The City of San Diego

PRIORITY DEVELOPMENT PROJECT (PDP) STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR

Project Name: Via Grimaldi CDP
PTS No. 460737

ENGINEER OF WORK:

Michael C. Kinnear, RCE 76785

Insert Civil Engineer's Name and PE Number Here
Provide Wet Signature and Stamp Above Line

PREPARED FOR:

Charles Ross
4962 Concannon Court
San Diego, CA 92130
(619) 246-8010

PREPARED BY:

COFFEY ENGINEERING, INC.

Coffey Engineering, Inc.
9666 Businesspark Ave., Suite 210
San Diego, CA 92131
(858) 831-0111

DATE:

7/1/16

Approved by: City of San Diego Date

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ACRONYMS

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

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CERTIFICATION PAGE

Project Name:
Permit Application Number:

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

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 Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design 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.

RCE 76785 Expiration Date 12/31/16

Engineer of Work's Signature, PE Number & Expiration Date

Michael C. Kinnear

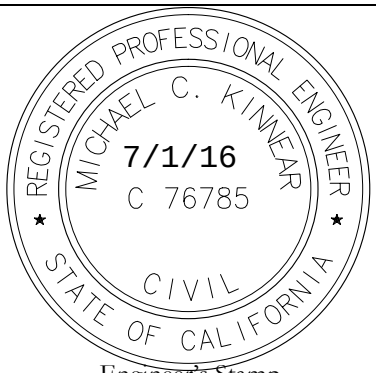
Print Name

Coffey Engineering, Inc.

Company

7/1/16

Date



Engineer's Stamp

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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 last column indicate changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments.

Submittal Number	Date	Project Status	Changes
1	7/1/16	☑ 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	

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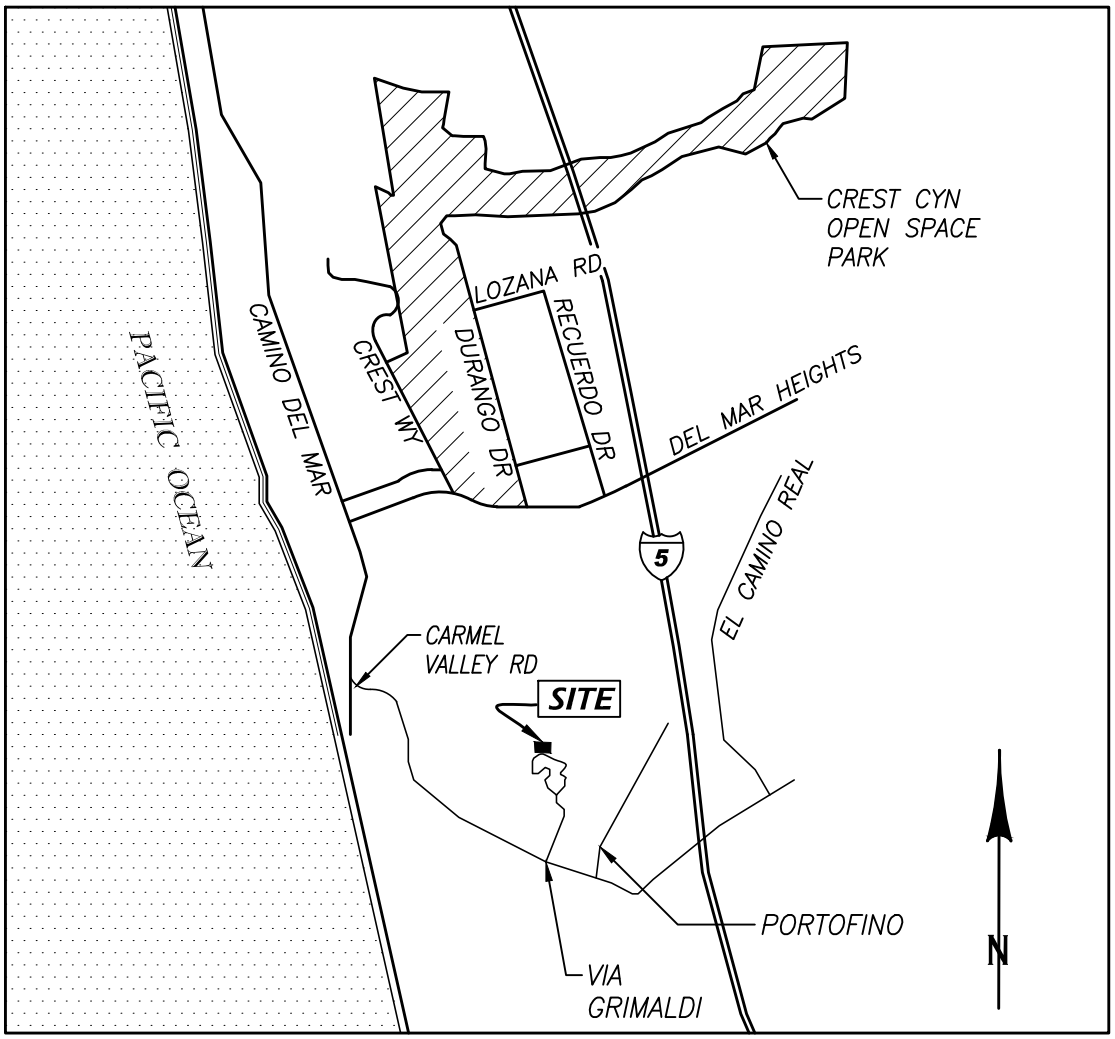
PROJECT VICINITY MAP

Project Name: Via Grimaldi CDP
Permit Application Number: PTS No. 460737



VICINITY MAP

THOMAS BROS. MAP 1207–H1
NO SCALE

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STORM WATER REQUIREMENTS APPLICABILITY CHECKLIST

Complete and attach DS-560 Form included in Appendix A.1

THE CITY OF SAN DIEGO	City of San Diego **Development Services** 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	**Storm Water Requirements Applicability Checklist**	FORM **DS-560** February 2016

Project Address:	Project Number *(for the City Use Only)*:
Via Grimaldi, San Diego, CA 92014	

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1], which is administrated by the State Water Resources Control Board.

For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with construction activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ☐ Yes; SWPPP required, skip questions 2-4 ☑ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ☑ Yes; WPCP required, skip questions 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (projects such as pipeline/utility replacement)

   ☐ Yes; WPCP required, skip question 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit, Right of Way Permit for pot holing.
   - Individual Right of Way Permits that exclusively include one of the following activities and associated curb/ sidewalk repair: water services, sewer lateral, storm drain lateral, or dry utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

Check one of the boxes to the right, and continue to PART B:

☐ If you checked "Yes" for question 1,
a SWPPP is REQUIRED. Continue to PART B

☑ If you checked "No" for question 1, and checked "Yes" for question 2 or 3,
a WPCP is REQUIRED. If the project processes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all question 1-3, and checked "Yes" for question 4
PART B **does not apply and no document is required. Continue to Section 2.**

[1]More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/swguide/constructing.shtml

PART B: Determine Construction Site Priority.

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk. Determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**
   a. Projects located in the ASBS watershed. A map of the ASBS watershed can he found here
   Click here for Map of ASBS Areas

2. ☐ **High Priority**
   a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.
   b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☐ **Medium Priority**
   a. Projects 1 acre or more but not subject to an ASBS or high priority designation.
   b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ☑ **Low Priority**
   a. Projects not subject to ASBS, high or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐Yes ☑No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐Yes ☑No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots, existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐Yes ☑No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."
If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:

   • Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   • Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   • Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ☐Yes; PDP exempt requirements apply ☑No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐Yes; PDP exempt requirements apply ☑No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP). Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".
If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Project".

1. **New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ☐Yes ☑No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces 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

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface. ☐Yes ☑No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ☐Yes ☑No

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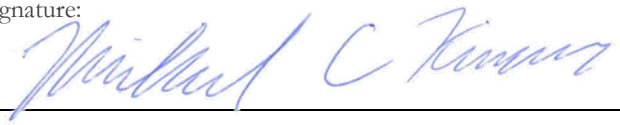
5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☐Yes ☑No
6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☐Yes ☑No
7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges 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).	☑Yes ☐No
8. **New development regardless of size or redevelopment projects that create and/or replace 5,000 square feet of impervious surface of a retail gasoline outlet.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic of 100 or more vehicles per day.	☐Yes ☑No
9. **New development regardless of size or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface of an automotive repair shops.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.	☐Yes ☑No
10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces.	☐Yes ☑No
PART F: Select the appropriate category based on the outcomes of PART C through PART E.	
1. The project is **NOT SUBJECT TO PERMANENT STORM WATER REQUIREMENTS**.	☐
2. The project is a **STANDARD PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	☐
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires hydromodification management.	☑
Name of Owner or Agent *(Please Print)*: Michael C. Kinnear, Coffey Engineering	Title: Design Engineer
Signature: 	Date: 7/1/16

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Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1

Project Identification

Project Name: Via Grimaldi CDP

Permit Application Number: PTS No. 460737 | Date: 4/21/16

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 Part 1 of Storm Water Standards 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 BMP Design Manual (Part 1 of Storm Water Standards) 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):

N/A

Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) in its entirety for guidance, AND complete Storm Water Requirements Applicability Checklist.	☐ Standard Project	Stop. Standard Project requirements apply.
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ PDP Exempt	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.

Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:

Form I-1 Page 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 BMP Design Manual (Part 1 of Storm Water Standards) 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 BMP Design Manual (Part 1 of Storm Water Standards) 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 not apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) 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 not apply: No onsite or upstream CCSYA's.		

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	Via Grimaldi CDP
Project Address	Via Grimaldi, Del Mar, CA 92014
Assessor's Parcel Number(s) (APN(s))	301-061-48
Permit Application Number	PTS No. 460737
Project Watershed	Select One: ☐ San Dieguito River ☑ Penasquitos ☐ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Miramar Hydrologic Area (906.10)
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	0.11 Acres (4,833 Square Feet)
Area to be disturbed by the project (Project Footprint)	0.11 Acres (4,833 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.07 Acres (3,018 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.04 Acres (1,815 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	Increase of 3,018 SQFT %

Form I-3B Page 2 of 11

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:

Minor grading from development of local road

Existing Land Cover Includes (select all that apply):
- ☑ Vegetative Cover
- ☐ Non-Vegetated Pervious Areas
- ☐ Impervious Areas

Description / Additional Information:

Sparse natural vegetation

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
- ☐ NRCS Type A
- ☐ NRCS Type B
- ☐ NRCS Type C
- ☑ NRCS Type D

Assuming D given no geologic investigation

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:

Form I-3B Page 3 of 11

Description of Existing Site Topography and Drainage:

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1. Whether existing drainage conveyance is natural or urban;
2. If runoff from offsite is conveyed through the site? If yes, quantification of 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 storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the 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.

Description / Additional Information:

The existing site can be categorized as natural sheet flow that flows northwest across the site towards a local canyon to the northwest. The site does not experience any off-site run-on. The existing drainage basin is 0.11 acres and experiences flows of 0.22 cfs during the 100 year storm.

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

The project proposes to develop a single family residence with associated hardscape and landscape features. The development will have an impervious footprint of approximately 3,018 ft2 (62.4% impervious)

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

Proposed impervious features consist of the house, sidewalks & walkways around the perimeter of the house, stairs leading from the street to the front door, stairs leading from the backyard to the street.

List/describe proposed pervious features of the project (e.g., landscape areas):

The pervious features of the site consist of landscaping adjacent to the house and walkways as well as pervious paver patio.

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

The existing site slopes from east to west. The project proposes to level the site onto three tiers for use as a parking area, pad for the home, and a back yard area. These level areas will be attained through the use of retaining and stem walls.

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 and 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.

Description / Additional Information:

No current storm drain provisions exist within the site. All run off currently sheet flows to The canyon to the northwest.

The proposed drainage pattern consists of three drainage basins. The upper basin consists of a small sliver of the eastern property line and directs runoff around the site and into the local canyon to the northwest. the major development basin consists of Drainage from the driveway, single family residence, and associated hardscape. Storm flows will be pitched to the surrounding landscaping before sheet flowing to a biofiltration system on the north edge of the site. After being treated, the storm water will be drained to the lower basin via a PVC drain line. The lower basin is a small remnant of the site that will be undeveloped and release via sheet flow to the local canyon to the northwest.

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- ☑ On-site 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
- ☐ Large Trash Generating Facilities
- ☐ Animal Facilities
- ☐ Plant Nurseries and Garden Centers
- ☐ Automotive-related Uses

Description / Additional Information:

Proposed site use is for a single family residence.

Identification and Narrative of Receiving Water

Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable)

The Upper and lower basin will remain undeveloped and continue to drain to the canyon to the northwest
the developed portion of the lot will drain from the bioretention facility to an underground storage facility and then will be pumped to the street. Site storm flows will commingle with other stormwater and drain south along Via Grimaldi until it reaches a public storm drain inlet. The stormwater once in the public drainage system will travel to the Los Penasquitos Lagoon and then into the Pacific Ocean.

Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations.

See next page.

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations.

None.

Provide distance from project outfall location to impaired or sensitive receiving waters.

The Los Penasquitos Lagoon is approximately 0.33 miles to the south of the site.

Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands

The entire site lies within the City's Environmentally Sensitive Lands area. The MHPA area borders the site to the north but does not envelope any area or the site.

Beneficial Uses of Receiving Water

Reservoirs & Lakes	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	REC1	REC2	WARM	COLD	WILD	RARE	POW		
Miramar Reservoir	6.10	●		●				●	●	●		●		●		
Ground Water	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	FRESH	GWR									
Miramar Reservoir	6.10	●	●	●												
Coastal Waters	Hydrologic Unit Basin Number	IND	NAV	REC 1	REC 2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Pacific Ocean		●	●	●	●	●	●		●	●	●	●	●	●		●
Los Penasquitos Lagoon	6.10			●	●	●	●	●	●	●	●		●	●		●
Inland Surface Waters	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Soledad Canyon	6.10	+	●	●					○	●		●	●	●		
Carol Canyon	6.10	+	●	●					○	●		●	●	●	●	
Los Penasquitos Creek	6.10	+	●	●					○	●	●	●		●		
Unnamed Tributary	6.10	+	●	●					○	●		●		●	●	
Carmel Valley	6.10	+	●	●					○	●		●		●		
Deer Canyon	6.10	+	●	●					○	●		●		●		
McGonigle Canyon	6.10	+	●	●					○	●		●		●		
Bell Valley	6.10	+	●	●					○	●		●		●		
Shaw Valley	6.10	+	●	●					○	●		●		●		

+ Excepted from Municipal ● Existing Beneficial Use ○ Potential Beneficial Use

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
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
Los Penasquitos Lagoon	Sedimentation Siltation	Req. Status 5A-Comp. 2019
Los Penasquitos River Mouth	Total Coliform	Req. Status 5A-Comp. 2019

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 anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):			
Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	X		
Nutrients	X		
Heavy Metals	X		
Organic Compounds	X		
Trash & Debris	X		
Oxygen Demanding Substances	X		
Oil & Grease	X		
Bacteria & Viruses	X		
Pesticides	X		

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 Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

☑ No

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.

There is only one Point of Compliance, labeled 'POC 1' on the HMP Exhibit. This point is the discharge point of the outflow pipe from the onsite underground storage area.

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 11 of 11
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. None.
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.

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Source Control BMP Checklist for All Development Projects	Form I-4

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 BMP Design Manual (Part 1 of the Storm Water Standards) 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 BMP Design 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: Project is a single family residence no outdoor material storage proposed			
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: Project is a single family residence no outdoor work areas proposed			
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:			

Form I-4 Page 2 of 2			
Source Control Requirement	Applied?		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site 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/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
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive-related Uses	☐ 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	Form I-5

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 BMP Design Manual (Part 1 of Storm Water Standards) 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 BMP Design 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.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if SD-1 not implemented: No natural drainage pathways within the site.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	
1-3 Implemented trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	
SD-2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-2 not implemented: Size of the lot combined with planned use did not present many opportunities to preserve natural areas. Very little existing onsite vegetation to preserve.			

Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented: Pervious pavers to be used for outdoor patio area.			
SD-4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented: Soil compaction to be minimized in planned landscape areas.			
SD-5 Impervious Area Dispersion	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented: Walkways and sidewalks within site are pitched to landscape areas. Drains are not installed in hardscape.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☑ Yes	☐ No	
5-2 Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☑ Yes	☐ No	
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E?	☐ Yes	☑ No	

Form I-5 Page 3 of 4			
Site Design Requirement	Applied?		
SD-6 Runoff Collection	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented: Green roof not implemented. Permeable pavement implemented.			
6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐ Yes	☑ No	
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	☐ Yes	☑ No	
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: Storm water will be detained on-site within the biofiltration area and undergound storage area, however water collected will not be harvested for future use.			
8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	☑ No	

Form I-5 Page 4 of 4
Insert Site Map with all site design BMPs identified:

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). 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 City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design 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 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.

To address the primary and secondary pollutants of concern, those being sedimentation/siltation & total coliform, structural BMP treatment control options were evaluated for required pollutant removal efficiency for the pollutants of concern. A biofiltration facility was selected which meets the required removal efficiency for all anticipated pollutants from the project.

Runoff from the flat graded area which will contain the house and majority of the landscaping & hardscape will be collected by area drains and will be directed to a single biofiltration area located at the northern border of the site. A perforated underdrain will be incorporated into the base layers of the planter that will allow runoff to filter through the engineered soil layer before discharging from the biofiltration area through a 6" PVC drain discharging to the underground storage area which will then perform hydromodification for the developed project. After water has been detained and released at a low flow threshold stormwater will flow unto a pump system that drains to a curb outlet at the street (see plan sheet C.1 – Grading & Drainage Plan reproduced in Appendix A). An 18"x18" inlet will also be incorporated into the biofiltration area for overflow control.

The hydromodification component (underground storage area) was sized utilizing the design guidelines of Section G.2 based on the pre-development condition. The Water Quality component (biofiltration) was sized utilizing the design guidelines of Section B

(Continue on page 2 as necessary.)

Form I-6 Page 2 of X
(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	
Structural BMP ID No. IMP 1	
Construction Plan Sheet No. Sheet C.1	
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 ○ 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 form DS-563	
Who will be the final owner of this BMP?	The property owner(s) in perpetuity. Current owner is Sue A. Sessa
Who will maintain this BMP into perpetuity?	The property owner(s).
What is the funding mechanism for maintenance?	Funding provided by private property owner(s).

Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No.
Construction Plan Sheet No.
Discussion (as needed):

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. Underground Storage No. 1	
Construction Plan Sheet No. Sheet C.1	
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 ◉ 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 form DS-563	
Who will be the final owner of this BMP?	The property owner(s) in perpetuity. Current owner is Sue A. Sessa
Who will maintain this BMP into perpetuity?	The property owner(s).
What is the funding mechanism for maintenance?	Funding provided by private property owner(s).

Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No.
Construction Plan Sheet No.
Discussion (as needed):

THE CITY OF SAN DIEGO City of San Diego **Development Services** 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	**Permanent BMP Construction** **Self Certification Form**	FORM DS-563 February 2016

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address:	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

CERTIFICATION:

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No. _____; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____

Date of Signature: _____

Printed Name: _____

Title: _____

Phone No. _____

Engineer's Stamp

DS-563 (01-16)

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ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☑ 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 and site design credit calculations	☑ 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 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)

BASIN C
0.00 AC*

BASIN B
0.10 AC

IMP 1
87.5 SQFT
BIOFILTRATION
AREA

BASIN A
0.01 AC

6" INLET
94.1 RIM
92.6 IE

TRW 95.0
BRW 89.6

TRW 93.0
BRW 92.8

TRW 95.0
BRW 89.2

UNDERGROUND
STORAGE
OUTLET

TRW 95.8
BRW 94.0

POC 1
CURB OUTLET
Q100= 0.27 CFS
V100= 3.08 FPS

VIA GRIMALDI

BOT
RIM

95.8
98.8
98.3
109.8
102.0
107.4
108.0
109.13
109.03
105.5
(TC108.22)
(IE107.97)

DS
WM
SDGE VAULT
TEL RISER
TREE
BLOCK WALL
PINES
CREST
SLOPE
CURB
LINE
20'
L=90.94
R=89.97
Δ=57°55'00"

BASIN A:

PERVIOUS AREA: 529.06 SQFT

BASIN B:

IMPERVIOUS AREA: 3,017.74 SQFT

PERVIOUS AREA: 1,174.82 SQFT

BASIN C:

PERVIOUS AREA: 111.21 SQFT

N

5 0 5 10 15

SCALE: 1"=10'

BASIN A: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 529.06 SQFT = 0.01AC

BASIN B: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 4,192.56 SQFT = 0.10AC

BASIN C: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 111.21 SQFT = 0.00AC*
*ACTUAL ACREAGE VALUE ROUNDS TO 0.00 AT THE NEAREST HUNDREDTH

SITE CHARACTERISTICS:

HYDROLOGIC SOILS GROUP:	D*
APPROXIMATE DEPTH TO GROUND WATER:	>15'
CRITICAL COARSE SEDIMENT YIELD AREAS:	NONE

*SITE HYDROLOGIC SOILS POTENTIALLY MAY BE CLASS A DETERMINATION WILL BE MADE AFTER A FULL GEOLOGIC AND GROUND WATER INVESTIGATION IS PERFORMED

DRAINAGE MAP - (P)
DRAINAGE MANAGEMENT AREAS

<table>
<tr><th colspan="2">Harvest and Use Feasibility Checklist</th><th>Form I-7</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: None</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.
DCV = _____ (cubic feet)</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>
<tr><td colspan="3">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.</td></tr>
</table>

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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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, storm water 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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		NO

*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 the City Engineer 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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, storm water 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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: Potentially Hydrologic soil group A based on NRCS maps. Shall be evaluated with further geotechnical & groundwater investigation. Project has been designed to biofilter 1.5 times the DCV. Applicant understands that during the ministerial review for a building permit, project must perform and report a complete feasibility analysis for infiltration with respect to geotechnical and groundwater conditions. 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.		NO

*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 the City Engineer to substantiate findings


117° 15' 2" W
117° 14' 58" W
476570
476580
476590
476600
476610
476620
476630
476640
476650
476660
32° 56' 14" N
32° 56' 12" N
3644360
3644350
3644340
3644330
3644320
3644310
CsD
TeF
Via Grimaldi
Map Scale: 1:434 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 5 10 20 30
Feet
0 20 40 80 120
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 9, Sep 17, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
CsD	Corralitos loamy sand, 9 to 15 percent slopes	A	0.1	31.2%
TeF	Terrace escarpments		0.3	68.8%
Totals for Area of Interest			**0.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

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=	0.48	inches
2	Area tributary to BMP (s)	A=	0.1	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.68	unitless
4	Trees Credit Volume	TCV=	0	cubic-feet
5	Rain barrels Credit Volume	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	118.48	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	118.48	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	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]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	87.5	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	13.125	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	105.36	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18	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	23	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	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)]	9.60	inches
19	Total Depth Treated [Line 17 + Line 18]	39.6	inches

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)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (continued)

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 2 of 2)	
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	158.04	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	47.89	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]	79.02	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	98.77	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	4192.56	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	.68	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	85.53	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	85.53	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]		unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☐ Yes ☐ No	

Note:

1. 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)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.
4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
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 and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP 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)

BASIN C
0.00 AC*

BASIN B
0.10 AC

IMP 1
87.5 SQFT
BIOFILTRATION
AREA

BASIN A
0.01 AC

6" INLET
94.1 RIM
92.6 IE

TRW 95.0
BRW 89.6

TRW 93.0
BRW 92.8

TRW 95.0
BRW 89.2

UNDERGROUND
STORAGE
OUTLET

TRW 95.8
BRW 94.0

POC 1
CURB OUTLET
Q100= 0.27 CFS
V100= 3.08 FPS

VIA GRIMALDI

BOT
RIM

95.8
98.8
98.3
109.8
102.0
107.4
108.0
109.13
109.03
105.5
(TC108.22)
(IE107.97)

DS
WM
SDGE VAULT
TEL RISER
TREE
BLOCK WALL
PINES
CREST
SLOPE
CURB
LINE
20'
L=90.94
R=89.97
Δ=57°55'00"

BASIN A:

PERVIOUS AREA: 529.06 SQFT

BASIN B:

IMPERVIOUS AREA: 3,017.74 SQFT

PERVIOUS AREA: 1,174.82 SQFT

BASIN C:

PERVIOUS AREA: 111.21 SQFT

N

5 0 5 10 15

SCALE: 1"=10'

BASIN A: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 529.06 SQFT = 0.01AC

BASIN B: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 4,192.56 SQFT = 0.10AC

BASIN C: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 111.21 SQFT = 0.00AC*
*ACTUAL ACREAGE VALUE ROUNDS TO 0.00 AT THE NEAREST HUNDREDTH

SITE CHARACTERISTICS:

HYDROLOGIC SOILS GROUP:	D*
APPROXIMATE DEPTH TO GROUND WATER:	>15'
CRITICAL COARSE SEDIMENT YIELD AREAS:	NONE

*SITE HYDROLOGIC SOILS POTENTIALLY MAY BE CLASS A DETERMINATION WILL BE MADE AFTER A FULL GEOLOGIC AND GROUND WATER INVESTIGATION IS PERFORMED

DRAINAGE MAP - (P)
DRAINAGE MANAGEMENT AREAS

Via Grimaldi CDP – Critical Course Sediment Yield Areas Map

Site Information			
Project Name:	Via Grimaldi CDP	Hydrologic Unit:	906.1
Project Applicant:	Charles Ross	Rain Guage:	Oceanside
Jurisdiction	San Diego	Total Project Area:	4832.83
APN:	301-061-48	Low Flow Threshold:	0.1Q2
BMP Name:	IMP 1	BMP Type:	Cistern

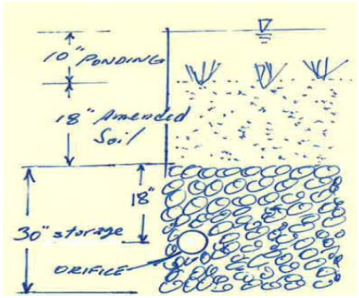
Areas Draining to BMP						Sizing Factors			Min. BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (From Table G.2-1)	Surface Area	Surface Volume	Subsurface Volume	Surface Area (sf)	Surface Volume (CF)	Subsurface Volume (cf)
Basin B	2038.8	A	Low	Roofs	1	N/A	0.16	N/A	N/A	326.21	N/A
Basin B	978.94	A	Low	Concrete	1	N/A	0.16	N/A	N/A	156.63	N/A
Basin B	1174.82	A	Low	Landscape	0.1	N/A	0.16	N/A	N/A	18.80	N/A
Total DMA Area	4192.56							Minimum BMP Size*	N/A	501.64	N/A
								Proposed BMP Size*	N/A	542	N/A

(1) $Q=C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

(2) $A= [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$ Orifice Area Equation (for 0.1Q2 as lower limit threshold)

Cd = 0.6 dimensionless g = 32.2 ft/s2 H = 5.75 ft

Q_2s provided (see 2012 Methodology, Page 1-30, Sec. 1.6, Table 1-6)



Dimentional Analysis indicates a factor of 144 is required:
in2 = {(ft3/sec x acre)x(acre of DMA)/[(ft/sec2)xft]^0.5} x 144 in2/ft2

	Rain Gage	Soil Type	Cover	Slope	Q2 Sizing Factor	DMA Area (ac)	Lower Limit of Q2	**Orifice Area (in2)**
DMA B (B.1+B.2)	Oceanside	D	Scrub	Moderate	0.212	0.1	0.1	**0.03**

0.03	**0.18**
Tot. Orifice Area	**Orifice Dia**

Table 1-6. Unit Runoff Ratios

Rain Gauge	Soil	Cover	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	D	Scrub	Moderate	0.212	0.455

Drawdown Time

Orifice Dia. (ft)	Orifice Dia. (in)	Surface Area (A_{SF})	Void Space (%)	Proposed Storage Volume (V_S)	Drawdown Time (hours)
0.015	0.18	234.0	40.3	542	87.14
void space* = V_S / (A_{SF} x D_S)		40.3%	*assumes vertical side slopes		

Depth of Water in Vault Area (D_S)	Q (ft^3/sec)	∆Vol (ft^3)	∆Time (sec)	∆Time (min)	∆Time (hours)
5.75	0.003400551	0			
5.6667	0.003375819	7.86	2319.38	38.65	0.64
5.5833	0.003350905	7.86	2336.50	38.94	0.64
5.5000	0.003325804	7.86	2354.00	39.23	0.65
5.4167	0.003300513	7.86	2371.90	39.53	0.65
5.3333	0.003275026	7.86	2390.22	39.83	0.66
5.2500	0.003249339	7.86	2408.97	40.14	0.66
5.1667	0.003223447	7.86	2428.16	40.46	0.67
5.0833	0.003197346	7.86	2447.82	40.79	0.67
5.0000	0.00317103	7.86	2467.97	41.13	0.68
4.9167	0.003144494	7.86	2488.62	41.47	0.69
4.8333	0.003117731	7.86	2509.81	41.83	0.69
4.7500	0.003090738	7.86	2531.54	42.19	0.7
4.6667	0.003063506	7.86	2553.84	42.56	0.7
4.5833	0.00303603	7.86	2576.75	42.94	0.71
4.5000	0.003008303	7.86	2600.28	43.33	0.72
4.4167	0.002980318	7.86	2624.47	43.74	0.72
4.3333	0.002952068	7.86	2649.35	44.15	0.73
4.2500	0.002923545	7.86	2674.95	44.58	0.74
4.1667	0.002894741	7.86	2701.31	45.02	0.75
4.0833	0.002865647	7.86	2728.46	45.47	0.75
4.0000	0.002836255	7.86	2756.44	45.94	0.76
3.9167	0.002806556	7.86	2785.31	46.42	0.77
3.8333	0.002776538	7.86	2815.10	46.91	0.78
3.7500	0.002746192	7.86	2845.87	47.43	0.79
3.6667	0.002715508	7.86	2877.67	47.96	0.79
3.5833	0.002684472	7.86	2910.56	48.5	0.8
3.5000	0.002653074	7.86	2944.61	49.07	0.81
3.4167	0.002621299	7.86	2979.88	49.66	0.82
3.3333	0.002589135	7.86	3016.44	50.27	0.83
3.2500	0.002556566	7.86	3054.39	50.9	0.84
3.1667	0.002523577	7.86	3093.81	51.56	0.85
3.0833	0.00249015	7.86	3134.79	52.24	0.87
3.0000	0.002456269	7.86	3177.44	52.95	0.88
2.9167	0.002421914	7.86	3221.89	53.69	0.89
2.8333	0.002387065	7.86	3268.26	54.47	0.9
2.7500	0.002351699	7.86	3316.68	55.27	0.92
2.6667	0.002315793	7.86	3367.33	56.12	0.93

2.5833	0.002279321	7.86	3420.37	57	0.95
2.5000	0.002242257	7.86	3475.99	57.93	0.96
2.4167	0.002204569	7.86	3534.43	58.9	0.98
2.3333	0.002166226	7.86	3595.91	59.93	0.99
2.2500	0.002127192	7.86	3660.72	61.01	1.01
2.1667	0.002087427	7.86	3729.16	62.15	1.03
2.0833	0.002046891	7.86	3801.59	63.35	1.05
2.0000	0.002005535	7.86	3878.41	64.64	1.07
1.9167	0.001963309	7.86	3960.09	66	1.1
1.8333	0.001920154	7.86	4047.16	67.45	1.12
1.7500	0.001876007	7.86	4140.23	69	1.15
1.6667	0.001830795	7.86	4240.04	70.66	1.17
1.5833	0.001784438	7.86	4347.43	72.45	1.2
1.5000	0.001736845	7.86	4463.43	74.39	1.23
1.4167	0.00168791	7.86	4589.23	76.48	1.27
1.3333	0.001637513	7.86	4726.31	78.77	1.31
1.2500	0.001585515	7.86	4876.47	81.27	1.35
1.1667	0.001531753	7.86	5041.91	84.03	1.4
1.0833	0.001476034	7.86	5225.43	87.09	1.45
1.0000	0.001418128	7.86	5430.58	90.5	1.5
0.9167	0.001357754	7.86	5661.98	94.36	1.57
0.8333	0.001294568	7.86	5925.75	98.76	1.64
0.7500	0.001228135	7.86	6230.22	103.83	1.73
0.6667	0.001157896	7.86	6587.08	109.78	1.82
0.5833	0.001083113	7.86	7013.35	116.88	1.94
0.5000	0.001002768	7.86	7534.94	125.58	2.09
0.4167	0.000915397	7.86	8193.76	136.56	2.27
0.3333	0.000818756	7.86	9063.20	151.05	2.51
0.2500	0.000709064	7.86	10287.20	171.45	2.85
0.1667	0.000578948	7.86	12202.52	203.37	3.38
0.0833	0.000409378	7.86	15902.64	265.04	4.41
0.0008	4.09378E-05	7.78	34553.13	575.88	9.59
	Total Vol.	**542.16**		**Total Hours**	**87.14**

ATTACHMENT 3
STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☑ Included See Structural BMP Maintenance Information Checklist.
Attachment 3b	Maintenance Agreement (Form DS-3247) (when applicable)	◉ Included ○ Not Applicable

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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)
- ☑ When applicable, frequency of bioretention soil media replacement.
- ☑ 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 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☑ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☑ BMP and HMP location and dimensions
- ☑ BMP and HMP specifications/cross section/model
- ☑ Maintenance recommendations and frequency
- ☑ LID features such as (permeable paver and LS location, dim, SF).

ATTACHMENT 3A

Maintenance Plan

Via Grimaldi

Treatment BMP Maintenance Plan for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Activities
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
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 and adjust the irrigation system.
Erosion due to concentrated storm water 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, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
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 irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

- **Access of Structural BMPs for Inspection and Maintenance**

    - The Bio-filtration BMP consists of a vegetated area 460 ft^2 that will be 1.4' deep. A 2'x2' concrete inlet will be installed within the BMP with its rim elevated 0.7' above the surface. The total depth of the inlet will be 2.95'.
    - The inlet should be visible from the surface and can be accessed through the grate.
        - The 2.95' depth should not require a ladder to access the full extent of the inlet.
    - The bioretention basin is accessible from the back yard of the private residence.

- **Maintenance Thresholds**

    - Any grasses within the biofiltration area shall be cut when in excess of 4" tall.
    - Debris & sediment shall be cleared from the basin when 2" have accumulated.
    - Any amount sediment or debris accumulation observed within the overflow inlet shall be removed when seen.
    - During routine landscape maintenance activities, if bare areas or erosion are observed they shall be re-seeded.
    - If standing water is observed for longer than 24-hours the soil media shall be inspected for clogging and cleaned.

- **Bioretention Soil Media Replacement**

    - Soil media within the bioretention area shall be replaced when the filtration rate drops below 5"/hour if regular maintenance cannot restore this rate.

- **Recommended Maintenance Equipment**

    - Equipment needed for maintenance will typically include those needed for routine landscape maintenance:

        - Hand Shovels
        - Wheel barrows
        - Lawn mower
        - Hedge clippers
        - Other

- **Inspection & Maintenance for Underground Storage**

    - Isolator Row and Port Inspection
        - Ports
            - Remove/open lids on inline drain
            - Remove and clean pretreatment filters
            - Using flashlight and measurement rod take measurement of sediment depth and record

        - If sediment is at or above 3" proceed to cleaning steps
    - Isolator Rows
        - Remove cover from structure at upstream end of isolator row
        - Using flashlight inspect down isolator row through outlet pipe
        - If sediment is at or above 3" proceed to cleaning steps
- Cleaning isolator row with jetvac process *IF REQUIRED*
    - A fixed culvert cleaning nozzle with rear facing spread of 45" or more is preferred
    - Apply multiple passes of jetvac until backflush water is clean
    - Vacuum structure sump as required
- Replace all covers, grates, filters, and lids; record observations and actions
- Inspect and clean basins and manholes upstream of StormTech system

- **Notes for Underground Storage**
    - Inspect every 6 months during the first year of operation. Adjust the inspection interval based on previous observations of sediment accumulation and high water elevations
    - Conduct jetting and vactoring annually or when inspection shows that the maintenance is necessary

- **Special Training**

    - Maintenance and inspection activities required are typical for routine landscape maintenance. No special training required.

THE CITY OF SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

Charles Ross

4962 Concannon Ct

San Diego, CA 92130

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSORS PARCEL NUMBER:	PROJECT NUMBER:
	301-061-48	460737

This agreement is made by and between the City of San Diego, a municipal corporation [City] and Ross Charles & Gail Family Trust 04-40-08, the owner or duly authorized representative of the owner [Property Owner] of property located at 301-061-48

(PROPERTY ADDRESS)

and more particularly described as: Lot 82 BLK 12 of Map 1527 Del Mar Terrace

(LEGAL DESCRIPTION OF PROPERTY)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Water Quality Technical Report [WQTR] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): 460737.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): 460737.

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): 460737.

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's WQTR and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) 460737.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): A, B, C

_____
(Owner Signature)

_____
(Print Name and Title)

_____
(Company/Organization Name)

_____
(Date)

THE CITY OF SAN DIEGO

_____
(Engineer Signature)

_____
(Print Name)

_____
(Date)

NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDGMENTS PER CIVIL CODE SEC. 1180 ET.SEQ.

Reset Button Page 2

EXHIBIT 'A'

LEGEND:

PROPERTY LINE — N45°45'45"W

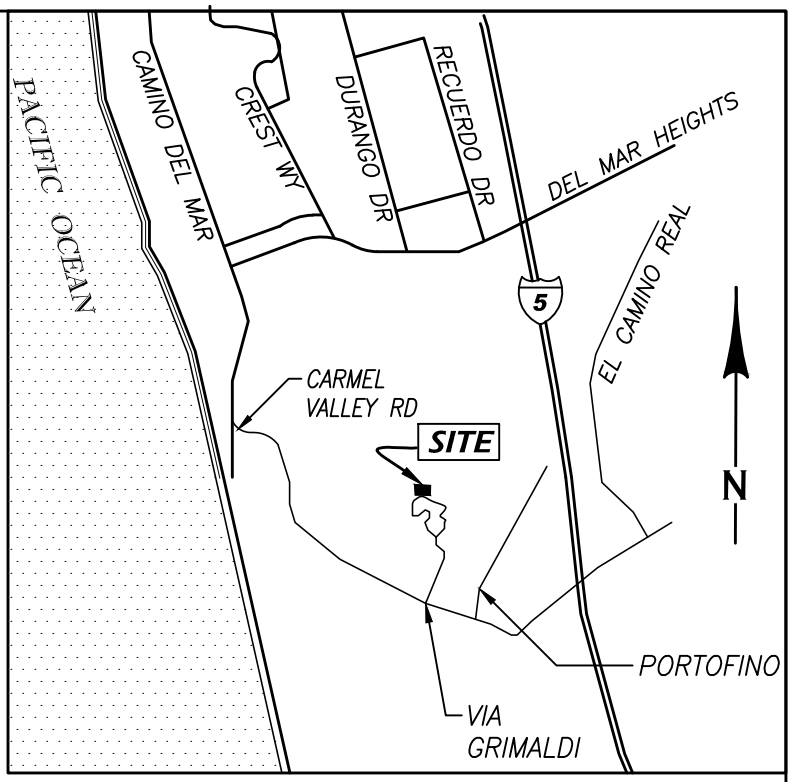
CENTER LINE — ℄

ROW — R/W

STORM WATER BMP:

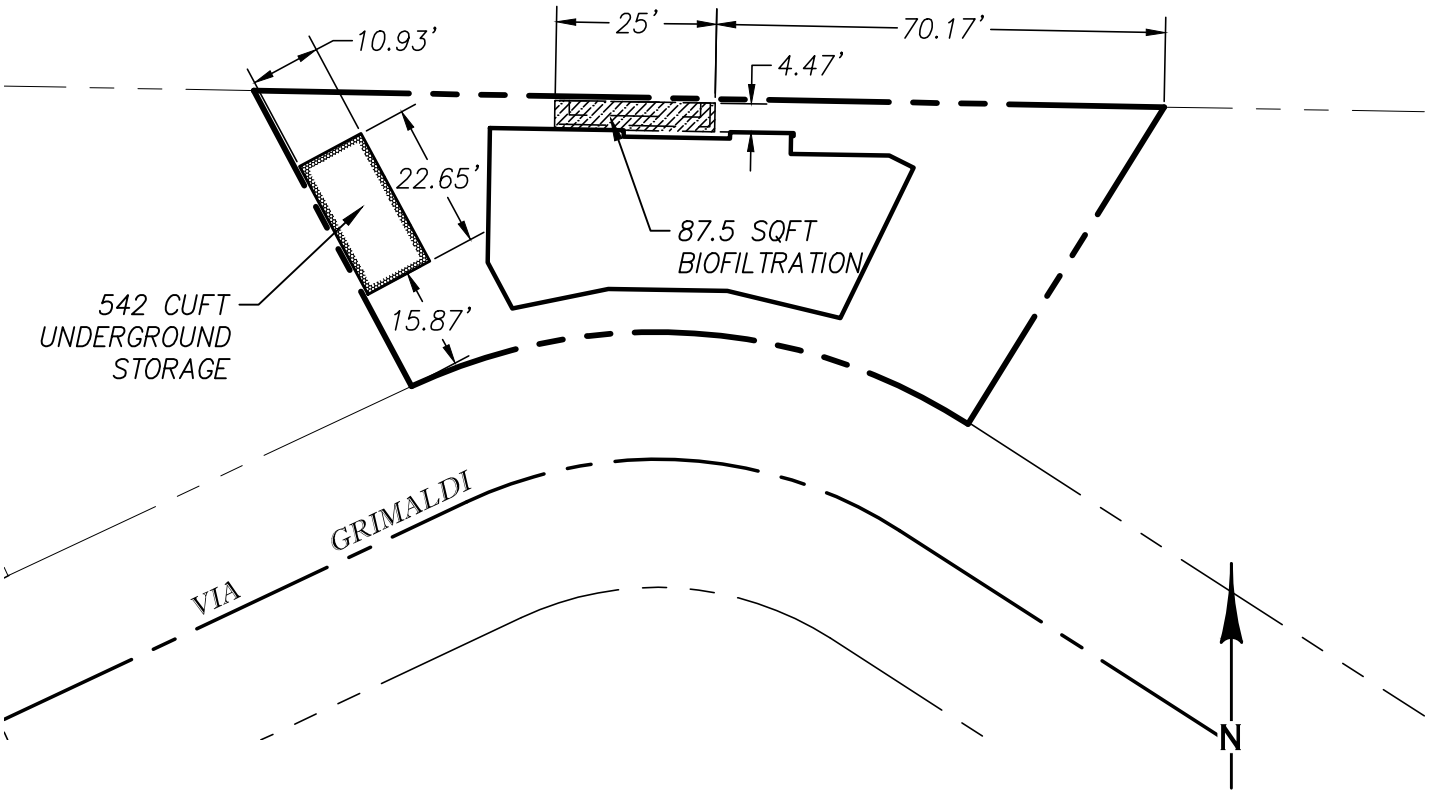
BIOFILTRATION AREA

UNDERGROUND STORAGE



VICINITY MAP

THOMAS BROS. MAP 1207–H1
NO SCALE

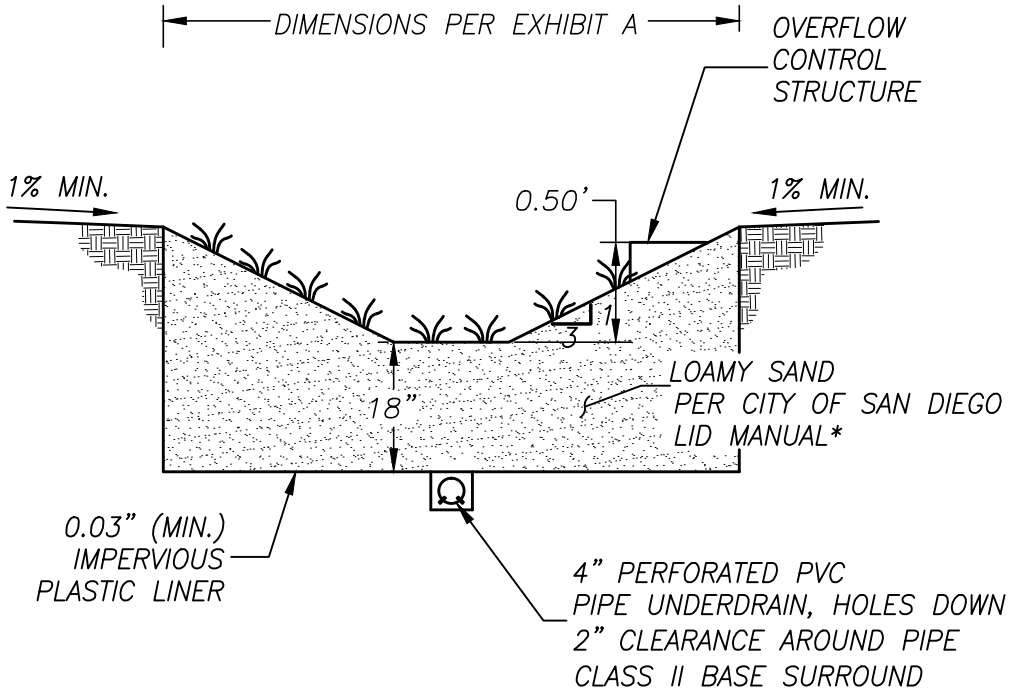


SCALE 1"=30'

COFFEY ENGINEERING, INC.

Via Grimaldi
Del Mar, CA. 92014
301–061–48

EXHIBIT 'B'



DETAIL 'B' -BIOFILTRATION AREA (IMP '1')

TYPICAL SECTION

NOT TO SCALE

* SOIL MEDIA CONSISTS OF 85% WASHED COURSE SAND, 10% FINES (RANGE: 8–12%; 8% = 2 IN/HR INFILTRATION RATE, 12% = 1 IN/HR INFILTRATION RATE), AND 5% ORGANIC MATTER. FOR ADDITIONAL STANDARDS SEE SAN DIEGO LOW IMPACT DEVELOPMENT DESIGN MANUAL SECTION 1.2.4.2 SOIL MEDIA MUST MAINTAIN A MINIMUM INFILTRATION RATE OF 5 IN/HR

COFFEY ENGINEERING, INC.

EXHIBIT 'C' Via Grimaldi • Del Mar, CA. 92014 • 301-061-48

POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.:

O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
SITE DESIGN					
DISPERSE RUNOFF TO ADJACENT LANDSCAPING	WEEKLY	MONTHLY	CLEAR EXCESS VEGETATION/DEBRIS	WHOLE SITE	C.1
NATIVE OR DROUGHT TOLERANT VEGETATION	WEEKLY	MONTHLY	REPLACE DYING/DEAD VEGETATION	WHOLE SITE	C.1
SOURCE CONTROL					
PREVENTION OF ILLICIT DISCHARGES	WEEKLY	MONTHLY	REPLACE/REPAIR DAMAGED COMPONENTS	WHOLE SITE	C.1
INTEGRATED PEST MANAGEMENT PRACTICES	WEEKLY	MONTHLY	REMOVE NON-PEST RESISTANT VEGETATION (WEEDS)	WHOLE SITE	C.1
STORM DRAIN INLET STAMPING	MONTHLY	MONTHLY	CLEAN OR REPLACE STAMPING AS NEEDED	3 EA.	C.1
TREATMENT CONTROL					
BIOFILTRATION AREA	WEEKLY	ANNUALLY	CLEAR EXCESS VEGETATION/DEBRIS	1 EA.	C.1
HMP FACILITY					
UNDERGOUND STORAGE	BIANNUALLY	ANNUALLY	CLEAR SEDIMENT/DEBRIS	1 EA.	C.1
OUTFLOW ORIFICE	BIANNUALLY	ANNUALLY	CLEAR SEDIMENT/DEBRIS	1 EA.	C.1

ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

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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. Broucher photocopies are not allowed.

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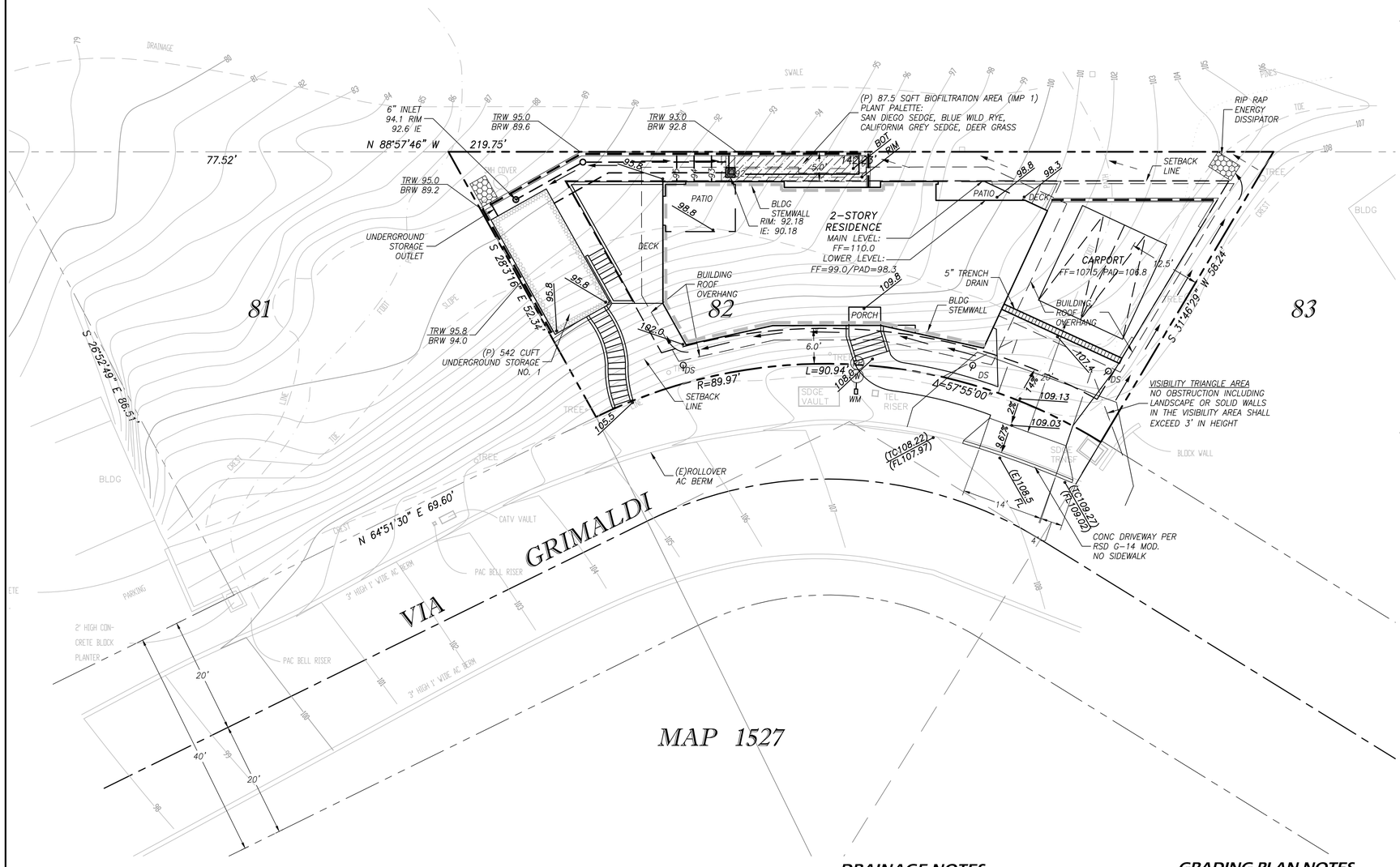
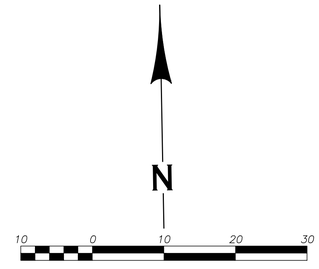


LEGEND

DESCRIPTION	STD DWG	SYMBOL
PROPERTY LINE		N45°45'45"W
PROPERTY LINE – OFFSITE		
STREET CENTERLINE		℄
EX CONTOUR		90
PR CONTOUR		90
PR SPOT ELEVATION		100.00
PR DRAINAGE SWALE OR DIRECTION OF FLOW		
BUILDING FOOTPRINT		
PR CMU RETAINING WALL		
PR FREE STANDING WALL		
PR HARDSCAPE DRAIN	(NDS OR EQ)	
PR LANDSCAPE DRAIN	(NDS OR EQ)	
PR CLEANOUT	(NDS OR EQ)	
PR PVC DRAIN LINE	SDR-35 SCH 40	
PR TRENCH DRAIN	(NDS OR EQ)	
PR RIP RAP		
PR 1" WATER SERVICE w/RP BACKFLOW PREVENTION ASSY		W RP
EX TREE CANOPY/ BRUSH LINE		

ABBREVIATIONS

BLDG	BUILDING	F; FL	FLOW LINE
BRW	BOTTOM OF RETAINING WALL GRADE	H	HEIGHT
℄	CENTER LINE	HP	HIGH POINT
CB	CATCH BASIN	IE	INVERT ELEVATION
CMU	CONCRETE MASONRY UNIT	(P); PR	PROPOSED
CO	CLEANOUT	SMH	SEWER MANHOLE
(E); EX	EXISTING	TRW	TOP OF RETAINING WALL GRADE
FF	FINISH FLOOR	WM	WATER METER



SCALE: 1"=10'

POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.:

O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
SITE DESIGN					
DISPERSE RUNOFF TO ADJACENT LANDSCAPING	WEEKLY	MONTHLY	CLEAR EXCESS VEGETATION/DEBRIS	WHOLE SITE	C.1
NATIVE OR DROUGHT TOLERANT VEGETATION	WEEKLY	MONTHLY	REPLACE DYING/DEAD VEGETATION	WHOLE SITE	C.1
SOURCE CONTROL					
PREVENTION OF ILLICIT DISCHARGES	WEEKLY	MONTHLY	REPLACE/REPAIR DAMAGED COMPONENTS	WHOLE SITE	C.1
INTEGRATED PEST MANAGEMENT PRACTICES	WEEKLY	MONTHLY	REMOVE NON-PEST RESISTANT VEGETATION (WEEDS)	WHOLE SITE	C.1
STORM DRAIN INLET STAMPING	MONTHLY	MONTHLY	CLEAN OR REPLACE STAMPING AS NEEDED	3 EA.	C.1
TREATMENT CONTROL					
BIOFILTRATION AREA	WEEKLY	ANNUALLY	CLEAR EXCESS VEGETATION/DEBRIS	1 EA.	C.1
HMP FACILITY					
UNDERGOUND STORAGE	BIANNUALLY	ANNUALLY	CLEAR SEDIMENT/DEBRIS	1 EA.	C.1
OUTFLOW ORIFICE	BIANNUALLY	ANNUALLY	CLEAR SEDIMENT/DEBRIS	1 EA.	C.1

GRADING TABULATIONS

TOTAL AMOUNT OF SITE TO BE GRADED:	0.1 ACRE	% OF TOTAL SITE:	76.6%
AMOUNT OF CUT:	295 CUBIC YARDS	MAXIMUM DEPTH OF CUT:	2.5 FEET
AMOUNT OF FILL:	39 CUBIC YARDS	MAXIMUM DEPTH OF FILL:	5.8 FEET
MAXIMUM HEIGHT OF FILL SLOPE(S):	2.0 FEET	SLOPE RATIO:	N/A
MAXIMUM HEIGHT OF CUT SLOPE(S):	N/A FEET	SLOPE RATIO:	N/A
AMOUNT OF IMPORT/ EXPORT SOIL:	256 CUBIC YARDS		
RETAINING/ CRIB WALLS: LENGTH	256 FEET	MAXIMUM HEIGHT:	6.5 FEET

DRAINAGE NOTES

1. ALL MAIN DRAIN LINES SHOWN TO BE 6" PVC @ 1% MINIMUM SLOPE UNLESS OTHERWISE NOTED.
2. ALL CATCH BASIN LEADS TO BE 4" PVC @ 2% MINIMUM SLOPE UNLESS OTHERWISE NOTED.
3. HARDSCAPE GRADES TO BE 1% MINIMUM TO DRAINS AND AWAY FROM STRUCTURE.
4. SOFTSCAPE GRADES TO BE 2% MINIMUM TO DRAINS (1% WHERE FLOW IS CONCENTRATED) AND 2% MINIMUM AWAY FROM STRUCTURE.
5. SOIL COVER ABOVE DRAIN LINES SHALL BE 12" MINIMUM UNLESS OTHERWISE NOTED.
6. NOTIFY CIVIL ENGINEER IF ANY NON-DRAINING SUMP CONDITIONS BECOME APPARANT DURING CONSTRUCTION.
5. THIS PROJECT WILL NOT DISCHARGE ANY INCREASE IN STORMWATER RUN-OFF ONTO EXISTING HILLSIDE AREAS
6. AT THE STORMWATER DISCHARGE LOCATIONS, SUITABLE ENERGY DISSIPATERS ARE TO BE INSTALLED TO REDUCE THE DISCHARGE TO NON-ERODIBLE VELOCITIES
7. NO UNMITIGATED ADDITIONAL RUN-OFF IS PROPOSED FOR DISCHARGE LOCATIONS

GRADING PLAN NOTES

1. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE APPLICANT SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
2. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE APPLICANT SHALL SUBMIT A WATER POLLUTION CONTROL PLAN (WPCP). THE WPCP SHALL BE PREPARED IN ACCORDANCE WITH THE GUIDELINES IN APPENDIX E OF THE CITY'S STORM WATER STANDARDS.
3. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
4. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, AN EMRA WILL BE NECESSARY FOR ANY PRIVATE IMPROVEMENTS WITHIN THE PUBLIC RIGHT OF WAY.
5. ALL GRADED, DISTURBED OR ERODED AREAS THAT WILL NOT BE PERMANENTLY PAVED OR COVERED BY STRUCTURES SHALL BE PERMANENTLY REVEGETATED AND IRRIGATED AS SHOWN IN TABLE 142-04F AND IN ACCORDANCE WITH THE STANDARDS IN THE SAN DIEGO MUNICIPAN CODE, SECTION 142.0411. ALL REQUIRED REVEGETATION AND EROSION CONTROL SHALL BE COMPLETED WITHIN 90 CALENDAR DAYS OF THE COMPLETION OF GRADING OR DISTURBANCE.

SOURCE OF TOPO:

THE SOURCE OF TOPOGRAPHIC INFORMATION ON THIS PLAN WAS FROM A GROUND-BASED FIELD SURVEY BY MONUMENT PEAK LAND SURVEYING, NOVEMBER 20,1996, ROBERT LEE McCOMB, PLS 4441. BOUNDARY INFORMATION ON THIS PLAN FROM GROUND BASED SURVEY BY PATRICK ENGINEERING & SURVEYING JUNE 30, 2015, PATRICK L. BROWN, RCE 18067.

EASEMENTS

THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT. EASEMENTS MAY BE PRESENT ON THE SUBJECT PROPERTY.

NOTES:

1. THIS GRADING PLAN IS BASED ON A TOPOGRAPHIC SURVEY, NOT A BOUNDARY SURVEY OR RECORD OF SURVEY. THE PROPERTY LINES DEPICTED ON THIS PLAN ARE GENERATED FROM EXISTING PUBLIC RECORD MAPS, DRAWINGS, OR DESCRIPTIONS. THE PROPERTY LINES AND/OR EASEMENTS SHOWN HEREON HAVE BEEN INCLUDED TO REPRESENT THEIR APPROXIMATE LOCATIONS RELATIVE TO THE TOPOGRAPHIC FEATURES.
2. THE LOCATIONS OF UTILITIES, IF ANY, SHOWN ON THIS PLAN ARE GENERATED FROM RECORDS PROVIDED BY UTILITY/GOVERNING AGENCIES AND/OR FIELD DATA COLLECTED DURING THE SURVEY. THE PLOTTING OF UTILITIES ON THIS PLAN DOES NOT CONSTITUTE A GUARANTEE OF THEIR LOCATION, DEPTH, SIZE, OR TYPE.

COFFEY ENGINEERING, INC.
10660 SCRIPPS RANCH BLVD. SUITE 102, SAN DIEGO, CA 92131 PH (858)831-0111 FAX (858)831-0179

REGISTERED PROFESSIONAL ENGINEER JOHN S. COFFEY No. 41716 EXP. 6/30/16 CIVIL STATE OF CALIFORNIA

PRELIMINARY

ROSS RESIDENCE

13000 Blk Via Grimaldi
Del Mar, CA 92014

DRAWN BY: MK
CHECKED BY: JC

ORIGINAL 11/6/15
REVISION 1
REVISION 2
REVISION 3
REVISION 4
REVISION 5

GRADING PLAN

SCALE: 1" = 10'

C.1

SHT 1 OF 2 SHTS

ATTACHMENT 5
DRAINAGE REPORT

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

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COFFEY ENGINEERING, INC.

Preliminary Drainage Study

Ross Residence
Via Grimaldi, Del Mar, CA. 92014
APN 301-061-48

Prepared For:
Charles Ross
and
The City of San Diego

April 22, 2016

10660 Scripps Ranch Blvd, Suite 102 San Diego, CA 92131 Phone: (858) 831-0111 Fax: (858) 831-0179

Table of Contents

Appendix

1. **Existing Conditions**

The site is located in San Diego, 0.6 miles north west of the I-5/SR-56 interchange. The approximately 0.1 acre lot is currently undeveloped.

The site lies approximately 2,500 feet west of the I-5 and 3,800 feet east of the Pacific Ocean, with a general drainage pattern that flows from east to west through the site.

See Drainage Map – (E) in the appendix for existing conditions.

2. **Proposed Project**

The project proposes to develop a single family residence with associated hardscape and landscape features. The development will have an impervious footprint of approximately 3,018 ft^2 (62.4% impervious), this is an increase of 62.4% from the existing impervious footprint of 0 ft^2 (0% impervious). The proposed development is not part of a larger master development. The site qualifies as a priority development project due to its location in a Water Quality Sensitive Area and its creation of 2,500 SF or more of impervious area. The project developer is Charles Ross.

See Drainage Map – (P) in the appendix for proposed conditions.

The project proposes to release storm water runoff to the Torrey Pines State Natural Reserve. Flows will be dissipated through the use of adequately sized rip-rap energy dissipaters. The project has been presented to the California State Department of Parks & Recreation and has been approved in its current form (See State approval in Appendix).

3. **Purpose and Scope of Report**

In addition to addressing any general drainage concerns for the property, this report will evaluate the pre-construction hydrologic conditions and compare them to post-construction to determine the required detention/flow attenuation. The runoff quantities were calculated using a 100-year storm, see isopluvial maps attached in the appendix of this report.

The following will be evaluated:

- Pre-construction flows: Basins X (see Drainage Map – (E))
- Post Construction flows: Basins A, B, & C (see Drainage Map – (P))
- General site conditions/observations pertaining to drainage.

4. **Method of Calculations**

The Rational Method, as defined by the City of San Diego Drainage Design Manual (1984), will be used to calculate storm water flow rates. Where noted, the following calculations were used to determine flow properties:

<u>Rainfall Characteristics</u>

$Q = C * I * A$, where

Q = Flow rate (ft^3/sec)
C = Runoff coefficient
I = Rainfall intensity (in/hr)
A = Area (acres)

$I = 7.44 * P_6 * D^{-0.645}$, where

I = Rainfall intensity (in/hr)
P_6 = Adjusted 6-hour precipitation (inches)
D = Storm duration (min), equal to T_c for time-of-concentration storms

Tc = Ti+Tt+Tp (time-of-concentration), where
Ti=Over land initial time.
Tt=Travel time on natural watersheds.
Tp=Travel time on drainage structures (pipes, brow ditch, gutter etc.)

$Ti = 1.8(1.1-C)\, D^{0.50} / (\, s^{0.33}\,)$ (Overland initial time of concentration formula),where

D= Watercourse Distance (feet)(see table 3-2 for the max. overland flow length)
s = Slope (%)
C= Runoff Coefficient
Ti=Initial time of concentration (min.)

$T_t = (11.9*L^3 / \Delta H)^{0.385}$ (formula for travel time for natural watersheds), where

T_c = Time of Concentration or Travel time (hours)
L = Length of watercourse (miles)
ΔH = Change in effective slope height (ft)

<u>Pipe and Open Channel Flow Characteristics</u>

$V = 1/n * R^{2/3} * S^{1/2}$ (from Manning), where

V = Average cross-sectional velocity (ft/sec)
n = Manning roughness coefficient
R = Hydraulic radius (ft)
S = Slope of water surface (ft height/ft length)

$p/\gamma + V^2/2g + z_1 + h_L = p/\gamma + V^2/2g + z_2$ (from Bernoulli), where

p = pressure (lbs/ft^2)
γ = density (lbs/ft^3)
V = velocity (ft/sec)

g = gravity (ft/sec/sec)
z = height of fluid (ft)
h_L = head loss (ft)

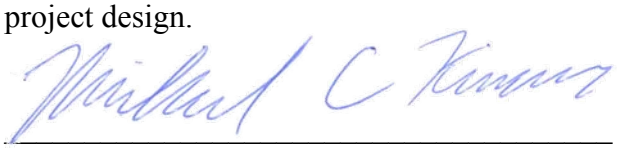
5. **Results and Conclusions:**

During the 100 year storm the site will experience a flow of 0.27 CFS. This is 0.05 CFS greater than the existing 100 year storm flow of 0.22 CFS this increase can be attributed to the development of the site including the residence and associated hardscape. This increase will be mitigated through hydromodification measures and does not present any adverse impacts. The project in question is not subject to regulations as set forth in CWA 401/404

6. **Declaration of Responsible Charge**

I hereby declare that I am the Civil Engineer of Work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the City of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

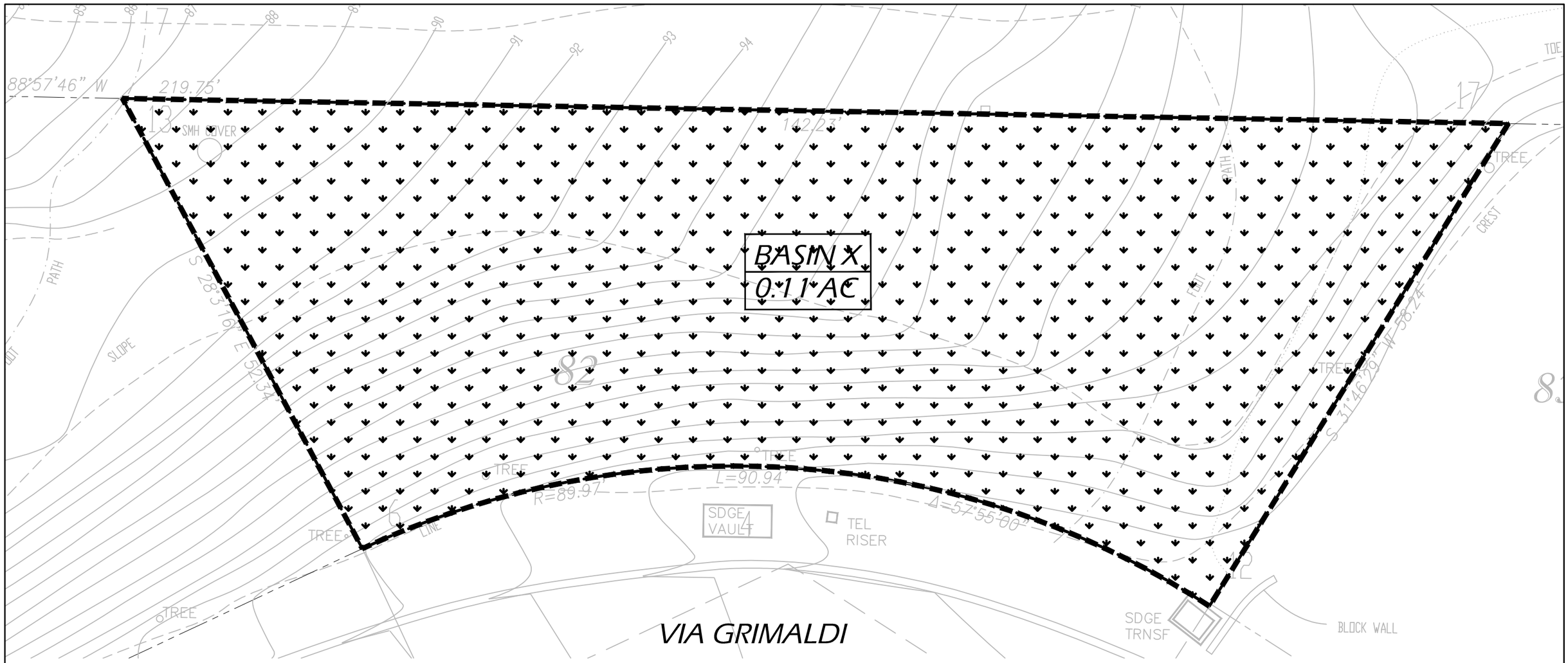


7/1/16

Michael Kinnear
RCE 76785
Exp. 12-31-16

Date

Appendix



N

5 0 5 10 15

SCALE: 1"=10'

BASIN X: STEEP TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.45
TOTAL AREA: 4,832.83 SQFT = 0.11AC

IMPERVIOUS AREA: 0 SQFT

PERVIOUS AREA: 4,832.83 SQFT

DRAINAGE MAP - (E)
DRAINAGE MANAGEMENT AREAS

BASIN C
0.00 AC*

BASIN B
0.10 AC

IMP 1
87.5 SQFT
BIOFILTRATION
AREA

BASIN A
0.01 AC

6" INLET
94.1 RIM
92.6 IE

TRW 95.0
BRW 89.6

TRW 93.0
BRW 92.8

TRW 95.0
BRW 89.2

UNDERGROUND
STORAGE
OUTLET

TRW 95.8
BRW 94.0

POC 1
CURB OUTLET
Q100= 0.27 CFS
V100= 3.08 FPS

VIA GRIMALDI

BOT
RIM

95.8
98.8
98.3
109.8
102.0
107.4
108.0
109.13
109.03
105.5
(TC108.22)
(IE107.97)

DS
WM
SDGE VAULT
TEL RISER
TREE
BLOCK WALL
PINES
CREST
SLOPE
CURB
LINE
20'
L=90.94
R=89.97
Δ=57°55'00"

BASIN A:

PERVIOUS AREA: 529.06 SQFT

BASIN B:

IMPERVIOUS AREA: 3,017.74 SQFT

PERVIOUS AREA: 1,174.82 SQFT

BASIN C:

PERVIOUS AREA: 111.21 SQFT

N

5 0 5 10 15

SCALE: 1"=10'

BASIN A: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 529.06 SQFT = 0.01AC

BASIN B: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 4,192.56 SQFT = 0.10AC

BASIN C: FLAT TERRAIN, SOIL TYPE D
RUNOFF COEFFICIENT: 0.55
TOTAL AREA: 111.21 SQFT = 0.00AC*
*ACTUAL ACREAGE VALUE ROUNDS TO 0.00 AT THE NEAREST HUNDREDTH

SITE CHARACTERISTICS:

HYDROLOGIC SOILS GROUP:	D*
APPROXIMATE DEPTH TO GROUND WATER:	>15'
CRITICAL COARSE SEDIMENT YIELD AREAS:	NONE

*SITE HYDROLOGIC SOILS POTENTIALLY MAY BE CLASS A DETERMINATION WILL BE MADE AFTER A FULL GEOLOGIC AND GROUND WATER INVESTIGATION IS PERFORMED

DRAINAGE MAP - (P)
DRAINAGE MANAGEMENT AREAS

Water Quality Event

Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.45	5.00	0.20	0.11	**0.01**	X	Sheet-flow to street
				Sum =	0.01		

Table B - Post Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	0.20	0.01	**0.00**	A	Divert Off-site
B	0.55	5.00	0.20	0.10	**0.01**	B	Residence
C	0.55	5.00	0.20	0.00	**0.00**	C	Remainder
				Sum =	0.01		

2 Year Storm

Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.45	5.00	2.40	0.11	**0.12**	X	Sheet-flow to street
				Sum =	0.12		

Table B - Post Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	2.40	0.01	**0.01**	A	Divert Off-site
B	0.55	5.00	2.40	0.10	**0.13**	B	Residence
C	0.55	5.00	2.40	0.00	**0.00**	C	Remainder
				Sum =	0.15		

10 Year Storm

Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.45	5.00	3.40	0.11	**0.17**	X	Sheet-flow to street
				Sum =	0.17		

Table B - Post Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	3.40	0.01	**0.02**	A	Divert Off-site
B	0.55	5.00	3.40	0.10	**0.19**	B	Residence
C	0.55	5.00	3.40	0.00	**0.00**	C	Remainder
				Sum =	0.21		

100 Year Storm

Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.45	5.00	4.40	0.11	**0.22**	X	Sheet-flow to street
				Sum =	0.22		

Table B - Post Construction Flow Conditions						Table B - Hydraulics of Proposed Structures	
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	4.40	0.01	**0.02**	A	Divert Off-site
B	0.55	5.00	4.40	0.10	**0.24**	B	Residence
C	0.55	5.00	4.40	0.00	**0.00**	C	Remainder
				Sum =	0.27		

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1)
	D
Residential:	
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

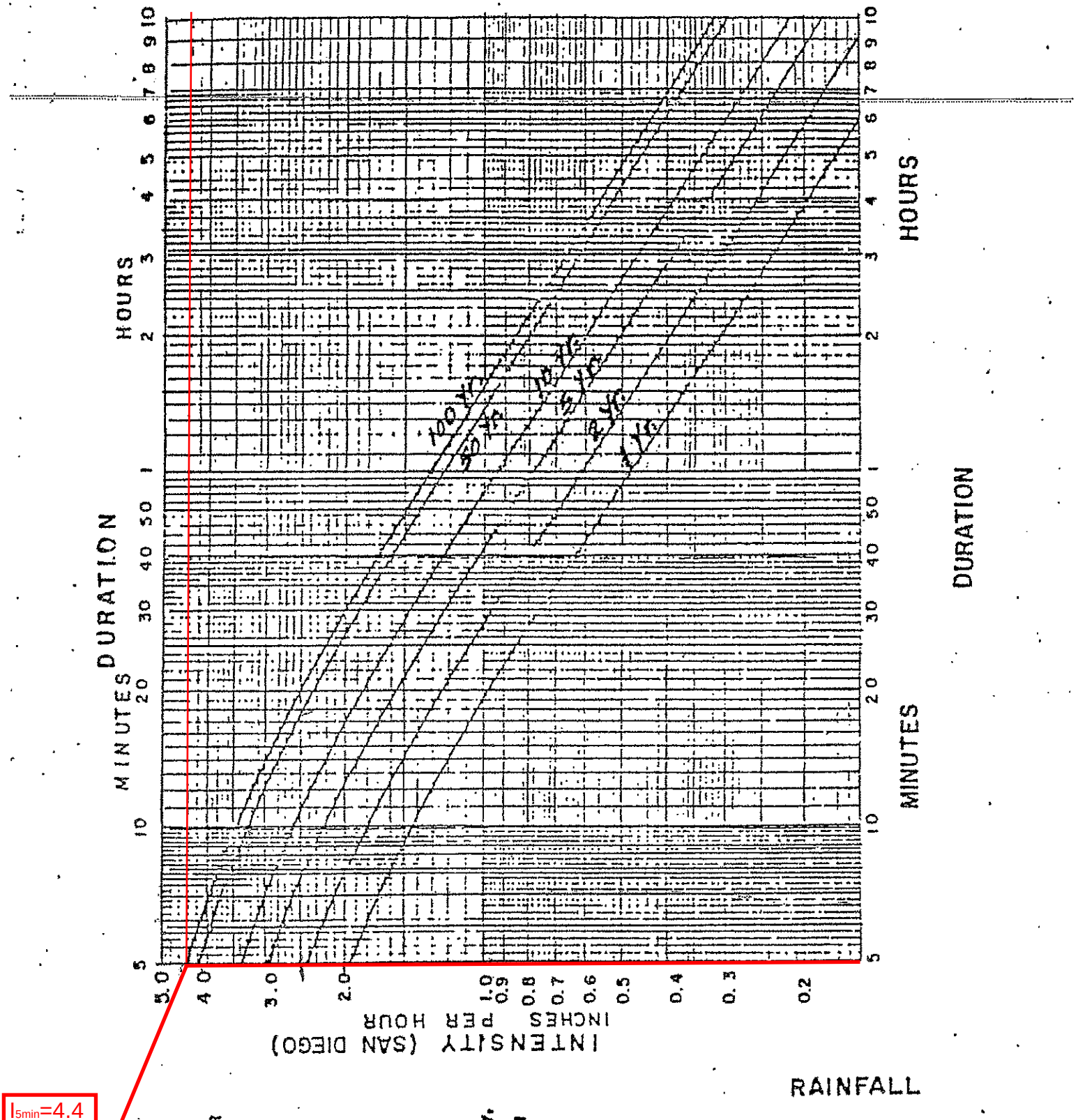
(1) Type D soil to be used for all areas.

(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

Revised C = $\frac{50}{80}$ x 0.85 = 0.53



ELEV.	FACTOR
0—1500	1.00
1500—3000	1.25
3000—4000	1.42
4000—5000	1.60
5000—6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

RAINFALL

INTENSITY - DURATION - FREQUEN

CURVES

for

COUNTY OF SAN DIEGO

APPENDIX

ATTACHMENT 6
GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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C. W. La Monte Company Inc.

Soil and Foundation Engineers

UPDATED GEOTECHNICAL REPORT
Proposed Ross Residence
13070 Via Grimaldi
San Diego, CA 92014
A.P.N. 301-061-48

Job No. 15 6610

November 16, 2015

PREPARED FOR:

Chuck Ross
4962 Concannon Court
San Diego, CA 92130

8265 Commercial Street #12 ♦ La Mesa, CA 91942 ♦ 619-462-9861 ♦ Fax 619 462-9859

C. W. La Monte Company Inc.

Soil and Foundation Engineers

8265 COMMERCIAL STREET #12 ■ LA MESA, California 91941
Phone: (619) 462-9861 ■ Fax: (619) 462-9859 ■ Email: clamonte@flash.net

November 16, 2015 Job No. 15 6610

TO: Chuck Ross
4962 Concannon Court
San Diego, CA 92130

SUBJECT: **UPDATED GEOTECHNICAL REPORT**
Proposed Ross Residence
13070 Via Grimaldi
San Diego, CA 92014
A.P.N. 301-061-48

REFERENCE: *Architectural Plans , Ross Residence, 13070 Via Grimaldi, San Diego, CA 92014*, by Hubbell & Hubbell, dated October 20, 2015

Report of Soils Investigation, Backus Residence, Via Grimaldi, San Diego, California, by C.W. La Monte Company, dated March 2000

In accordance with your request and our proposal dated October 24, 2015, we are providing an update to the above referenced geotechnical report. Due to the date and scope of work of the prior report, changes to the scope of the proposed project plus changes to the building codes and standard-of-care for the industry, we have compiled a new comprehensive updated report that will **completely replace** the referenced report. The new report provides the design recommendations required by the design team, as well as address current Building Code requirements.

Generally, the building site is underlain with compressible fills and alluvium that require mitigation. Therefore, a deep foundation system is recommended

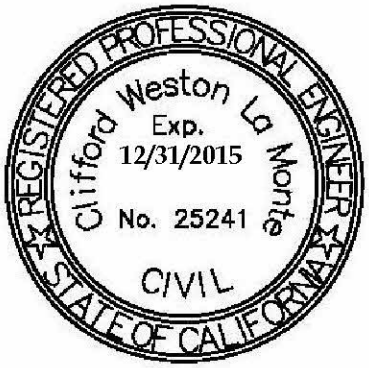
If you should have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

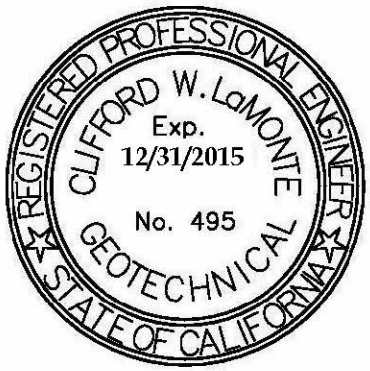
Respectfully submitted,

C.W. La Monte Company Inc.

Jerry Redolfi, Project Engineering Geologist

Clifford W. La Monte, R.C.E. 25241, G.E. 0495





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UPDATED GEOTECHNICAL REPORT
Proposed Ross Residence
13070 Via Grimaldi
San Diego, CA 92014
A.P.N. 301-061-48

PROJECT DESCRIPTION

The following report presents the results of a geotechnical investigation performed for the proposed project site, located at 13070 Via Grimaldi in the Del Mar area of the City of San Diego, California. Figure Number 1 (attached) provides a vicinity map showing the location of the property and area topography. The lot is vacant and approximately 4840 square feet in area. In general, the purpose of our investigation was to provide the foundation and grading recommendations for the proposed residential construction.

It is our understanding that the site is being developed to receive a single family residence with a detached garage. The proposed structure will be a maximum of two stories in height and will be of typical frame construction. We anticipate the structures will be founded on a combination of conventional shallow foundations and deep pier foundations with raised wooden and concrete slab-on-grade floors. Development of the site will utilize a cut and fill grading operation and will include minor cuts into the existing road fill slope and filling the lower elevations of the site. Retaining walls, up to 7 feet in height, will be used to retain cuts into the road fill.

To aid in the preparation of this report, we were provided with the referenced Plan Set. The attached Plot Plan and Geotechnical Map (Figure 2) and field geotechnical mapping was prepared using the Floor Plans from the plan set.

This report has been prepared for the exclusive use of the stated client and his design consultants for specific application to the project described herein. Should the project be changed in any way, the modified plans should be submitted to C.W. La Monte Company, Inc. for review to determine their conformance with our recommendations and to determine if any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed, our findings obtained and our recommendations

prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, expressed or implied.

SCOPE OF WORK

The scope of this investigation was limited to: surface reconnaissance, research of readily available geotechnical literature pertinent to the site; subsurface exploration, laboratory testing, engineering and geologic analysis of the field and laboratory data and preparation of this report. More specifically, the intent of this investigation was to:

- Identify the subsurface conditions of the site to the depths influenced by the proposed grading and construction.

- Based on laboratory testing and our experience with similar sites in the area, identify the engineering properties of the various strata that may influence the proposed construction, including the allowable soil bearing pressures, expansive characteristics and settlement potential.

- Describe the general geology of the site including possible geologic factors that could have an effect on the site development, and provide seismic design parameters established in the latest edition of the California Building Code.

- Address potential construction difficulties that may be encountered due to soil conditions, groundwater, and provide recommendations concerning these problems.

- Provide mapped spectral acceleration parameters relative to the 2013 CBC

- Develop soil-engineering criteria for site grading.

- Recommend an appropriate foundation system for the type of structure anticipated and develop soil engineering design criteria for the recommended foundation designs.

- Present our opinions in this written report, which includes in addition to our findings and recommendations, a site plan showing the location of our subsurface explorations, logs of the test trenches and a summary of our laboratory test results.

It was not within our scope of work to evaluate the site for hazardous materials contamination.

SITE DESCRIPTION

The project site is located on the north side of Via Grimaldi in the Del Mar Area of the City of San Diego. The property is also bounded on the east by a single-family residence, on the west with a similar vacant lot and on the north by Torrey Pines State Park property. The lot is a vacant and irregular-shaped parcel of land approximately 4840 square feet in area. The property is identified as Assessor's Parcel Number 301-061-48. Refer to the attached Plot Plan and Geotechnical Map (Figure 2) a layout and topography of the property.

The approximate, southern half the property area is comprised of a north facing fill slope, descending from Via Grimaldi. The slope is a maximum of 15 feet in height and is sloped at an approximate 1.3:1 to 2:1 (horizontal to vertical) angle. A step cut slope into sandstone is located across the street. The northern half of the site encroaches onto a narrow alluvial channel, which consists of terrain sloping gently to the west. A west flowing, shallow arroyo is located off-site, but adjacent to the north property line. Actual survey elevations were not available at the time of our investigations. However, a review of area topographic maps indicates elevations roughly ranging from 180 to 200 feet MSL. Relative elevations are provided in the referenced plan set with an elevation differential across the site of about 21 feet (northwest corner low; east end high)

There were no existing structures on the site at the time of our investigation. However, a sewer manhole and easement encroaches onto the northwest corner of the property. The sewer line extends west from the manhole and is approximately 10 feet deep from top to bottom. Vegetation on the site consists of ice plant and light to moderate growth of wild grass, weeds and native shrubs.. Several Torrey Pines are located along the south and east property lines.

DESCRIPTION OF SITE GEOLOGY AND SUBSURFACE CONDITIONS

The site is underlain with Tertiary-aged sandstone, Quaternary-aged terrace deposits and "recent" alluvium. Also a sliver of fill encroaches onto the subject site. The encountered soil types are described individually below in order of increasing age. Also refer to the attached new Test Boring Logs (Figure Nos. 3A through 3E). For reference, the boring logs from the 2000 geotechnical investigation are included as Appendix "C". The original and new borings are located on the Plot Plan and Geotechnical Map, Figure No. 2. Geotechnical cross sections are attached as Figure No. 4A and 4B. A regional geologic map excerpt is included as Figure No. 5.

Artificial Fill (Qaf): As described previously, a road fill slope a maximum of 15 feet in height, descends onto the site from the northern edge of Via Grimaldi. This slope appears to consist of a sliver fill placed over alluvium and natural sandstone deposits. The fills consists of light brown, loose to dense, slightly silty sands.

Young Alluvium (Qya): The lower elevations of the site form a narrow "alluvial plane", which is underlain with alluvium capped with a thin veneer of fill, which is undifferentiated for the purposes of this report. The fill/alluvium was encountered to depths ranging 10 to 17.5 feet below the existing grade in the drainage course area of the site. The alluvium consists primarily of light brown, loose to medium dense, silty to slightly silty fine to medium sand with a little gravel.

Old Paralic Deposits (Qop): The alluvium is underlain with competent, old paralic deposits that were encountered to maximum depth of exploration of 20 feet. The encountered old paralic deposits consists primarily of light brown to orange brown, medium dense to dense, silty sand and clayey sand.

Torrey Sandstone: The Torrey Sandstone Formation forms the "bedding" for the southerly fill slope. The sandstone is also exposed in a near vertical cut slope located on the south side of Via Grimaldi, across from the subject site. The Torrey Sandstone consists of light brown to tan, dense to very dense, silty to slightly silty sand.

A review of *Geology of the San Diego 30' x 60' Quadrangle, California*, (compiled by Michael P. Kennedy and Siang S. Tan, 2005-2008) indicates the site is underlain entirely with the Torrey Sandstone. However, old paralic deposits (specifically Unit

6) are mapped nearby in the same drainage channel (see Figure No. 5) and actually encroach onto the drainage course area of the subject site.

Ground Water: No groundwater was encountered in our test excavations. However, it is anticipated that seasonal perched ground water could potentially develop at the alluvium-sandstone contact under the drainage course area of the site.

It should further, be kept in mind, that any required grading operations may change surface drainage patterns and/or reduce permeability's due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of minor amounts of surface or near-surface water at locations where none existed previously. The damage from such water is expected to be minor and cosmetic in nature, if good positive drainage is implemented at the completion of construction. Corrective action should be taken on a site-specific basis if, and when, it becomes necessary.

STORMWATER INFILTRATION

Our scope of work did not include infiltration testing, since the location of LID improvements have not been provided at this time. However, a preliminary evaluation includes the following conclusions:

Soil Conditions: According to the soil group map from *County of San Diego, BMP Sizing Calculator (website)*, the site is in an unclassified area. However, we would anticipate the alluvial area of the site will fall under Hydrologic Soil Groups (HSG) Group "A". Group "A" soils have a very good infiltration rate when thoroughly wet.

The infiltration rate of the Torrey Sandstone materials can vary depending on grain-size, density and cementation . Additional testing would be required to determine the infiltration rate of the sandstone.

Groundwater: We do not anticipate any limitations to surface bioretention systems, related to groundwater conditions. We anticipate groundwater levels

will exceed 15 feet below the existing grade, based on an evaluation of the area topography and geology.

Conclusion: LID systems that depend on infiltration should be appropriate for if installed in the undisturbed alluvial plane area of the site. We anticipate these alluvial sands will possess very good infiltration rates.

Any infiltration devices planned to be founded in the Torrey Sandstone require infiltration testing at site specific LID locations to verify suitability or feasibility.

Infiltration LID's should not be installed in filled ground.

TECTONIC SETTING

No major faults are known to traverse the subject site but it should be noted that much of Southern California, including the San Diego County area, is characterized by a series of Quaternary-age fault zones, which typically consist of several individual, en echelon faults that generally strike in a south easterly – northwesterly direction. Some of these fault zones (and the individual faults within the zones) are classified as active. According to the criteria of the California Division of Mines and Geology, active fault zones are those, which have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years). A local excerpt the 2010, *Fault Activity Map of California* is attached to this report as Figure No. 6.

A review of available geologic maps indicates that the Rose Canyon / Newport - Englewood Fault Zone is the nearest active fault and is located offshore about 4 kilometers west of the site. According to California Department of Conservation, Division of Mines and Geology, *Open-File Report 96-08 / U.S. Department of the Interior, U.S. Geological Survey Open-File Report 96-706*, a 7.1 magnitude earthquake would be the Mmax event along the Rose Canyon Rose Canyon / Newport -Englewood Fault Zone. The Fault Zone is considered a type "B" fault with a slip-rate of 1.5 mm/year. Other active fault zones in the region that could possibly affect the site include the Coronado Bank and San Clemente Fault Zones to the southwest and the Elsinore, Earthquake Valley, San Jacinto, and San Andreas Fault Zones to the northeast. However, a Maximum Magnitude Earthquake on the Rose Canyon –northeast is anticipated to generate ground accelerations on the site, greater than any of these other nearby fault zones.

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 defines active faults as those with evidence of displacement during the Holocene epoch (roughly the past 11,000 years). According to *Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones, of California, Southern Region (DMG CD 2000-003)*, by the California Department of Conservation, the site IS NOT located in or adjacent to an Alquist-Priolo Earthquake Fault Zone.

SEISMIC DESIGN PARAMETERS

This report includes an update to site the seismic parameters of the site to include design information relative to the 2013 edition of the California Building Code. We have determined the mapped spectral acceleration values for the site utilizing U.S. Seismic Design Maps, Version 3.1.0 (July 11, 2013) from the USGS website. The seismic design parameters are specific to the site and provide a solution for Section 1613 of the 2012 IBC (which uses USGS hazard data available in 2008).

The analysis included the following input parameters:

Design Code Reference Document: 2012 IBC

Site Soil Classification: Site Class C

Risk Category: I or II or III

Site Coordinates: 32.93686°N, 117.24981°W

The values generated by the *Design Map Report* are provided in the following table:

TABLE I

Site Coefficients and Spectral Response Acceleration Parameters

S_s	S_1	F_a	F_v	S_{ms}	S_{m1}	S_{ds}	S_{d1}
1.159	0.446	1.0	1.354	1.159	0.604	0.773	0.402

Application to the criteria in Table I for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if ever seismic shaking occurs. The primary goal of seismic design is to

protect life, not to avoid all damage, since such design may be economically prohibitive.

GEOLOGIC HAZARDS

General: No geologic hazards of sufficient magnitude to preclude development of the site as currently proposed are known to exist. In our professional opinion and to the best of our knowledge, the site is suitable for the proposed project.

Ground Shaking: A likely geologic hazard to affect the site is ground shaking resulting from movement along one of the major active fault zones mentioned above. Probable ground shaking levels at the site could range from slight to severe, depending on such factors as the magnitude of the seismic event and the distance to the epicenter. It is likely that the site will experience the effects of at least one moderate to large earthquake during the life of the proposed structure. Construction in accordance with the minimum requirements of the current building codes and local governing agencies should minimize potential damage due to seismic activity.

Landslide Potential and Slope Stability: Our scope of work did not include a detailed slope stability analysis for the hillside terrain. However, a review of the geologic hazards map indicates there are no known deep or suspected ancient landslides located on the site. However, as part of this investigation, we reviewed the publication, "*Landslide Hazards in the Northern Part of the San Diego Metropolitan Area*" by Tan and Giffen, 1995. This reference is a comprehensive study that classifies San Diego County into areas of relative landslide susceptibility. The subject site is located in an area classified as 3-1. The 3-1 is a general classification assigned to areas generally susceptible to slope movement. Slopes within the 3-1 classification are considered at or near their stability limits due to steep slopes and can be expected to fail locally when adversely modified. Sites Within this classification are located outside the boundaries of known landslides but may contain observably unstable slopes that may be underlain by weak materials and/or adverse geologic structure. It should be noted that that this reference, typically classifies most hillside terrain, (that is not underlain by landslides or landslide prone formations) within the 3 category.

No significant unretained cuts are planned for the proposed development and therefore the project is not anticipated to significantly impact the overall site

stability. The site is underlain with generally, massively bedded materials of the Torrey Sandstone Formation. Therefore, according to current geotechnical literature, the potential for deep-seated landsliding within the formational deposits is considered a low risk to the site. It should be noted that existing undocumented fill and slope wash materials draped over the face of the hillside could be subject to soil creep and shallow slope failure. However, the proposed improvements will be founded on stable soil and therefore, should not be significantly impacted by such surficial instability.

Also to consider, concentrations of surface water can result in rapid erosion of these slope materials and should be avoided.

Liquefaction: The materials at the site are not subject to significant liquefaction due to such factors as soil density, grain-size distribution, and groundwater conditions.

Soil Expansion: The foundation level materials at the site are considered to possess a very low expansion potential.

Flooding: The site is located outside the boundaries of both the 100-year and the 500-year floodplains according to the maps prepared by the Federal Emergency Management Agency.

Tsunamis and Seiches: Tsunamis are great sea waves produced by submarine earthquakes or volcanic eruptions. Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays or reservoirs. Based on the project's elevated location, the site is considered to possess a low risk potential from tsunamis or seiche activity.

CONCLUSIONS

In general, we found the subject property suitable for the proposed construction, provided the recommendations provided herein are followed. The most significant findings and geotechnical considerations that will influence site development are summarized below. Detailed recommendations for precede this section of the report.

- The major consideration when developing the property is the presence of the

loose fill and alluvial soils that overlie the site. The combined thickness of these materials may range from approximately 3 to 18 feet below the existing ground surface obtaining the maximum thickness in the alluvial plane area as encountered in Test Boring NB-2. These materials are unsuitable in there present condition to support a conventionally constructed building. The presence of the unsuitable fill soils and underlying alluvial deposits, together with the characteristics of the formational deposits, indicates that specially-designed foundations will most likely be necessary. In order to found the proposed residence on competent formational materials, a deep foundation system consisting of cast- in-place concrete piers and grade beams will likely be required. Where planned site grading will include the complete removal of the fill and colluvium, conventional shallow foundations, which bear upon competent formational materials, may also be utilized.

- As an alternative to a foundation system which bears entirely on the competent formational sandstone, a conventional shallow foundation system which is founded on properly recompacted fill soil would be suitable. This alternative would require the complete removal of all existing fill and alluvial materials, the benching of the slope at the base of the excavation, and the proper recompaction of the removed materials to a minimum of 90 percent the material's maximum dry density (based on ASTM test method D1557). **However, the configuration of the site, including topography and size, will likely cause great difficulties during such operations.** Further, required lateral removals of loose soil would be inhibited by property line constraints and would likely require grading to extend offsite (Typically, removals should extend laterally one-foot for every one-foot of removal depth; a 1:1 ratio). Also to consider an engineered, geogrid reinforced fill can be reconstructed to reduce the required lateral removals.

  If however, the existing fill and colluvium can be properly removed and recompacted as structural fill, a conventional shallow foundation may, depending upon the proposed structural loads, be suitable. If such remedial earthwork operations are planned, please contact this office so that we may obtain anticipated structure loads and provide you with additional recommendations.

- As described previously, existing fill slope descends from Via Grimaldi and form the south end of the property. The slope is composed of undocumented fill and is, therefore, not considered adequately to stable (to contemporary

standards). The existing slopes can be reconstructed by remedial grading, but would need to be reconstructed to a 2:1 (horizontal to vertical) inclination extending the toe-slope further to the north (from the existing location). Also grading may prove challenging due to utilities in the road shoulder plus a row of Torrey Pines along the top of slope.

Alternately, the City of San Diego will likely allow the existing fill slope to remain, undisturbed. However, an *Uncontrolled Embankment* document will likely be required in association with the property.

- The soil materials encountered at the above subject site possess a very low expansion potential (expansion index [EI] less than 20) as defined by ASTM D4829. Recommendations for heaving soils are not required.

- We anticipate the proposed structure will be founded entirely on competent formational deposits. Therefore, no significant transition (cut/fill) conditions are anticipated at the completion of grading.

EARTH WORK AND GRADING

Specification Guidelines

All grading should conform to the guidelines presented in this report, Sections 1804, J107, J108, J109 and J110S of the 2013 California Building Code, the minimum requirements of the City of San Diego, and the Standard Grading and Construction Specifications, Appendix "A", attached hereto, except where specifically superseded in the text of this report. Prior to grading, a representative of C.W. La Monte Company Inc. should be present at the preconstruction meeting to provide additional grading guidelines, if necessary, and to review the earthwork schedule.

Observation and testing by the soil engineer is essential during the grading operations. This allows the soil engineer to confirm the conditions anticipated by our investigation, to allow adjustments in design criteria to reflect the actual field conditions exposed, and to determine that the grading proceeds in general accordance with the recommendations contained herein

Fill Suitability

On-site excavated materials may be used as compacted fill material or backfill. The on-site materials are anticipated to posses a very low- to low-expansion potential.. Grading may generate oversize rock, which should be handled as discussed in the following report section. Any potential import soil sites should be evaluated and approved by the Geotechnical Consultant prior to importation at least two working days notice of a potential import source should be given to the Geotechnical Consultant so that appropriate testing can be accomplished. The type of material considered most desirable for import is a non-detrimentally expansive granular material with some silt or clay binder.

Site Preparation

Site preparation should begin with the removal of all vegetation and other deleterious materials from the portion of lot that will be graded and that will receive improvements. This should include all root balls from the trees removed and all significant root material. The resulting materials should be disposed of off-site. We anticipate the structure will be supported on a deep foundation extending into the underlying formational soil (without remedial grading), and no significant remedial grading is anticipated. As such, the specifications included in this report do not specify all remedial grading requirements. Should the scope of the project change to include remedial grading, we should be contacted to provide the necessary site preparation recommendations and grading specifications

Excavation Characteristics

The on-site alluvium and fill material is likely to be excavated with easy to moderate effort using large excavating equipment. However, any deep excavations into the Torrey Sandstone may be more challenging. No significant amounts oversize material is anticipated.

Compaction and Method of Filling

All structural fill placed at the site should be compacted to a relative compaction of at least 90 percent of its maximum dry density as determined by ASTM Laboratory Test D1557-91 guidelines. Fills should be placed at or slightly above optimum moisture content, in lifts six to eight inches thick, with each lift compacted by mechanical means. Fills should consist of approved earth material, free of trash or debris, roots, vegetation, or other materials determined to be unsuitable by our soil technicians or project geologist. All material should be free of rocks or lumps of soil in excess of twelve inches in maximum width. However, in the upper two feet of pad grade, no rocks or lumps of soil in excess of six inches should be allowed.

Utility trench backfill within five feet of the proposed structure and beneath all pavements and concrete flatwork should be compacted to a minimum of 90 percent of its maximum dry density. The upper one-foot of pavement subgrade and base material should be compacted to at least 95 percent relative density. All grading and fill placement should be performed in accordance with the local Grading Ordinance, the 2013 California Building Code, and the *Standard Grading and Construction Specifications,* attached hereto as Appendix A.

Manufactured Slope Construction

Any new and permanent cut and fill slopes should be constructed at an inclination of 2:1 or flatter (horizontal to vertical). Such slopes would be considered adequately stable.

Compaction of constructed fill slopes should be performed by back-rolling with a sheepsfoot compactor at vertical intervals of four feet or less as the fill is being placed, and track-walking the face of the slope when the slope is completed. As an alternative, the fill slopes may be overfilled by at least three feet and then cut back to the compacted core at the design line and grade.

Surface Drainage

Per Section 1804 of the California Building Code, in general, the ground immediately adjacent to foundations shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet (3048 mm) measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet (3048 mm) of horizontal

distance, a 5-percent slope shall be provided to an approved alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet (3048 mm) of the building foundation. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building.

Exceptions are allowed where climatic or soil conditions warrant, the slope of the ground away from the building foundation shall be permitted to be reduced to not less than one unit vertical in 48 units horizontal (2-percent slope). The procedure used to establish the final ground level adjacent to the foundation shall account for additional settlement of the backfill.

Erosion Control

In addition, appropriate erosion-control measures shall be taken at all times during construction to prevent surface runoff waters from entering footing excavations, ponding on finished building pad or pavement areas, or running uncontrolled over the tops of newly-constructed cut or fill slopes. Appropriate Best Management Practice (BMP) erosion control devices should be provided in accordance with local and federal governing agencies.

Temporary Cut Slopes

Temporary cut slopes, up to 8 feet in height, are planned for the proposed retaining walls. We anticipate temporary slopes may be excavated at a minimum inclination of 1.0:1.0 (horizontal to vertical) In addition, a short vertical cut will be allowable at the base to accommodate the foundation excavation into formation. The stability of temporary slopes should be verified by the geotechnical consultant at the time of excavation.

No surcharge loads such as stockpiles, vehicles, etc. should be allowed within a distance from the top of temporary slopes equal to half the slope height. Further care should be taken not to undermine adjacent improvements by the placement of temporary excavations.

It should be noted that the contractor is solely responsible for designing and constructing stable, temporary excavations and may need to shore, slope, or bench the sides of trench excavations as required to maintain the stability of the

excavation sides where friable sands or loose soils are exposed. The contractor's "responsible person", as defined in the OSHA Construction Standards for Excavations, 29 CFR, Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety process. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. Actual safe slope angles should be verified by the geotechnical consultant at the time of excavation. Temporary cut slopes sloped at the recommended inclinations may not be feasible in some areas due to structure constraints. If such is the case, excavation shoring should be provided in such locations where undermining or other damage to adjacent structures and improvements is an issue.

Grading Plans Review

The finalized grading plans, if significantly different from the referenced plans, should be submitted to this office for review to ascertain that the recommendations provided in this report have been followed and that the assumptions utilized in its preparation are still valid. Additional or amended recommendations may be issued based on this review.

FOUNDATIONS

Due to presence of undocumented fill and compressible alluvium, the proposed structure shall be founded on deep foundation system that extends through the loose fill and slope wash and into dense formational bedrock materials. The new foundation should consist of a structurally designed pier and post foundation system supporting a structural beam. The concrete pier foundation system essentially bridges the structure over the loose soil section. Where cuts expose bedrock at or near the finish surface conventional foundations may be utilized in conjunction with the pier system. Specific foundation recommendations and design criteria are detailed in the below sections.

DEEP FOUNDATION SYSTEMS

GENERAL: Augered, cast-in-place concrete piers which are tied together with concrete reinforced grade beams, are considered suitable for support of the

structure loads of the proposed residence. Pier support will be afforded by end bearing within the dense to very dense formational materials.

MINIMUM PIER DIMENSIONS: All drilled, cast-in-place concrete piers should extend at least three feet into undisturbed, firm formational soils and have a minimum diameter of 24 inches. All piers should extend a minimum of five feet into the competent formational sandstone, and should be designed by the project structural engineer. Piers should also be reinforced in accordance with the recommendations of the project structural engineer. The reinforcing cage should extend the full height of the pier.

BEARING CAPACITY: Incorporating the minimum dimensions recommended, the cast-in-place concrete piers may be designed for an allowable downward axial bearing capacity of 5000 per square foot. This value may be increased by 800 psf for each additional foot of pier depth, up to a maximum allowable bearing capacity of 8000 per square foot.

LATERAL PIER CAPACITY: The passive pressure for the formational materials may be considered to be 350 pounds per square foot per foot of depth, up to a maximum value of 2,500 psf. These values may be assumed to act on an area equal to twice the pier diameter.

CLEANING OF PIER EXCAVATIONS: If 24-inch diameter piers are used, the cleaning of the bottom of the pier excavation may be performed by careful operations of the driller and back-spinning the drill auger under pressure or utilizing a clean-out plate. For larger diameter piers, hand cleaning may be required. This will be determined by the observation of a geologist or engineer from our staff during the excavation of the piers.

SHALLOW FOUNDATIONS

FOUNDATION DIMENSIONS: If planned site grading removes all fill and colluvial materials in areas to receive settlement-sensitive structure, new spread footings may be used for structural support provided they are embedded in undisturbed, competent formational sandstone. Refer to the attached cross sections.

Spread footings to support the structural loads of one and two-story portions of the residence should be embedded at least twelve to eighteen inches

(respectively) into the dense to very dense formational sandstone. It should be understood that based upon the observation of our field representative, deeper embedment depths may be necessary. Continuous footings to support one and two-story portions of the proposed residence should be at least twelve and fifteen inches in width (respectively), while isolated spread footing should be minimally dimensioned at twenty-four inches in width or diameter.

BEARING CAPACITY: Conventional spread footings which bear entirely in undisturbed formational deposits and with the above minimum dimensions may be designed for an allowable soil bearing pressure of 3,000 pounds per square foot (psf). This value may be increased 750 psf and 400 psf for each additional foot of footing depth and width, respectively, up to a maximum of 5000 psf. The bearing value may also be increased by one-third when considering temporary loads such as those due to wind or seismic loads.

FOOTING REINFORCING: Reinforcement requirements for new foundations should be provided by the project structural engineer. However, based on the existing soil conditions, we recommend that the minimum reinforcing for continuous footings consist of at least one No. 5 bar positioned three inches above the bottom of the footing and one No. 5 bar positioned two inches below the top of the footing.

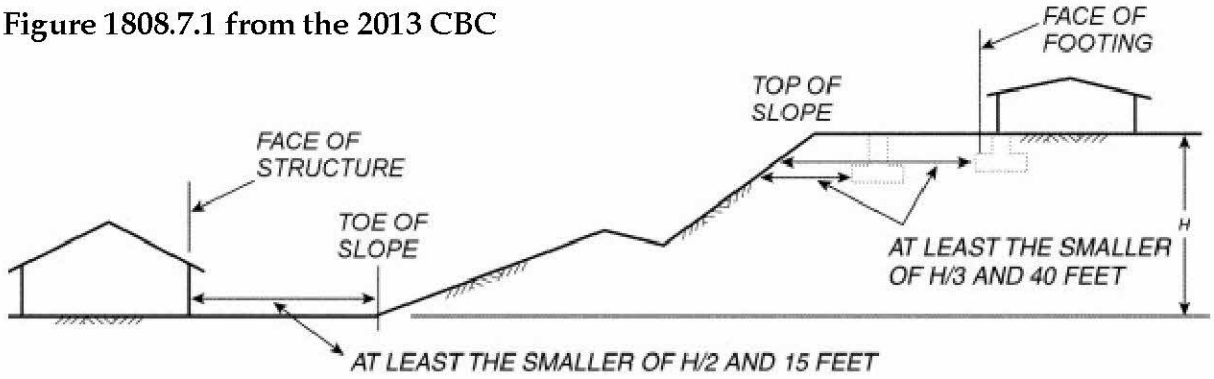
LATERAL LOAD RESISTANCE: Lateral loads against foundations may be resisted by friction between the bottom of the footing and the supporting soil, and by the passive pressure against the footing. The coefficient of friction between concrete and soil may be considered to be 0.40. The passive resistance may be considered to be equal to an equivalent fluid weight of 350 pounds per cubic foot. This assumes the footings are poured tight against undisturbed formational materials. The upper foot of soil should be neglected when calculating the passive resistance of the soil acting upon footings. If a combination of the passive pressure and friction is used, the friction value should be reduced by one-third.

Horizontal Distance of Footings from Slopes

According to Section 1808.7 (Foundation on or adjacent to slopes), of the 2013 California Building Code foundations on or adjacent to slope surfaces shall be

founded in firm material with an embedment and set back from the slope surface sufficient to provide vertical and lateral support for the foundation without detrimental settlement. Generally, setbacks should conform to Figure 1808*A*.7.1, which is reproduced below. Where the slope is steeper than 1 unit vertical in 1 unit horizontal (100-percent slope), the required setback shall be measured from an imaginary plane 45 degrees to the horizontal, projected upward from the toe of the slope.

Figure 1808.7.1 from the 2013 CBC



Foundation Excavation Observation

The general contractor is responsible for implementing the foundation recommendations in this report. All foundation excavations should be observed by the Geotechnical Consultant prior to placing reinforcing steel and formwork in order to verify compliance with the foundation recommendations presented herein. All footing excavations should be excavated neat, level and square. All loose or unsuitable material should be removed prior to the placement of concrete.

Foundation Plans Review

The finalized, foundation plans should be submitted to this office for review to ascertain that the recommendations provided in this report have been followed and that the assumptions utilized in its preparation are still valid. Additional or amended recommendations may be issued based on this review.

CONCRETE SLABS-ON-GRADE

Interior Floor Slabs

The minimum floor slab thickness should be 4 inches. The floor slabs should be reinforced with at least No. 3 bars placed at 18 inches on center each way. Slab reinforcing should be supported by chairs and be positioned at mid-height in the floor slab. This recommendation does not supersede the section required for structural considerations.

Exterior Concrete Flatwork

On-grade exterior concrete slabs for walks and patios should have a thickness of four inches and should be reinforced with at least No. 3 reinforcing bars placed at 24 inches on center each way. Exterior slab reinforcement should be placed approximately at mid-height of the slab. Reinforcement and control joints should be constructed in exterior concrete flatwork to reduce the potential for cracking and movement. Joints should be placed in exterior concrete flatwork to help control the location of shrinkage cracks. Spacing of control joints should be in accordance with the American Concrete Institute specifications. Where slabs abut foundations they should be doweled into the footings.

SLAB MOISTURE BARRIERS

A moisture barrier system is recommended beneath any new interior slab-on-grade floors with moisture sensitive floor coverings or coatings to help reduce the upward migration of moisture vapor from the underlying subgrade soil. A properly selected and installed vapor retarder is essential for long-term moisture resistance and can minimize the potential for flooring problems related to excessive moisture.

Interior floor slabs should be underlain by a minimum 10-mil thick moisture retarder product over a two-inch thick layer of clean sand (Please note, additional moisture reduction and/or prevention measures may be needed, depending on the performance requirements for future floor covering products). The moisture retarder product used should meet or exceed the performance standards dictated by ASTM E 1745 Class A material and be properly installed in accordance with ACI publication 302 (*Guide to Concrete Floor and Slab Construction*) and ASTM E1643

(*Standard Practice for Installation of Water Vapor Retarder Used in Contact with Earth or Granular Fill Under Concrete Slabs).* Ultimately, the design of the moisture retarder system and recommendations for concrete placement and curing are purview of the structural engineer, in consideration of the project requirements provided by the project architect and developer.

Moisture Retarders and Installation

Vapor retarder joints must have at least 6-inch-wide overlaps and be sealed with mastic or the manufacturer's recommended tape or compound. No heavy equipment, stakes or other puncturing instruments should be used on top of the liner before or during concrete placement. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarders' effectiveness. It is the responsibility of the contractor to ensure that the moisture retarder is properly placed in accordance with the project plans and specifications and that the moisture retarder material is free of tears and punctures and is properly sealed prior to the placement of concrete.

Interior Slab Curing Time

Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials. Prior to installation, standardized testing (calcium chloride test and/or relative humidity) should be performed to determine if the slab moisture emissions are within the limits recommended by the manufacturer of the specified floor-covering product.

DESIGN PARAMETERS FOR EARTH RETAINING STRUCTURES

The below foundation values are provided for conventional shallow foundations.

Passive Pressure: The **passive pressure** for the prevailing soil conditions may be considered to **be 350 pounds per square foot** per foot of depth. This pressure may be increased one-third for seismic loading. The **coefficient of friction** for concrete to soil may be assumed to be **0.4** for the resistance to lateral movement. When

combining frictional and passive resistance, the friction value should be reduced by one-third.

Soil Bearing Value

Conventional spread footings with the above minimum dimensions may be designed for an allowable soil bearing pressure of **2,500 pounds per square foot** for foundation bearing in compacted fill or firm natural ground.

Active Pressure for Retaining Walls

Active Pressure for Retaining Walls: Lateral pressures acting against masonry and cast-in-place concrete retaining walls can be calculated using soil equivalent fluid weight. The equivalent fluid weight value used for design depends on allowable wall movement. Walls that are free to rotate at least 0.5 percent of the wall height can be designed for the active equivalent fluid weight. Retaining walls that are restrained at the top (such as basement walls), or are sensitive to movement and tilting should be designed for the at-rest equivalent fluid weight.

Values given in the table below are in terms of equivalent fluid weight and assume a triangular distribution.

Table II
Equivalent Fluid Weights (efw) For Calculating Lateral Earth Pressures
(Using "Select" Onsite Backfill)

Surface slope of Retained material Horizontal to vertical*	Cantilever equivalent Fluid weight *(active* pressure) (pcf)	Restrained equivalent Fluid weight *(at-rest* pressure) (pcf)
LEVEL	30	60
2 to 1	43	73

Pressures for Seismic Ground Motions: Using a K_h value of 0.13 the modified equivalent fluid pressure (EFP) due to earthquake ground motion **is 16 pcf**. This is

an inverted triangular distribution. The point of application of the resultant force of the seismic EFP is located at approximately 0.6H (H=Height of the retaining wall) above the base of the wall. The above seismic force should be used in addition to the "static" or at-rest earth pressure.

Vehicular Loads: In the case of vehicular loads coming closer than one-half the height of the wall, we recommend a live load surcharge pressure equal to not less than 2 feet of soil surcharge with an average unit weight of 125 pcf.

Waterproofing and Drainage

In general, retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and waterproofed as specified by the project architect. **Also refer to American Concrete Institute ACI 515.R (A Guide to the Use of Waterproofing, Damp Proofing, Protective and Decorative Barriers Systems for Concrete).**

Positive drainage for retaining walls should consist of a vertical layer of permeable material positioned between the retaining wall and the soil backfill. Such permeable material may be composed of a composite drainage geosynthetic or a natural permeable material such as crushed rock or clean sand at least 12 inches thick and capped with at least 12 inches of backfill soil. The gravel should be wrapped in a geosynthetic filter fabric. Provisions should be made for the discharge of any accumulated groundwater. The selected drainage system should be provided with a perforated collection and discharge pipe placed along the bottom of the permeable material near the base of the wall. The drain pipe should discharge to a suitable drainage facility. A typical retaining wall detail is attached as Figure No. 7A. If lateral space (due to property line constraints) is insufficient to allow installation of the gravel-wrapped "burrito" drain, a geocomposite system may be used in lieu of the typical gravel and pipe subdrain system. TenCate's MiraDrain (and similar products) provide a "low-profile" drainage system that requires minimal lateral clearance for installation. See Figure No. 7B for a typical MiraDrain detail, which is provided by the manufacturer. MiraDRAIN and similar products may also be incorporated into a waterproofing system and provide a slab drainage system (Please note that supplemental manufacturer's details will be required to provide a waterproofed system).

Please note natural stone gravity walls do not require a subdrainage system unless specifically recommended by the design engineer (due the abundant openings between rocks).

Backfill

All backfill soils should be compacted to at least 90% relative compaction. The typical on-site clay (CH) materials **are not** suitable for retaining wall backfill. Soil with an expansion index (EI) of greater than 50 should not be used as backfill material behind retaining walls. The wall should not be backfilled until the masonry has reached an adequate strength.

LIMITATIONS

The recommendations presented in this report are contingent upon our review of final plans and specifications. Such plans and specifications should be made available to the Geotechnical Engineer and Engineering Geologist so that they may review and verify their compliance with this report and with California Building Code. It is recommended that C.W. La Monte Company Inc. be retained to provide soil engineering services during the construction operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations and/or cut and fill slopes may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the Geotechnical Engineer so that he may make modifications if necessary.

Our firm will not be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the Owner and Contractor. The Contractor should notify the Owner if he considers any of the recommended actions presented herein to be unsafe.

This office should be advised of any changes in the project scope or proposed site grading so that we may determine if the recommendations contained herein are

appropriate. It should be verified in writing if the recommendations are found to be appropriate for the proposed changes or our recommendations should be modified by a written addendum.

The findings of this report are valid as of this date. Changes in the condition of a property can occur, however, with the passage of time, whether they are due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Government Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the locations where our borings, surveys, and explorations are made, and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for the interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

It is the responsibility of the stated client or their representatives to ensure that the information and recommendations contained herein are brought to the attention of the structural engineer and architect for the project and incorporated into the project's plans and specifications. It is further their responsibility to take the necessary measures to insure that the contractor and his subcontractors carry out such recommendations during construction.

The firm of C.W. La Monte Co. Inc. shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to the issuance of this report.

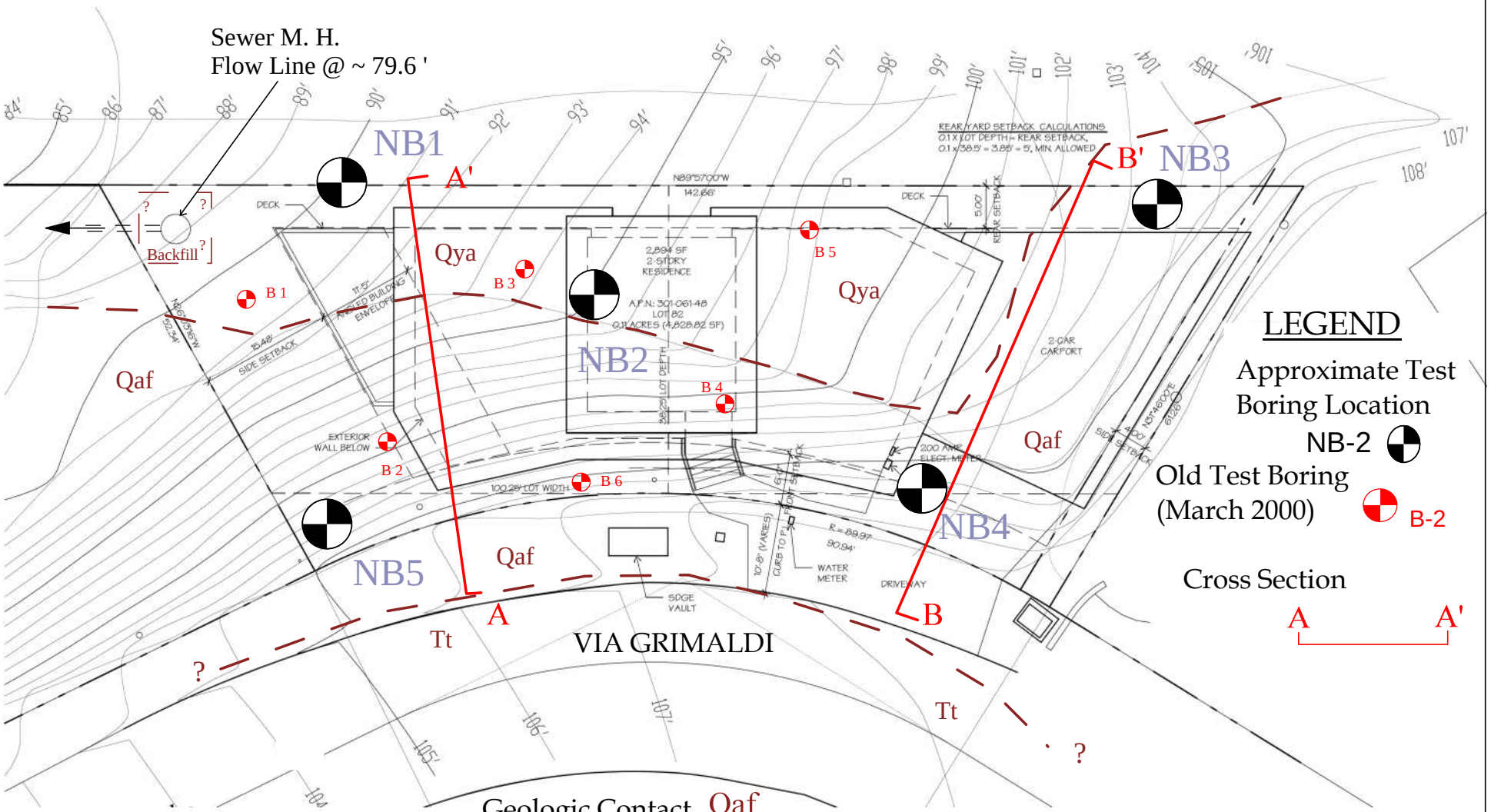
SITE LOCATION AND TOPOGRAPHIC MAP

Excerpts from USGS Topographic Maps Del Mar and Del Mar OE-W Quadrangles, 7.5-Minute Series, 2015

C.W. La Monte Company Inc.
Soil and Foundation Engineers

Figure No. 1

PLOT PLAN (EXISTING SITE CONDITONS)



C. W. La Monte Company Inc.
Soil and Foundation Engineers

ROSS RESIDENCE
13070 VIA GRIMALDI
SAN DIEGO, CA 92014

Figure No. 2

Log of Test Boring No. NB-1

Surface Elevation: 89.5' * **Date:** 11/3/2015 **Logged By:** JBR
Drilling Method: 4" Dia. Hand Auger
Sampling Methods: 2.5" I.D. California Sampler (CA)

DEPTH (feet)	SAMPLES BULK	SAMPLES DRIVEN	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S	DESCRIPTION OF SUBSURFACE CONDITIONS
5						SM	**ALLUVIUM (Qya)** Orange brown, light brown and brown, slightly moist, loose to medium dense, slightly silty, fine to medium sand. Minor caving upper 1.5 feet
10							
15						SM	**OLD PARALIC DEPOSITS (Qop_6)** Orange brown & light brown, medium dense to dense, slightly moist, silty, fine to medium sand.
20							**Excavation Bottom** No Groundwater *Relative Elevation per plan

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FIGURE NO. 3 A

Log of Test Boring No. NB-2

Surface Elevation: 95' * **Date:** 11/3/2015 **Logged By:** JBR
Drilling Method: 4" Dia. Hand Auger
Sampling Methods: 2.5" I.D. California Sampler (CA)

DEPTH (feet)	SAMPLES BULK	SAMPLES DRIVEN	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S	DESCRIPTION OF SUBSURFACE CONDITIONS
5						SM	**ALLUVIUM (Qya)** Orange brown, light brown and brown, slightly moist, loose to medium dense, slightly silty, fine to medium sand. Minor caving upper 1.5 feet
10							
15							**OLD PARALIC DEPOSITS (Qop_6)** Orange brown & light brown, medium dense to dense, slightly moist, silty sand and clayey sand.
						SM SC	No Groundwater
20							**Excavation Bottom**

* Relative Elevation per plan

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FIGURE NO. 3B

Log of Test Boring No. NB-3

Surface Elevation: 103.5' * **Date:** 11/3/2015 **Logged By:** JBR
Drilling Method: 4" Dia. Hand Auger
Sampling Methods: 2.5" I.D. California Sampler (CA)

DEPTH (feet)	SAMPLES BULK	SAMPLES DRIVEN	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S	DESCRIPTION OF SUBSURFACE CONDITIONS
						SM	**FILL (Qaf)** Light brown, dry, loose, silty, fine to medium sand.
5						SM	**ALLUVIUM (Qya)** Orange brown, light brown and brown, slightly moist, loose to medium dense, slightly silty, fine to medium sand.
10						SM SC	**OLD PARALIC DEPOSITS (Qop_6)** Orange brown & light brown, medium dense to dense, slightly moist, silty sand and clayey sand.
15							**Excavation Bottom** No Groundwater *Relative Elevation per plan
20							

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FIGURE NO. 3C

Log of Test Boring No. NB-4

Surface Elevation: 107' * **Date:** 11/3/2015 **Logged By:** JBR
Drilling Method: 4" Dia. Hand Auger
Sampling Methods: 2.5" I.D. California Sampler (CA)

DEPTH (feet)	SAMPLES BULK	SAMPLES DRIVEN	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S	DESCRIPTION OF SUBSURFACE CONDITIONS
5						SM	**FILL (Qaf)** Orange brown, light brown and brown, slightly moist, loose to medium dense, slightly silty, fine to medium sand. Minor caving upper 1 foot
10						SM	**COLLUVIUM / ALLUVIUM** Dark brown, slightly moist, loose to medium dense, slightly silty, fine to medium sand.
15						SM	**TORREY SANDSTONE (Tt)** Light brown, very dense, slightly moist, silty sandtone.
20							**Excavation Bottom** No Groundwater *Relative Elevation per plan

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FIGURE NO. 3 D

Log of Test Boring No. NB-5

Surface Elevation: 103' * **Date:** 11/3/2015 **Logged By:** JBR
Drilling Method: 4" Dia. Hand Auger
Sampling Methods: 2.5" I.D. California Sampler (CA)

DEPTH (feet)	SAMPLES BULK	SAMPLES DRIVEN	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S	DESCRIPTION OF SUBSURFACE CONDITIONS
						SM	**FILL (Qaf)** Light brown, slightly moist, loose to medium dense, silty, fine to medium sand.
5						SM	**TORREY SANDSTONE (Tt)** Light brown, very dense, slightly moist, silty sandtone.
10							**Excavation Bottom** No Groundwater *Relative Elevation per plan
15							
20							

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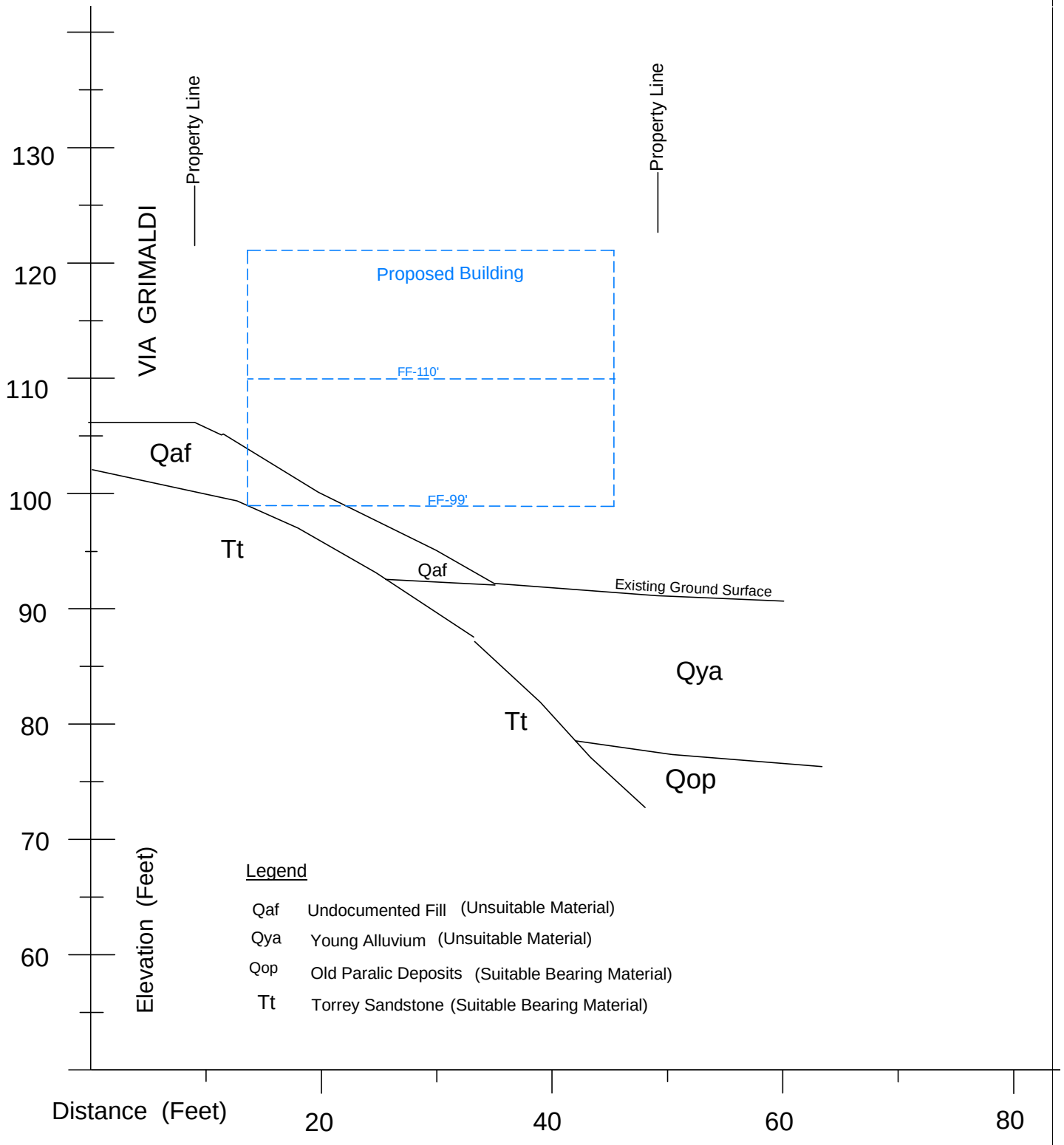
FIGURE NO. 3 E

CROSS SECTION A-A'



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ROSS RESIDENCE
13070 VIA GRIMALDI
SAN DIEGO, CA 92014

FIGURE NO. 4 A

CROSS SECTION B-B'

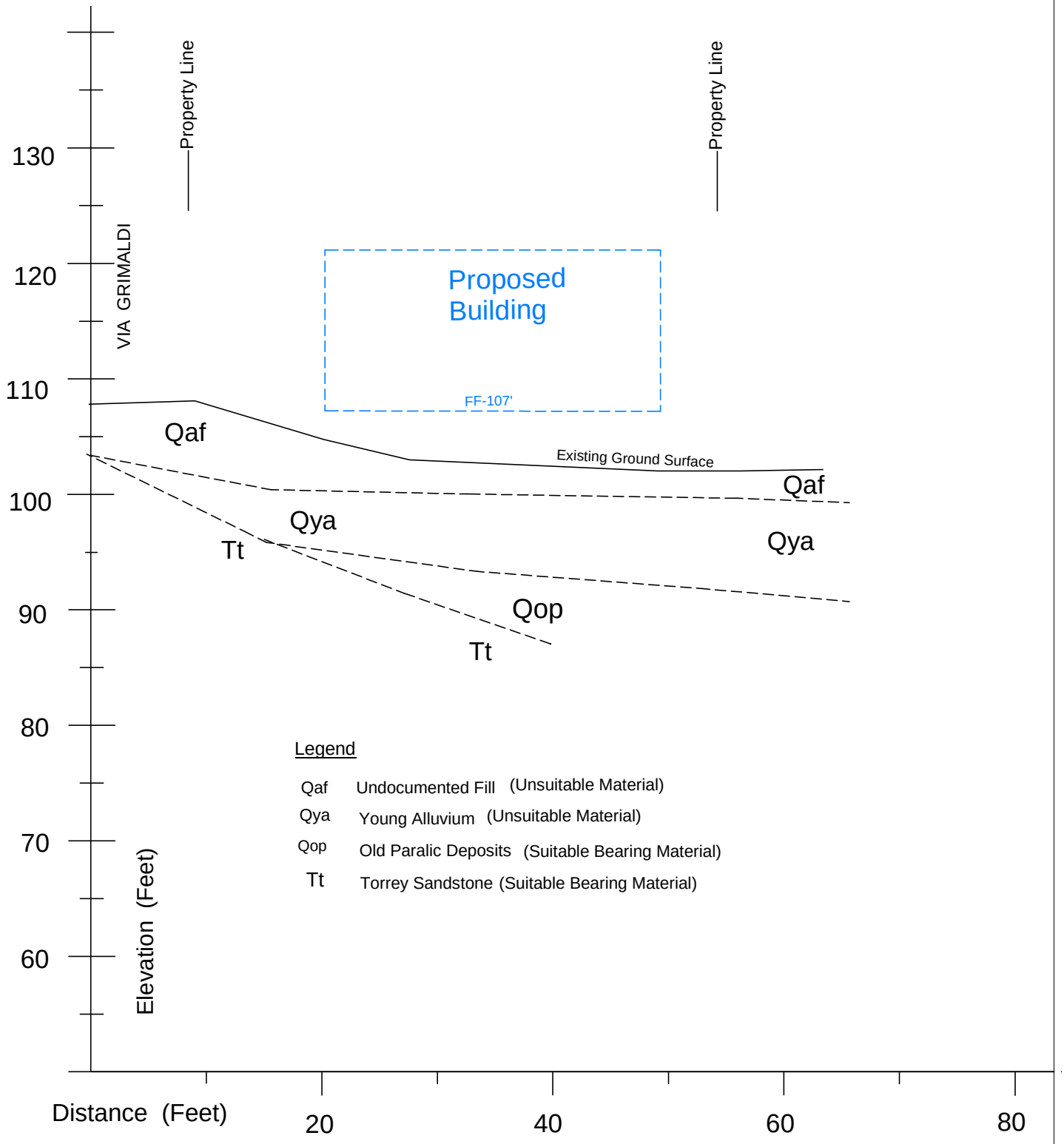

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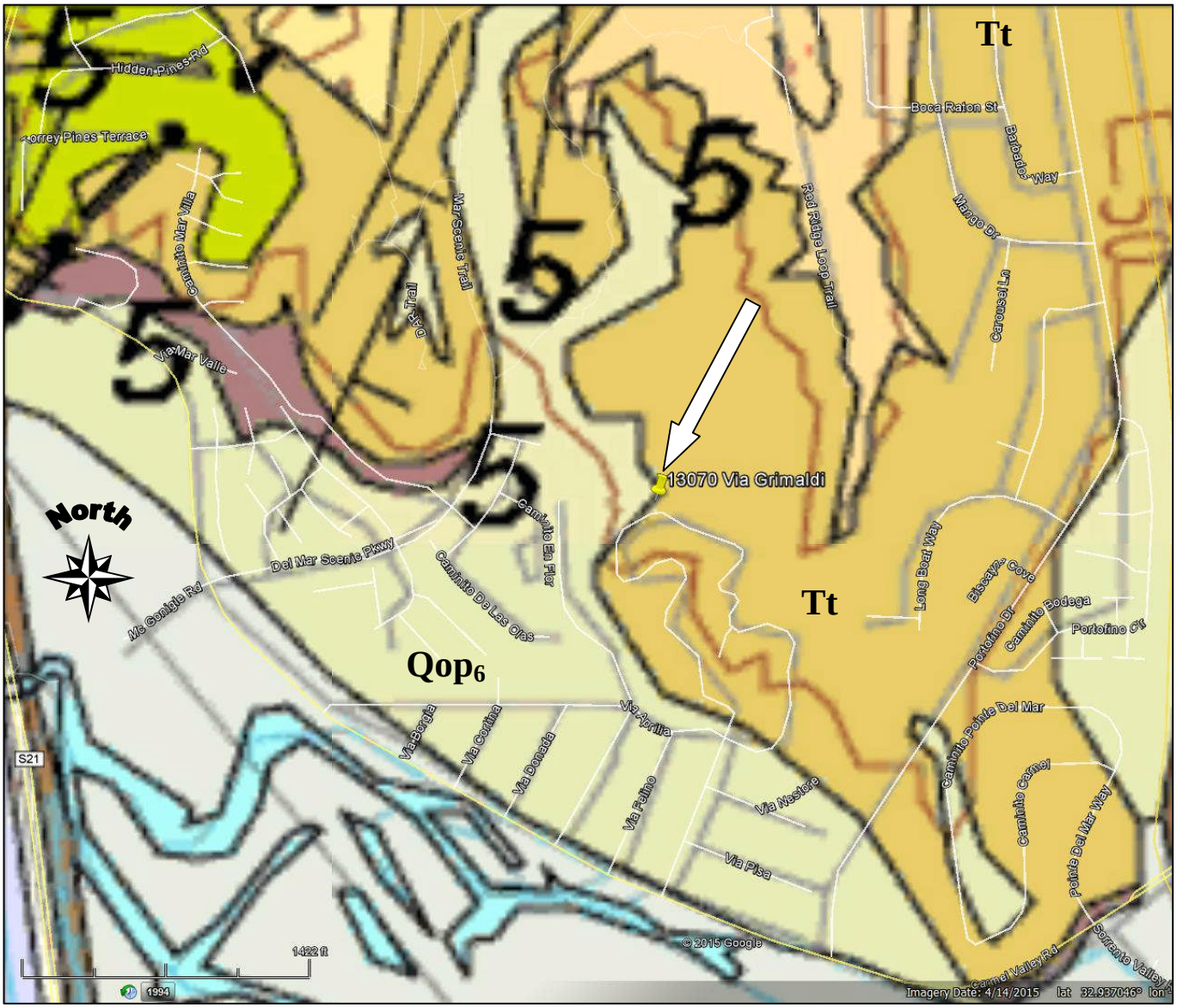
FIGURE NO. 4 B

GEOLOGY MAP EXCERPT

13070 Via Gramaldi
Del Mar, CA



Excerpt from *Geology of the San Diego 30′ x 60′ Quadrangle, California, Compiled by Michael P. Kennedy and Siang S. Tan, 2005*

LEGEND (Localized)

Qop_6 = Old paralic deposits, Unit 6

Tt = Torrey Sandstone

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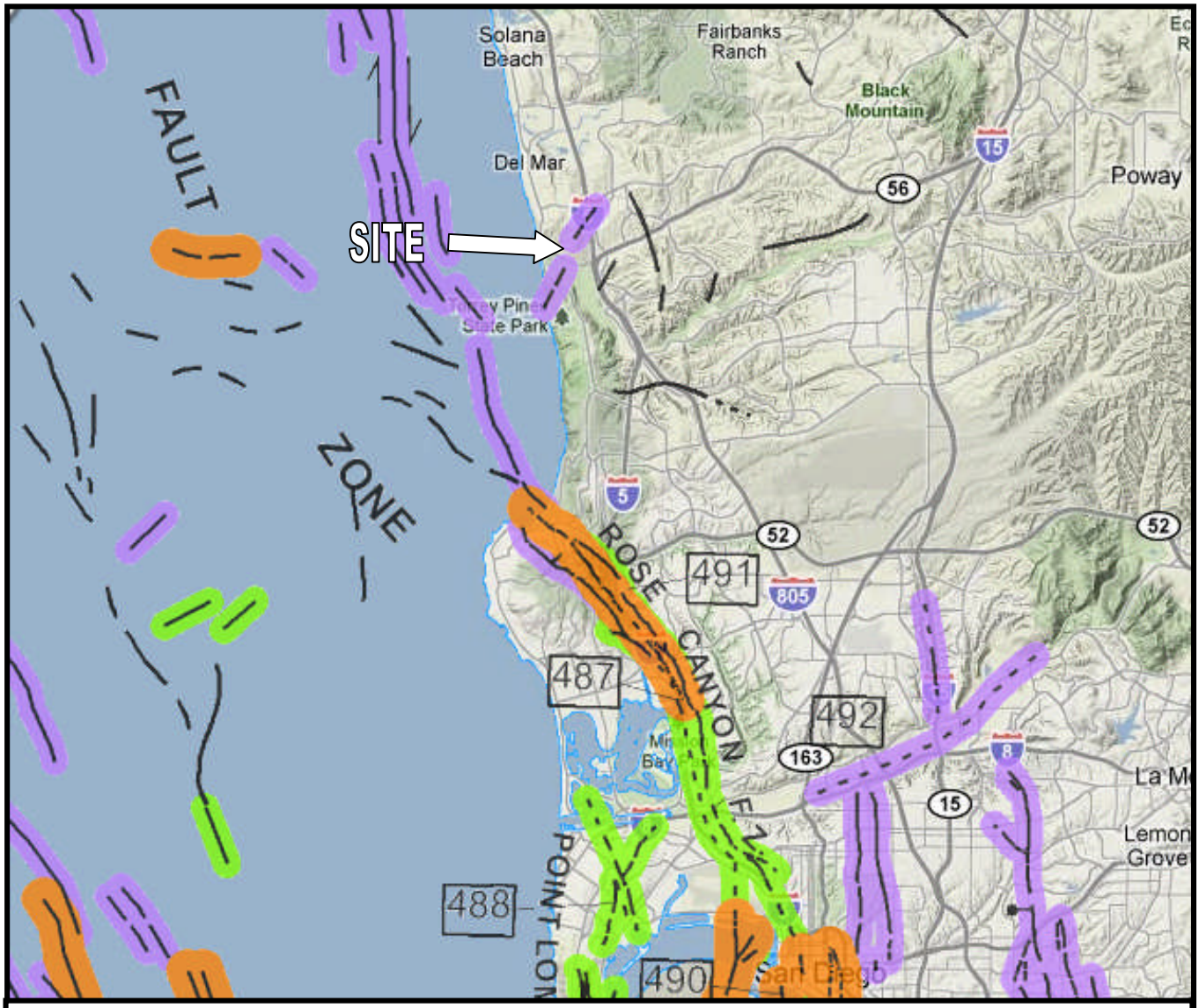
Figure No 5

Excerpt from: 2010 Fault Activity Map of California
California Geological Survey, Geologic Data Map No. 6



SUMMARY EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

FAULT CLASSIFICATION COLOR CODE (Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred:

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (Age undifferentiated)

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

Figure No. 6

Excerpt From Map 38 City of San Diego
SEISMIC SAFETY STUDY Geologic Hazards and Faults

13030 Via Gramaldi, Del Mar, CA

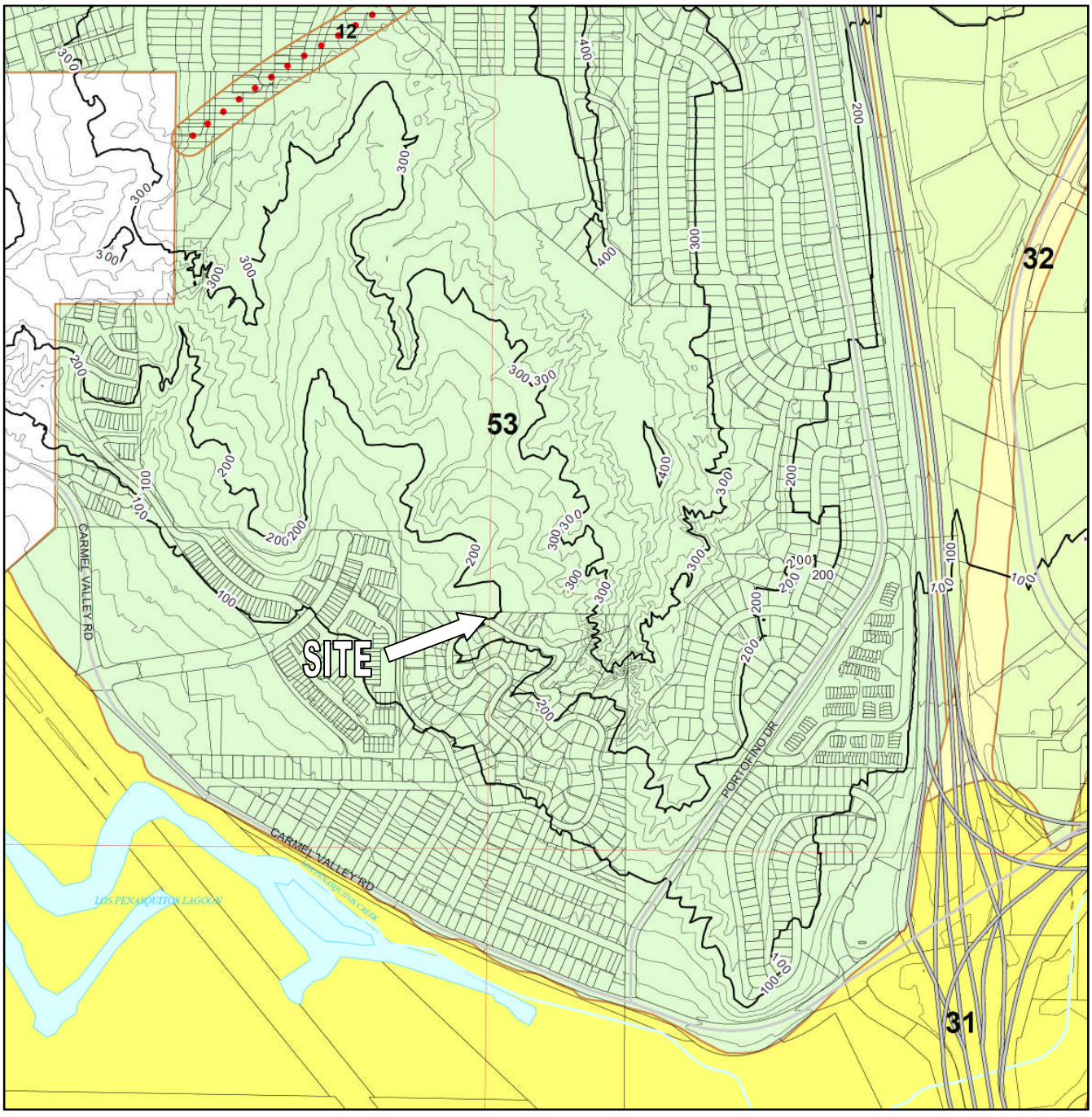


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Figure No. 7

TYPICAL RETAINING WALL SECTION

(No Scale)

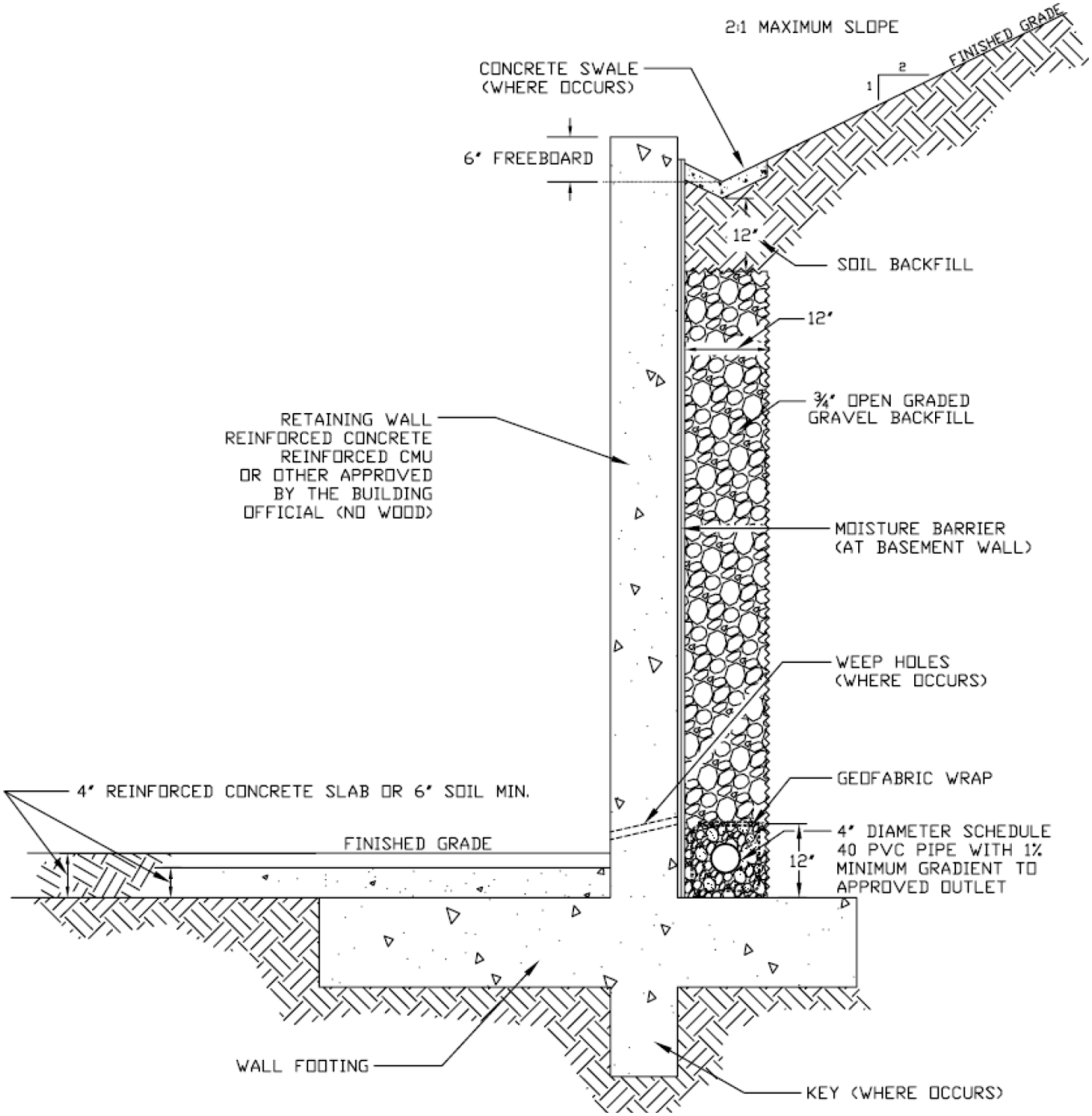

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Figure No. 8A

Appendix “A”

STANDARD GRADING AND CONSTRUCTION SPECIFICATIONS

Appendix "A"

STANDARD GRADING AND CONSTRUCTION SPECIFICATIONS

These specifications present the usual and minimum requirements for projects on which C.W. La Monte Company is the geotechnical consultant. No deviation from these specifications will be allowed, except where specifically superseded in the preliminary geology and soils report or in other written communication signed by the Soils Engineer or Engineering Geologist of record.

GENERAL

A. The Soils Engineer and Engineering Geologist is the Owner's or Builders' representative on the Project. For the purpose of these specifications, participation by the Soils Engineer includes that observation performed by any person or persons employed by, and responsible to, the licensed Civil Engineer signing the soils reports.

B. All clearing, site preparation, or earthwork performed on the project shall be conducted by the Contractor under the supervision of the Soils Engineer.

C. It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Soils Engineer and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Soils Engineer. The Contractor shall also remove all material considered unsatisfactory by the Soils Engineer.

D. It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement, and time of year.

E. A final report shall be issued by the Soils Engineer attesting to the Contractor's conformance with these specifications.

SITE PREPARATION

A. All vegetation and deleterious material shall be disposed of off site. This removal shall be concluded prior to placing fill.

B. Soil, alluvium, or bedrock materials determined by the Soils Engineer, as being unsuitable for placement in compacted fills shall be removed from the site. The Soils Engineer must approve any material incorporated as a part of a compacted fill.

C. After the ground surface to receive fill has been cleared, it shall be scarified, disced, or bladed by the Contractor until it is uniform and free from ruts, hollows, hummocks, or other uneven features which may prevent uniform compaction.

   The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted as specified. If the scarified zone is greater than 12 inches in depth, the excess shall be removed and placed in lifts restricted to 6 inches.

   Prior to placing fill, the ground surface to receive fill shall be inspected, tested as necessary, and approved by the Soils Engineer.

D. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, or others are to be removed or treated in a manner prescribed by the Soils Engineer and /or governing agency.

E. In order to provide uniform bearing conditions in cut-fill transition lots and where cut lots are partially in soil, colluvium, or un-weathered bedrock materials, the bedrock portion of the lot extending a minimum of 3 feet outside of building lines shall be over excavated a minimum of 3 feet and replaced with compacted fill.

COMPACTED FILLS

A. Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Soils Engineer. Roots, tree branches, and other matter missed during clearing shall be removed from the fill as directed by the Soils Engineer.

B. Rock fragments less than 6 inches in diameter may be utilized in the fill, provided:

1. They are not placed in concentrated pockets.
2. There is a sufficient percentage of fine-grained material to surround the rocks.
3. The Soils Engineer shall supervise the distribution of rocks.

C. Rocks greater than 6 inches in diameter shall be taken off site, or placed in accordance with the recommendations of the Soils Engineer in areas designated as suitable for rock disposal.

D. Material that is spongy, subject to decay or otherwise considered unsuitable should not be used in the compacted fill.

E. Representative samples of material to be utilized as compacted fill shall be analyzed by the laboratory of the Soils Engineer to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Soils Engineer as soon as possible.

F. Material used in the compaction process shall be evenly spread, watered processed, and compacted in thin lifts not to exceed 6 inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Soils Engineer.

G. If the moisture content or relative density varies from that required by the Soils Engineer, the Contractor should re-work the fill until the Soils Engineer approves it.

H. Each layer shall be compacted to 90 percent of the maximum density in compliance with the testing method specified by the controlling governmental agency. (In general, ASTM D-1557-91, the five-layer method will be used.)

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soils condition, the area to receive fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the soils report.

H. All fills shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material except where the slope receiving fill exceeds a ratio of five horizontal to one vertical, in accordance with the recommendations of the Soils Engineer.

I. The key for hillside fills should be a minimum of 15 feet in width and within bedrock or similar materials, unless otherwise specified in the soil report.

K. Subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendations of the Soils Engineer or Engineering Geologist.

L. The contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

M. All fill slopes should be planted or protected from erosion or by other methods specified in the soils report.

N. Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials, and the transition shall be stripped of all soil prior to placing fill.

CUT SLOPES

A. The Engineering Geologist shall inspect all cut slopes at vertical intervals not exceeding 10 feet.

B. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Soils Engineer, and recommendations shall be made to treat these problems.

C. Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erodible interceptor swale placed at the top of the slope.

Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Soils Engineer or Engineering Geologist.

GRADING CONTROL

A. Observation of the fill placement shall be provided by the Soils Engineer during the progress of grading.

B. In general, density tests should be made at intervals not exceeding 2 feet of fill height or every 500 cubic yards of fill placement. This criteria will vary, depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verily that the required compaction is being achieved.

C. Density tests may also be conducted on the surface material to receive fills as determined by the Soils Engineer.

D. All clean-outs, processed ground to receive fill, key excavations, subdrains, and rock disposals must be inspected and approved by the Soils Engineer or Engineering Geologist prior to placing any fill. It shall be the Contractor's responsibility to notify the Soils Engineer when such areas are ready for inspection.

CONSTRUCTION CONSIDERATIONS

A. The Contractor shall provide necessary erosion control measures, during grading and prior to the completion and construction of permanent drainage controls.

B. Upon completion of grading and termination of inspections by the Soils Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Soils Engineer or Engineering Geologist.

C. Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of permanent nature on or adjacent to the property.

D. In the event that temporary ramps or pads are constructed of uncontrolled fill soils during a future grading operation, the location and extent of the loose fill soils shall be noted by the on-site representative of a qualified soil engineering firm. These materials shall be removed and properly recompacted prior to completion of grading operations.

E. Where not superseded by specific recommendations presented in this report, trenches, excavations, and temporary slopes at the subject site shall be constructed in accordance with section 1541 of Title 8, Construction Safety Orders, issued by OSHA.

APPENDIX " B"
UNIFIED SOIL CLASSIFICATION CHART

SOI L DESC RI PTI ON

I . COARSE GRAINED: More than half of material is larger than No. 200 sieve size.

GRAVELS: More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".

	GROUP SYMBOL	TYPICAL NAMES
CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
	GP	Poorly graded gravels, gravel sand mixtures, little or no fines
GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, poorly graded gravel- sand-silt mixtures
	GC	Clayey gravels, poorly graded gravel sand, clay mixtures.

SANDS: More than half of coarse fraction is smaller than No. 4 sieve size

CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
SANDS WITH FINES (Appreciable amount of fines	SM	Silty sands, poorly graded sand and silty mixtures.
	SC	Clayey sands, poorly graded sand and clay **mixtures**

II. FINE GRAINED: More than half of material is smaller than No. 200 sieve size

SILTS AND CLAYS	ML	Inorganic silts and very fine sands, rock flour, sandy silt - or clayey-silt with slight plasticity.
Liquid Limit Less than 50	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silt
Liquid Limit greater than 50	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils.