume and infiltration rate.
Enclosed Embayments (Enclosed Bays)	Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters. In San Diego: Mission Bay and San Diego Bay.
Environmentally Sensitive Areas (ESAs)	Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.
Filter Course	Aggregate used to prevent particle migration between two different materials when stormwater runoff passes through.
Filter Fabric	A permeable textile material, also termed a non-woven geotextile, that prevents particle migration between two different materials when stormwater runoff passes through.
Filtration	Controlled seepage of stormwater runoff through media, vegetation, or aggregate to reduce pollutants via physical separation.
Flow Control	Control of runoff rates and durations as required by the HMP.
Flow Control BMP	A structural BMP designed to provide control of post-project runoff flow rates and durations for the purpose of hydromodification management.
Flow-thru Treatment	Treatment from a BMP meeting the flow-thru treatment control standard.
Flow-Thru Treatment	Flow-thru treatment control BMPs are structural, engineered facilities

BMPs	that are designed to remove pollutants from stormwater runoff using treatment processes that do not incorporate significant biological methods. Flow-thru BMPs include vegetated swales, media filters, sand filters, and dry extended detention basins. (See **Section 5.5.4** for illustration and additional information).
Forebay	An initial storage area at the entrance to a structural BMP designed to trap and settle out solid pollutants such as sediment in a concentrated location, to provide pre-treatment within the structural BMP and facilitate removal of solid pollutants during maintenance operations.
Full Infiltration	Infiltration of a stormwater runoff volume equal to the DCV.
Geomorphic Assessment	A quantification or measure of the changing properties of a stream channel.
Geomorphically Significant Flows	Flows that have the potential to cause, or accelerate, stream channel erosion or other adverse impacts to beneficial stream uses. The range of geomorphically significant flows was determined as part of the development of the March 2011 Final HMP, and has not changed under the 2013 MS4 Permit. However, under the 2013 MS4 Permit, Q2 and Q10 must be based on the pre-development condition rather than the pre-project condition, meaning that no pre-project impervious area may be considered in the computation of pre-development Q2 and Q10.
GLUs	Classifications that provide an estimate of sediment yield based upon three factors: geology, hillslope, and land cover. GLUs are developed based on the methodology presented in the SCCWRP Technical Report 605 titled "Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge" (SCCWRP, 2010).
Gross Pollutants	In stormwater, generally litter (trash), organic debris (leaves, branches, seeds, twigs, grass clippings), and coarse sediments (inorganic breakdown products from soils, pavement, or building materials).
Harvest and Use BMP	Harvest and use (aka rainwater harvesting) BMPs capture and store stormwater runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. (See **Section 5.5.1.1** for illustration and additional information).

HMP	A plan implemented by the Copermittees so that post-project runoff shall not exceed estimated pre-development rates and/or durations by more than 10%, where increased runoff would result in increased potential for erosion or other adverse impacts to beneficial uses. The March 2011 Final HMP and the updated MS4 Permit are the basis of the flow control requirements of this manual.
Hungry Water	Also known as "sediment-starved" water, "hungry" water refers to channel flow that is hungry for sediment from the channel bed or banks because it currently contains less bed material sediment than it is capable of conveying. The "hungry water" phenomenon occurs when the natural sediment load decreases and the erosive force of the runoff increases as a natural counterbalance, as described by Lane's Equation.
Hydraulic Head	Energy represented as a difference in elevation, typically as the difference between the inlet and outlet water surface elevation for a BMP.
Hydraulic Residence Time	The length of time between inflow and outflow that runoff remains in a BMP.
Hydrologic Soil Group	Classification of soils by the Natural Resources Conservation Service (NRCS) into A, B, C, and D groups according to infiltration capacity.
Hydromodification	The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive stream-bank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.
Hydromodification Management BMP	A structural BMP for the purpose of hydromodification management, either for protection of critical coarse sediment yield areas or for flow control. See also flow control BMP.
Impervious Surface	Any material that prevents or substantially reduces infiltration of water into the soil.
Infeasible	As applied to BMPs, refers to condition in which a BMP approach is not practicable based on technical constraints specific to the site,

including by not limited to physical constraints, risks of impacts to environmental resources, risks of harm to human health, or risk of loss or damage to property. Feasibility criteria are provided in this manual.

Infiltration

In the context of LID, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-stormwater, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Infiltration BMP

Infiltration BMPs are structural measures that capture, store and infiltrate stormwater runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. These types of BMPs may also support evapotranspiration processes, but are characterized by having their most dominant volume losses due to infiltration. (See **Section 5.5.1.2** for illustration and additional information).

Jurisdiction

The term "jurisdiction" is used in this manual to refer to individual copermittees who have independent responsibility for implementing the requirements of the MS4 Permit.

LID

A stormwater management and land development strategy that emphasizes conservation and the use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. See **Site Design**.

Lower Flow Threshold

The lower limit of the range of flows to be controlled for hydromodification management. The lower flow threshold is the flow at which erosion of sediment from the stream bed or banks begins to occur. See also critical channel flow. For the San Diego region, the lower flow threshold shall be a fraction (0.1, 0.3, or 0.5) of the pre-development 2-year flow rate based on continuous simulation modeling (0.1Q2, 0.3Q2, or 0.5Q2).

Media

Stormwater runoff pollutant treatment material, typically included as a permeable constructed bed or container (cartridge) within a BMP.

MEP	Refer to the definition in the MS4 Permit. [Appendix C, Definitions, Page C-6]
National Pollutant Discharge Elimination System	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.
New Development	Land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.
O&M	Requirements in the MS4 Permit to inspect structural BMPs and verify the implementation of operational practices and preventative and corrective maintenance in perpetuity.
Partial Infiltration	Infiltration of a stormwater runoff volume less than the DCV.
Partial Retention	Partial retention category is defined by structural measures that incorporate both infiltration (in the lower treatment zone) and biofiltration (in the upper treatment zone).
PDPs	As defined by the MS4 Permit provision E.3.b, land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements in addition to those required of Standard Projects. Refer to **Section 1.4** to determine if your project is a PDP.
PDPs with only Pollutant Control Requirements	PDPs that need to meet Source Control, Site Design and Pollutant Control Requirements (but are exempt from Hydromodification Management Requirements).
PDPs with Pollutant Control and Hydromodification Management Requirements	PDPs that need to meet Source Control, Site Design, Pollutant Control and Hydromodification Management Requirements.
Point of Compliance	1. For channel screening and determination of low flow threshold: the point at which collected stormwater from a development is delivered from a constructed or modified drainage system into a natural or un-lined channel. POC for channel screening may be located onsite or

	offsite, depending on where runoff from the project meets a natural or un-lined channel. 2. For flow control: the point at which pre-development and post-development flow rates and durations will be compared. POC for flow control is typically onsite. A project may have a different POC for channel screening vs. POC for flow control if runoff from the project site is conveyed in hardened systems from the project site boundary to the natural or un-lined channel.
Pollutant Control	Control of pollutants via physical, chemical or biological processes
Pollution Prevention	Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.
Post-Project Hydrology Flows, Volumes	The peak runoff flows and runoff volume anticipated after the project has been constructed taking into account all permeable and impermeable surfaces, soil and vegetation types and conditions after landscaping is complete, detention or retention basins or other water storage elements incorporated into the site design, and any other site features that would affect runoff volumes and peak flows.
Potential Critical Coarse Sediment Yield Area	A GLU with coarse-grained geologic material and high relative sediment production, as defined in the Regional WMAA. The Regional WMAA identified GLUs as potential critical coarse sediment yield areas based on slope, geology, and land cover. GLU analysis does not determine whether the sediment produced is critical to the receiving stream (a source of bed material to the receiving stream) therefore the areas are designated as potential.
Pre-Development Runoff Conditions	Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before any new project disturbance or grading. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment PDP must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.
Pre-Project Condition	The condition prior to any project work or the existing condition. Note that pre-project condition and pre-development condition will not be

	the same for redevelopment projects.
Pretreatment	Removal of gross solids, including organic debris and coarse sediment, from runoff to minimize clogging and increase the effectiveness of BMPs.
Project Area	All areas proposed by an applicant to be altered or developed, plus any additional areas that drain on to areas to be altered or developed. Also see **Section 1.3**.
Project Submittal	Documents submitted to a jurisdiction or Copermittee in connection with an application for development approval and demonstrating compliance with MS4 Permit requirements for the project. Specific requirements vary from municipality to municipality.
Proprietary BMP	BMP designed and marketed by private business for treatment of stormwater. Check with City Engineer prior to proposing to use a proprietary BMP.
Receiving Waters	See **Waters of the United States**.
Redevelopment	The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; and existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.
Regional Water Quality Control Board (SDRWQCB)	California RWQCBs are responsible for implementing pollution control provisions of the Clean Water Act and California Water Code within their jurisdiction. There are nine California RWQCBs.
Retention (Retention BMPs)	A category of BMP that does not have any service outlets that discharge to surface water or to a conveyance system that drains to surface waters for the design event (i.e. 85th percentile 24-hour). Mechanisms used for stormwater retention include infiltration, evapotranspiration, and use of retained water for non-potable or

	potable purposes.
Saturated Storage	Storage that provides a permanent volume of water at the bottom of the BMP as an anaerobic zone to promote denitrification and/or thermal pollution control. Also known as internal water storage or a saturation zone.
Self-mitigating Areas	A natural, landscaped, or turf area that does not generate significant pollutants and drains directly offsite or to the public storm drain system without being treated by a structural BMP. See **Section 5.2.1**.
Self-retaining DMA via Qualifying Site Design BMPs	An area designed to retain runoff to fully eliminate stormwater runoff from the 85th percentile 24 hours storm event; See **Section 5.2.3**.
SIC	A Federal government system for classifying industries by 4-digit code. It is being supplanted by the North American Industrial Classification System but SIC codes are still referenced by the Regional Water Board in identifying development sites subject to regulation under the National Pollutant Discharge Elimination System permit. Information and an SIC search function are available at https://www.osha.gov/pls/imis/sicsearch.html
Significant Redevelopment	Redevelopment that meets the definition of a "PDP" in this manual. See **Section 1.4**.
Site Design	A stormwater management and land development strategy that emphasizes conservation of natural features and the use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.
Sizing Factor Method	A method for designing flow control BMPs for hydromodification management using sizing factors developed from unit area continuous simulation models.
Sorption	Physical and/or chemical process where pollutants are taken out of runoff through attachment to another substance.
Source Control	Land use or site planning practices, or structures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimizes the contact between pollutants and stormwater runoff. Examples include roof

structures over trash or material storage areas, and berms around fuel dispensing areas. Source control BMPs are described within this manual.

Standard Project Any development project that is not defined as a PDP by the MS4 Permit.

Stormwater Conveyance System A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the Clean Water Act that discharges to waters of the United States; (ii) Designated or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works as defined at 40 CFR 122.26.

Stormwater Pollutant Control BMP A category of stormwater management requirements that includes treatment of stormwater to remove pollutants by measures such as retention, biofiltration, and/or flow-thru treatment control, as specified in this manual. Also called a Pollutant Control BMP.

Structural BMP Throughout the manual, the term "structural BMP" is a general term that encompasses the pollutant control BMPs and hydromodification BMPs required for PDPs under the MS4 Permit. A structural BMP may be a pollutant control BMP, a hydromodification management BMP, or an integrated pollutant control and hydromodification management BMP. Structural BMPs as defined in the MS4 Permit are: a subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Subgrade In-situ soil that lies underneath a BMP.

Tributary Area The total surface area of land or hardscape that contributes runoff to the BMP; including any offsite or onsite areas that comingles with project runoff and drains to the BMP. Refer to **Section 3.3.3** for

	additional guidance Also termed the drainage area or catchment area.
Unified BMP Design Approach	This term refers to the standardized process for site and watershed investigation, BMP selection, BMP sizing, and BMP design that is outlined and described in this manual with associated appendices and templates. This approach is considered to be "unified" because it represents a pathway for compliance with MS4 Permit requirements that is anticipated to be reasonably consistent across the local jurisdictions in San Diego County. In contrast, applicants may choose to take an alternative approach where they demonstrate to the satisfaction of the Copermittee, in their submittal, compliance with applicable performance standards without necessarily following the process identified in this manual.
Upper Flow Threshold	The upper limit of the range of flows to be controlled for hydromodification management. For the San Diego region, the upper flow threshold shall be the pre-development 10-year flow rate (Q10) based on continuous simulation modeling.
Vactor	Refers to a sewer or storm drain cleaning truck equipped to remove materials from sewer or storm drain pipes or structures, including some stormwater BMPs.
Vector	An animal or insect capable of transmitting the causative agent of human disease. An example of a vector in San Diego County that is of concern in stormwater management is a mosquito.
Water Quality Improvement Plan	Copermittees are required to develop a Water Quality Improvement Plan for each Watershed Management Area in the San Diego Region. The purpose of the Water Quality Improvement Plans is to guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. WQIPs requirements are defined in the MS4 Permit provision B.
Waters of the United States	Surface bodies of water, including naturally occurring wetlands, streams (perennial, intermittent, and ephemeral (exhibiting bed, bank, and ordinary high water mark)), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean which directly or indirectly receive discharges from stormwater conveyance systems. The Copermittee shall determine the definition for wetlands and the limits

thereof for the purposes of this definition, which shall be as protective as the Federal definition utilized by the United States Army Corps of Engineers and the United States Environmental Protection Agency. Constructed wetlands are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs are not considered receiving waters under this definition, unless the BMP was originally constructed within the boundaries of the receiving waters. Also see MS4 permit definition.

Watershed Management Area

The ten areas defined by the SDRWQCB in Regional MS4 Permit provision B.1, Table B-1. Each Watershed Management Area is defined by one or more Hydrologic Unit, major surface water body, and responsible Copermittee.

Watershed Management Area Analysis

For each Watershed Management Area, the Copermittees have the option to perform a WMAA for the purpose of developing watershed-specific requirements for structural BMP implementation. Each WMAA includes: GIS layers developed to provide physical characteristics of the watershed management area, a list of potential offsite alternative compliance projects, and areas exempt from hydromodification management requirements.