County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

San Pasqual Valley Road
(PDS2017-AP-17-001, PDS2017-REZ-17-001, PDS2017-TM-5620)

2260 San Pasqual Valley Road
Escondido, CA 92027

ASSESSOR'S PARCEL NUMBER(S):
234-261-23, 234-440-05, & 234-430-21

ENGINEER OF WORK:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM LUNDSTROM
No. C61630
Exp. 06/30/21
CIVIL
STATE OF CALIFORNIA

William Lundstrom R.C.E. 61630

PREPARED FOR:

KAE Investments, LLC
9970 W. Cheyenne
Las Vegas, CA 89129

PDP SWQMP PREPARED BY:

Lundstrom Engineering & Surveying, Inc.
5333 Mission Center Road, #115
San Diego, CA 92108
619 814-1220

DATE OF SWQMP:
May 21, 2020

PLANS PREPARED BY:
Lundstrom Engineering & Surveying, Inc.

SWQMP APPROVED BY:

APPROVAL DATE:

SDC PDS RCVD 01-07-20
TM5620

PDP SWQMP Preparer's Certification Page

Project Name: San Pasqual Valley Road
Permit Application Number: PDS2017-AP-17-001, PDS2017-REZ-17-001, PDS2017-TM-5620

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

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

William Lundstrom
Print Name

Lundstrom Engineering & Surveying, Inc.
Company

May 21, 2020
Date

Engineer's Seal:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM LUNDSTROM
No. C61630
Exp. 06/30/21
CIVIL
STATE OF CALIFORNIA

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Table of Contents

Attachments

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: San Pasqual Valley Road
Permit Application Number: PDS2016-MPA-16-008, PDS2017-REZ-17-001, PDS2017-TM-5620

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

William Lundstrom
Print Name

Lundstrom Engineering & Surveying, Inc.
Company

December 30, 2019
Date

Engineer's Seal:

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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 column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	07/25/2016	Initial Submittal
2	03/20/2018	Resubmittal
3	11/12/2018	Resubmittal
4	*07/03/2019*	Resubmittal

Final Design

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

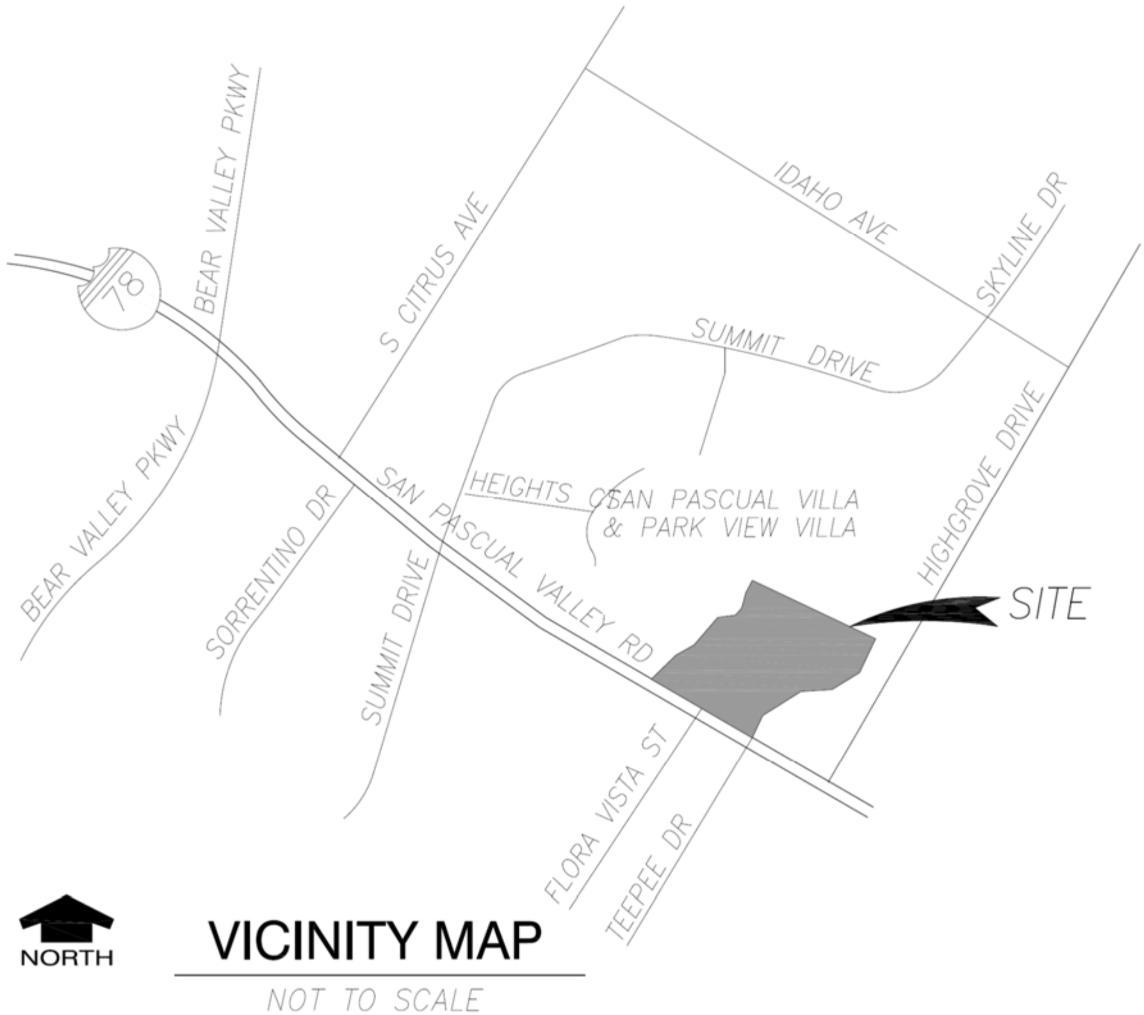
Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Project Vicinity Map

Project Name: [San Pasqual Valley Road]
Record ID: PDS2016-MPA-16-008, PDS2017-REZ-17-001, PDS2017-TM-5620

[



]

Step 1: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? If so, a PDP SWQMP is required. Go to Step 2.			(☒ Yes ☐ No
The project is (select one): ☐ New Development ☒ Redevelopment[1]			
The total proposed newly created or replaced impervious area is:			169,420 ft²
The total existing (pre-project) impervious area is:			24,120 ft²
The total area disturbed by the project is:			801,740 ft²
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: ___			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☐	No ☒	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

1 Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

2 Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

3 For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☒	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). “Discharging directly to” includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is <u>not</u> a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: 24,120 ft^2 (A)
The total proposed newly created or replaced impervious area is 169,420 ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: 1,000 %
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☒ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP ☐ PDP with ACP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.** If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following:	If so:
☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;	Standard Project requirements apply, AND any additional requirements specific to the type of project. County concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP**
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.	**Complete Green Streets PDP Exempt SWQMP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☐Yes	☒No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☐	
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☐	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☒	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☐	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☒	
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☒	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☒	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☐	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☒	
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	
Fiber Rolls (Straw Wattles)	SC-5	☒	
Gravel & Sand Bags	SC-6 & 8	☒	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☒	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☒	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☐	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☒	
Street Sweeping and Vacuuming	SC-7	☒	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☒	

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

9 Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

10 Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

Step 3: County of San Diego PDP SWQMP Site Information Checklist

Step 3.1: Description of Existing Site Condition

<table>
<tr><td>Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)</td><td>San Dieguito, Hodges, Bear HSA# 905.24</td></tr>
<tr><td colspan="2">Current Status of the Site (select all that apply):
☒ Existing development
☐ Previously graded but not built out
☐ Demolition completed without new construction
☒ Agricultural or other non-impervious use
☐ Vacant, undeveloped/natural

Description / Additional Information:</td></tr>
</table>

Existing Land Cover Includes (select all that apply and provide each area on site):
☒ Vegetative Cover _____ Acres (____777,720___ Square Feet)
☐ Non-Vegetated Pervious Areas _______ Acres (_______ Square Feet)
☒ Impervious Areas _____ Acres (____14,000___ Square Feet)

Description / Additional Information:
The site is bounded to the south by San Pasqual Valley Road (Highway 78), to the west by a southwesterly trending drainage channel, and to the north and east by existing single-family residential properties. In general, the site exhibits moderately sloping topography toward the south and west, with a hill in the central portion of the site. Approximate elevations within the overall site limits range from a low elevation of 655 msl at the southwesterly boundary to a high of 770 msl near the northeasterly boundary. The site currently supports an existing single-family residence on the hill in the central portion of the site with an asphalt paved driveway, and the rest of the site is currently vacant and undeveloped with the exception of a few dirt roads. The site is covered with a light to moderate growth of weeds and grass with localized small trees and bushes.

The site involves two un-named channels tributary to the San Dieguito River. The channels have bed and bank and wetland-associated vegetation, so are jurisdictional under federal, state, or county criteria for such habitat.

Three key agencies regulate activities within inland streams, wetlands, and riparian areas in California. The U. S. Army Corps of Engineers (Corps) Regulatory Program regulates activities pursuant to Section 404 of the Federal Clean Water Act, and Section 10 of the Rivers and Harbors Act. The CDFW regulates activities under the Fish and Game Code Section 1600-1607, and the Regional Water Quality Control Board (RWQCB) under Section 401 of the Federal Clean Water Act and the California Porter-Cologne Act. The County of San Diego also defines wetlands through its Resource Protection Ordinance.

See Attachment 6, Biological Letter Report for wetland delineation.

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

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used):
☐ 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
☐ Other

Description / Additional Information:
Runoff generated on site is conveyed naturally via overland flow to two existing natural drainage channels, along westerly and easterly property lines. The natural drainage channels conveys offsite runoff and onsite runoff in a southwesterly direction along the property lines.

The westerly natural drainage channel has an upstream tributary of approximately 215.4 acres. During the 100 year storm event, the westerly channel conveys approximately 286 cfs of off-site runoff along the westerly property line to an existing to a 5 foot by 3 foot concrete box culvert at San Pasqual Valley Road.

The easterly drainage channel has an upstream tributary of approximately 15.5 acres. During the 100 year storm event, the easterly channel conveys approximately 46 cfs of off-site runoff along the easterly property line, in a concrete ditch for 150 linear feet, and then into an existing 30-inch Caltrans storm drain in San Pasqual Valley Road.

Along the southerly property line is a rock lined drainage channel that flows east to west.

Step 3.2: Description of Existing Site Drainage Patterns

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) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:
Runoff generated on site is conveyed naturally via overland flow to two existing natural drainage channels, along westerly and easterly property lines. The natural drainage channels conveys offsite runoff and onsite runoff in a southwesterly direction along the property lines.

The westerly natural drainage channel has an upstream tributary of approximately 215.4 acres. During the 100 year storm event, the westerly channel conveys approximately 286 cfs of off-site runoff along the westerly property line to an existing to a 5 foot by 3 foot concrete box culvert at San Pasqual Valley Road.

The easterly drainage channel has an upstream tributary of approximately 27.3 acres. During the 100 year storm event, the easterly channel conveys approximately 46 cfs of off-site runoff along the easterly property line, in a concrete ditch for 150 linear feet, and then into an existing 30-inch Caltrans storm drain lateral in San Pasqual Valley Road. Runoff continues west along San Pasqual Valley Road in a 48” storm drain and outlets through a headwall. The existing headwall is directly downstream of the westerly box culvert. This confluence location is POC #1.

Along the southerly property line is an existing rock lined drainage channel that flows east to west.

The existing box culvert at San Pasqual Valley Road has a tributary of approximately 215 acres and an existing 100 year runoff flow rate of 286 cfs.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities: The proposed single family development will consists of 14 single-family homes within the 18.2 acre development. Additional activities proposed include construction of a street, bioretention basins, and storm drain.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): Proposed impervious areas will comprise of 14 single family homes with concrete paved driveways, asphalt paved public and private roads.
List/describe proposed pervious features of the project (e.g., landscape areas): Proposed landscape areas will comprise of private yards and street parkways. Landscape areas will have drought tolerant plants.
Does the project include grading and changes to site topography? ☒Yes ☐No *Description / Additional Information:* The post-project condition conforms to the existing topography and drainage patterns.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	17.8 acres	14.5 acres	
Pervious (non-vegetated)	0	0	
Impervious	0.6 acres	3.9 acres	

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes

☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

Runoff generated on-site will be collected any conveyed to privately maintained storm drainage system with bioretention basins and hydromodification storage and flow control components.

Proposed drainage system will conform to existing drainage patterns. Site runoff and off-site runoff will be conveyed to the existing box culvert at San Pasqual Valley Road. Existing storm drain system will remain in place.

The existing box culvert at San Pasqual Valley Road has a tributary of approximately 243 acres and an existing 100 year runoff flow rate of 378 cfs. The proposed bioretention basins will mitigate developed runoff rates to existing rates

Table 3-1 Summary of Hydrology Analysis.

EXISTING

NODE	C	TC (MIN.)	INTENSITY (IN/HR)	AREA (ACRES)	VELOCITY (FPS)	RUN-OFF (CFS)
6	0.41	24.2	3.24	215.4	9.20	286.5
10	0.41	16.5	4.14	27.3	9.0	46.4

PROPOSED

NODE	C	TC (MIN.)	INTENSITY (IN/HR)	AREA (ACRES)	VELOCITY (FPS)	MITIGATED RUN-OFF (CFS)	UNMITIGATED RUN-OFF (CFS)
6	0.41	24.2	3.24	215.4	9.20	286.5	288.7
10	0.41	16.5	4.14	27.3	9.0	46.4	47.3

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

☒ 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
☐ Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
Runoff from the project will be convey to Lake Hodges through a series of storm drain systems and creeks.

List any 303(d) impaired water bodies[11] 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
Hodges HA (905.21)	*Color, Manganese, Mercury, Nitrogen, Phosphorus, Turbidity, pH*	*Pesticides, Heavy Metals, Nutrients, Sediment*
Kit Carson Creek (905.21)	*Pentachlorophenol (PCP), Total Dissolved Solids*	*Pesticides*

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☒	☒
Nutrients	☐	☒	☒
Heavy Metals	☐	☒	☒
Organic Compounds	☐	☒	☐
Trash & Debris	☐	☒	☐
Oxygen Demanding Substances	☐	☒	☐
Oil & Grease	☐	☒	☐
Bacteria & Viruses	☐	☒	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Pesticides	☐	☐	☒

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.
☐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[12] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**
Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact. ☒ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*. ☒ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50’ tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,* ☒ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND, ☒ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR, ☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water. ☐ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3). ☐ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50’ tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,* ☐ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND, ☐ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR, ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).* ☐ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs. ☐ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☒ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☐ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☐ Project has provided alternate mapping of CCSYAs. ☐ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Step 3.7.2: 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. Each residential lot (Lots 1-14) shall have a HMP flow control orifice device at each on-lot bioretention basin.
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)*

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Step 4: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County 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 must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.4 not implemented:			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.5 not implemented:			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☒ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☐Yes	☐No	☒N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☐ H. Refuse areas	☐Yes	☐No	☒N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☐ O. Fire sprinkler test water	☐Yes	☐No	☒N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County 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 must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented: The existing natural drainage pathway along the westerly property line will remain. The proposed development will not encroach into or impact the natural drainage channel.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented: The existing natural drainage pathway and vegetation along the westerly property line will remain.			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented: The residential streets are at the minimum width required by County standards. Proposed street will have an unlined drainage swales to convey runoff.			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented: Re-till soils compacted by construction vehicles/equipment. Collect & re-use upper soil layers of development site containing organic Materials.			
4.3.5 Impervious Area Dispersion	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.5 not implemented: Runoff from impervious areas drain to bioretention BMPs.			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.6 not implemented:			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.8 not implemented: Full infiltration of DCV is anticipated with the use of bioretention basins. See Worksheet B.3-1 in Attachment 1. Harvest and Use account for 8% of the DCV, therefore bioretention will full infiltration are proposed.			

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the County at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the County must confirm the maintenance (see Section 7 of the BMP Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

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. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number. The following structural BMP strategy is based on full infiltration and no harvesting per worksheet B3.-1 of County of San Diego BMP Design Manual.

Runoff generated on-site impervious areas will be collected any conveyed to privately maintained bioretention basins with hydromodification storage and flow control components. Soil report shows suitable infiltration rates throughout the site. Proposed bioretention basins will be designed for full infiltration of the DCV.

(Continue on following page as necessary.)

Description of structural BMP strategy continued **(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)**
(Continued from previous page)

Step 6.2: Structural BMP Checklist

<table>
<tr><td colspan="2">(Copy this page as needed to provide information for each individual proposed structural BMP)</td></tr>
<tr><td colspan="2">Structural BMP ID No. Bioretention (full DCV infiltration) BMP # 1 through 14</td></tr>
<tr><td colspan="2">Construction Plan Sheet No. Preliminary</td></tr>
<tr><td colspan="2">Type of structural BMP:
☐ Retention by harvest and use (HU-1)
☐ Retention by infiltration basin (INF-1)
☒ Retention by bioretention (INF-2)
☐ Retention by permeable pavement (INF-3)
☐ Partial retention by biofiltration with partial retention (PR-1)
☐ Biofiltration (BF-1)
☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐ Detention pond or vault for hydromodification management
☐ Other (describe in discussion section below)</td></tr>
<tr><td colspan="2">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)</td></tr>
<tr><td>Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)</td><td>William Lundstrom
Lundstrom Engineering & Surveying, Inc.
5333 Mission Center Road #115
San Diego, CA 92018
619-814-1220</td></tr>
<tr><td>Who will be the final owner of this BMP?</td><td>☒ HOA ☐ Property Owner ☐ County
☐ Other (describe)</td></tr>
<tr><td>Who will maintain this BMP into perpetuity?</td><td>☒ HOA ☐ Property Owner ☐ County
☐ Other (describe)</td></tr>
<tr><td>What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.</td><td>Category 1 for all bioretention serving single lot.
Category 2 for all bioretention serving common areas or more than one lot.</td></tr>
</table>

Discussion (as needed): *(Continue on subsequent pages as necessary)*

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	n/a
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	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 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☐ Included

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	11,388	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	42	#
	3	Total Planted Area within Development	632,490	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	No	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	No	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	78	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	757	cubic-feet
	13	Total Anticipated Use Over 36 Hours	835	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.07	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	Yes	yes/no
	17	Is Partial Retention Feasible for this Project?	Yes	yes/no
Result	18	Feasibility Category	3	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BMP #1	BMP #2	BMP #3	BMP #4	BMP #5	BMP #6	BMP #7	BMP #8	BMP #9	BMP #10	unitless
	1	Basin Drains to the Following BMP Type	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	unitless
	2	85th Percentile 24-hr Storm Depth	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	29,800	21,020	7,500	3,500	3,500	16,580	3,500	6,700	8,500	8,500	sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	9,225		8,910	10,055	12,825		9,610	30,330	28,225	31,915	sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	39,025	21,020	16,410	13,555	16,325	16,580	13,110	37,030	36,725	40,415	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.74	0.90	0.54	0.40	0.37	0.90	0.41	0.35	0.39	0.37	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.74	0.90	0.54	0.40	0.37	0.90	0.41	0.35	0.39	0.37	unitless
	32	Initial Design Capture Volume	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.74	0.90	0.54	0.40	0.37	0.90	0.41	0.35	0.39	0.37	unitless
	38	Design Capture Volume After Dispersion Techniques	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.74	0.90	0.54	0.40	0.37	0.90	0.41	0.35	0.39	0.37	unitless
	42	Final Effective Tributary Area	28,879	18,918	8,861	5,422	6,040	14,922	5,375	12,961	14,323	14,954	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	i	ii	iii	iv	v	vi	vii	viii	ix	x	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BMP #11	BMP#12	BMP #13	BMP #14	BMP #15	BMP #16					unitless
	1	Basin Drains to the Following BMP Type	Retention	Retention	Retention	Retention	Retention	Retention					unitless
	2	85th Percentile 24-hr Storm Depth	0.68	0.68	0.68	0.68	0.68	0.68					inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600					in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	3,500	36,200	3,500	3,500	3,500	10,120					sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	18,760	22,455	18,175	5,615	4,700						sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No					yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	22,260	58,655	21,675	9,115	8,200	10,120	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.34	0.64	0.34	0.49	0.52	0.90	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.34	0.64	0.34	0.49	0.52	0.90	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	429	2,127	418	253	242	516	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.34	0.64	0.34	0.49	0.52	0.90	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	429	2,127	418	253	242	516	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.34	0.64	0.34	0.49	0.52	0.90	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	7,568	37,539	7,370	4,466	4,264	9,108	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	429	2,127	418	253	242	516	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.4-1: Sizing Retention BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	BMP #1	BMP #2	BMP #3	BMP #4	BMP #5	BMP #6	BMP #7	BMP #8	BMP #9	BMP #10	unitless
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	in/hr
	2	Design Capture Volume Tributary to BMP	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet
	3	Is Retention BMP Vegetated or Non-Vegetated?	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	unitless
	4	Provided Surface Area	2,000	2,000	300	300	300	300	300	300	300	300	sq-ft
	5	Provided Surface Ponding Depth	12	12	12	12	12	12	12	12	12	12	inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18	18	inches
	7	Provided Gravel Storage Thickness	12	12	12	12	12	12	12	12	12	12	inches
Infiltration Calculations	8	Volume Infiltrated Over 6 Hour Storm	1,600	1,072	240	240	240	240	240	240	240	240	cubic-feet
	9	Soil Media Pore Space	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	unitless
	10	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	11	Effective Depth of Retention Storage	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	inches
	12	Drawdown Time for Surface Ponding (Post-Storm)	8	8	8	8	8	8	8	8	8	8	hours
	13	Drawdown Time for Entire Basin (Including 6 Hour Storm)	19	19	19	19	19	19	19	19	19	19	hours
	14	Volume Retained by BMP	5,150	4,622	773	773	773	773	773	773	773	773	cubic-feet
	15	Fraction of DCV Retained	3.00	3.00	1.54	2.52	2.26	0.91	2.53	1.05	0.95	0.91	ratio
	16	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	17	Fraction of DCV Retained (normalized to 36-hr drawdown)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	18	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
Result	19	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	cubic-feet

Worksheet B.4-1 General Notes:

A. Applicants may use this worksheet to size Infiltration, Bioretention, and/or Permeable Pavement BMPs (INF-1, INF-2, INF-3) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.4-1: Sizing Retention BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	BMP #11	BMP#12	BMP #13	BMP #14	BMP #15	BMP #16	-	-	-	-	unitless
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600	-	-	-	-	in/hr
	2	Design Capture Volume Tributary to BMP	429	2,127	418	253	242	516	-	-	-	-	cubic-feet
	3	Is Retention BMP Vegetated or Non-Vegetated?	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated					unitless
	4	Provided Surface Area	300	1,500	300	300	300	300					sq-ft
	5	Provided Surface Ponding Depth	12	12	12	12	12	12					inches
	6	Provided Soil Media Thickness	18	18	18	18	18	18					inches
	7	Provided Gravel Storage Thickness	12	12	12	12	12	12					inches
Infiltration Calculations	8	Volume Infiltrated Over 6 Hour Storm	240	1,200	240	240	240	240	0	0	0	0	cubic-feet
	9	Soil Media Pore Space	0.25	0.25	0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.40	unitless
	10	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	11	Effective Depth of Retention Storage	21.3	21.3	21.3	21.3	21.3	21.3	0.0	0.0	0.0	0.0	inches
	12	Drawdown Time for Surface Ponding (Post-Storm)	8	8	8	8	8	8	0	0	0	0	hours
	13	Drawdown Time for Entire Basin (Including 6 Hour Storm)	19	19	19	19	19	19	0	0	0	0	hours
	14	Volume Retained by BMP	773	3,863	773	773	773	773	0	0	0	0	cubic-feet
	15	Fraction of DCV Retained	1.80	1.82	1.85	3.00	3.00	1.50	0.00	0.00	0.00	0.00	ratio
	16	Percentage of Performance Requirement Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
	17	Fraction of DCV Retained (normalized to 36-hr drawdown)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	ratio
	18	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
Result	19	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.4-1 General Notes:

A. Applicants may use this worksheet to size Infiltration, Bioretention, and/or Permeable Pavement BMPs (INF-1, INF-2, INF-3) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	i	ii	iii	iv	v	vi	vii	viii	ix	x	Units
General Info	0	Drainage Basin ID or Name	BMP #1	BMP #2	BMP #3	BMP #4	BMP #5	BMP #6	BMP #7	BMP #8	BMP #9	BMP #10	unitless
	1	85th Percentile Storm Depth	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	in/hr
	3	Total Tributary Area	39,025	21,020	16,410	13,555	16,325	16,580	13,110	37,030	36,725	40,415	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	2,211	1,191	930	768	925	940	743	2,098	2,081	2,290	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.74	0.90	0.54	0.40	0.37	0.90	0.41	0.35	0.39	0.37	unitless
	6	Initial Design Capture Volume	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	28,879	18,918	8,861	5,422	6,040	14,922	5,375	12,961	14,323	14,954	square feet
	10	Final Design Capture Volume Tributary to BMP	1,636	1,072	502	307	342	846	305	734	812	847	cubic-feet
	11	Basin Drains to the Following BMP Type	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	Retention	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	1,636	1,072	502	307	342	846	305	734	812	847.00	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	fraction
	14	Percent of Average Annual Runoff Retention Provided	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	%
	15	Percent of Average Annual Runoff Retention Required	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	0	0	0	0	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	BMP #11	BMP#12	BMP #13	BMP #14	BMP #15	BMP #16	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.68	0.68	0.68	0.68	0.68	0.68	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	1.600	1.600	1.600	1.600	1.600	1.600	-	-	-	-	in/hr
	3	Total Tributary Area	22,260	58,655	21,675	9,115	8,200	10,120	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	1,261	3,324	1,228	517	465	573	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.34	0.64	0.34	0.49	0.52	0.90	-	-	-	-	unitless
	6	Initial Design Capture Volume	429	2,127	418	253	242	516	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	7,568	37,539	7,370	4,466	4,264	9,108	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	429	2,127	418	253	242	516	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Retention	Retention	Retention	Retention	Retention	Retention	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	429	2,127	418	253	242	516	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	1.00	1.00	1.00	1.00	1.00	1.00	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	80.4%	80.4%	80.4%	80.4%	80.4%	80.4%	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	✓	

Provide basis:

PLEASE SEE SOIL REPORT IN ATTACHMENT 7.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Criteria	Screening Question	Yes	No
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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	✓	

Provide basis:

PLEASE SEE SOIL REPORT IN ATTACHMENT 7

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: NO GROUNDWATER ENCOUNTERED DURING EXPLORATORY EXCAVATIONS. 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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	✓	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	FULL INFILTRATION	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) $p = w \times v$
A	Suitability Assessment	Soil assessment methods	0.25	2	0.50
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	2	0.50
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.50
B	Design	Level of pretreatment/ expected sediment loads	0.5	2	1.00
		Redundancy/resiliency	0.25	2	0.50
		Compaction during construction	0.25	2	0.50
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{total} = S_A \times S_B$				3.00	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				4.8	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				1.6	
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

exposure condition when classified in accordance with ACI 318-11 Table 4.2.1 (per 2013 CBC). The soils are also anticipated to be "low to moderately" corrosive to metals in contact with those soils. Final determination should be based upon post-graded testing of near-surface soils. Determination as to the need and specification for protection of metal construction materials should be determined by engineers(s) specializing in corrosion analysis.

7.9. Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formulas presented in *NAVFAC DM-7.1*. Allowable bearing was determined by applying a factor of safety of at least three (3) to the ultimate bearing capacity.

Static lateral earth pressures were calculated using *Rankine* methods for active and passive cases. If it is desired to use *Coulomb* forces, a separate analysis specific to the application can be conducted.

7.10. Permeability/Percolation Characteristics

AGS conducted a limited percolation study to evaluate the feasibility of the site for use of onsite wastewater treatment systems. Testing was conducted in general conformance with the San Diego County DEH Design Manual (2013).

One percolation test hole was excavated at each lot (P-1 through P-14) at the approximate locations depicted on Plate 1. Holes were approximately twelve inches in diameter and three to four feet deep.

Preliminary percolation rates ranged from 8 to 48 minutes per inch. A summary of results is presented in Table 7.10 below.

TABLE 7.10
Preliminary Percolation Rates

Percolation Test Boring	Percolation Rate (minutes per inch)		Percolation Test Boring	Percolation Rate (minutes per inch)	
P-1	13 4.6 in/hr	1.5	P-8	8 7.5	2.5
P-2	10 6.0	2	P-9	17 3.5	1.2
P-3	48 1.25	0.4	P-10	17 3.5	1.2
P-4	12 5	1.7	P-11	13 4.6	1.5
P-5	11 5.45	1.8	P-12	26 2.3	0.8
P-6	12 5	1.7	P-13	8 7.5	2.5
P-7	9 6.7	2.2	P-14	9 6.7	2.2

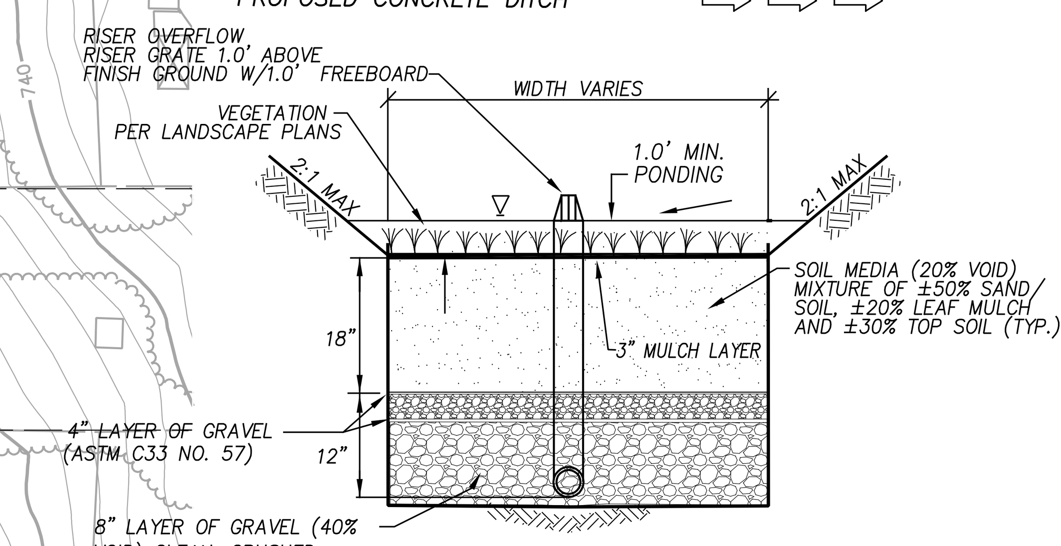
Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography and impervious areas
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed demolition
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☒ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

LEGEND

BMP NUMBER	1 THRU 16
DMA NUMBER	1 THRU 28
DMA LIMITS	
DIRECTION OF FLOW	
PROPOSED STORM DRAIN	
BIORETENTION BASIN	
ASPHALT PAVEMENT (IMPERVIOUS)	
ROOF AREA (IMPERVIOUS)	
PROPOSED CONCRETE DITCH	



BIORETENTION

NOT TO SCALE

SOURCE CONTROL BMPs (TABLE 4.2.6 SWQMP)

SOURCE CONTROL BMPS	PROJECT IMPLEMENTATION
1 STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! DRAINS TO WATERWAYS" IN ENGLISH AND "NO CONTAMINE" IN SPANISH. MAINTAIN AND PERIODICALLY REPLACE INLET MARKINGS. SEE APPLICABLE OPERATIONAL BMPS IN CASQA FACT SHEET SC-44, "DRAINAGE SYSTEM MAINTENANCE."
LANDSCAPE/OUTDOOR PESTICIDE USE	LANDSCAPE HAS BEEN DESIGNED PER CITY OF SAN SAN DIEGO LANDSCAPE STANDARDS TO MINIMIZE IRRIGATION AND RUNOFF, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION. SEE APPLICABLE BMPS IN CASQA FACT SHEETS SC-41, "BUILDING AND GROUNDS MAINTENANCE."
DRIVEWAYS, SIDEWALKS, ROADS	DRIVEWAYS SIDEWALKS, AND ROADS SHALL BE SWEPT REGULARLY AND ONCE PRIOR TO OCTOBER 1ST TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. SEE CASQA FACT SHEET SC-41, "BUILDING AND GROUNDS MAINTENANCE."

SITE DESIGN BMPs (4.3.1 TRHOUGH 4.3.8 SWQMP)

CONSERVE NATURAL DRAINAGE FEATURES & VEGETATION: DRAINAGE COURSE AND VEGETATION WILL BE PRESERVED.

MINIMIZE IMPERVIOUS AREA: RESIDENTIAL STREETS ARE AT THE MINIMUM REQUIRED WIDTH PER COUNTY STANDARDS.

MINIMIZE SOIL COMPACTION: RE-TILL SOILS COMPACTED BY CONSTRUCTION VEHICLES. COLLECT AND RE-USE UPPER SOIL LAYERS DEVELOPMENT SITE CONTAINING ORGANIC MATERIALS.

RUNOFF FROM WALKS AND ROOF DRAIN DOWNSPOUTS SHALL DISCHARGE ONTO SPLASH BLOCKS AND FLOW THROUGH ADJACENT LANDSCAPE AREA BEFORE ENTERING BIORETENTION BASINS

LANDSCAPING WITH DROUGHT TOLERANT SPECIES

HYDROLOGIC SOIL GROUP C

GROUND WATER DEPTH > 20FT

DMA	Post-project Surface Type	DMA Area (SF)	Drains to
1	Asphalt Road	26300	BMP #1
2	Asphalt Road	21020	BMP #2
3	Asphalt Road	29200	BMP #12
4	Asphalt Road	16580	BMP #6
5	Pad with 3500 sf Roof	12725	BMP #1
6	Landscape (self-mitigating)	22260	
7	Landscape (self-mitigating)	20050	
8	Landscape (self-mitigating)	14810	
9	Pad with 3500 sf Roof	21300	BMP #3
10	Pad with 3500 sf Roof	12410	BMP #4
11	Landscape (self-mitigating)	115033	
12	Pad with 3500 sf Roof	13110	BMP #7
13	Pad with 3500 sf Roof	19560	BMP #8
14	Landscape	17780	BMP #8
15	Pad with 3500 sf Roof	18625	BMP #9
16	Landscape	18100	BMP # 9
17	Pad with 3500 sf Roof	22135	BMP #10
18	Landscape	18280	BMP #10
19	Pad with 3500 sf Roof	21730	BMP #11
20	Pad with 3500 sf Roof	14035	BMP #12
21	Landscape (self-mitigating)	222140	
22	Pad with 3500 sf Roof	15420	BMP #12
23	Landscape (self-mitigating)	28880	
24	Pad with 3500 sf Roof	16325	BMP #5
25	Pad with 3500 sf Roof	8200	BMP #15
26	Pad with 3500 sf Roof	21675	BMP #13
27	Pad with 3500 sf Roof	9115	BMP #14
28	San Pasquall Valley Rd	10120	BMP #16

SLEF-MITIGATING DMA's

SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.

SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.

THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.

IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).

THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SAN PASQUAL VALLEY ROAD

DMA/HMP EXHIBIT

JOB NO.: L321-01 | DATE: 3-02-16

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.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☒ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☒ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☒ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	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 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

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	L321-01 SDHM 2
Site Name:	San Pasqual
Site Address:	
City:	
Report Date:	1/2/2020
Gage:	ESCONDID
Data Start:	10/01/1964
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2018/01/19

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Moderate	17.853
Pervious Total	17.853
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.5537
Impervious Total	0.5537
Basin Total	18.4067

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

DMA 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Moderate	0.2117
Pervious Total	0.2117
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.6841
Impervious Total	0.6841
Basin Total	0.8958

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #1	Surface BMP #1	

DMA 2

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.4825
Impervious Total	0.4825
Basin Total	0.4825

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #2	Surface BMP #2	

DMA 9

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.2045
Pervious Total	0.2045
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.1721
Impervious Total	0.1721
Basin Total	0.3766

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #3	Surface BMP #3	

DMA 10

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.2308
Pervious Total	0.2308
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0803
Impervious Total	0.0803
Basin Total	0.3111

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #4	Surface BMP #4	

DMA 24

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.2944
Pervious Total	0.2944
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0803
Impervious Total	0.0803
Basin Total	0.3747

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #5	Surface BMP #5	

DMA 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.3806
Impervious Total	0.3806
Basin Total	0.3806

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #6	Surface BMP #6	

DMA 12

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.2206
Pervious Total	0.2206
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0804
Impervious Total	0.0804
Basin Total	0.301

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #7	Surface BMP #7	

DMA 13 & 14

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.6962
Pervious Total	0.6962
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.1538
Impervious Total	0.1538
Basin Total	0.85

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #8	Surface BMP #8	

DMA 15 & 16

Bypass:	No	
GroundWater:	No	
Pervious Land Use	acre	
D,Urban,Flat	0.6479	
Pervious Total	0.6479	
Impervious Land Use	acre	
IMPERVIOUS-FLAT	0.1951	
Impervious Total	0.1951	
Basin Total	0.843	

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #9	Surface BMP #9	

DMA 17 & 18

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.7326
Pervious Total	0.7326
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.1951
Impervious Total	0.1951
Basin Total	0.9277

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #10	Surface BMP #10	

DMA 19

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.4306
Pervious Total	0.4306
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0804
Impervious Total	0.0804
Basin Total	0.511

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #11	Surface BMP #11	

DMA 20 & 22

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.5154
Pervious Total	0.5154
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.831
Impervious Total	0.831
Basin Total	1.3464

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #12	Surface BMP #12	

DMA 26

Bypass:	No	
GroundWater:	No	
Pervious Land Use	acre	
D,Urban,Flat	0.4172	
Pervious Total	0.4172	
Impervious Land Use	acre	
IMPERVIOUS-FLAT	0.0804	
Impervious Total	0.0804	
Basin Total	0.4976	

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #13	Surface BMP #13	

DMA 27

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.1289
Pervious Total	0.1289
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0804
Impervious Total	0.0804
Basin Total	0.2093

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #14	Surface BMP #14	

DMA 25

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Urban,Flat	0.1078
Pervious Total	0.1078
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.0804
Impervious Total	0.0804
Basin Total	0.1882

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #15	Surface BMP #15	

DMA 28

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.2323
Impervious Total	0.2323
Basin Total	0.2323

Element Flows To:

Surface	Interflow	Groundwater
Surface BMP #16	Surface BMP #16	

DMA 6, 7, 8, 9, 11, 21 & 22

Bypass:	Yes	
GroundWater:	No	
Pervious Land Use	acre	
D,NatVeg,Moderate	9.6742	
Pervious Total	9.6742	
Impervious Land Use	acre	
Impervious Total	0	
Basin Total	9.6742	

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Mitigated Routing

BMP #1

Bottom Length:	40.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	27.012
Total Volume Through Riser (ac-ft.):	1.197
Total Volume Through Facility (ac-ft.):	28.209
Percent Infiltrated:	95.76
Total Precip Applied to Facility:	1.562
Total Evap From Facility:	1.282

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 18 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0459	0.0000	0.0000	0.0000
0.0467	0.0459	0.0006	0.0000	0.0000
0.0934	0.0459	0.0013	0.0000	0.0000
0.1401	0.0459	0.0019	0.0000	0.0000
0.1868	0.0459	0.0026	0.0000	0.0000
0.2335	0.0459	0.0032	0.0003	0.0003
0.2802	0.0459	0.0039	0.0008	0.0008
0.3269	0.0459	0.0045	0.0014	0.0014
0.3736	0.0459	0.0051	0.0024	0.0024
0.4203	0.0459	0.0058	0.0037	0.0037
0.4670	0.0459	0.0064	0.0049	0.0049
0.5137	0.0459	0.0071	0.0054	0.0054
0.5604	0.0459	0.0077	0.0074	0.0074
0.6071	0.0459	0.0084	0.0099	0.0099
0.6538	0.0459	0.0090	0.0128	0.0128
0.7005	0.0459	0.0096	0.0162	0.0162
0.7473	0.0459	0.0103	0.0201	0.0201
0.7940	0.0459	0.0109	0.0219	0.0219
0.8407	0.0459	0.0116	0.0245	0.0245
0.8874	0.0459	0.0122	0.0294	0.0294
0.9341	0.0459	0.0129	0.0349	0.0349
0.9808	0.0459	0.0135	0.0409	0.0409
1.0275	0.0459	0.0142	0.0476	0.0476
1.0742	0.0459	0.0148	0.0548	0.0548
1.1209	0.0459	0.0154	0.0569	0.0569
1.1676	0.0459	0.0161	0.0627	0.0627

1.2143	0.0459	0.0167	0.0713	0.0713
1.2610	0.0459	0.0174	0.0741	0.0741
1.3077	0.0459	0.0180	0.0741	0.0741
1.3544	0.0459	0.0187	0.0741	0.0741
1.4011	0.0459	0.0193	0.0741	0.0741
1.4478	0.0459	0.0199	0.0741	0.0741
1.4945	0.0459	0.0206	0.0741	0.0741
1.5412	0.0459	0.0212	0.0741	0.0741
1.5879	0.0459	0.0219	0.0741	0.0741
1.6346	0.0459	0.0225	0.0741	0.0741
1.6813	0.0459	0.0232	0.0741	0.0741
1.7280	0.0459	0.0238	0.0741	0.0741
1.7747	0.0459	0.0247	0.0741	0.0741
1.8214	0.0459	0.0256	0.0741	0.0741
1.8681	0.0459	0.0265	0.0741	0.0741
1.9148	0.0459	0.0274	0.0741	0.0741
1.9615	0.0459	0.0283	0.0741	0.0741
2.0082	0.0459	0.0291	0.0741	0.0741
2.0549	0.0459	0.0300	0.0741	0.0741
2.1016	0.0459	0.0309	0.0741	0.0741
2.1484	0.0459	0.0318	0.0741	0.0741
2.1951	0.0459	0.0327	0.0741	0.0741
2.2418	0.0459	0.0336	0.0741	0.0741
2.2885	0.0459	0.0345	0.0741	0.0741
2.3352	0.0459	0.0354	0.0741	0.0741
2.3819	0.0459	0.0363	0.0741	0.0741
2.4286	0.0459	0.0372	0.0741	0.0741
2.4753	0.0459	0.0380	0.0741	0.0741
2.5220	0.0459	0.0389	0.0741	0.0741
2.5687	0.0459	0.0398	0.0741	0.0741
2.6154	0.0459	0.0407	0.0741	0.0741
2.6621	0.0459	0.0416	0.0741	0.0741
2.7088	0.0459	0.0425	0.0741	0.0741
2.7500	0.0459	0.0433	0.0741	0.0741

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0459	0.0433	0.0000	0.2377	0.0000
2.7967	0.0459	0.0454	0.0000	0.2377	0.0000
2.8434	0.0459	0.0476	0.0000	0.2438	0.0000
2.8901	0.0459	0.0497	0.0000	0.2500	0.0000
2.9368	0.0459	0.0519	0.0000	0.2562	0.0000
2.9835	0.0459	0.0540	0.0000	0.2624	0.0000
3.0302	0.0459	0.0561	0.0000	0.2685	0.0000
3.0769	0.0459	0.0583	0.0000	0.2747	0.0000
3.1236	0.0459	0.0604	0.0000	0.2809	0.0000
3.1703	0.0459	0.0626	0.0000	0.2871	0.0000
3.2170	0.0459	0.0647	0.0000	0.2933	0.0000
3.2637	0.0459	0.0669	0.0000	0.2994	0.0000
3.3104	0.0459	0.0690	0.0000	0.3056	0.0000
3.3571	0.0459	0.0712	0.0000	0.3118	0.0000
3.4038	0.0459	0.0733	0.0000	0.3180	0.0000
3.4505	0.0459	0.0754	0.0000	0.3241	0.0000
3.4973	0.0459	0.0776	0.0000	0.3303	0.0000
3.5440	0.0459	0.0797	0.0000	0.3365	0.0000
3.5907	0.0459	0.0819	0.0000	0.3427	0.0000
3.6374	0.0459	0.0840	0.0000	0.3489	0.0000
3.6841	0.0459	0.0862	0.0000	0.3550	0.0000

3.7308	0.0459	0.0883	0.0000	0.3612	0.0000
3.7775	0.0459	0.0904	0.0000	0.3674	0.0000
3.8242	0.0459	0.0926	0.0000	0.3736	0.0000
3.8709	0.0459	0.0947	0.0000	0.3797	0.0000
3.9176	0.0459	0.0969	0.0000	0.3859	0.0000
3.9643	0.0459	0.0990	0.0000	0.3921	0.0000
4.0110	0.0459	0.1012	0.0000	0.3983	0.0000
4.0577	0.0459	0.1033	0.0000	0.4045	0.0000
4.1044	0.0459	0.1055	0.0000	0.4106	0.0000
4.1511	0.0459	0.1076	0.0000	0.4168	0.0000
4.1978	0.0459	0.1097	0.0000	0.4230	0.0000
4.2445	0.0459	0.1119	0.0000	0.4292	0.0000
4.2500	0.0459	0.1121	0.0000	0.4299	0.0000

Surface BMP #1

Element Flows To:

Outlet 1	Outlet 2
	BMP #1

BMP #2

Bottom Length:	40.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	17.648
Total Volume Through Riser (ac-ft.):	0.145
Total Volume Through Facility (ac-ft.):	17.793
Percent Infiltrated:	99.19
Total Precip Applied to Facility:	1.18
Total Evap From Facility:	1.082

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 18 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0459	0.0000	0.0000	0.0000
0.0467	0.0459	0.0006	0.0000	0.0000
0.0934	0.0459	0.0013	0.0000	0.0000
0.1401	0.0459	0.0019	0.0000	0.0000
0.1868	0.0459	0.0026	0.0000	0.0000
0.2335	0.0459	0.0032	0.0003	0.0003
0.2802	0.0459	0.0039	0.0008	0.0008
0.3269	0.0459	0.0045	0.0014	0.0014
0.3736	0.0459	0.0051	0.0024	0.0024
0.4203	0.0459	0.0058	0.0037	0.0037
0.4670	0.0459	0.0064	0.0049	0.0049
0.5137	0.0459	0.0071	0.0054	0.0054
0.5604	0.0459	0.0077	0.0074	0.0074
0.6071	0.0459	0.0084	0.0099	0.0099
0.6538	0.0459	0.0090	0.0128	0.0128
0.7005	0.0459	0.0096	0.0162	0.0162
0.7473	0.0459	0.0103	0.0201	0.0201
0.7940	0.0459	0.0109	0.0219	0.0219
0.8407	0.0459	0.0116	0.0245	0.0245
0.8874	0.0459	0.0122	0.0294	0.0294
0.9341	0.0459	0.0129	0.0349	0.0349
0.9808	0.0459	0.0135	0.0409	0.0409
1.0275	0.0459	0.0142	0.0476	0.0476
1.0742	0.0459	0.0148	0.0548	0.0548
1.1209	0.0459	0.0154	0.0569	0.0569
1.1676	0.0459	0.0161	0.0627	0.0627
1.2143	0.0459	0.0167	0.0713	0.0713
1.2610	0.0459	0.0174	0.0741	0.0741

1.3077	0.0459	0.0180	0.0741	0.0741
1.3544	0.0459	0.0187	0.0741	0.0741
1.4011	0.0459	0.0193	0.0741	0.0741
1.4478	0.0459	0.0199	0.0741	0.0741
1.4945	0.0459	0.0206	0.0741	0.0741
1.5412	0.0459	0.0212	0.0741	0.0741
1.5879	0.0459	0.0219	0.0741	0.0741
1.6346	0.0459	0.0225	0.0741	0.0741
1.6813	0.0459	0.0232	0.0741	0.0741
1.7280	0.0459	0.0238	0.0741	0.0741
1.7747	0.0459	0.0247	0.0741	0.0741
1.8214	0.0459	0.0256	0.0741	0.0741
1.8681	0.0459	0.0265	0.0741	0.0741
1.9148	0.0459	0.0274	0.0741	0.0741
1.9615	0.0459	0.0283	0.0741	0.0741
2.0082	0.0459	0.0291	0.0741	0.0741
2.0549	0.0459	0.0300	0.0741	0.0741
2.1016	0.0459	0.0309	0.0741	0.0741
2.1484	0.0459	0.0318	0.0741	0.0741
2.1951	0.0459	0.0327	0.0741	0.0741
2.2418	0.0459	0.0336	0.0741	0.0741
2.2885	0.0459	0.0345	0.0741	0.0741
2.3352	0.0459	0.0354	0.0741	0.0741
2.3819	0.0459	0.0363	0.0741	0.0741
2.4286	0.0459	0.0372	0.0741	0.0741
2.4753	0.0459	0.0380	0.0741	0.0741
2.5220	0.0459	0.0389	0.0741	0.0741
2.5687	0.0459	0.0398	0.0741	0.0741
2.6154	0.0459	0.0407	0.0741	0.0741
2.6621	0.0459	0.0416	0.0741	0.0741
2.7088	0.0459	0.0425	0.0741	0.0741
2.7500	0.0459	0.0433	0.0741	0.0741

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0459	0.0433	0.0000	0.2377	0.0000
2.7967	0.0459	0.0454	0.0000	0.2377	0.0000
2.8434	0.0459	0.0476	0.0000	0.2438	0.0000
2.8901	0.0459	0.0497	0.0000	0.2500	0.0000
2.9368	0.0459	0.0519	0.0000	0.2562	0.0000
2.9835	0.0459	0.0540	0.0000	0.2624	0.0000
3.0302	0.0459	0.0561	0.0000	0.2685	0.0000
3.0769	0.0459	0.0583	0.0000	0.2747	0.0000
3.1236	0.0459	0.0604	0.0000	0.2809	0.0000
3.1703	0.0459	0.0626	0.0000	0.2871	0.0000
3.2170	0.0459	0.0647	0.0000	0.2933	0.0000
3.2637	0.0459	0.0669	0.0000	0.2994	0.0000
3.3104	0.0459	0.0690	0.0000	0.3056	0.0000
3.3571	0.0459	0.0712	0.0000	0.3118	0.0000
3.4038	0.0459	0.0733	0.0000	0.3180	0.0000
3.4505	0.0459	0.0754	0.0000	0.3241	0.0000
3.4973	0.0459	0.0776	0.0000	0.3303	0.0000
3.5440	0.0459	0.0797	0.0000	0.3365	0.0000
3.5907	0.0459	0.0819	0.0000	0.3427	0.0000
3.6374	0.0459	0.0840	0.0000	0.3489	0.0000
3.6841	0.0459	0.0862	0.0000	0.3550	0.0000
3.7308	0.0459	0.0883	0.0000	0.3612	0.0000
3.7775	0.0459	0.0904	0.0000	0.3674	0.0000

3.8242	0.0459	0.0926	0.0000	0.3736	0.0000
3.8709	0.0459	0.0947	0.0000	0.3797	0.0000
3.9176	0.0459	0.0969	0.0000	0.3859	0.0000
3.9643	0.0459	0.0990	0.0000	0.3921	0.0000
4.0110	0.0459	0.1012	0.0000	0.3983	0.0000
4.0577	0.0459	0.1033	0.0000	0.4045	0.0000
4.1044	0.0459	0.1055	0.0000	0.4106	0.0000
4.1511	0.0459	0.1076	0.0000	0.4168	0.0000
4.1978	0.0459	0.1097	0.0000	0.4230	0.0000
4.2445	0.0459	0.1119	0.0000	0.4292	0.0000
4.2500	0.0459	0.1121	0.0000	0.4299	0.0000

Surface BMP #2

Element Flows To:

Outlet 1	Outlet 2
	BMP #2

BMP #3

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	6.846
Total Volume Through Riser (ac-ft.):	1.96
Total Volume Through Facility (ac-ft.):	8.806
Percent Infiltrated:	77.74
Total Precip Applied to Facility:	0.246
Total Evap From Facility:	0.233

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #3

Element Flows To:

Outlet 1	Outlet 2
	BMP #3

BMP #4

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	4.809
Total Volume Through Riser (ac-ft.):	0.946
Total Volume Through Facility (ac-ft.):	5.755
Percent Infiltrated:	83.56
Total Precip Applied to Facility:	0.239
Total Evap From Facility:	0.235

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 12 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**To Amended(cfs)**	**Infilt(cfs)**
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #4

Element Flows To:

Outlet 1	Outlet 2
	BMP #4

BMP #5

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	5.184
Total Volume Through Riser (ac-ft.):	1.338
Total Volume Through Facility (ac-ft.):	6.522
Percent Infiltrated:	79.48
Total Precip Applied to Facility:	0.24
Total Evap From Facility:	0.249

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #5

Element Flows To:

Outlet 1	Outlet 2
	BMP #5

BMP #6

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	9.224
Total Volume Through Riser (ac-ft.):	4.762
Total Volume Through Facility (ac-ft.):	13.986
Percent Infiltrated:	65.95
Total Precip Applied to Facility:	0.206
Total Evap From Facility:	0.175

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #6

Element Flows To:

Outlet 1	Outlet 2
	BMP #6

BMP #7

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	4.749
Total Volume Through Riser (ac-ft.):	0.886
Total Volume Through Facility (ac-ft.):	5.635
Percent Infiltrated:	84.28
Total Precip Applied to Facility:	0.238
Total Evap From Facility:	0.233

Underdrain not used

Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #7

Element Flows To:

Outlet 1	Outlet 2
	BMP #7

BMP #8

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	8.423
Total Volume Through Riser (ac-ft.):	5.654
Total Volume Through Facility (ac-ft.):	14.077
Percent Infiltrated:	59.84
Total Precip Applied to Facility:	0.25
Total Evap From Facility:	0.327

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #8

Element Flows To:

Outlet 1	Outlet 2
	BMP #8

BMP #9

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	8.926
Total Volume Through Riser (ac-ft.):	6.076
Total Volume Through Facility (ac-ft.):	15.002
Percent Infiltrated:	59.5
Total Precip Applied to Facility:	0.25
Total Evap From Facility:	0.32

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #9

Element Flows To:

Outlet 1	Outlet 2
	BMP #9

BMP #10

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	9.186
Total Volume Through Riser (ac-ft.):	6.842
Total Volume Through Facility (ac-ft.):	16.028
Percent Infiltrated:	57.31
Total Precip Applied to Facility:	0.251
Total Evap From Facility:	0.335

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 12 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #10

Element Flows To:

Outlet 1	Outlet 2
	BMP #10

BMP #11

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	5.903
Total Volume Through Riser (ac-ft.):	2.269
Total Volume Through Facility (ac-ft.):	8.172
Percent Infiltrated:	72.23
Total Precip Applied to Facility:	0.243
Total Evap From Facility:	0.277

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #11

Element Flows To:

Outlet 1	Outlet 2
	BMP #11

BMP #12

Bottom Length:	30.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	31.408
Total Volume Through Riser (ac-ft.):	5.505
Total Volume Through Facility (ac-ft.):	36.913
Percent Infiltrated:	85.09
Total Precip Applied to Facility:	1.22
Total Evap From Facility:	1.081

Underdrain not used
Discharge Structure

Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0344	0.0000	0.0000	0.0000
0.0467	0.0344	0.0005	0.0000	0.0000
0.0934	0.0344	0.0010	0.0000	0.0000
0.1401	0.0344	0.0014	0.0000	0.0000
0.1868	0.0344	0.0019	0.0000	0.0000
0.2335	0.0344	0.0024	0.0003	0.0003
0.2802	0.0344	0.0029	0.0006	0.0006
0.3269	0.0344	0.0034	0.0011	0.0011
0.3736	0.0344	0.0039	0.0018	0.0018
0.4203	0.0344	0.0043	0.0028	0.0028
0.4670	0.0344	0.0048	0.0037	0.0037
0.5137	0.0344	0.0053	0.0040	0.0040
0.5604	0.0344	0.0058	0.0056	0.0056
0.6071	0.0344	0.0063	0.0074	0.0074
0.6538	0.0344	0.0068	0.0096	0.0096
0.7005	0.0344	0.0072	0.0122	0.0122
0.7473	0.0344	0.0077	0.0151	0.0151
0.7940	0.0344	0.0082	0.0164	0.0164
0.8407	0.0344	0.0087	0.0184	0.0184
0.8874	0.0344	0.0092	0.0221	0.0221
0.9341	0.0344	0.0096	0.0262	0.0262
0.9808	0.0344	0.0101	0.0307	0.0307
1.0275	0.0344	0.0106	0.0357	0.0357
1.0742	0.0344	0.0111	0.0411	0.0411
1.1209	0.0344	0.0116	0.0427	0.0427
1.1676	0.0344	0.0121	0.0470	0.0470
1.2143	0.0344	0.0125	0.0534	0.0534
1.2610	0.0344	0.0130	0.0556	0.0556

1.3077	0.0344	0.0135	0.0556	0.0556
1.3544	0.0344	0.0140	0.0556	0.0556
1.4011	0.0344	0.0145	0.0556	0.0556
1.4478	0.0344	0.0150	0.0556	0.0556
1.4945	0.0344	0.0154	0.0556	0.0556
1.5412	0.0344	0.0159	0.0556	0.0556
1.5879	0.0344	0.0164	0.0556	0.0556
1.6346	0.0344	0.0169	0.0556	0.0556
1.6813	0.0344	0.0174	0.0556	0.0556
1.7280	0.0344	0.0179	0.0556	0.0556
1.7747	0.0344	0.0185	0.0556	0.0556
1.8214	0.0344	0.0192	0.0556	0.0556
1.8681	0.0344	0.0199	0.0556	0.0556
1.9148	0.0344	0.0205	0.0556	0.0556
1.9615	0.0344	0.0212	0.0556	0.0556
2.0082	0.0344	0.0219	0.0556	0.0556
2.0549	0.0344	0.0225	0.0556	0.0556
2.1016	0.0344	0.0232	0.0556	0.0556
2.1484	0.0344	0.0239	0.0556	0.0556
2.1951	0.0344	0.0245	0.0556	0.0556
2.2418	0.0344	0.0252	0.0556	0.0556
2.2885	0.0344	0.0259	0.0556	0.0556
2.3352	0.0344	0.0265	0.0556	0.0556
2.3819	0.0344	0.0272	0.0556	0.0556
2.4286	0.0344	0.0279	0.0556	0.0556
2.4753	0.0344	0.0285	0.0556	0.0556
2.5220	0.0344	0.0292	0.0556	0.0556
2.5687	0.0344	0.0299	0.0556	0.0556
2.6154	0.0344	0.0305	0.0556	0.0556
2.6621	0.0344	0.0312	0.0556	0.0556
2.7088	0.0344	0.0319	0.0556	0.0556
2.7500	0.0344	0.0325	0.0556	0.0556

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**To Amended(cfs)**	**Infilt(cfs)**
2.7500	0.0344	0.0325	0.0000	0.1782	0.0000
2.7967	0.0344	0.0341	0.0000	0.1782	0.0000
2.8434	0.0344	0.0357	0.0000	0.1829	0.0000
2.8901	0.0344	0.0373	0.0000	0.1875	0.0000
2.9368	0.0344	0.0389	0.0000	0.1921	0.0000
2.9835	0.0344	0.0405	0.0000	0.1968	0.0000
3.0302	0.0344	0.0421	0.0000	0.2014	0.0000
3.0769	0.0344	0.0437	0.0000	0.2060	0.0000
3.1236	0.0344	0.0453	0.0000	0.2107	0.0000
3.1703	0.0344	0.0469	0.0000	0.2153	0.0000
3.2170	0.0344	0.0485	0.0000	0.2199	0.0000
3.2637	0.0344	0.0501	0.0000	0.2246	0.0000
3.3104	0.0344	0.0518	0.0000	0.2292	0.0000
3.3571	0.0344	0.0534	0.0000	0.2338	0.0000
3.4038	0.0344	0.0550	0.0000	0.2385	0.0000
3.4505	0.0344	0.0566	0.0000	0.2431	0.0000
3.4973	0.0344	0.0582	0.0000	0.2477	0.0000
3.5440	0.0344	0.0598	0.0000	0.2524	0.0000
3.5907	0.0344	0.0614	0.0000	0.2570	0.0000
3.6374	0.0344	0.0630	0.0000	0.2616	0.0000
3.6841	0.0344	0.0646	0.0000	0.2663	0.0000
3.7308	0.0344	0.0662	0.0000	0.2709	0.0000
3.7775	0.0344	0.0678	0.0000	0.2755	0.0000

3.8242	0.0344	0.0694	0.0000	0.2802	0.0000
3.8709	0.0344	0.0711	0.0000	0.2848	0.0000
3.9176	0.0344	0.0727	0.0000	0.2894	0.0000
3.9643	0.0344	0.0743	0.0000	0.2941	0.0000
4.0110	0.0344	0.0759	0.0000	0.2987	0.0000
4.0577	0.0344	0.0775	0.0000	0.3033	0.0000
4.1044	0.0344	0.0791	0.0000	0.3080	0.0000
4.1511	0.0344	0.0807	0.0000	0.3126	0.0000
4.1978	0.0344	0.0823	0.0000	0.3172	0.0000
4.2445	0.0344	0.0839	0.0000	0.3219	0.0000
4.2500	0.0344	0.0841	0.0000	0.3224	0.0000

Surface BMP #12

Element Flows To:

Outlet 1	Outlet 2
	BMP #12

BMP #13

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	5.836
Total Volume Through Riser (ac-ft.):	2.175
Total Volume Through Facility (ac-ft.):	8.011
Percent Infiltrated:	72.85
Total Precip Applied to Facility:	0.243
Total Evap From Facility:	0.274

Underdrain not used
Discharge Structure

Riser Height: 1 ft.
Riser Diameter: 12 in.

Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #13

Element Flows To:

Outlet 1	Outlet 2
	BMP #13

BMP #14

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	4.1
Total Volume Through Riser (ac-ft.):	0.432
Total Volume Through Facility (ac-ft.):	4.532
Percent Infiltrated:	90.47
Total Precip Applied to Facility:	0.236
Total Evap From Facility:	0.211

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 12 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #14

Element Flows To:

Outlet 1	Outlet 2
	BMP #14

BMP #15

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	3.944
Total Volume Through Riser (ac-ft.):	0.334
Total Volume Through Facility (ac-ft.):	4.278
Percent Infiltrated:	92.19
Total Precip Applied to Facility:	0.235
Total Evap From Facility:	0.206

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 12 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**To Amended(cfs)**	**Infilt(cfs)**
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

Surface BMP #15

Element Flows To:

Outlet 1	Outlet 2
	BMP #15

BMP #16

Bottom Length:	30.00 ft.
Bottom Width:	10.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	1.6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	7.064
Total Volume Through Riser (ac-ft.):	1.479
Total Volume Through Facility (ac-ft.):	8.543
Percent Infiltrated:	82.69
Total Precip Applied to Facility:	0.197
Total Evap From Facility:	0.172

Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 12 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0069	0.0000	0.0000	0.0000
0.0467	0.0069	0.0001	0.0000	0.0000
0.0934	0.0069	0.0002	0.0000	0.0000
0.1401	0.0069	0.0003	0.0000	0.0000
0.1868	0.0069	0.0004	0.0000	0.0000
0.2335	0.0069	0.0005	0.0001	0.0001
0.2802	0.0069	0.0006	0.0001	0.0001
0.3269	0.0069	0.0007	0.0002	0.0002
0.3736	0.0069	0.0008	0.0004	0.0004
0.4203	0.0069	0.0009	0.0006	0.0006
0.4670	0.0069	0.0010	0.0007	0.0007
0.5137	0.0069	0.0011	0.0008	0.0008
0.5604	0.0069	0.0012	0.0011	0.0011
0.6071	0.0069	0.0013	0.0015	0.0015
0.6538	0.0069	0.0014	0.0019	0.0019
0.7005	0.0069	0.0014	0.0024	0.0024
0.7473	0.0069	0.0015	0.0030	0.0030
0.7940	0.0069	0.0016	0.0033	0.0033
0.8407	0.0069	0.0017	0.0037	0.0037
0.8874	0.0069	0.0018	0.0044	0.0044
0.9341	0.0069	0.0019	0.0052	0.0052
0.9808	0.0069	0.0020	0.0061	0.0061
1.0275	0.0069	0.0021	0.0071	0.0071
1.0742	0.0069	0.0022	0.0082	0.0082
1.1209	0.0069	0.0023	0.0085	0.0085
1.1676	0.0069	0.0024	0.0094	0.0094
1.2143	0.0069	0.0025	0.0107	0.0107
1.2610	0.0069	0.0026	0.0111	0.0111

1.3077	0.0069	0.0027	0.0111	0.0111
1.3544	0.0069	0.0028	0.0111	0.0111
1.4011	0.0069	0.0029	0.0111	0.0111
1.4478	0.0069	0.0030	0.0111	0.0111
1.4945	0.0069	0.0031	0.0111	0.0111
1.5412	0.0069	0.0032	0.0111	0.0111
1.5879	0.0069	0.0033	0.0111	0.0111
1.6346	0.0069	0.0034	0.0111	0.0111
1.6813	0.0069	0.0035	0.0111	0.0111
1.7280	0.0069	0.0036	0.0111	0.0111
1.7747	0.0069	0.0037	0.0111	0.0111
1.8214	0.0069	0.0038	0.0111	0.0111
1.8681	0.0069	0.0040	0.0111	0.0111
1.9148	0.0069	0.0041	0.0111	0.0111
1.9615	0.0069	0.0042	0.0111	0.0111
2.0082	0.0069	0.0044	0.0111	0.0111
2.0549	0.0069	0.0045	0.0111	0.0111
2.1016	0.0069	0.0046	0.0111	0.0111
2.1484	0.0069	0.0048	0.0111	0.0111
2.1951	0.0069	0.0049	0.0111	0.0111
2.2418	0.0069	0.0050	0.0111	0.0111
2.2885	0.0069	0.0052	0.0111	0.0111
2.3352	0.0069	0.0053	0.0111	0.0111
2.3819	0.0069	0.0054	0.0111	0.0111
2.4286	0.0069	0.0056	0.0111	0.0111
2.4753	0.0069	0.0057	0.0111	0.0111
2.5220	0.0069	0.0058	0.0111	0.0111
2.5687	0.0069	0.0060	0.0111	0.0111
2.6154	0.0069	0.0061	0.0111	0.0111
2.6621	0.0069	0.0062	0.0111	0.0111
2.7088	0.0069	0.0064	0.0111	0.0111
2.7500	0.0069	0.0065	0.0111	0.0111

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0069	0.0065	0.0000	0.0356	0.0000
2.7967	0.0069	0.0068	0.0000	0.0356	0.0000
2.8434	0.0069	0.0071	0.0000	0.0366	0.0000
2.8901	0.0069	0.0075	0.0000	0.0375	0.0000
2.9368	0.0069	0.0078	0.0000	0.0384	0.0000
2.9835	0.0069	0.0081	0.0000	0.0394	0.0000
3.0302	0.0069	0.0084	0.0000	0.0403	0.0000
3.0769	0.0069	0.0087	0.0000	0.0412	0.0000
3.1236	0.0069	0.0091	0.0000	0.0421	0.0000
3.1703	0.0069	0.0094	0.0000	0.0431	0.0000
3.2170	0.0069	0.0097	0.0000	0.0440	0.0000
3.2637	0.0069	0.0100	0.0000	0.0449	0.0000
3.3104	0.0069	0.0104	0.0000	0.0458	0.0000
3.3571	0.0069	0.0107	0.0000	0.0468	0.0000
3.4038	0.0069	0.0110	0.0000	0.0477	0.0000
3.4505	0.0069	0.0113	0.0000	0.0486	0.0000
3.4973	0.0069	0.0116	0.0000	0.0495	0.0000
3.5440	0.0069	0.0120	0.0000	0.0505	0.0000
3.5907	0.0069	0.0123	0.0000	0.0514	0.0000
3.6374	0.0069	0.0126	0.0000	0.0523	0.0000
3.6841	0.0069	0.0129	0.0000	0.0533	0.0000
3.7308	0.0069	0.0132	0.0000	0.0542	0.0000
3.7775	0.0069	0.0136	0.0000	0.0551	0.0000

3.8242	0.0069	0.0139	0.0000	0.0560	0.0000
3.8709	0.0069	0.0142	0.0000	0.0570	0.0000
3.9176	0.0069	0.0145	0.0000	0.0579	0.0000
3.9643	0.0069	0.0149	0.0000	0.0588	0.0000
4.0110	0.0069	0.0152	0.0000	0.0597	0.0000
4.0577	0.0069	0.0155	0.0000	0.0607	0.0000
4.1044	0.0069	0.0158	0.0000	0.0616	0.0000
4.1511	0.0069	0.0161	0.0000	0.0625	0.0000
4.1978	0.0069	0.0165	0.0000	0.0634	0.0000
4.2445	0.0069	0.0168	0.0000	0.0644	0.0000
4.2500	0.0069	0.0168	0.0000	0.0645	0.0000

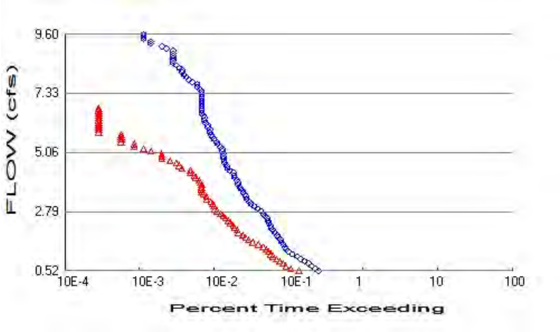
Surface BMP #16

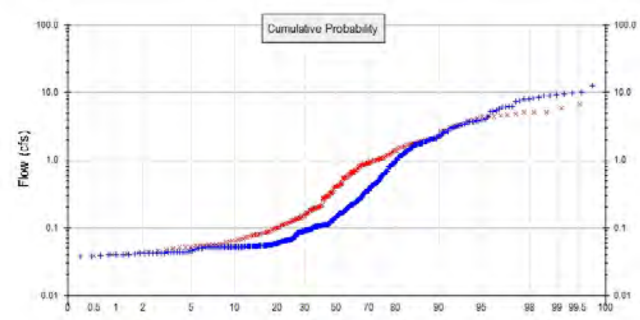
Element Flows To:

Outlet 1	Outlet 2
	BMP #16

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 17.853
Total Impervious Area: 0.5537

Mitigated Landuse Totals for POC #1
Total Pervious Area: 14.5128
Total Impervious Area: 3.8892

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	5.217709
5 year	8.410119
10 year	9.599839
25 year	10.727406

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	2.777339
5 year	4.538034
10 year	5.082911
25 year	6.036503

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.5218	883	483	54	Pass
0.6135	804	375	46	Pass
0.7052	715	322	45	Pass
0.7969	648	296	45	Pass
0.8886	574	267	46	Pass
0.9803	507	239	47	Pass
1.0720	457	216	47	Pass
1.1637	393	202	51	Pass
1.2554	351	188	53	Pass
1.3470	327	175	53	Pass
1.4387	314	160	50	Pass
1.5304	297	139	46	Pass
1.6221	286	116	40	Pass
1.7138	271	101	37	Pass
1.8055	255	93	36	Pass
1.8972	244	85	34	Pass
1.9889	228	75	32	Pass
2.0806	216	72	33	Pass
2.1723	204	66	32	Pass
2.2640	199	64	32	Pass
2.3557	191	59	30	Pass
2.4474	186	55	29	Pass
2.5391	179	50	27	Pass
2.6308	169	47	27	Pass
2.7225	161	43	26	Pass
2.8142	150	39	26	Pass
2.9059	138	36	26	Pass
2.9976	121	35	28	Pass
3.0893	109	34	31	Pass
3.1810	103	32	31	Pass
3.2727	98	28	28	Pass
3.3644	94	28	29	Pass
3.4561	90	25	27	Pass
3.5478	86	24	27	Pass
3.6395	82	24	29	Pass
3.7312	79	24	30	Pass
3.8229	74	24	32	Pass
3.9146	73	23	31	Pass
4.0063	71	22	30	Pass
4.0980	67	20	29	Pass
4.1897	65	19	29	Pass
4.2814	64	17	26	Pass
4.3731	57	17	29	Pass
4.4648	53	13	24	Pass
4.5565	52	12	23	Pass
4.6482	49	11	22	Pass
4.7399	48	9	18	Pass
4.8316	47	7	14	Pass
4.9233	47	7	14	Pass
5.0150	47	7	14	Pass
5.1067	45	5	11	Pass
5.1984	45	4	8	Pass
5.2900	42	3	7	Pass

5.3817	40	3	7	Pass
5.4734	38	2	5	Pass
5.5651	35	2	5	Pass
5.6568	33	2	6	Pass
5.7485	32	2	6	Pass
5.8402	31	1	3	Pass
5.9319	31	1	3	Pass
6.0236	29	1	3	Pass
6.1153	29	1	3	Pass
6.2070	27	1	3	Pass
6.2987	26	1	3	Pass
6.3904	26	1	3	Pass
6.4821	25	1	4	Pass
6.5738	24	1	4	Pass
6.6655	24	1	4	Pass
6.7572	24	1	4	Pass
6.8489	24	0	0	Pass
6.9406	24	0	0	Pass
7.0323	24	0	0	Pass
7.1240	24	0	0	Pass
7.2157	24	0	0	Pass
7.3074	24	0	0	Pass
7.3991	24	0	0	Pass
7.4908	23	0	0	Pass
7.5825	21	0	0	Pass
7.6742	21	0	0	Pass
7.7659	18	0	0	Pass
7.8576	16	0	0	Pass
7.9493	15	0	0	Pass
8.0410	14	0	0	Pass
8.1327	13	0	0	Pass
8.2244	13	0	0	Pass
8.3161	12	0	0	Pass
8.4078	11	0	0	Pass
8.4995	10	0	0	Pass
8.5912	10	0	0	Pass
8.6829	10	0	0	Pass
8.7746	10	0	0	Pass
8.8663	10	0	0	Pass
8.9580	10	0	0	Pass
9.0497	8	0	0	Pass
9.1414	7	0	0	Pass
9.2330	5	0	0	Pass
9.3247	5	0	0	Pass
9.4164	4	0	0	Pass
9.5081	4	0	0	Pass
9.5998	4	0	0	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   L321-01 SDHM 2.wdm
MESSU      25   PreL321-01 SDHM 2.MES
           27   PreL321-01 SDHM 2.L61
           28   PreL321-01 SDHM 2.L62
           30   POCL321-01 SDHM 21.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      29
      IMPLND       1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                    MAX                      1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                         in  out           ***
   29      D,NatVeg,Moderate      1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   29         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   29           0         3     0.025        80       0.1       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   29           0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   29           0       0.6      0.04         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   29       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   29       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   29           0         0      0.01         0       0.4      0.01         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            100      0.05     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  29                      17.853     COPY   501     12
PERLND  29                      17.853     COPY   501     13
IMPLND   1                      0.5537     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
```

```
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   L321-01 SDHM 2.wdm
MESSU      25   MitL321-01 SDHM 2.MES
           27   MitL321-01 SDHM 2.L61
           28   MitL321-01 SDHM 2.L62
           30   POCL321-01 SDHM 21.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      47
      IMPLND       1
      PERLND      46
      PERLND      29
      GENER        2
      RCHRES       1
      RCHRES       2
      GENER        4
      RCHRES       3
      RCHRES       4
      GENER        6
      RCHRES       5
      RCHRES       6
      GENER        8
      RCHRES       7
      RCHRES       8
      GENER       10
      RCHRES       9
      RCHRES      10
      GENER       12
      RCHRES      11
      RCHRES      12
      GENER       14
      RCHRES      13
      RCHRES      14
      GENER       16
      RCHRES      15
      RCHRES      16
      GENER       18
      RCHRES      17
      RCHRES      18
      GENER       20
      RCHRES      19
      RCHRES      20
      GENER       22
      RCHRES      21
      RCHRES      22
      GENER       24
      RCHRES      23
      RCHRES      24
      GENER       26
      RCHRES      25
      RCHRES      26
      GENER       28
      RCHRES      27
      RCHRES      28
      GENER       30
```

```
      RCHRES      29
      RCHRES      30
      GENER       32
      RCHRES      31
      RCHRES      32
      COPY         1
      COPY       501
      COPY       601
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface BMP #1              MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  601         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
    2        24
    4        24
    6        24
    8        24
   10        24
   12        24
   14        24
   16        24
   18        24
   20        24
   22        24
   24        24
   26        24
   28        24
   30        24
   32        24
  END OPCODE
  PARM
    #    #         K ***
    2             0.
    4             0.
    6             0.
    8             0.
   10             0.
   12             0.
   14             0.
   16             0.
   18             0.
   20             0.
   22             0.
   24             0.
   26             0.
   28             0.
   30             0.
   32             0.
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
```

```
 47      D,Urban,Moderate       1    1    1    1   27    0
 46      D,Urban,Flat           1    1    1    1   27    0
 29      D,NatVeg,Moderate      1    1    1    1   27    0
END GEN-INFO
*** Section PWATER***

ACTIVITY
  <PLS > ************* Active Sections *****************************
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
 47         0    0    1    0    0    0    0    0    0    0    0    0
 46         0    0    1    0    0    0    0    0    0    0    0    0
 29         0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags ***************************** PIVL  PYR
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
 47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 46         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 47         0    1    1    1    0    0    0    0    1    1    0
 46         0    1    1    1    0    0    0    0    1    1    0
 29         0    1    1    1    0    0    0    0    1    1    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >      PWATER input info: Part 2         ***
  # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
 47              0       3.5     0.025        50       0.1       2.5     0.915
 46              0       3.8      0.03        50      0.05       2.5     0.915
 29              0         3     0.025        80       0.1       2.5     0.915
END PWAT-PARM2

PWAT-PARM3
  <PLS >      PWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
 47              0         0         2         2         0      0.05      0.05
 46              0         0         2         2         0      0.05      0.05
 29              0         0         2         2         0      0.05      0.05
END PWAT-PARM3
PWAT-PARM4
  <PLS >     PWATER input info: Part 4                               ***
  # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
 47              0       0.6      0.03         1       0.3         0
 46              0       0.6      0.03         1       0.3         0
 29              0       0.6      0.04         1       0.3         0
END PWAT-PARM4
MON-LZETPARM
  <PLS >      PWATER input info: Part 3         ***
  # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
 47       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
 46       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
 29       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
END MON-LZETPARM
MON-INTERCEP
  <PLS >      PWATER input info: Part 3         ***
  # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
 47       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
 46       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
 29       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
END MON-INTERCEP

PWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
```

```
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   47             0         0      0.15         0         1      0.05         0
   46             0         0      0.15         0         1      0.05         0
   29             0         0      0.01         0       0.4      0.01         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            100      0.05     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1             0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
DMA 1***
PERLND  47                      0.2117     RCHRES   1      2
PERLND  47                      0.2117     RCHRES   1      3
IMPLND   1                      0.6841     RCHRES   1      5
DMA 2***
IMPLND   1                      0.4825     RCHRES   3      5
DMA 9***
PERLND  46                      0.2045     RCHRES   5      2
PERLND  46                      0.2045     RCHRES   5      3
IMPLND   1                      0.1721     RCHRES   5      5
DMA 10***
PERLND  46                      0.2308     RCHRES   7      2
```

```
PERLND  46                        0.2308     RCHRES   7       3
IMPLND   1                        0.0803     RCHRES   7       5
DMA 24***
PERLND  46                        0.2944     RCHRES   9       2
PERLND  46                        0.2944     RCHRES   9       3
IMPLND   1                        0.0803     RCHRES   9       5
DMA 4***
IMPLND   1                        0.3806     RCHRES  11       5
DMA 12***
PERLND  46                        0.2206     RCHRES  13       2
PERLND  46                        0.2206     RCHRES  13       3
IMPLND   1                        0.0804     RCHRES  13       5
DMA 13 & 14***
PERLND  46                        0.6962     RCHRES  15       2
PERLND  46                        0.6962     RCHRES  15       3
IMPLND   1                        0.1538     RCHRES  15       5
DMA 15 & 16***
PERLND  46                        0.6479     RCHRES  17       2
PERLND  46                        0.6479     RCHRES  17       3
IMPLND   1                        0.1951     RCHRES  17       5
DMA 17 & 18***
PERLND  46                        0.7326     RCHRES  19       2
PERLND  46                        0.7326     RCHRES  19       3
IMPLND   1                        0.1951     RCHRES  19       5
DMA 19***
PERLND  46                        0.4306     RCHRES  21       2
PERLND  46                        0.4306     RCHRES  21       3
IMPLND   1                        0.0804     RCHRES  21       5
DMA 20 & 22***
PERLND  46                        0.5154     RCHRES  23       2
PERLND  46                        0.5154     RCHRES  23       3
IMPLND   1                         0.831     RCHRES  23       5
DMA 26***
PERLND  46                        0.4172     RCHRES  25       2
PERLND  46                        0.4172     RCHRES  25       3
IMPLND   1                        0.0804     RCHRES  25       5
DMA 27***
PERLND  46                        0.1289     RCHRES  27       2
PERLND  46                        0.1289     RCHRES  27       3
IMPLND   1                        0.0804     RCHRES  27       5
DMA 25***
PERLND  46                        0.1078     RCHRES  29       2
PERLND  46                        0.1078     RCHRES  29       3
IMPLND   1                        0.0804     RCHRES  29       5
DMA 28***
IMPLND   1                        0.2323     RCHRES  31       5
DMA 6, 7, 8, 9, 11, 21 &  22***
PERLND  29                        9.6742     COPY   501      12
PERLND  29                        9.6742     COPY   601      12
PERLND  29                        9.6742     COPY   501      13
PERLND  29                        9.6742     COPY   601      13

******Routing******
PERLND  47                        0.2117     COPY     1      12
IMPLND   1                        0.6841     COPY     1      15
PERLND  47                        0.2117     COPY     1      13
RCHRES   1                             1     RCHRES   2       8
RCHRES   3                             1     RCHRES   4       8
RCHRES   3                                   COPY     1      18
RCHRES   5                             1     RCHRES   6       8
RCHRES   5                                   COPY     1      18
RCHRES   7                             1     RCHRES   8       8
RCHRES   7                                   COPY     1      18
RCHRES   9                             1     RCHRES  10       8
RCHRES   9                                   COPY     1      18
RCHRES  11                             1     RCHRES  12       8
RCHRES  11                                   COPY     1      18
RCHRES  13                             1     RCHRES  14       8
RCHRES  13                                   COPY     1      18
RCHRES  15                             1     RCHRES  16       8
```

```
RCHRES  15                                 COPY     1     18
RCHRES  17                           1     RCHRES  18      8
RCHRES  17                                 COPY     1     18
RCHRES  19                           1     RCHRES  20      8
RCHRES  19                                 COPY     1     18
RCHRES  21                           1     RCHRES  22      8
RCHRES  21                                 COPY     1     18
RCHRES  23                           1     RCHRES  24      8
RCHRES  23                                 COPY     1     18
RCHRES  25                           1     RCHRES  26      8
RCHRES  25                                 COPY     1     18
RCHRES  27                           1     RCHRES  28      8
RCHRES  27                                 COPY     1     18
RCHRES  29                           1     RCHRES  30      8
RCHRES  29                                 COPY     1     18
RCHRES  31                           1     RCHRES  32      8
RCHRES  31                                 COPY     1     18
RCHRES   2                           1     COPY   501     17
RCHRES   1                           1     COPY   501     17
RCHRES   4                           1     COPY   501     17
RCHRES   6                           1     COPY   501     17
RCHRES   8                           1     COPY   501     17
RCHRES  10                           1     COPY   501     17
RCHRES  12                           1     COPY   501     17
RCHRES  14                           1     COPY   501     17
RCHRES  16                           1     COPY   501     17
RCHRES  18                           1     COPY   501     17
RCHRES  20                           1     COPY   501     17
RCHRES  22                           1     COPY   501     17
RCHRES  24                           1     COPY   501     17
RCHRES  26                           1     COPY   501     17
RCHRES  28                           1     COPY   501     17
RCHRES  30                           1     COPY   501     17
RCHRES  32                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
GENER    2 OUTPUT TIMSER      .0002778     RCHRES   1     EXTNL  OUTDGT 1
GENER    4 OUTPUT TIMSER      .0002778     RCHRES   3     EXTNL  OUTDGT 1
GENER    6 OUTPUT TIMSER      .0002778     RCHRES   5     EXTNL  OUTDGT 1
GENER    8 OUTPUT TIMSER      .0002778     RCHRES   7     EXTNL  OUTDGT 1
GENER   10 OUTPUT TIMSER      .0002778     RCHRES   9     EXTNL  OUTDGT 1
GENER   12 OUTPUT TIMSER      .0002778     RCHRES  11     EXTNL  OUTDGT 1
GENER   14 OUTPUT TIMSER      .0002778     RCHRES  13     EXTNL  OUTDGT 1
GENER   16 OUTPUT TIMSER      .0002778     RCHRES  15     EXTNL  OUTDGT 1
GENER   18 OUTPUT TIMSER      .0002778     RCHRES  17     EXTNL  OUTDGT 1
GENER   20 OUTPUT TIMSER      .0002778     RCHRES  19     EXTNL  OUTDGT 1
GENER   22 OUTPUT TIMSER      .0002778     RCHRES  21     EXTNL  OUTDGT 1
GENER   24 OUTPUT TIMSER      .0002778     RCHRES  23     EXTNL  OUTDGT 1
GENER   26 OUTPUT TIMSER      .0002778     RCHRES  25     EXTNL  OUTDGT 1
GENER   28 OUTPUT TIMSER      .0002778     RCHRES  27     EXTNL  OUTDGT 1
GENER   30 OUTPUT TIMSER      .0002778     RCHRES  29     EXTNL  OUTDGT 1
GENER   32 OUTPUT TIMSER      .0002778     RCHRES  31     EXTNL  OUTDGT 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
    1     Surface BMP #1         3    1    1    1   28    0    1
    2     BMP #1                 2    1    1    1   28    0    1
```

```
  3      Surface BMP #2          3    1    1    1   28    0    1
  4      BMP #2                  2    1    1    1   28    0    1
  5      Surface BMP #3          3    1    1    1   28    0    1
  6      BMP #3                  2    1    1    1   28    0    1
  7      Surface BMP #4          3    1    1    1   28    0    1
  8      BMP #4                  2    1    1    1   28    0    1
  9      Surface BMP #5          3    1    1    1   28    0    1
 10      BMP #5                  2    1    1    1   28    0    1
 11      Surface BMP #6          3    1    1    1   28    0    1
 12      BMP #6                  2    1    1    1   28    0    1
 13      Surface BMP #7          3    1    1    1   28    0    1
 14      BMP #7                  2    1    1    1   28    0    1
 15      Surface BMP #8          3    1    1    1   28    0    1
 16      BMP #8                  2    1    1    1   28    0    1
 17      Surface BMP #9          3    1    1    1   28    0    1
 18      BMP #9                  2    1    1    1   28    0    1
 19      Surface BMP #10         3    1    1    1   28    0    1
 20      BMP #10                 2    1    1    1   28    0    1
 21      Surface BMP #11         3    1    1    1   28    0    1
 22      BMP #11                 2    1    1    1   28    0    1
 23      Surface BMP #12         3    1    1    1   28    0    1
 24      BMP #12                 2    1    1    1   28    0    1
 25      Surface BMP #13         3    1    1    1   28    0    1
 26      BMP #13                 2    1    1    1   28    0    1
 27      Surface BMP #14         3    1    1    1   28    0    1
 28      BMP #14                 2    1    1    1   28    0    1
 29      Surface BMP #15         3    1    1    1   28    0    1
 30      BMP #15                 2    1    1    1   28    0    1
 31      Surface BMP #16         3    1    1    1   28    0    1
 32      BMP #16                 2    1    1    1   28    0    1
END GEN-INFO
*** Section RCHRES***

ACTIVITY
  <PLS > ************* Active Sections *****************************
  # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  1         1    0    0    0    0    0    0    0    0    0
  2         1    0    0    0    0    0    0    0    0    0
  3         1    0    0    0    0    0    0    0    0    0
  4         1    0    0    0    0    0    0    0    0    0
  5         1    0    0    0    0    0    0    0    0    0
  6         1    0    0    0    0    0    0    0    0    0
  7         1    0    0    0    0    0    0    0    0    0
  8         1    0    0    0    0    0    0    0    0    0
  9         1    0    0    0    0    0    0    0    0    0
 10         1    0    0    0    0    0    0    0    0    0
 11         1    0    0    0    0    0    0    0    0    0
 12         1    0    0    0    0    0    0    0    0    0
 13         1    0    0    0    0    0    0    0    0    0
 14         1    0    0    0    0    0    0    0    0    0
 15         1    0    0    0    0    0    0    0    0    0
 16         1    0    0    0    0    0    0    0    0    0
 17         1    0    0    0    0    0    0    0    0    0
 18         1    0    0    0    0    0    0    0    0    0
 19         1    0    0    0    0    0    0    0    0    0
 20         1    0    0    0    0    0    0    0    0    0
 21         1    0    0    0    0    0    0    0    0    0
 22         1    0    0    0    0    0    0    0    0    0
 23         1    0    0    0    0    0    0    0    0    0
 24         1    0    0    0    0    0    0    0    0    0
 25         1    0    0    0    0    0    0    0    0    0
 26         1    0    0    0    0    0    0    0    0    0
 27         1    0    0    0    0    0    0    0    0    0
 28         1    0    0    0    0    0    0    0    0    0
 29         1    0    0    0    0    0    0    0    0    0
 30         1    0    0    0    0    0    0    0    0    0
 31         1    0    0    0    0    0    0    0    0    0
 32         1    0    0    0    0    0    0    0    0    0
END ACTIVITY
```

```
PRINT-INFO
  <PLS > ***************** Print-flags ****************** PIVL  PYR
  # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR   *********
  1         4    0    0    0    0    0    0    0    0    0    1    9
  2         4    0    0    0    0    0    0    0    0    0    1    9
  3         4    0    0    0    0    0    0    0    0    0    1    9
  4         4    0    0    0    0    0    0    0    0    0    1    9
  5         4    0    0    0    0    0    0    0    0    0    1    9
  6         4    0    0    0    0    0    0    0    0    0    1    9
  7         4    0    0    0    0    0    0    0    0    0    1    9
  8         4    0    0    0    0    0    0    0    0    0    1    9
  9         4    0    0    0    0    0    0    0    0    0    1    9
 10         4    0    0    0    0    0    0    0    0    0    1    9
 11         4    0    0    0    0    0    0    0    0    0    1    9
 12         4    0    0    0    0    0    0    0    0    0    1    9
 13         4    0    0    0    0    0    0    0    0    0    1    9
 14         4    0    0    0    0    0    0    0    0    0    1    9
 15         4    0    0    0    0    0    0    0    0    0    1    9
 16         4    0    0    0    0    0    0    0    0    0    1    9
 17         4    0    0    0    0    0    0    0    0    0    1    9
 18         4    0    0    0    0    0    0    0    0    0    1    9
 19         4    0    0    0    0    0    0    0    0    0    1    9
 20         4    0    0    0    0    0    0    0    0    0    1    9
 21         4    0    0    0    0    0    0    0    0    0    1    9
 22         4    0    0    0    0    0    0    0    0    0    1    9
 23         4    0    0    0    0    0    0    0    0    0    1    9
 24         4    0    0    0    0    0    0    0    0    0    1    9
 25         4    0    0    0    0    0    0    0    0    0    1    9
 26         4    0    0    0    0    0    0    0    0    0    1    9
 27         4    0    0    0    0    0    0    0    0    0    1    9
 28         4    0    0    0    0    0    0    0    0    0    1    9
 29         4    0    0    0    0    0    0    0    0    0    1    9
 30         4    0    0    0    0    0    0    0    0    0    1    9
 31         4    0    0    0    0    0    0    0    0    0    1    9
 32         4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

HYDR-PARM1
  RCHRES  Flags for each HYDR Section                                           ***
  # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each      FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit       possible  exit
           *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  1        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
  2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  3        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
  4        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  5        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
  6        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  7        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
  8        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  9        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 10        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 11        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 12        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 13        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 14        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 15        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 16        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 17        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 18        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 19        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 20        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 21        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 22        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 23        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 24        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 25        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 26        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 27        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 28        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
```

```
 29        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 30        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
 31        0  1  0  0    4  5  6  0  0       0  1  0  0  0       2  1  2  2  2
 32        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
END HYDR-PARM1

HYDR-PARM2
  # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50        ***
<------><--------><--------><--------><--------><--------><-------->        ***
  1              1      0.01       0.0       0.0       0.5       0.0
  2              2      0.01       0.0       0.0       0.5       0.0
  3              3      0.01       0.0       0.0       0.5       0.0
  4              4      0.01       0.0       0.0       0.5       0.0
  5              5      0.01       0.0       0.0       0.5       0.0
  6              6      0.01       0.0       0.0       0.5       0.0
  7              7      0.01       0.0       0.0       0.5       0.0
  8              8      0.01       0.0       0.0       0.5       0.0
  9              9      0.01       0.0       0.0       0.5       0.0
 10             10      0.01       0.0       0.0       0.5       0.0
 11             11      0.01       0.0       0.0       0.5       0.0
 12             12      0.01       0.0       0.0       0.5       0.0
 13             13      0.01       0.0       0.0       0.5       0.0
 14             14      0.01       0.0       0.0       0.5       0.0
 15             15      0.01       0.0       0.0       0.5       0.0
 16             16      0.01       0.0       0.0       0.5       0.0
 17             17      0.01       0.0       0.0       0.5       0.0
 18             18      0.01       0.0       0.0       0.5       0.0
 19             19      0.01       0.0       0.0       0.5       0.0
 20             20      0.01       0.0       0.0       0.5       0.0
 21             21      0.01       0.0       0.0       0.5       0.0
 22             22      0.01       0.0       0.0       0.5       0.0
 23             23      0.01       0.0       0.0       0.5       0.0
 24             24      0.01       0.0       0.0       0.5       0.0
 25             25      0.01       0.0       0.0       0.5       0.0
 26             26      0.01       0.0       0.0       0.5       0.0
 27             27      0.01       0.0       0.0       0.5       0.0
 28             28      0.01       0.0       0.0       0.5       0.0
 29             29      0.01       0.0       0.0       0.5       0.0
 30             30      0.01       0.0       0.0       0.5       0.0
 31             31      0.01       0.0       0.0       0.5       0.0
 32             32      0.01       0.0       0.0       0.5       0.0
END HYDR-PARM2
HYDR-INIT
  RCHRES  Initial conditions for each HYDR section                         ***
  # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
        *** ac-ft     for each possible exit        for each possible exit
<------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  1            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  2            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  3            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  4            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  5            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  6            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  7            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  8            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  9            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 10         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 11         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 12         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 13         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 14         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 15         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 16         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 17         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 18         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 19         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 20         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 21         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 22         0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
 23         0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
```

```
   24        0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   25        0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   26        0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   27        0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   28        0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   29        0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   30        0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   31        0            4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
   32        0            4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol2   RCHRES   2 VOL              4
  UVQUAN v2m2   GLOBAL     WORKSP  1        3
  UVQUAN vpo2   GLOBAL     WORKSP  2        3
  UVQUAN v2d2   GENER    2 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol4   RCHRES   4 VOL              4
  UVQUAN v2m4   GLOBAL     WORKSP  3        3
  UVQUAN vpo4   GLOBAL     WORKSP  4        3
  UVQUAN v2d4   GENER    4 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol6   RCHRES   6 VOL              4
  UVQUAN v2m6   GLOBAL     WORKSP  5        3
  UVQUAN vpo6   GLOBAL     WORKSP  6        3
  UVQUAN v2d6   GENER    6 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol8   RCHRES   8 VOL              4
  UVQUAN v2m8   GLOBAL     WORKSP  7        3
  UVQUAN vpo8   GLOBAL     WORKSP  8        3
  UVQUAN v2d8   GENER    8 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol10  RCHRES  10 VOL              4
  UVQUAN v2m10  GLOBAL     WORKSP  9        3
  UVQUAN vpo10  GLOBAL     WORKSP 10        3
  UVQUAN v2d10  GENER   10 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol12  RCHRES  12 VOL              4
  UVQUAN v2m12  GLOBAL     WORKSP 11        3
  UVQUAN vpo12  GLOBAL     WORKSP 12        3
  UVQUAN v2d12  GENER   12 K       1        3
*** User-Defined Variable Quantity Lines
***                           addr
***                         <------>
```

```
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol14  RCHRES  14 VOL            4
  UVQUAN v2m14  GLOBAL     WORKSP 13      3
  UVQUAN vpo14  GLOBAL     WORKSP 14      3
  UVQUAN v2d14  GENER   14 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol16  RCHRES  16 VOL            4
  UVQUAN v2m16  GLOBAL     WORKSP 15      3
  UVQUAN vpo16  GLOBAL     WORKSP 16      3
  UVQUAN v2d16  GENER   16 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol18  RCHRES  18 VOL            4
  UVQUAN v2m18  GLOBAL     WORKSP 17      3
  UVQUAN vpo18  GLOBAL     WORKSP 18      3
  UVQUAN v2d18  GENER   18 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol20  RCHRES  20 VOL            4
  UVQUAN v2m20  GLOBAL     WORKSP 19      3
  UVQUAN vpo20  GLOBAL     WORKSP 20      3
  UVQUAN v2d20  GENER   20 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol22  RCHRES  22 VOL            4
  UVQUAN v2m22  GLOBAL     WORKSP 21      3
  UVQUAN vpo22  GLOBAL     WORKSP 22      3
  UVQUAN v2d22  GENER   22 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol24  RCHRES  24 VOL            4
  UVQUAN v2m24  GLOBAL     WORKSP 23      3
  UVQUAN vpo24  GLOBAL     WORKSP 24      3
  UVQUAN v2d24  GENER   24 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol26  RCHRES  26 VOL            4
  UVQUAN v2m26  GLOBAL     WORKSP 25      3
  UVQUAN vpo26  GLOBAL     WORKSP 26      3
  UVQUAN v2d26  GENER   26 K       1      3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol28  RCHRES  28 VOL            4
  UVQUAN v2m28  GLOBAL     WORKSP 27      3
  UVQUAN vpo28  GLOBAL     WORKSP 28      3
  UVQUAN v2d28  GENER   28 K       1      3
*** User-Defined Variable Quantity Lines
```

```
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol30  RCHRES  30 VOL              4
  UVQUAN v2m30  GLOBAL     WORKSP 29        3
  UVQUAN vpo30  GLOBAL     WORKSP 30        3
  UVQUAN v2d30  GENER   30 K       1        3
*** User-Defined Variable Quantity Lines
***                          addr
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol32  RCHRES  32 VOL              4
  UVQUAN v2m32  GLOBAL     WORKSP 31        3
  UVQUAN vpo32  GLOBAL     WORKSP 32        3
  UVQUAN v2d32  GENER   32 K       1        3
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m2    1 WORKSP  1         1.0 QUAN
  UVNAME  vpo2    1 WORKSP  2         1.0 QUAN
  UVNAME  v2d2    1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m4    1 WORKSP  3         1.0 QUAN
  UVNAME  vpo4    1 WORKSP  4         1.0 QUAN
  UVNAME  v2d4    1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m6    1 WORKSP  5         1.0 QUAN
  UVNAME  vpo6    1 WORKSP  6         1.0 QUAN
  UVNAME  v2d6    1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m8    1 WORKSP  7         1.0 QUAN
  UVNAME  vpo8    1 WORKSP  8         1.0 QUAN
  UVNAME  v2d8    1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m10   1 WORKSP  9         1.0 QUAN
  UVNAME  vpo10   1 WORKSP 10         1.0 QUAN
  UVNAME  v2d10   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m12   1 WORKSP 11         1.0 QUAN
  UVNAME  vpo12   1 WORKSP 12         1.0 QUAN
  UVNAME  v2d12   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
```

```
  UVNAME  v2m14   1 WORKSP 13         1.0 QUAN
  UVNAME  vpo14   1 WORKSP 14         1.0 QUAN
  UVNAME  v2d14   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m16   1 WORKSP 15         1.0 QUAN
  UVNAME  vpo16   1 WORKSP 16         1.0 QUAN
  UVNAME  v2d16   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m18   1 WORKSP 17         1.0 QUAN
  UVNAME  vpo18   1 WORKSP 18         1.0 QUAN
  UVNAME  v2d18   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m20   1 WORKSP 19         1.0 QUAN
  UVNAME  vpo20   1 WORKSP 20         1.0 QUAN
  UVNAME  v2d20   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m22   1 WORKSP 21         1.0 QUAN
  UVNAME  vpo22   1 WORKSP 22         1.0 QUAN
  UVNAME  v2d22   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m24   1 WORKSP 23         1.0 QUAN
  UVNAME  vpo24   1 WORKSP 24         1.0 QUAN
  UVNAME  v2d24   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m26   1 WORKSP 25         1.0 QUAN
  UVNAME  vpo26   1 WORKSP 26         1.0 QUAN
  UVNAME  v2d26   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m28   1 WORKSP 27         1.0 QUAN
  UVNAME  vpo28   1 WORKSP 28         1.0 QUAN
  UVNAME  v2d28   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper      vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->     <----><-><-><-> <---> <-->
  UVNAME  v2m30   1 WORKSP 29         1.0 QUAN
  UVNAME  vpo30   1 WORKSP 30         1.0 QUAN
  UVNAME  v2d30   1 K       1         1.0 QUAN
*** User-Defined Target Variable Names
***                  addr or                        addr or
***                 <------>                       <------>
```

```
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m32   1 WORKSP 31         1.0 QUAN
  UVNAME  vpo32   1 WORKSP 32         1.0 QUAN
  UVNAME  v2d32   1 K       1         1.0 QUAN
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   2                               v2m2            =  1758.
*** Compute remaining available pore space
  GENER   2                               vpo2            =  v2m2
  GENER   2                               vpo2           -=  vol2
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo2 < 0.0) THEN
  GENER   2                               vpo2            =  0.0
END IF
*** Infiltration volume
  GENER   2                               v2d2            =  vpo2
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   4                               v2m4            =  1758.
*** Compute remaining available pore space
  GENER   4                               vpo4            =  v2m4
  GENER   4                               vpo4           -=  vol4
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo4 < 0.0) THEN
  GENER   4                               vpo4            =  0.0
END IF
*** Infiltration volume
  GENER   4                               v2d4            =  vpo4
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   6                               v2m6            =  263.
*** Compute remaining available pore space
  GENER   6                               vpo6            =  v2m6
  GENER   6                               vpo6           -=  vol6
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo6 < 0.0) THEN
  GENER   6                               vpo6            =  0.0
END IF
*** Infiltration volume
  GENER   6                               v2d6            =  vpo6
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   8                               v2m8            =  263.
*** Compute remaining available pore space
  GENER   8                               vpo8            =  v2m8
  GENER   8                               vpo8           -=  vol8
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo8 < 0.0) THEN
  GENER   8                               vpo8            =  0.0
END IF
*** Infiltration volume
  GENER   8                               v2d8            =  vpo8
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  10                               v2m10           =  263.
*** Compute remaining available pore space
  GENER  10                               vpo10           =  v2m10
  GENER  10                               vpo10          -=  vol10
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo10 < 0.0) THEN
  GENER  10                               vpo10           =  0.0
END IF
*** Infiltration volume
  GENER  10                               v2d10           =  vpo10
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  12                               v2m12           =  263.
*** Compute remaining available pore space
  GENER  12                               vpo12           =  v2m12
```

```
  GENER  12                             vpo12          -=  vol12
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo12 < 0.0) THEN
  GENER  12                             vpo12           =  0.0
END IF
*** Infiltration volume
  GENER  12                             v2d12           =  vpo12
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  14                             v2m14           =  263.
*** Compute remaining available pore space
  GENER  14                             vpo14           =  v2m14
  GENER  14                             vpo14          -=  vol14
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo14 < 0.0) THEN
  GENER  14                             vpo14           =  0.0
END IF
*** Infiltration volume
  GENER  14                             v2d14           =  vpo14
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  16                             v2m16           =  263.
*** Compute remaining available pore space
  GENER  16                             vpo16           =  v2m16
  GENER  16                             vpo16          -=  vol16
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo16 < 0.0) THEN
  GENER  16                             vpo16           =  0.0
END IF
*** Infiltration volume
  GENER  16                             v2d16           =  vpo16
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  18                             v2m18           =  263.
*** Compute remaining available pore space
  GENER  18                             vpo18           =  v2m18
  GENER  18                             vpo18          -=  vol18
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo18 < 0.0) THEN
  GENER  18                             vpo18           =  0.0
END IF
*** Infiltration volume
  GENER  18                             v2d18           =  vpo18
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  20                             v2m20           =  263.
*** Compute remaining available pore space
  GENER  20                             vpo20           =  v2m20
  GENER  20                             vpo20          -=  vol20
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo20 < 0.0) THEN
  GENER  20                             vpo20           =  0.0
END IF
*** Infiltration volume
  GENER  20                             v2d20           =  vpo20
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  22                             v2m22           =  263.
*** Compute remaining available pore space
  GENER  22                             vpo22           =  v2m22
  GENER  22                             vpo22          -=  vol22
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo22 < 0.0) THEN
  GENER  22                             vpo22           =  0.0
END IF
*** Infiltration volume
  GENER  22                             v2d22           =  vpo22
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  24                             v2m24           =  1319.
```

```
*** Compute remaining available pore space
  GENER  24                             vpo24          =  v2m24
  GENER  24                             vpo24         -=  vol24
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo24 < 0.0) THEN
  GENER  24                             vpo24          =  0.0
END IF
*** Infiltration volume
  GENER  24                             v2d24          =  vpo24
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  26                             v2m26          =  263.
*** Compute remaining available pore space
  GENER  26                             vpo26          =  v2m26
  GENER  26                             vpo26         -=  vol26
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo26 < 0.0) THEN
  GENER  26                             vpo26          =  0.0
END IF
*** Infiltration volume
  GENER  26                             v2d26          =  vpo26
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  28                             v2m28          =  263.
*** Compute remaining available pore space
  GENER  28                             vpo28          =  v2m28
  GENER  28                             vpo28         -=  vol28
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo28 < 0.0) THEN
  GENER  28                             vpo28          =  0.0
END IF
*** Infiltration volume
  GENER  28                             v2d28          =  vpo28
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  30                             v2m30          =  263.
*** Compute remaining available pore space
  GENER  30                             vpo30          =  v2m30
  GENER  30                             vpo30         -=  vol30
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo30 < 0.0) THEN
  GENER  30                             vpo30          =  0.0
END IF
*** Infiltration volume
  GENER  30                             v2d30          =  vpo30
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER  32                             v2m32          =  263.
*** Compute remaining available pore space
  GENER  32                             vpo32          =  v2m32
  GENER  32                             vpo32         -=  vol32
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo32 < 0.0) THEN
  GENER  32                             vpo32          =  0.0
END IF
*** Infiltration volume
  GENER  32                             v2d32          =  vpo32
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.045914  0.000000  0.000000  0.000000
  0.046703  0.045914  0.000643  0.000000  0.000000
  0.093407  0.045914  0.001287  0.000000  0.000000
  0.140110  0.045914  0.001930  0.000000  0.000000
  0.186813  0.045914  0.002573  0.000000  0.000000
  0.233516  0.045914  0.003216  0.000000  0.000339
  0.280220  0.045914  0.003860  0.000000  0.000767
```

```
  0.326923  0.045914  0.004503  0.000000  0.001448
  0.373626  0.045914  0.005146  0.000000  0.002423
  0.420330  0.045914  0.005790  0.000000  0.003726
  0.467033  0.045914  0.006433  0.000000  0.004900
  0.513736  0.045914  0.007076  0.000000  0.005392
  0.560440  0.045914  0.007720  0.000000  0.007448
  0.607143  0.045914  0.008363  0.000000  0.009922
  0.653846  0.045914  0.009006  0.000000  0.012840
  0.700549  0.045914  0.009649  0.000000  0.016226
  0.747253  0.045914  0.010293  0.000000  0.020103
  0.793956  0.045914  0.010936  0.000000  0.021857
  0.840659  0.045914  0.011579  0.000000  0.024492
  0.887363  0.045914  0.012223  0.000000  0.029416
  0.934066  0.045914  0.012866  0.000000  0.034893
  0.980769  0.045914  0.013509  0.000000  0.040944
  1.027473  0.045914  0.014153  0.000000  0.047588
  1.074176  0.045914  0.014796  0.000000  0.054841
  1.120879  0.045914  0.015439  0.000000  0.056898
  1.167582  0.045914  0.016082  0.000000  0.062723
  1.214286  0.045914  0.016726  0.000000  0.071250
  1.260989  0.045914  0.017369  0.000000  0.074074
  1.307692  0.045914  0.018012  0.000000  0.074074
  1.354396  0.045914  0.018656  0.000000  0.074074
  1.401099  0.045914  0.019299  0.000000  0.074074
  1.447802  0.045914  0.019942  0.000000  0.074074
  1.494505  0.045914  0.020585  0.000000  0.074074
  1.541209  0.045914  0.021229  0.000000  0.074074
  1.587912  0.045914  0.021872  0.000000  0.074074
  1.634615  0.045914  0.022515  0.000000  0.074074
  1.681319  0.045914  0.023159  0.000000  0.074074
  1.728022  0.045914  0.023802  0.000000  0.074074
  1.774725  0.045914  0.024692  0.000000  0.074074
  1.821429  0.045914  0.025582  0.000000  0.074074
  1.868132  0.045914  0.026472  0.000000  0.074074
  1.914835  0.045914  0.027362  0.000000  0.074074
  1.961538  0.045914  0.028251  0.000000  0.074074
  2.008242  0.045914  0.029141  0.000000  0.074074
  2.054945  0.045914  0.030031  0.000000  0.074074
  2.101648  0.045914  0.030921  0.000000  0.074074
  2.148352  0.045914  0.031811  0.000000  0.074074
  2.195055  0.045914  0.032701  0.000000  0.074074
  2.241758  0.045914  0.033591  0.000000  0.074074
  2.288462  0.045914  0.034481  0.000000  0.074074
  2.335165  0.045914  0.035371  0.000000  0.074074
  2.381868  0.045914  0.036260  0.000000  0.074074
  2.428571  0.045914  0.037150  0.000000  0.074074
  2.475275  0.045914  0.038040  0.000000  0.074074
  2.521978  0.045914  0.038930  0.000000  0.074074
  2.568681  0.045914  0.039820  0.000000  0.074074
  2.615385  0.045914  0.040710  0.000000  0.074074
  2.662088  0.045914  0.041600  0.000000  0.074074
  2.708791  0.045914  0.042490  0.000000  0.074074
  2.750000  0.045914  0.090877  0.000000  0.074074
  END FTABLE  2
  FTABLE      1
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.045914  0.000000  0.000000  0.000000  0.000000
  0.046703  0.045914  0.002144  0.000000  0.237659  0.000000
  0.093407  0.045914  0.004289  0.000000  0.243837  0.000000
  0.140110  0.045914  0.006433  0.000000  0.250015  0.000000
  0.186813  0.045914  0.008577  0.000000  0.256192  0.000000
  0.233516  0.045914  0.010722  0.000000  0.262370  0.000000
  0.280220  0.045914  0.012866  0.000000  0.268548  0.000000
  0.326923  0.045914  0.015010  0.000000  0.274725  0.000000
  0.373626  0.045914  0.017155  0.000000  0.280903  0.000000
  0.420330  0.045914  0.019299  0.000000  0.287081  0.000000
```

```
 0.467033  0.045914  0.021443  0.000000  0.293259  0.000000
 0.513736  0.045914  0.023588  0.000000  0.299436  0.000000
 0.560440  0.045914  0.025732  0.000000  0.305614  0.000000
 0.607143  0.045914  0.027876  0.000000  0.311792  0.000000
 0.653846  0.045914  0.030020  0.000000  0.317969  0.000000
 0.700549  0.045914  0.032165  0.000000  0.324147  0.000000
 0.747253  0.045914  0.034309  0.000000  0.330325  0.000000
 0.793956  0.045914  0.036453  0.000000  0.336502  0.000000
 0.840659  0.045914  0.038598  0.000000  0.342680  0.000000
 0.887363  0.045914  0.040742  0.000000  0.348858  0.000000
 0.934066  0.045914  0.042886  0.000000  0.355035  0.000000
 0.980769  0.045914  0.045031  0.000000  0.361213  0.000000
 1.027473  0.045914  0.047175  0.072479  0.367391  0.000000
 1.074176  0.045914  0.049319  0.321143  0.373569  0.000000
 1.120879  0.045914  0.051464  0.666578  0.379746  0.000000
 1.167582  0.045914  0.053608  1.083002  0.385924  0.000000
 1.214286  0.045914  0.055752  1.552922  0.392102  0.000000
 1.260989  0.045914  0.057897  2.060353  0.398279  0.000000
 1.307692  0.045914  0.060041  2.589127  0.404457  0.000000
 1.354396  0.045914  0.062185  3.122637  0.410635  0.000000
 1.401099  0.045914  0.064330  3.644213  0.416812  0.000000
 1.447802  0.045914  0.066474  4.137873  0.422990  0.000000
 1.494505  0.045914  0.068618  4.589323  0.429168  0.000000
 1.500000  0.045914  0.068871  4.987154  0.429895  0.000000
 END FTABLE  1
 FTABLE      4
  60    5
    Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
     (ft)   (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
 0.000000  0.045914  0.000000  0.000000  0.000000
 0.046703  0.045914  0.000643  0.000000  0.000000
 0.093407  0.045914  0.001287  0.000000  0.000000
 0.140110  0.045914  0.001930  0.000000  0.000000
 0.186813  0.045914  0.002573  0.000000  0.000000
 0.233516  0.045914  0.003216  0.000000  0.000339
 0.280220  0.045914  0.003860  0.000000  0.000767
 0.326923  0.045914  0.004503  0.000000  0.001448
 0.373626  0.045914  0.005146  0.000000  0.002423
 0.420330  0.045914  0.005790  0.000000  0.003726
 0.467033  0.045914  0.006433  0.000000  0.004900
 0.513736  0.045914  0.007076  0.000000  0.005392
 0.560440  0.045914  0.007720  0.000000  0.007448
 0.607143  0.045914  0.008363  0.000000  0.009922
 0.653846  0.045914  0.009006  0.000000  0.012840
 0.700549  0.045914  0.009649  0.000000  0.016226
 0.747253  0.045914  0.010293  0.000000  0.020103
 0.793956  0.045914  0.010936  0.000000  0.021857
 0.840659  0.045914  0.011579  0.000000  0.024492
 0.887363  0.045914  0.012223  0.000000  0.029416
 0.934066  0.045914  0.012866  0.000000  0.034893
 0.980769  0.045914  0.013509  0.000000  0.040944
 1.027473  0.045914  0.014153  0.000000  0.047588
 1.074176  0.045914  0.014796  0.000000  0.054841
 1.120879  0.045914  0.015439  0.000000  0.056898
 1.167582  0.045914  0.016082  0.000000  0.062723
 1.214286  0.045914  0.016726  0.000000  0.071250
 1.260989  0.045914  0.017369  0.000000  0.074074
 1.307692  0.045914  0.018012  0.000000  0.074074
 1.354396  0.045914  0.018656  0.000000  0.074074
 1.401099  0.045914  0.019299  0.000000  0.074074
 1.447802  0.045914  0.019942  0.000000  0.074074
 1.494505  0.045914  0.020585  0.000000  0.074074
 1.541209  0.045914  0.021229  0.000000  0.074074
 1.587912  0.045914  0.021872  0.000000  0.074074
 1.634615  0.045914  0.022515  0.000000  0.074074
 1.681319  0.045914  0.023159  0.000000  0.074074
 1.728022  0.045914  0.023802  0.000000  0.074074
 1.774725  0.045914  0.024692  0.000000  0.074074
 1.821429  0.045914  0.025582  0.000000  0.074074
 1.868132  0.045914  0.026472  0.000000  0.074074
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  1.914835  0.045914  0.027362  0.000000  0.074074
  1.961538  0.045914  0.028251  0.000000  0.074074
  2.008242  0.045914  0.029141  0.000000  0.074074
  2.054945  0.045914  0.030031  0.000000  0.074074
  2.101648  0.045914  0.030921  0.000000  0.074074
  2.148352  0.045914  0.031811  0.000000  0.074074
  2.195055  0.045914  0.032701  0.000000  0.074074
  2.241758  0.045914  0.033591  0.000000  0.074074
  2.288462  0.045914  0.034481  0.000000  0.074074
  2.335165  0.045914  0.035371  0.000000  0.074074
  2.381868  0.045914  0.036260  0.000000  0.074074
  2.428571  0.045914  0.037150  0.000000  0.074074
  2.475275  0.045914  0.038040  0.000000  0.074074
  2.521978  0.045914  0.038930  0.000000  0.074074
  2.568681  0.045914  0.039820  0.000000  0.074074
  2.615385  0.045914  0.040710  0.000000  0.074074
  2.662088  0.045914  0.041600  0.000000  0.074074
  2.708791  0.045914  0.042490  0.000000  0.074074
  2.750000  0.045914  0.090877  0.000000  0.074074
  END FTABLE  4
  FTABLE      3
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.045914  0.000000  0.000000  0.000000  0.000000
  0.046703  0.045914  0.002144  0.000000  0.237659  0.000000
  0.093407  0.045914  0.004289  0.000000  0.243837  0.000000
  0.140110  0.045914  0.006433  0.000000  0.250015  0.000000
  0.186813  0.045914  0.008577  0.000000  0.256192  0.000000
  0.233516  0.045914  0.010722  0.000000  0.262370  0.000000
  0.280220  0.045914  0.012866  0.000000  0.268548  0.000000
  0.326923  0.045914  0.015010  0.000000  0.274725  0.000000
  0.373626  0.045914  0.017155  0.000000  0.280903  0.000000
  0.420330  0.045914  0.019299  0.000000  0.287081  0.000000
  0.467033  0.045914  0.021443  0.000000  0.293259  0.000000
  0.513736  0.045914  0.023588  0.000000  0.299436  0.000000
  0.560440  0.045914  0.025732  0.000000  0.305614  0.000000
  0.607143  0.045914  0.027876  0.000000  0.311792  0.000000
  0.653846  0.045914  0.030020  0.000000  0.317969  0.000000
  0.700549  0.045914  0.032165  0.000000  0.324147  0.000000
  0.747253  0.045914  0.034309  0.000000  0.330325  0.000000
  0.793956  0.045914  0.036453  0.000000  0.336502  0.000000
  0.840659  0.045914  0.038598  0.000000  0.342680  0.000000
  0.887363  0.045914  0.040742  0.000000  0.348858  0.000000
  0.934066  0.045914  0.042886  0.000000  0.355035  0.000000
  0.980769  0.045914  0.045031  0.000000  0.361213  0.000000
  1.027473  0.045914  0.047175  0.072479  0.367391  0.000000
  1.074176  0.045914  0.049319  0.321143  0.373569  0.000000
  1.120879  0.045914  0.051464  0.666578  0.379746  0.000000
  1.167582  0.045914  0.053608  1.083002  0.385924  0.000000
  1.214286  0.045914  0.055752  1.552922  0.392102  0.000000
  1.260989  0.045914  0.057897  2.060353  0.398279  0.000000
  1.307692  0.045914  0.060041  2.589127  0.404457  0.000000
  1.354396  0.045914  0.062185  3.122637  0.410635  0.000000
  1.401099  0.045914  0.064330  3.644213  0.416812  0.000000
  1.447802  0.045914  0.066474  4.137873  0.422990  0.000000
  1.494505  0.045914  0.068618  4.589323  0.429168  0.000000
  1.500000  0.045914  0.068871  4.987154  0.429895  0.000000
  END FTABLE  3
  FTABLE      6
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000096  0.000000  0.000000
  0.093407  0.006887  0.000193  0.000000  0.000000
  0.140110  0.006887  0.000289  0.000000  0.000000
  0.186813  0.006887  0.000386  0.000000  0.000000
```

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  0.233516  0.006887  0.000482  0.000000  0.000051
  0.280220  0.006887  0.000579  0.000000  0.000115
  0.326923  0.006887  0.000675  0.000000  0.000217
  0.373626  0.006887  0.000772  0.000000  0.000363
  0.420330  0.006887  0.000868  0.000000  0.000559
  0.467033  0.006887  0.000965  0.000000  0.000735
  0.513736  0.006887  0.001061  0.000000  0.000809
  0.560440  0.006887  0.001158  0.000000  0.001117
  0.607143  0.006887  0.001254  0.000000  0.001488
  0.653846  0.006887  0.001351  0.000000  0.001926
  0.700549  0.006887  0.001447  0.000000  0.002434
  0.747253  0.006887  0.001544  0.000000  0.003015
  0.793956  0.006887  0.001640  0.000000  0.003279
  0.840659  0.006887  0.001737  0.000000  0.003674
  0.887363  0.006887  0.001833  0.000000  0.004412
  0.934066  0.006887  0.001930  0.000000  0.005234
  0.980769  0.006887  0.002026  0.000000  0.006142
  1.027473  0.006887  0.002123  0.000000  0.007138
  1.074176  0.006887  0.002219  0.000000  0.008226
  1.120879  0.006887  0.002316  0.000000  0.008535
  1.167582  0.006887  0.002412  0.000000  0.009408
  1.214286  0.006887  0.002509  0.000000  0.010688
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
  1.354396  0.006887  0.002798  0.000000  0.011111
  1.401099  0.006887  0.002895  0.000000  0.011111
  1.447802  0.006887  0.002991  0.000000  0.011111
  1.494505  0.006887  0.003088  0.000000  0.011111
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE  6
  FTABLE      5
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
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 0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
 0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
 0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
 0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
 0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
 0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
 0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
 0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
 0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
 0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
 0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
 0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
 0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
 0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
 1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
 1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
 1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
 1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
 1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
 1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
 1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
 1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
 1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
 1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
 1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
 1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
 END FTABLE  5
 FTABLE      8
  60    5
    Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
     (ft)   (acres) (acre-ft)    (cfs)      (cfs)  (ft/sec)    (Minutes)***
 0.000000  0.006887  0.000000  0.000000  0.000000
 0.046703  0.006887  0.000096  0.000000  0.000000
 0.093407  0.006887  0.000193  0.000000  0.000000
 0.140110  0.006887  0.000289  0.000000  0.000000
 0.186813  0.006887  0.000386  0.000000  0.000000
 0.233516  0.006887  0.000482  0.000000  0.000051
 0.280220  0.006887  0.000579  0.000000  0.000115
 0.326923  0.006887  0.000675  0.000000  0.000217
 0.373626  0.006887  0.000772  0.000000  0.000363
 0.420330  0.006887  0.000868  0.000000  0.000559
 0.467033  0.006887  0.000965  0.000000  0.000735
 0.513736  0.006887  0.001061  0.000000  0.000809
 0.560440  0.006887  0.001158  0.000000  0.001117
 0.607143  0.006887  0.001254  0.000000  0.001488
 0.653846  0.006887  0.001351  0.000000  0.001926
 0.700549  0.006887  0.001447  0.000000  0.002434
 0.747253  0.006887  0.001544  0.000000  0.003015
 0.793956  0.006887  0.001640  0.000000  0.003279
 0.840659  0.006887  0.001737  0.000000  0.003674
 0.887363  0.006887  0.001833  0.000000  0.004412
 0.934066  0.006887  0.001930  0.000000  0.005234
 0.980769  0.006887  0.002026  0.000000  0.006142
 1.027473  0.006887  0.002123  0.000000  0.007138
 1.074176  0.006887  0.002219  0.000000  0.008226
 1.120879  0.006887  0.002316  0.000000  0.008535
 1.167582  0.006887  0.002412  0.000000  0.009408
 1.214286  0.006887  0.002509  0.000000  0.010688
 1.260989  0.006887  0.002605  0.000000  0.011111
 1.307692  0.006887  0.002702  0.000000  0.011111
 1.354396  0.006887  0.002798  0.000000  0.011111
 1.401099  0.006887  0.002895  0.000000  0.011111
 1.447802  0.006887  0.002991  0.000000  0.011111
 1.494505  0.006887  0.003088  0.000000  0.011111
 1.541209  0.006887  0.003184  0.000000  0.011111
 1.587912  0.006887  0.003281  0.000000  0.011111
 1.634615  0.006887  0.003377  0.000000  0.011111
 1.681319  0.006887  0.003474  0.000000  0.011111
 1.728022  0.006887  0.003570  0.000000  0.011111
 1.774725  0.006887  0.003704  0.000000  0.011111
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  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE  8
  FTABLE      7
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
  1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
  1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
  1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
  1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE  7
  FTABLE     10
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000096  0.000000  0.000000
  0.093407  0.006887  0.000193  0.000000  0.000000
```

```
  0.140110  0.006887  0.000289  0.000000  0.000000
  0.186813  0.006887  0.000386  0.000000  0.000000
  0.233516  0.006887  0.000482  0.000000  0.000051
  0.280220  0.006887  0.000579  0.000000  0.000115
  0.326923  0.006887  0.000675  0.000000  0.000217
  0.373626  0.006887  0.000772  0.000000  0.000363
  0.420330  0.006887  0.000868  0.000000  0.000559
  0.467033  0.006887  0.000965  0.000000  0.000735
  0.513736  0.006887  0.001061  0.000000  0.000809
  0.560440  0.006887  0.001158  0.000000  0.001117
  0.607143  0.006887  0.001254  0.000000  0.001488
  0.653846  0.006887  0.001351  0.000000  0.001926
  0.700549  0.006887  0.001447  0.000000  0.002434
  0.747253  0.006887  0.001544  0.000000  0.003015
  0.793956  0.006887  0.001640  0.000000  0.003279
  0.840659  0.006887  0.001737  0.000000  0.003674
  0.887363  0.006887  0.001833  0.000000  0.004412
  0.934066  0.006887  0.001930  0.000000  0.005234
  0.980769  0.006887  0.002026  0.000000  0.006142
  1.027473  0.006887  0.002123  0.000000  0.007138
  1.074176  0.006887  0.002219  0.000000  0.008226
  1.120879  0.006887  0.002316  0.000000  0.008535
  1.167582  0.006887  0.002412  0.000000  0.009408
  1.214286  0.006887  0.002509  0.000000  0.010688
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
  1.354396  0.006887  0.002798  0.000000  0.011111
  1.401099  0.006887  0.002895  0.000000  0.011111
  1.447802  0.006887  0.002991  0.000000  0.011111
  1.494505  0.006887  0.003088  0.000000  0.011111
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 10
  FTABLE      9
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
```

0.280220	0.006887	0.001930	0.000000	0.040282	0.000000
0.326923	0.006887	0.002252	0.000000	0.041209	0.000000
0.373626	0.006887	0.002573	0.000000	0.042135	0.000000
0.420330	0.006887	0.002895	0.000000	0.043062	0.000000
0.467033	0.006887	0.003216	0.000000	0.043989	0.000000
0.513736	0.006887	0.003538	0.000000	0.044915	0.000000
0.560440	0.006887	0.003860	0.000000	0.045842	0.000000
0.607143	0.006887	0.004181	0.000000	0.046769	0.000000
0.653846	0.006887	0.004503	0.000000	0.047695	0.000000
0.700549	0.006887	0.004825	0.000000	0.048622	0.000000
0.747253	0.006887	0.005146	0.000000	0.049549	0.000000
0.793956	0.006887	0.005468	0.000000	0.050475	0.000000
0.840659	0.006887	0.005790	0.000000	0.051402	0.000000
0.887363	0.006887	0.006111	0.000000	0.052329	0.000000
0.934066	0.006887	0.006433	0.000000	0.053255	0.000000
0.980769	0.006887	0.006755	0.000000	0.054182	0.000000
1.027473	0.006887	0.007076	0.048301	0.055109	0.000000
1.074176	0.006887	0.007398	0.213745	0.056035	0.000000
1.120879	0.006887	0.007720	0.441409	0.056962	0.000000
1.167582	0.006887	0.008041	0.708936	0.057889	0.000000
1.214286	0.006887	0.008363	0.996598	0.058815	0.000000
1.260989	0.006887	0.008684	1.284115	0.059742	0.000000
1.307692	0.006887	0.009006	1.551565	0.060669	0.000000
1.354396	0.006887	0.009328	1.781797	0.061595	0.000000
1.401099	0.006887	0.009649	1.963728	0.062522	0.000000
1.447802	0.006887	0.009971	2.096308	0.063449	0.000000
1.494505	0.006887	0.010293	2.193018	0.064375	0.000000
1.500000	0.006887	0.010331	2.317085	0.064484	0.000000

END FTABLE 9
FTABLE 12
60 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000096	0.000000	0.000000		
0.093407	0.006887	0.000193	0.000000	0.000000		
0.140110	0.006887	0.000289	0.000000	0.000000		
0.186813	0.006887	0.000386	0.000000	0.000000		
0.233516	0.006887	0.000482	0.000000	0.000051		
0.280220	0.006887	0.000579	0.000000	0.000115		
0.326923	0.006887	0.000675	0.000000	0.000217		
0.373626	0.006887	0.000772	0.000000	0.000363		
0.420330	0.006887	0.000868	0.000000	0.000559		
0.467033	0.006887	0.000965	0.000000	0.000735		
0.513736	0.006887	0.001061	0.000000	0.000809		
0.560440	0.006887	0.001158	0.000000	0.001117		
0.607143	0.006887	0.001254	0.000000	0.001488		
0.653846	0.006887	0.001351	0.000000	0.001926		
0.700549	0.006887	0.001447	0.000000	0.002434		
0.747253	0.006887	0.001544	0.000000	0.003015		
0.793956	0.006887	0.001640	0.000000	0.003279		
0.840659	0.006887	0.001737	0.000000	0.003674		
0.887363	0.006887	0.001833	0.000000	0.004412		
0.934066	0.006887	0.001930	0.000000	0.005234		
0.980769	0.006887	0.002026	0.000000	0.006142		
1.027473	0.006887	0.002123	0.000000	0.007138		
1.074176	0.006887	0.002219	0.000000	0.008226		
1.120879	0.006887	0.002316	0.000000	0.008535		
1.167582	0.006887	0.002412	0.000000	0.009408		
1.214286	0.006887	0.002509	0.000000	0.010688		
1.260989	0.006887	0.002605	0.000000	0.011111		
1.307692	0.006887	0.002702	0.000000	0.011111		
1.354396	0.006887	0.002798	0.000000	0.011111		
1.401099	0.006887	0.002895	0.000000	0.011111		
1.447802	0.006887	0.002991	0.000000	0.011111		
1.494505	0.006887	0.003088	0.000000	0.011111		
1.541209	0.006887	0.003184	0.000000	0.011111		
1.587912	0.006887	0.003281	0.000000	0.011111		
1.634615	0.006887	0.003377	0.000000	0.011111		
1.681319	0.006887	0.003474	0.000000	0.011111		

```
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 12
  FTABLE     11
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
  1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
  1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
  1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
  1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE 11
  FTABLE     14
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000
```

```
  0.046703  0.006887  0.000096  0.000000  0.000000
  0.093407  0.006887  0.000193  0.000000  0.000000
  0.140110  0.006887  0.000289  0.000000  0.000000
  0.186813  0.006887  0.000386  0.000000  0.000000
  0.233516  0.006887  0.000482  0.000000  0.000051
  0.280220  0.006887  0.000579  0.000000  0.000115
  0.326923  0.006887  0.000675  0.000000  0.000217
  0.373626  0.006887  0.000772  0.000000  0.000363
  0.420330  0.006887  0.000868  0.000000  0.000559
  0.467033  0.006887  0.000965  0.000000  0.000735
  0.513736  0.006887  0.001061  0.000000  0.000809
  0.560440  0.006887  0.001158  0.000000  0.001117
  0.607143  0.006887  0.001254  0.000000  0.001488
  0.653846  0.006887  0.001351  0.000000  0.001926
  0.700549  0.006887  0.001447  0.000000  0.002434
  0.747253  0.006887  0.001544  0.000000  0.003015
  0.793956  0.006887  0.001640  0.000000  0.003279
  0.840659  0.006887  0.001737  0.000000  0.003674
  0.887363  0.006887  0.001833  0.000000  0.004412
  0.934066  0.006887  0.001930  0.000000  0.005234
  0.980769  0.006887  0.002026  0.000000  0.006142
  1.027473  0.006887  0.002123  0.000000  0.007138
  1.074176  0.006887  0.002219  0.000000  0.008226
  1.120879  0.006887  0.002316  0.000000  0.008535
  1.167582  0.006887  0.002412  0.000000  0.009408
  1.214286  0.006887  0.002509  0.000000  0.010688
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
  1.354396  0.006887  0.002798  0.000000  0.011111
  1.401099  0.006887  0.002895  0.000000  0.011111
  1.447802  0.006887  0.002991  0.000000  0.011111
  1.494505  0.006887  0.003088  0.000000  0.011111
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 14
  FTABLE     13
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
```

0.186813	0.006887	0.001287	0.000000	0.038429	0.000000
0.233516	0.006887	0.001608	0.000000	0.039356	0.000000
0.280220	0.006887	0.001930	0.000000	0.040282	0.000000
0.326923	0.006887	0.002252	0.000000	0.041209	0.000000
0.373626	0.006887	0.002573	0.000000	0.042135	0.000000
0.420330	0.006887	0.002895	0.000000	0.043062	0.000000
0.467033	0.006887	0.003216	0.000000	0.043989	0.000000
0.513736	0.006887	0.003538	0.000000	0.044915	0.000000
0.560440	0.006887	0.003860	0.000000	0.045842	0.000000
0.607143	0.006887	0.004181	0.000000	0.046769	0.000000
0.653846	0.006887	0.004503	0.000000	0.047695	0.000000
0.700549	0.006887	0.004825	0.000000	0.048622	0.000000
0.747253	0.006887	0.005146	0.000000	0.049549	0.000000
0.793956	0.006887	0.005468	0.000000	0.050475	0.000000
0.840659	0.006887	0.005790	0.000000	0.051402	0.000000
0.887363	0.006887	0.006111	0.000000	0.052329	0.000000
0.934066	0.006887	0.006433	0.000000	0.053255	0.000000
0.980769	0.006887	0.006755	0.000000	0.054182	0.000000
1.027473	0.006887	0.007076	0.048301	0.055109	0.000000
1.074176	0.006887	0.007398	0.213745	0.056035	0.000000
1.120879	0.006887	0.007720	0.441409	0.056962	0.000000
1.167582	0.006887	0.008041	0.708936	0.057889	0.000000
1.214286	0.006887	0.008363	0.996598	0.058815	0.000000
1.260989	0.006887	0.008684	1.284115	0.059742	0.000000
1.307692	0.006887	0.009006	1.551565	0.060669	0.000000
1.354396	0.006887	0.009328	1.781797	0.061595	0.000000
1.401099	0.006887	0.009649	1.963728	0.062522	0.000000
1.447802	0.006887	0.009971	2.096308	0.063449	0.000000
1.494505	0.006887	0.010293	2.193018	0.064375	0.000000
1.500000	0.006887	0.010331	2.317085	0.064484	0.000000

END FTABLE 13
FTABLE 16
60 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000096	0.000000	0.000000		
0.093407	0.006887	0.000193	0.000000	0.000000		
0.140110	0.006887	0.000289	0.000000	0.000000		
0.186813	0.006887	0.000386	0.000000	0.000000		
0.233516	0.006887	0.000482	0.000000	0.000051		
0.280220	0.006887	0.000579	0.000000	0.000115		
0.326923	0.006887	0.000675	0.000000	0.000217		
0.373626	0.006887	0.000772	0.000000	0.000363		
0.420330	0.006887	0.000868	0.000000	0.000559		
0.467033	0.006887	0.000965	0.000000	0.000735		
0.513736	0.006887	0.001061	0.000000	0.000809		
0.560440	0.006887	0.001158	0.000000	0.001117		
0.607143	0.006887	0.001254	0.000000	0.001488		
0.653846	0.006887	0.001351	0.000000	0.001926		
0.700549	0.006887	0.001447	0.000000	0.002434		
0.747253	0.006887	0.001544	0.000000	0.003015		
0.793956	0.006887	0.001640	0.000000	0.003279		
0.840659	0.006887	0.001737	0.000000	0.003674		
0.887363	0.006887	0.001833	0.000000	0.004412		
0.934066	0.006887	0.001930	0.000000	0.005234		
0.980769	0.006887	0.002026	0.000000	0.006142		
1.027473	0.006887	0.002123	0.000000	0.007138		
1.074176	0.006887	0.002219	0.000000	0.008226		
1.120879	0.006887	0.002316	0.000000	0.008535		
1.167582	0.006887	0.002412	0.000000	0.009408		
1.214286	0.006887	0.002509	0.000000	0.010688		
1.260989	0.006887	0.002605	0.000000	0.011111		
1.307692	0.006887	0.002702	0.000000	0.011111		
1.354396	0.006887	0.002798	0.000000	0.011111		
1.401099	0.006887	0.002895	0.000000	0.011111		
1.447802	0.006887	0.002991	0.000000	0.011111		
1.494505	0.006887	0.003088	0.000000	0.011111		
1.541209	0.006887	0.003184	0.000000	0.011111		
1.587912	0.006887	0.003281	0.000000	0.011111		

```
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 16
  FTABLE     15
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
  1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
  1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
  1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
  1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE 15
  FTABLE     18
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
```

```
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000096  0.000000  0.000000
  0.093407  0.006887  0.000193  0.000000  0.000000
  0.140110  0.006887  0.000289  0.000000  0.000000
  0.186813  0.006887  0.000386  0.000000  0.000000
  0.233516  0.006887  0.000482  0.000000  0.000051
  0.280220  0.006887  0.000579  0.000000  0.000115
  0.326923  0.006887  0.000675  0.000000  0.000217
  0.373626  0.006887  0.000772  0.000000  0.000363
  0.420330  0.006887  0.000868  0.000000  0.000559
  0.467033  0.006887  0.000965  0.000000  0.000735
  0.513736  0.006887  0.001061  0.000000  0.000809
  0.560440  0.006887  0.001158  0.000000  0.001117
  0.607143  0.006887  0.001254  0.000000  0.001488
  0.653846  0.006887  0.001351  0.000000  0.001926
  0.700549  0.006887  0.001447  0.000000  0.002434
  0.747253  0.006887  0.001544  0.000000  0.003015
  0.793956  0.006887  0.001640  0.000000  0.003279
  0.840659  0.006887  0.001737  0.000000  0.003674
  0.887363  0.006887  0.001833  0.000000  0.004412
  0.934066  0.006887  0.001930  0.000000  0.005234
  0.980769  0.006887  0.002026  0.000000  0.006142
  1.027473  0.006887  0.002123  0.000000  0.007138
  1.074176  0.006887  0.002219  0.000000  0.008226
  1.120879  0.006887  0.002316  0.000000  0.008535
  1.167582  0.006887  0.002412  0.000000  0.009408
  1.214286  0.006887  0.002509  0.000000  0.010688
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
  1.354396  0.006887  0.002798  0.000000  0.011111
  1.401099  0.006887  0.002895  0.000000  0.011111
  1.447802  0.006887  0.002991  0.000000  0.011111
  1.494505  0.006887  0.003088  0.000000  0.011111
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 18
  FTABLE     17
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
```

```
0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
END FTABLE 17
FTABLE     20
 60    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.006887  0.000000  0.000000  0.000000
0.046703  0.006887  0.000096  0.000000  0.000000
0.093407  0.006887  0.000193  0.000000  0.000000
0.140110  0.006887  0.000289  0.000000  0.000000
0.186813  0.006887  0.000386  0.000000  0.000000
0.233516  0.006887  0.000482  0.000000  0.000051
0.280220  0.006887  0.000579  0.000000  0.000115
0.326923  0.006887  0.000675  0.000000  0.000217
0.373626  0.006887  0.000772  0.000000  0.000363
0.420330  0.006887  0.000868  0.000000  0.000559
0.467033  0.006887  0.000965  0.000000  0.000735
0.513736  0.006887  0.001061  0.000000  0.000809
0.560440  0.006887  0.001158  0.000000  0.001117
0.607143  0.006887  0.001254  0.000000  0.001488
0.653846  0.006887  0.001351  0.000000  0.001926
0.700549  0.006887  0.001447  0.000000  0.002434
0.747253  0.006887  0.001544  0.000000  0.003015
0.793956  0.006887  0.001640  0.000000  0.003279
0.840659  0.006887  0.001737  0.000000  0.003674
0.887363  0.006887  0.001833  0.000000  0.004412
0.934066  0.006887  0.001930  0.000000  0.005234
0.980769  0.006887  0.002026  0.000000  0.006142
1.027473  0.006887  0.002123  0.000000  0.007138
1.074176  0.006887  0.002219  0.000000  0.008226
1.120879  0.006887  0.002316  0.000000  0.008535
1.167582  0.006887  0.002412  0.000000  0.009408
1.214286  0.006887  0.002509  0.000000  0.010688
1.260989  0.006887  0.002605  0.000000  0.011111
1.307692  0.006887  0.002702  0.000000  0.011111
1.354396  0.006887  0.002798  0.000000  0.011111
1.401099  0.006887  0.002895  0.000000  0.011111
1.447802  0.006887  0.002991  0.000000  0.011111
1.494505  0.006887  0.003088  0.000000  0.011111
```

```
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 20
  FTABLE     19
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
  1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
  1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
  1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
  1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE 19
  FTABLE     22
```

```
    60    5
      Depth       Area     Volume  Outflow1  Outflow2  Velocity  Travel Time***
       (ft)    (acres) (acre-ft)    (cfs)      (cfs)   (ft/sec)    (Minutes)***
   0.000000  0.006887  0.000000  0.000000  0.000000
   0.046703  0.006887  0.000096  0.000000  0.000000
   0.093407  0.006887  0.000193  0.000000  0.000000
   0.140110  0.006887  0.000289  0.000000  0.000000
   0.186813  0.006887  0.000386  0.000000  0.000000
   0.233516  0.006887  0.000482  0.000000  0.000051
   0.280220  0.006887  0.000579  0.000000  0.000115
   0.326923  0.006887  0.000675  0.000000  0.000217
   0.373626  0.006887  0.000772  0.000000  0.000363
   0.420330  0.006887  0.000868  0.000000  0.000559
   0.467033  0.006887  0.000965  0.000000  0.000735
   0.513736  0.006887  0.001061  0.000000  0.000809
   0.560440  0.006887  0.001158  0.000000  0.001117
   0.607143  0.006887  0.001254  0.000000  0.001488
   0.653846  0.006887  0.001351  0.000000  0.001926
   0.700549  0.006887  0.001447  0.000000  0.002434
   0.747253  0.006887  0.001544  0.000000  0.003015
   0.793956  0.006887  0.001640  0.000000  0.003279
   0.840659  0.006887  0.001737  0.000000  0.003674
   0.887363  0.006887  0.001833  0.000000  0.004412
   0.934066  0.006887  0.001930  0.000000  0.005234
   0.980769  0.006887  0.002026  0.000000  0.006142
   1.027473  0.006887  0.002123  0.000000  0.007138
   1.074176  0.006887  0.002219  0.000000  0.008226
   1.120879  0.006887  0.002316  0.000000  0.008535
   1.167582  0.006887  0.002412  0.000000  0.009408
   1.214286  0.006887  0.002509  0.000000  0.010688
   1.260989  0.006887  0.002605  0.000000  0.011111
   1.307692  0.006887  0.002702  0.000000  0.011111
   1.354396  0.006887  0.002798  0.000000  0.011111
   1.401099  0.006887  0.002895  0.000000  0.011111
   1.447802  0.006887  0.002991  0.000000  0.011111
   1.494505  0.006887  0.003088  0.000000  0.011111
   1.541209  0.006887  0.003184  0.000000  0.011111
   1.587912  0.006887  0.003281  0.000000  0.011111
   1.634615  0.006887  0.003377  0.000000  0.011111
   1.681319  0.006887  0.003474  0.000000  0.011111
   1.728022  0.006887  0.003570  0.000000  0.011111
   1.774725  0.006887  0.003704  0.000000  0.011111
   1.821429  0.006887  0.003837  0.000000  0.011111
   1.868132  0.006887  0.003971  0.000000  0.011111
   1.914835  0.006887  0.004104  0.000000  0.011111
   1.961538  0.006887  0.004238  0.000000  0.011111
   2.008242  0.006887  0.004371  0.000000  0.011111
   2.054945  0.006887  0.004505  0.000000  0.011111
   2.101648  0.006887  0.004638  0.000000  0.011111
   2.148352  0.006887  0.004772  0.000000  0.011111
   2.195055  0.006887  0.004905  0.000000  0.011111
   2.241758  0.006887  0.005039  0.000000  0.011111
   2.288462  0.006887  0.005172  0.000000  0.011111
   2.335165  0.006887  0.005306  0.000000  0.011111
   2.381868  0.006887  0.005439  0.000000  0.011111
   2.428571  0.006887  0.005573  0.000000  0.011111
   2.475275  0.006887  0.005706  0.000000  0.011111
   2.521978  0.006887  0.005840  0.000000  0.011111
   2.568681  0.006887  0.005973  0.000000  0.011111
   2.615385  0.006887  0.006106  0.000000  0.011111
   2.662088  0.006887  0.006240  0.000000  0.011111
   2.708791  0.006887  0.006373  0.000000  0.011111
   2.750000  0.006887  0.013632  0.000000  0.011111
   END FTABLE 22
   FTABLE     21
    34    6
      Depth       Area     Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
       (ft)    (acres) (acre-ft)    (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
```

0.000000	0.006887	0.000000	0.000000	0.000000	0.000000
0.046703	0.006887	0.000322	0.000000	0.035649	0.000000
0.093407	0.006887	0.000643	0.000000	0.036576	0.000000
0.140110	0.006887	0.000965	0.000000	0.037502	0.000000
0.186813	0.006887	0.001287	0.000000	0.038429	0.000000
0.233516	0.006887	0.001608	0.000000	0.039356	0.000000
0.280220	0.006887	0.001930	0.000000	0.040282	0.000000
0.326923	0.006887	0.002252	0.000000	0.041209	0.000000
0.373626	0.006887	0.002573	0.000000	0.042135	0.000000
0.420330	0.006887	0.002895	0.000000	0.043062	0.000000
0.467033	0.006887	0.003216	0.000000	0.043989	0.000000
0.513736	0.006887	0.003538	0.000000	0.044915	0.000000
0.560440	0.006887	0.003860	0.000000	0.045842	0.000000
0.607143	0.006887	0.004181	0.000000	0.046769	0.000000
0.653846	0.006887	0.004503	0.000000	0.047695	0.000000
0.700549	0.006887	0.004825	0.000000	0.048622	0.000000
0.747253	0.006887	0.005146	0.000000	0.049549	0.000000
0.793956	0.006887	0.005468	0.000000	0.050475	0.000000
0.840659	0.006887	0.005790	0.000000	0.051402	0.000000
0.887363	0.006887	0.006111	0.000000	0.052329	0.000000
0.934066	0.006887	0.006433	0.000000	0.053255	0.000000
0.980769	0.006887	0.006755	0.000000	0.054182	0.000000
1.027473	0.006887	0.007076	0.048301	0.055109	0.000000
1.074176	0.006887	0.007398	0.213745	0.056035	0.000000
1.120879	0.006887	0.007720	0.441409	0.056962	0.000000
1.167582	0.006887	0.008041	0.708936	0.057889	0.000000
1.214286	0.006887	0.008363	0.996598	0.058815	0.000000
1.260989	0.006887	0.008684	1.284115	0.059742	0.000000
1.307692	0.006887	0.009006	1.551565	0.060669	0.000000
1.354396	0.006887	0.009328	1.781797	0.061595	0.000000
1.401099	0.006887	0.009649	1.963728	0.062522	0.000000
1.447802	0.006887	0.009971	2.096308	0.063449	0.000000
1.494505	0.006887	0.010293	2.193018	0.064375	0.000000
1.500000	0.006887	0.010331	2.317085	0.064484	0.000000

END FTABLE 21
FTABLE 24
60 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.034435	0.000000	0.000000	0.000000		
0.046703	0.034435	0.000482	0.000000	0.000000		
0.093407	0.034435	0.000965	0.000000	0.000000		
0.140110	0.034435	0.001447	0.000000	0.000000		
0.186813	0.034435	0.001930	0.000000	0.000000		
0.233516	0.034435	0.002412	0.000000	0.000254		
0.280220	0.034435	0.002895	0.000000	0.000576		
0.326923	0.034435	0.003377	0.000000	0.001086		
0.373626	0.034435	0.003860	0.000000	0.001817		
0.420330	0.034435	0.004342	0.000000	0.002795		
0.467033	0.034435	0.004825	0.000000	0.003675		
0.513736	0.034435	0.005307	0.000000	0.004044		
0.560440	0.034435	0.005790	0.000000	0.005586		
0.607143	0.034435	0.006272	0.000000	0.007441		
0.653846	0.034435	0.006755	0.000000	0.009630		
0.700549	0.034435	0.007237	0.000000	0.012169		
0.747253	0.034435	0.007720	0.000000	0.015077		
0.793956	0.034435	0.008202	0.000000	0.016393		
0.840659	0.034435	0.008684	0.000000	0.018369		
0.887363	0.034435	0.009167	0.000000	0.022062		
0.934066	0.034435	0.009649	0.000000	0.026170		
0.980769	0.034435	0.010132	0.000000	0.030708		
1.027473	0.034435	0.010614	0.000000	0.035691		
1.074176	0.034435	0.011097	0.000000	0.041131		
1.120879	0.034435	0.011579	0.000000	0.042673		
1.167582	0.034435	0.012062	0.000000	0.047042		
1.214286	0.034435	0.012544	0.000000	0.053438		
1.260989	0.034435	0.013027	0.000000	0.055556		
1.307692	0.034435	0.013509	0.000000	0.055556		
1.354396	0.034435	0.013992	0.000000	0.055556		
1.401099	0.034435	0.014474	0.000000	0.055556		

```
  1.447802  0.034435  0.014957  0.000000  0.055556
  1.494505  0.034435  0.015439  0.000000  0.055556
  1.541209  0.034435  0.015922  0.000000  0.055556
  1.587912  0.034435  0.016404  0.000000  0.055556
  1.634615  0.034435  0.016887  0.000000  0.055556
  1.681319  0.034435  0.017369  0.000000  0.055556
  1.728022  0.034435  0.017851  0.000000  0.055556
  1.774725  0.034435  0.018519  0.000000  0.055556
  1.821429  0.034435  0.019186  0.000000  0.055556
  1.868132  0.034435  0.019854  0.000000  0.055556
  1.914835  0.034435  0.020521  0.000000  0.055556
  1.961538  0.034435  0.021189  0.000000  0.055556
  2.008242  0.034435  0.021856  0.000000  0.055556
  2.054945  0.034435  0.022523  0.000000  0.055556
  2.101648  0.034435  0.023191  0.000000  0.055556
  2.148352  0.034435  0.023858  0.000000  0.055556
  2.195055  0.034435  0.024526  0.000000  0.055556
  2.241758  0.034435  0.025193  0.000000  0.055556
  2.288462  0.034435  0.025861  0.000000  0.055556
  2.335165  0.034435  0.026528  0.000000  0.055556
  2.381868  0.034435  0.027195  0.000000  0.055556
  2.428571  0.034435  0.027863  0.000000  0.055556
  2.475275  0.034435  0.028530  0.000000  0.055556
  2.521978  0.034435  0.029198  0.000000  0.055556
  2.568681  0.034435  0.029865  0.000000  0.055556
  2.615385  0.034435  0.030532  0.000000  0.055556
  2.662088  0.034435  0.031200  0.000000  0.055556
  2.708791  0.034435  0.031867  0.000000  0.055556
  2.750000  0.034435  0.068158  0.000000  0.055556
  END FTABLE 24
  FTABLE     23
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.034435  0.000000  0.000000  0.000000  0.000000
  0.046703  0.034435  0.001608  0.000000  0.178245  0.000000
  0.093407  0.034435  0.003216  0.000000  0.182878  0.000000
  0.140110  0.034435  0.004825  0.000000  0.187511  0.000000
  0.186813  0.034435  0.006433  0.000000  0.192144  0.000000
  0.233516  0.034435  0.008041  0.000000  0.196778  0.000000
  0.280220  0.034435  0.009649  0.000000  0.201411  0.000000
  0.326923  0.034435  0.011258  0.000000  0.206044  0.000000
  0.373626  0.034435  0.012866  0.000000  0.210677  0.000000
  0.420330  0.034435  0.014474  0.000000  0.215311  0.000000
  0.467033  0.034435  0.016082  0.000000  0.219944  0.000000
  0.513736  0.034435  0.017691  0.000000  0.224577  0.000000
  0.560440  0.034435  0.019299  0.000000  0.229210  0.000000
  0.607143  0.034435  0.020907  0.000000  0.233844  0.000000
  0.653846  0.034435  0.022515  0.000000  0.238477  0.000000
  0.700549  0.034435  0.024124  0.000000  0.243110  0.000000
  0.747253  0.034435  0.025732  0.000000  0.247744  0.000000
  0.793956  0.034435  0.027340  0.000000  0.252377  0.000000
  0.840659  0.034435  0.028948  0.000000  0.257010  0.000000
  0.887363  0.034435  0.030557  0.000000  0.261643  0.000000
  0.934066  0.034435  0.032165  0.000000  0.266277  0.000000
  0.980769  0.034435  0.033773  0.000000  0.270910  0.000000
  1.027473  0.034435  0.035381  0.048301  0.275543  0.000000
  1.074176  0.034435  0.036990  0.213745  0.280176  0.000000
  1.120879  0.034435  0.038598  0.441409  0.284810  0.000000
  1.167582  0.034435  0.040206  0.708936  0.289443  0.000000
  1.214286  0.034435  0.041814  0.996598  0.294076  0.000000
  1.260989  0.034435  0.043422  1.284115  0.298709  0.000000
  1.307692  0.034435  0.045031  1.551565  0.303343  0.000000
  1.354396  0.034435  0.046639  1.781797  0.307976  0.000000
  1.401099  0.034435  0.048247  1.963728  0.312609  0.000000
  1.447802  0.034435  0.049855  2.096308  0.317243  0.000000
  1.494505  0.034435  0.051464  2.193018  0.321876  0.000000
  1.500000  0.034435  0.051653  2.317085  0.322421  0.000000
```

END FTABLE 23
FTABLE 26
60 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000096	0.000000	0.000000		
0.093407	0.006887	0.000193	0.000000	0.000000		
0.140110	0.006887	0.000289	0.000000	0.000000		
0.186813	0.006887	0.000386	0.000000	0.000000		
0.233516	0.006887	0.000482	0.000000	0.000051		
0.280220	0.006887	0.000579	0.000000	0.000115		
0.326923	0.006887	0.000675	0.000000	0.000217		
0.373626	0.006887	0.000772	0.000000	0.000363		
0.420330	0.006887	0.000868	0.000000	0.000559		
0.467033	0.006887	0.000965	0.000000	0.000735		
0.513736	0.006887	0.001061	0.000000	0.000809		
0.560440	0.006887	0.001158	0.000000	0.001117		
0.607143	0.006887	0.001254	0.000000	0.001488		
0.653846	0.006887	0.001351	0.000000	0.001926		
0.700549	0.006887	0.001447	0.000000	0.002434		
0.747253	0.006887	0.001544	0.000000	0.003015		
0.793956	0.006887	0.001640	0.000000	0.003279		
0.840659	0.006887	0.001737	0.000000	0.003674		
0.887363	0.006887	0.001833	0.000000	0.004412		
0.934066	0.006887	0.001930	0.000000	0.005234		
0.980769	0.006887	0.002026	0.000000	0.006142		
1.027473	0.006887	0.002123	0.000000	0.007138		
1.074176	0.006887	0.002219	0.000000	0.008226		
1.120879	0.006887	0.002316	0.000000	0.008535		
1.167582	0.006887	0.002412	0.000000	0.009408		
1.214286	0.006887	0.002509	0.000000	0.010688		
1.260989	0.006887	0.002605	0.000000	0.011111		
1.307692	0.006887	0.002702	0.000000	0.011111		
1.354396	0.006887	0.002798	0.000000	0.011111		
1.401099	0.006887	0.002895	0.000000	0.011111		
1.447802	0.006887	0.002991	0.000000	0.011111		
1.494505	0.006887	0.003088	0.000000	0.011111		
1.541209	0.006887	0.003184	0.000000	0.011111		
1.587912	0.006887	0.003281	0.000000	0.011111		
1.634615	0.006887	0.003377	0.000000	0.011111		
1.681319	0.006887	0.003474	0.000000	0.011111		
1.728022	0.006887	0.003570	0.000000	0.011111		
1.774725	0.006887	0.003704	0.000000	0.011111		
1.821429	0.006887	0.003837	0.000000	0.011111		
1.868132	0.006887	0.003971	0.000000	0.011111		
1.914835	0.006887	0.004104	0.000000	0.011111		
1.961538	0.006887	0.004238	0.000000	0.011111		
2.008242	0.006887	0.004371	0.000000	0.011111		
2.054945	0.006887	0.004505	0.000000	0.011111		
2.101648	0.006887	0.004638	0.000000	0.011111		
2.148352	0.006887	0.004772	0.000000	0.011111		
2.195055	0.006887	0.004905	0.000000	0.011111		
2.241758	0.006887	0.005039	0.000000	0.011111		
2.288462	0.006887	0.005172	0.000000	0.011111		
2.335165	0.006887	0.005306	0.000000	0.011111		
2.381868	0.006887	0.005439	0.000000	0.011111		
2.428571	0.006887	0.005573	0.000000	0.011111		
2.475275	0.006887	0.005706	0.000000	0.011111		
2.521978	0.006887	0.005840	0.000000	0.011111		
2.568681	0.006887	0.005973	0.000000	0.011111		
2.615385	0.006887	0.006106	0.000000	0.011111		
2.662088	0.006887	0.006240	0.000000	0.011111		
2.708791	0.006887	0.006373	0.000000	0.011111		
2.750000	0.006887	0.013632	0.000000	0.011111		

END FTABLE 26
FTABLE 25
34 6
Depth Area Volume Outflow1 Outflow2 outflow 3 Velocity Travel Time***

```
     (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
  1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
  1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
  1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
  1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE 25
  FTABLE     28
   60    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
     (ft)   (acres) (acre-ft)  (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000096  0.000000  0.000000
  0.093407  0.006887  0.000193  0.000000  0.000000
  0.140110  0.006887  0.000289  0.000000  0.000000
  0.186813  0.006887  0.000386  0.000000  0.000000
  0.233516  0.006887  0.000482  0.000000  0.000051
  0.280220  0.006887  0.000579  0.000000  0.000115
  0.326923  0.006887  0.000675  0.000000  0.000217
  0.373626  0.006887  0.000772  0.000000  0.000363
  0.420330  0.006887  0.000868  0.000000  0.000559
  0.467033  0.006887  0.000965  0.000000  0.000735
  0.513736  0.006887  0.001061  0.000000  0.000809
  0.560440  0.006887  0.001158  0.000000  0.001117
  0.607143  0.006887  0.001254  0.000000  0.001488
  0.653846  0.006887  0.001351  0.000000  0.001926
  0.700549  0.006887  0.001447  0.000000  0.002434
  0.747253  0.006887  0.001544  0.000000  0.003015
  0.793956  0.006887  0.001640  0.000000  0.003279
  0.840659  0.006887  0.001737  0.000000  0.003674
  0.887363  0.006887  0.001833  0.000000  0.004412
  0.934066  0.006887  0.001930  0.000000  0.005234
  0.980769  0.006887  0.002026  0.000000  0.006142
  1.027473  0.006887  0.002123  0.000000  0.007138
  1.074176  0.006887  0.002219  0.000000  0.008226
  1.120879  0.006887  0.002316  0.000000  0.008535
  1.167582  0.006887  0.002412  0.000000  0.009408
  1.214286  0.006887  0.002509  0.000000  0.010688
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
```

1.354396	0.006887	0.002798	0.000000	0.011111
1.401099	0.006887	0.002895	0.000000	0.011111
1.447802	0.006887	0.002991	0.000000	0.011111
1.494505	0.006887	0.003088	0.000000	0.011111
1.541209	0.006887	0.003184	0.000000	0.011111
1.587912	0.006887	0.003281	0.000000	0.011111
1.634615	0.006887	0.003377	0.000000	0.011111
1.681319	0.006887	0.003474	0.000000	0.011111
1.728022	0.006887	0.003570	0.000000	0.011111
1.774725	0.006887	0.003704	0.000000	0.011111
1.821429	0.006887	0.003837	0.000000	0.011111
1.868132	0.006887	0.003971	0.000000	0.011111
1.914835	0.006887	0.004104	0.000000	0.011111
1.961538	0.006887	0.004238	0.000000	0.011111
2.008242	0.006887	0.004371	0.000000	0.011111
2.054945	0.006887	0.004505	0.000000	0.011111
2.101648	0.006887	0.004638	0.000000	0.011111
2.148352	0.006887	0.004772	0.000000	0.011111
2.195055	0.006887	0.004905	0.000000	0.011111
2.241758	0.006887	0.005039	0.000000	0.011111
2.288462	0.006887	0.005172	0.000000	0.011111
2.335165	0.006887	0.005306	0.000000	0.011111
2.381868	0.006887	0.005439	0.000000	0.011111
2.428571	0.006887	0.005573	0.000000	0.011111
2.475275	0.006887	0.005706	0.000000	0.011111
2.521978	0.006887	0.005840	0.000000	0.011111
2.568681	0.006887	0.005973	0.000000	0.011111
2.615385	0.006887	0.006106	0.000000	0.011111
2.662088	0.006887	0.006240	0.000000	0.011111
2.708791	0.006887	0.006373	0.000000	0.011111
2.750000	0.006887	0.013632	0.000000	0.011111

END FTABLE 28
FTABLE 27
34 6

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	outflow 3 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000322	0.000000	0.035649	0.000000		
0.093407	0.006887	0.000643	0.000000	0.036576	0.000000		
0.140110	0.006887	0.000965	0.000000	0.037502	0.000000		
0.186813	0.006887	0.001287	0.000000	0.038429	0.000000		
0.233516	0.006887	0.001608	0.000000	0.039356	0.000000		
0.280220	0.006887	0.001930	0.000000	0.040282	0.000000		
0.326923	0.006887	0.002252	0.000000	0.041209	0.000000		
0.373626	0.006887	0.002573	0.000000	0.042135	0.000000		
0.420330	0.006887	0.002895	0.000000	0.043062	0.000000		
0.467033	0.006887	0.003216	0.000000	0.043989	0.000000		
0.513736	0.006887	0.003538	0.000000	0.044915	0.000000		
0.560440	0.006887	0.003860	0.000000	0.045842	0.000000		
0.607143	0.006887	0.004181	0.000000	0.046769	0.000000		
0.653846	0.006887	0.004503	0.000000	0.047695	0.000000		
0.700549	0.006887	0.004825	0.000000	0.048622	0.000000		
0.747253	0.006887	0.005146	0.000000	0.049549	0.000000		
0.793956	0.006887	0.005468	0.000000	0.050475	0.000000		
0.840659	0.006887	0.005790	0.000000	0.051402	0.000000		
0.887363	0.006887	0.006111	0.000000	0.052329	0.000000		
0.934066	0.006887	0.006433	0.000000	0.053255	0.000000		
0.980769	0.006887	0.006755	0.000000	0.054182	0.000000		
1.027473	0.006887	0.007076	0.048301	0.055109	0.000000		
1.074176	0.006887	0.007398	0.213745	0.056035	0.000000		
1.120879	0.006887	0.007720	0.441409	0.056962	0.000000		
1.167582	0.006887	0.008041	0.708936	0.057889	0.000000		
1.214286	0.006887	0.008363	0.996598	0.058815	0.000000		
1.260989	0.006887	0.008684	1.284115	0.059742	0.000000		
1.307692	0.006887	0.009006	1.551565	0.060669	0.000000		
1.354396	0.006887	0.009328	1.781797	0.061595	0.000000		
1.401099	0.006887	0.009649	1.963728	0.062522	0.000000		
1.447802	0.006887	0.009971	2.096308	0.063449	0.000000		

```
1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
END FTABLE 27
FTABLE     30
 60    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.006887  0.000000  0.000000  0.000000
0.046703  0.006887  0.000096  0.000000  0.000000
0.093407  0.006887  0.000193  0.000000  0.000000
0.140110  0.006887  0.000289  0.000000  0.000000
0.186813  0.006887  0.000386  0.000000  0.000000
0.233516  0.006887  0.000482  0.000000  0.000051
0.280220  0.006887  0.000579  0.000000  0.000115
0.326923  0.006887  0.000675  0.000000  0.000217
0.373626  0.006887  0.000772  0.000000  0.000363
0.420330  0.006887  0.000868  0.000000  0.000559
0.467033  0.006887  0.000965  0.000000  0.000735
0.513736  0.006887  0.001061  0.000000  0.000809
0.560440  0.006887  0.001158  0.000000  0.001117
0.607143  0.006887  0.001254  0.000000  0.001488
0.653846  0.006887  0.001351  0.000000  0.001926
0.700549  0.006887  0.001447  0.000000  0.002434
0.747253  0.006887  0.001544  0.000000  0.003015
0.793956  0.006887  0.001640  0.000000  0.003279
0.840659  0.006887  0.001737  0.000000  0.003674
0.887363  0.006887  0.001833  0.000000  0.004412
0.934066  0.006887  0.001930  0.000000  0.005234
0.980769  0.006887  0.002026  0.000000  0.006142
1.027473  0.006887  0.002123  0.000000  0.007138
1.074176  0.006887  0.002219  0.000000  0.008226
1.120879  0.006887  0.002316  0.000000  0.008535
1.167582  0.006887  0.002412  0.000000  0.009408
1.214286  0.006887  0.002509  0.000000  0.010688
1.260989  0.006887  0.002605  0.000000  0.011111
1.307692  0.006887  0.002702  0.000000  0.011111
1.354396  0.006887  0.002798  0.000000  0.011111
1.401099  0.006887  0.002895  0.000000  0.011111
1.447802  0.006887  0.002991  0.000000  0.011111
1.494505  0.006887  0.003088  0.000000  0.011111
1.541209  0.006887  0.003184  0.000000  0.011111
1.587912  0.006887  0.003281  0.000000  0.011111
1.634615  0.006887  0.003377  0.000000  0.011111
1.681319  0.006887  0.003474  0.000000  0.011111
1.728022  0.006887  0.003570  0.000000  0.011111
1.774725  0.006887  0.003704  0.000000  0.011111
1.821429  0.006887  0.003837  0.000000  0.011111
1.868132  0.006887  0.003971  0.000000  0.011111
1.914835  0.006887  0.004104  0.000000  0.011111
1.961538  0.006887  0.004238  0.000000  0.011111
2.008242  0.006887  0.004371  0.000000  0.011111
2.054945  0.006887  0.004505  0.000000  0.011111
2.101648  0.006887  0.004638  0.000000  0.011111
2.148352  0.006887  0.004772  0.000000  0.011111
2.195055  0.006887  0.004905  0.000000  0.011111
2.241758  0.006887  0.005039  0.000000  0.011111
2.288462  0.006887  0.005172  0.000000  0.011111
2.335165  0.006887  0.005306  0.000000  0.011111
2.381868  0.006887  0.005439  0.000000  0.011111
2.428571  0.006887  0.005573  0.000000  0.011111
2.475275  0.006887  0.005706  0.000000  0.011111
2.521978  0.006887  0.005840  0.000000  0.011111
2.568681  0.006887  0.005973  0.000000  0.011111
2.615385  0.006887  0.006106  0.000000  0.011111
2.662088  0.006887  0.006240  0.000000  0.011111
2.708791  0.006887  0.006373  0.000000  0.011111
2.750000  0.006887  0.013632  0.000000  0.011111
END FTABLE 30
FTABLE     29
 34    6
```

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	outflow 3 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000322	0.000000	0.035649	0.000000		
0.093407	0.006887	0.000643	0.000000	0.036576	0.000000		
0.140110	0.006887	0.000965	0.000000	0.037502	0.000000		
0.186813	0.006887	0.001287	0.000000	0.038429	0.000000		
0.233516	0.006887	0.001608	0.000000	0.039356	0.000000		
0.280220	0.006887	0.001930	0.000000	0.040282	0.000000		
0.326923	0.006887	0.002252	0.000000	0.041209	0.000000		
0.373626	0.006887	0.002573	0.000000	0.042135	0.000000		
0.420330	0.006887	0.002895	0.000000	0.043062	0.000000		
0.467033	0.006887	0.003216	0.000000	0.043989	0.000000		
0.513736	0.006887	0.003538	0.000000	0.044915	0.000000		
0.560440	0.006887	0.003860	0.000000	0.045842	0.000000		
0.607143	0.006887	0.004181	0.000000	0.046769	0.000000		
0.653846	0.006887	0.004503	0.000000	0.047695	0.000000		
0.700549	0.006887	0.004825	0.000000	0.048622	0.000000		
0.747253	0.006887	0.005146	0.000000	0.049549	0.000000		
0.793956	0.006887	0.005468	0.000000	0.050475	0.000000		
0.840659	0.006887	0.005790	0.000000	0.051402	0.000000		
0.887363	0.006887	0.006111	0.000000	0.052329	0.000000		
0.934066	0.006887	0.006433	0.000000	0.053255	0.000000		
0.980769	0.006887	0.006755	0.000000	0.054182	0.000000		
1.027473	0.006887	0.007076	0.048301	0.055109	0.000000		
1.074176	0.006887	0.007398	0.213745	0.056035	0.000000		
1.120879	0.006887	0.007720	0.441409	0.056962	0.000000		
1.167582	0.006887	0.008041	0.708936	0.057889	0.000000		
1.214286	0.006887	0.008363	0.996598	0.058815	0.000000		
1.260989	0.006887	0.008684	1.284115	0.059742	0.000000		
1.307692	0.006887	0.009006	1.551565	0.060669	0.000000		
1.354396	0.006887	0.009328	1.781797	0.061595	0.000000		
1.401099	0.006887	0.009649	1.963728	0.062522	0.000000		
1.447802	0.006887	0.009971	2.096308	0.063449	0.000000		
1.494505	0.006887	0.010293	2.193018	0.064375	0.000000		
1.500000	0.006887	0.010331	2.317085	0.064484	0.000000		

END FTABLE 29
FTABLE 32
60 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.006887	0.000000	0.000000	0.000000		
0.046703	0.006887	0.000096	0.000000	0.000000		
0.093407	0.006887	0.000193	0.000000	0.000000		
0.140110	0.006887	0.000289	0.000000	0.000000		
0.186813	0.006887	0.000386	0.000000	0.000000		
0.233516	0.006887	0.000482	0.000000	0.000051		
0.280220	0.006887	0.000579	0.000000	0.000115		
0.326923	0.006887	0.000675	0.000000	0.000217		
0.373626	0.006887	0.000772	0.000000	0.000363		
0.420330	0.006887	0.000868	0.000000	0.000559		
0.467033	0.006887	0.000965	0.000000	0.000735		
0.513736	0.006887	0.001061	0.000000	0.000809		
0.560440	0.006887	0.001158	0.000000	0.001117		
0.607143	0.006887	0.001254	0.000000	0.001488		
0.653846	0.006887	0.001351	0.000000	0.001926		
0.700549	0.006887	0.001447	0.000000	0.002434		
0.747253	0.006887	0.001544	0.000000	0.003015		
0.793956	0.006887	0.001640	0.000000	0.003279		
0.840659	0.006887	0.001737	0.000000	0.003674		
0.887363	0.006887	0.001833	0.000000	0.004412		
0.934066	0.006887	0.001930	0.000000	0.005234		
0.980769	0.006887	0.002026	0.000000	0.006142		
1.027473	0.006887	0.002123	0.000000	0.007138		
1.074176	0.006887	0.002219	0.000000	0.008226		
1.120879	0.006887	0.002316	0.000000	0.008535		
1.167582	0.006887	0.002412	0.000000	0.009408		
1.214286	0.006887	0.002509	0.000000	0.010688		

```
  1.260989  0.006887  0.002605  0.000000  0.011111
  1.307692  0.006887  0.002702  0.000000  0.011111
  1.354396  0.006887  0.002798  0.000000  0.011111
  1.401099  0.006887  0.002895  0.000000  0.011111
  1.447802  0.006887  0.002991  0.000000  0.011111
  1.494505  0.006887  0.003088  0.000000  0.011111
  1.541209  0.006887  0.003184  0.000000  0.011111
  1.587912  0.006887  0.003281  0.000000  0.011111
  1.634615  0.006887  0.003377  0.000000  0.011111
  1.681319  0.006887  0.003474  0.000000  0.011111
  1.728022  0.006887  0.003570  0.000000  0.011111
  1.774725  0.006887  0.003704  0.000000  0.011111
  1.821429  0.006887  0.003837  0.000000  0.011111
  1.868132  0.006887  0.003971  0.000000  0.011111
  1.914835  0.006887  0.004104  0.000000  0.011111
  1.961538  0.006887  0.004238  0.000000  0.011111
  2.008242  0.006887  0.004371  0.000000  0.011111
  2.054945  0.006887  0.004505  0.000000  0.011111
  2.101648  0.006887  0.004638  0.000000  0.011111
  2.148352  0.006887  0.004772  0.000000  0.011111
  2.195055  0.006887  0.004905  0.000000  0.011111
  2.241758  0.006887  0.005039  0.000000  0.011111
  2.288462  0.006887  0.005172  0.000000  0.011111
  2.335165  0.006887  0.005306  0.000000  0.011111
  2.381868  0.006887  0.005439  0.000000  0.011111
  2.428571  0.006887  0.005573  0.000000  0.011111
  2.475275  0.006887  0.005706  0.000000  0.011111
  2.521978  0.006887  0.005840  0.000000  0.011111
  2.568681  0.006887  0.005973  0.000000  0.011111
  2.615385  0.006887  0.006106  0.000000  0.011111
  2.662088  0.006887  0.006240  0.000000  0.011111
  2.708791  0.006887  0.006373  0.000000  0.011111
  2.750000  0.006887  0.013632  0.000000  0.011111
  END FTABLE 32
  FTABLE     31
   34    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.006887  0.000000  0.000000  0.000000  0.000000
  0.046703  0.006887  0.000322  0.000000  0.035649  0.000000
  0.093407  0.006887  0.000643  0.000000  0.036576  0.000000
  0.140110  0.006887  0.000965  0.000000  0.037502  0.000000
  0.186813  0.006887  0.001287  0.000000  0.038429  0.000000
  0.233516  0.006887  0.001608  0.000000  0.039356  0.000000
  0.280220  0.006887  0.001930  0.000000  0.040282  0.000000
  0.326923  0.006887  0.002252  0.000000  0.041209  0.000000
  0.373626  0.006887  0.002573  0.000000  0.042135  0.000000
  0.420330  0.006887  0.002895  0.000000  0.043062  0.000000
  0.467033  0.006887  0.003216  0.000000  0.043989  0.000000
  0.513736  0.006887  0.003538  0.000000  0.044915  0.000000
  0.560440  0.006887  0.003860  0.000000  0.045842  0.000000
  0.607143  0.006887  0.004181  0.000000  0.046769  0.000000
  0.653846  0.006887  0.004503  0.000000  0.047695  0.000000
  0.700549  0.006887  0.004825  0.000000  0.048622  0.000000
  0.747253  0.006887  0.005146  0.000000  0.049549  0.000000
  0.793956  0.006887  0.005468  0.000000  0.050475  0.000000
  0.840659  0.006887  0.005790  0.000000  0.051402  0.000000
  0.887363  0.006887  0.006111  0.000000  0.052329  0.000000
  0.934066  0.006887  0.006433  0.000000  0.053255  0.000000
  0.980769  0.006887  0.006755  0.000000  0.054182  0.000000
  1.027473  0.006887  0.007076  0.048301  0.055109  0.000000
  1.074176  0.006887  0.007398  0.213745  0.056035  0.000000
  1.120879  0.006887  0.007720  0.441409  0.056962  0.000000
  1.167582  0.006887  0.008041  0.708936  0.057889  0.000000
  1.214286  0.006887  0.008363  0.996598  0.058815  0.000000
  1.260989  0.006887  0.008684  1.284115  0.059742  0.000000
  1.307692  0.006887  0.009006  1.551565  0.060669  0.000000
  1.354396  0.006887  0.009328  1.781797  0.061595  0.000000
```

```
    1.401099  0.006887  0.009649  1.963728  0.062522  0.000000
    1.447802  0.006887  0.009971  2.096308  0.063449  0.000000
    1.494505  0.006887  0.010293  2.193018  0.064375  0.000000
    1.500000  0.006887  0.010331  2.317085  0.064484  0.000000
  END FTABLE 31
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  47     EXTNL  SURLI
WDM     22 IRRG     ENGL    0.7       SAME PERLND  46     EXTNL  SURLI
WDM      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   3     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   5     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   7     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   9     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  11     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  13     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  15     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  17     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  19     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  21     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  23     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  25     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  27     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  29     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES  31     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   3     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   4     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   5     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   6     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   7     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   8     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   9     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  10     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  11     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  12     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  13     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  14     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  15     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  16     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  17     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  18     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  19     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  20     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  21     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  22     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  23     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  24     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  25     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  26     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  27     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  28     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  29     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  30     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES  31     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES  32     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
```

RCHRES	2	HYDR	RO	1	1	1	WDM	1000	FLOW	ENGL	REPL
RCHRES	2	HYDR	O	1	1	1	WDM	1001	FLOW	ENGL	REPL
RCHRES	2	HYDR	O	2	1	1	WDM	1002	FLOW	ENGL	REPL
RCHRES	2	HYDR	STAGE	1	1	1	WDM	1003	STAG	ENGL	REPL
RCHRES	1	HYDR	STAGE	1	1	1	WDM	1004	STAG	ENGL	REPL
RCHRES	1	HYDR	O	1	1	1	WDM	1005	FLOW	ENGL	REPL
COPY	1	OUTPUT	MEAN	1	1	12.1	WDM	701	FLOW	ENGL	REPL
COPY	501	OUTPUT	MEAN	1	1	12.1	WDM	801	FLOW	ENGL	REPL
COPY	601	OUTPUT	MEAN	1	1	12.1	WDM	901	FLOW	ENGL	REPL
RCHRES	4	HYDR	RO	1	1	1	WDM	1006	FLOW	ENGL	REPL
RCHRES	4	HYDR	O	1	1	1	WDM	1007	FLOW	ENGL	REPL
RCHRES	4	HYDR	O	2	1	1	WDM	1008	FLOW	ENGL	REPL
RCHRES	4	HYDR	STAGE	1	1	1	WDM	1009	STAG	ENGL	REPL
RCHRES	3	HYDR	STAGE	1	1	1	WDM	1010	STAG	ENGL	REPL
RCHRES	3	HYDR	O	1	1	1	WDM	1011	FLOW	ENGL	REPL
RCHRES	6	HYDR	RO	1	1	1	WDM	1012	FLOW	ENGL	REPL
RCHRES	6	HYDR	O	1	1	1	WDM	1013	FLOW	ENGL	REPL
RCHRES	6	HYDR	O	2	1	1	WDM	1014	FLOW	ENGL	REPL
RCHRES	6	HYDR	STAGE	1	1	1	WDM	1015	STAG	ENGL	REPL
RCHRES	5	HYDR	STAGE	1	1	1	WDM	1016	STAG	ENGL	REPL
RCHRES	5	HYDR	O	1	1	1	WDM	1017	FLOW	ENGL	REPL
RCHRES	8	HYDR	RO	1	1	1	WDM	1018	FLOW	ENGL	REPL
RCHRES	8	HYDR	O	1	1	1	WDM	1019	FLOW	ENGL	REPL
RCHRES	8	HYDR	O	2	1	1	WDM	1020	FLOW	ENGL	REPL
RCHRES	8	HYDR	STAGE	1	1	1	WDM	1021	STAG	ENGL	REPL
RCHRES	7	HYDR	STAGE	1	1	1	WDM	1022	STAG	ENGL	REPL
RCHRES	7	HYDR	O	1	1	1	WDM	1023	FLOW	ENGL	REPL
RCHRES	10	HYDR	RO	1	1	1	WDM	1024	FLOW	ENGL	REPL
RCHRES	10	HYDR	O	1	1	1	WDM	1025	FLOW	ENGL	REPL
RCHRES	10	HYDR	O	2	1	1	WDM	1026	FLOW	ENGL	REPL
RCHRES	10	HYDR	STAGE	1	1	1	WDM	1027	STAG	ENGL	REPL
RCHRES	9	HYDR	STAGE	1	1	1	WDM	1028	STAG	ENGL	REPL
RCHRES	9	HYDR	O	1	1	1	WDM	1029	FLOW	ENGL	REPL
RCHRES	12	HYDR	RO	1	1	1	WDM	1030	FLOW	ENGL	REPL
RCHRES	12	HYDR	O	1	1	1	WDM	1031	FLOW	ENGL	REPL
RCHRES	12	HYDR	O	2	1	1	WDM	1032	FLOW	ENGL	REPL
RCHRES	12	HYDR	STAGE	1	1	1	WDM	1033	STAG	ENGL	REPL
RCHRES	11	HYDR	STAGE	1	1	1	WDM	1034	STAG	ENGL	REPL
RCHRES	11	HYDR	O	1	1	1	WDM	1035	FLOW	ENGL	REPL
RCHRES	14	HYDR	RO	1	1	1	WDM	1036	FLOW	ENGL	REPL
RCHRES	14	HYDR	O	1	1	1	WDM	1037	FLOW	ENGL	REPL
RCHRES	14	HYDR	O	2	1	1	WDM	1038	FLOW	ENGL	REPL
RCHRES	14	HYDR	STAGE	1	1	1	WDM	1039	STAG	ENGL	REPL
RCHRES	13	HYDR	STAGE	1	1	1	WDM	1040	STAG	ENGL	REPL
RCHRES	13	HYDR	O	1	1	1	WDM	1041	FLOW	ENGL	REPL
RCHRES	16	HYDR	RO	1	1	1	WDM	1042	FLOW	ENGL	REPL
RCHRES	16	HYDR	O	1	1	1	WDM	1043	FLOW	ENGL	REPL
RCHRES	16	HYDR	O	2	1	1	WDM	1044	FLOW	ENGL	REPL
RCHRES	16	HYDR	STAGE	1	1	1	WDM	1045	STAG	ENGL	REPL
RCHRES	15	HYDR	STAGE	1	1	1	WDM	1046	STAG	ENGL	REPL
RCHRES	15	HYDR	O	1	1	1	WDM	1047	FLOW	ENGL	REPL
RCHRES	18	HYDR	RO	1	1	1	WDM	1048	FLOW	ENGL	REPL
RCHRES	18	HYDR	O	1	1	1	WDM	1049	FLOW	ENGL	REPL
RCHRES	18	HYDR	O	2	1	1	WDM	1050	FLOW	ENGL	REPL
RCHRES	18	HYDR	STAGE	1	1	1	WDM	1051	STAG	ENGL	REPL
RCHRES	17	HYDR	STAGE	1	1	1	WDM	1052	STAG	ENGL	REPL
RCHRES	17	HYDR	O	1	1	1	WDM	1053	FLOW	ENGL	REPL
RCHRES	20	HYDR	RO	1	1	1	WDM	1054	FLOW	ENGL	REPL
RCHRES	20	HYDR	O	1	1	1	WDM	1055	FLOW	ENGL	REPL
RCHRES	20	HYDR	O	2	1	1	WDM	1056	FLOW	ENGL	REPL
RCHRES	20	HYDR	STAGE	1	1	1	WDM	1057	STAG	ENGL	REPL
RCHRES	19	HYDR	STAGE	1	1	1	WDM	1058	STAG	ENGL	REPL
RCHRES	19	HYDR	O	1	1	1	WDM	1059	FLOW	ENGL	REPL
RCHRES	22	HYDR	RO	1	1	1	WDM	1060	FLOW	ENGL	REPL
RCHRES	22	HYDR	O	1	1	1	WDM	1061	FLOW	ENGL	REPL
RCHRES	22	HYDR	O	2	1	1	WDM	1062	FLOW	ENGL	REPL
RCHRES	22	HYDR	STAGE	1	1	1	WDM	1063	STAG	ENGL	REPL
RCHRES	21	HYDR	STAGE	1	1	1	WDM	1064	STAG	ENGL	REPL
RCHRES	21	HYDR	O	1	1	1	WDM	1065	FLOW	ENGL	REPL
RCHRES	24	HYDR	RO	1	1	1	WDM	1066	FLOW	ENGL	REPL

```
RCHRES  24 HYDR   O       1 1         1       WDM   1067 FLOW     ENGL      REPL
RCHRES  24 HYDR   O       2 1         1       WDM   1068 FLOW     ENGL      REPL
RCHRES  24 HYDR   STAGE   1 1         1       WDM   1069 STAG     ENGL      REPL
RCHRES  23 HYDR   STAGE   1 1         1       WDM   1070 STAG     ENGL      REPL
RCHRES  23 HYDR   O       1 1         1       WDM   1071 FLOW     ENGL      REPL
RCHRES  26 HYDR   RO      1 1         1       WDM   1072 FLOW     ENGL      REPL
RCHRES  26 HYDR   O       1 1         1       WDM   1073 FLOW     ENGL      REPL
RCHRES  26 HYDR   O       2 1         1       WDM   1074 FLOW     ENGL      REPL
RCHRES  26 HYDR   STAGE   1 1         1       WDM   1075 STAG     ENGL      REPL
RCHRES  25 HYDR   STAGE   1 1         1       WDM   1076 STAG     ENGL      REPL
RCHRES  25 HYDR   O       1 1         1       WDM   1077 FLOW     ENGL      REPL
RCHRES  28 HYDR   RO      1 1         1       WDM   1078 FLOW     ENGL      REPL
RCHRES  28 HYDR   O       1 1         1       WDM   1079 FLOW     ENGL      REPL
RCHRES  28 HYDR   O       2 1         1       WDM   1080 FLOW     ENGL      REPL
RCHRES  28 HYDR   STAGE   1 1         1       WDM   1081 STAG     ENGL      REPL
RCHRES  27 HYDR   STAGE   1 1         1       WDM   1082 STAG     ENGL      REPL
RCHRES  27 HYDR   O       1 1         1       WDM   1083 FLOW     ENGL      REPL
RCHRES  30 HYDR   RO      1 1         1       WDM   1084 FLOW     ENGL      REPL
RCHRES  30 HYDR   O       1 1         1       WDM   1085 FLOW     ENGL      REPL
RCHRES  30 HYDR   O       2 1         1       WDM   1086 FLOW     ENGL      REPL
RCHRES  30 HYDR   STAGE   1 1         1       WDM   1087 STAG     ENGL      REPL
RCHRES  29 HYDR   STAGE   1 1         1       WDM   1088 STAG     ENGL      REPL
RCHRES  29 HYDR   O       1 1         1       WDM   1089 FLOW     ENGL      REPL
RCHRES  32 HYDR   RO      1 1         1       WDM   1090 FLOW     ENGL      REPL
RCHRES  32 HYDR   O       1 1         1       WDM   1091 FLOW     ENGL      REPL
RCHRES  32 HYDR   O       2 1         1       WDM   1092 FLOW     ENGL      REPL
RCHRES  32 HYDR   STAGE   1 1         1       WDM   1093 STAG     ENGL      REPL
RCHRES  31 HYDR   STAGE   1 1         1       WDM   1094 STAG     ENGL      REPL
RCHRES  31 HYDR   O       1 1         1       WDM   1095 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                 RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17

  MASS-LINK       18
RCHRES     OFLOW  OVOL   2                 COPY           INPUT  MEAN
  END MASS-LINK   18
```

```
END MASS-LINK
END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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Local (360)943-0304

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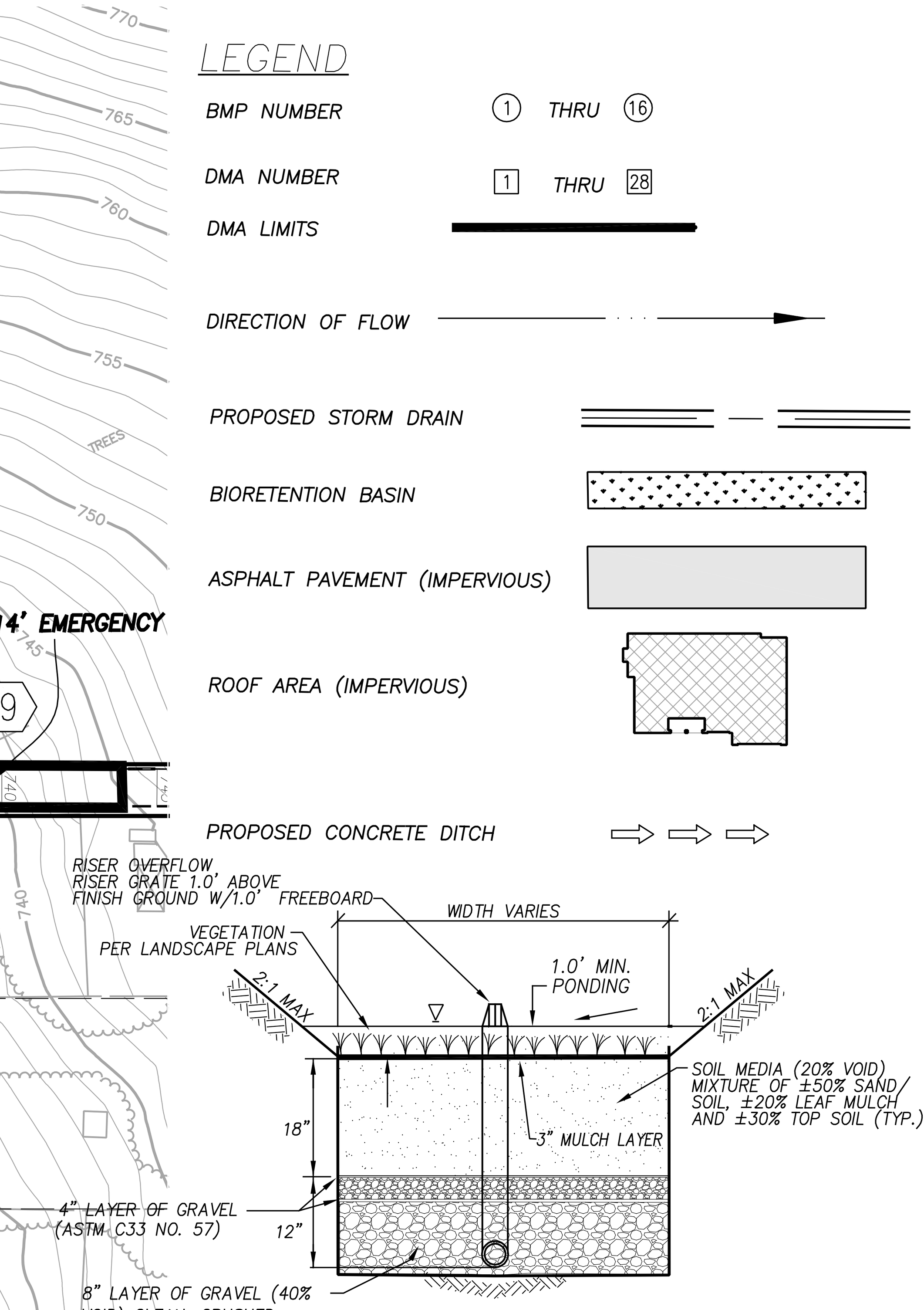
Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

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)



BIORETENTION
NOT TO SCALE

DMA	Post-project Surface Type	DMA Area (SF)	Drains to
1	Asphalt Road	26300	BMP #1
2	Asphalt Road	21020	BMP #2
3	Asphalt Road	29200	BMP #12
4	Asphalt Road	16580	BMP #6
5	Pad with 3500 sf Roof	12725	BMP #1
6	Landscape (self-mitigating)	22260	
7	Landscape (self-mitigating)	20050	
8	Landscape (self-mitigating)	14810	
9	Pad with 3500 sf Roof	21300	BMP #3
10	Pad with 3500 sf Roof	12410	BMP #4
11	Landscape (self-mitigating)	115033	
12	Pad with 3500 sf Roof	13110	BMP #7
13	Pad with 3500 sf Roof	19560	BMP #8
14	Landscape	17780	BMP #8
15	Pad with 3500 sf Roof	18625	BMP #9
16	Landscape	18100	BMP # 9
17	Pad with 3500 sf Roof	22135	BMP #10
18	Landscape	18280	BMP #10
19	Pad with 3500 sf Roof	21730	BMP #11
20	Pad with 3500 sf Roof	14035	BMP #12
21	Landscape (self-mitigating)	222140	
22	Pad with 3500 sf Roof	15420	BMP #12
23	Landscape (self-mitigating)	28880	
24	Pad with 3500 sf Roof	16325	BMP #5
25	Pad with 3500 sf Roof	8200	BMP #15
26	Pad with 3500 sf Roof	21675	BMP #13
27	Pad with 3500 sf Roof	9115	BMP #14
28	San Pasquall Valley Rd	10120	BMP #16

SOURCE CONTROL BMPs (TABLE 4.2.6 SWQMP)

SOURCE CONTROL BMPS	PROJECT IMPLEMENTATION
1 STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! DRAINS TO WATERWAYS" IN ENGLISH AND "NO CONTAMINE" IN SPANISH. MAINTAIN AND PERIODICALLY REPLACE INLET MARKINGS. SEE APPLICABLE OPERATIONAL BMPS IN CASQA FACT SHEET SC-44, "DRAINAGE SYSTEM MAINTENANCE."
LANDSCAPE/OUTDOOR PESTICIDE USE	LANDSCAPE HAS BEEN DESIGNED PER CITY OF SAN SAN DIEGO LANDSCAPE STANDARDS TO MINIMIZE IRRIGATION AND RUNOFF, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION. SEE APPLICABLE BMPS IN CASQA FACT SHEETS SC-41, "BUILDING AND GROUNDS MAINTENANCE."
DRIVEWAYS, SIDEWALKS, ROADS	DRIVEWAYS SIDEWALKS, AND ROADS SHALL BE SWEPT REGULARLY AND ONCE PRIOR TO OCTOBER 1ST TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. SEE CASQA FACT SHEET SC-41, "BUILDING AND GROUNDS MAINTENANCE."

SITE DESIGN BMPs (4.3.1 TRHOUGH 4.3.8 SWQMP)

CONSERVE NATURAL DRAINAGE FEATURES & VEGETATION: DRAINAGE COURSE AND VEGETATION WILL BE PRESERVED.

MINIMIZE IMPERVIOUS AREA: RESIDENTIAL STREETS ARE AT THE MINIMUM REQUIRED WIDTH PER COUNTY STANDARDS.

MINIMIZE SOIL COMPACTION: RE-TILL SOILS COMPACTED BY CONSTRUCTION VEHICLES. COLLECT AND RE-USE UPPER SOIL LAYERS DEVELOPMENT SITE CONTAINING ORGANIC MATERIALS.

RUNOFF FROM WALKS AND ROOF DRAIN DOWNSPOUTS SHALL DISCHARGE ONTO SPLASH BLOCKS AND FLOW THROUGH ADJACENT LANDSCAPE AREA BEFORE ENTERING BIORETENTION BASINS

LANDSCAPING WITH DROUGHT TOLERANT SPECIES

HYDROLOGIC SOIL GROUP C
GROUND WATER DEPTH > 20FT

SLEF-MITIGATING DMA's

SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.

SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.

THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.

IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).

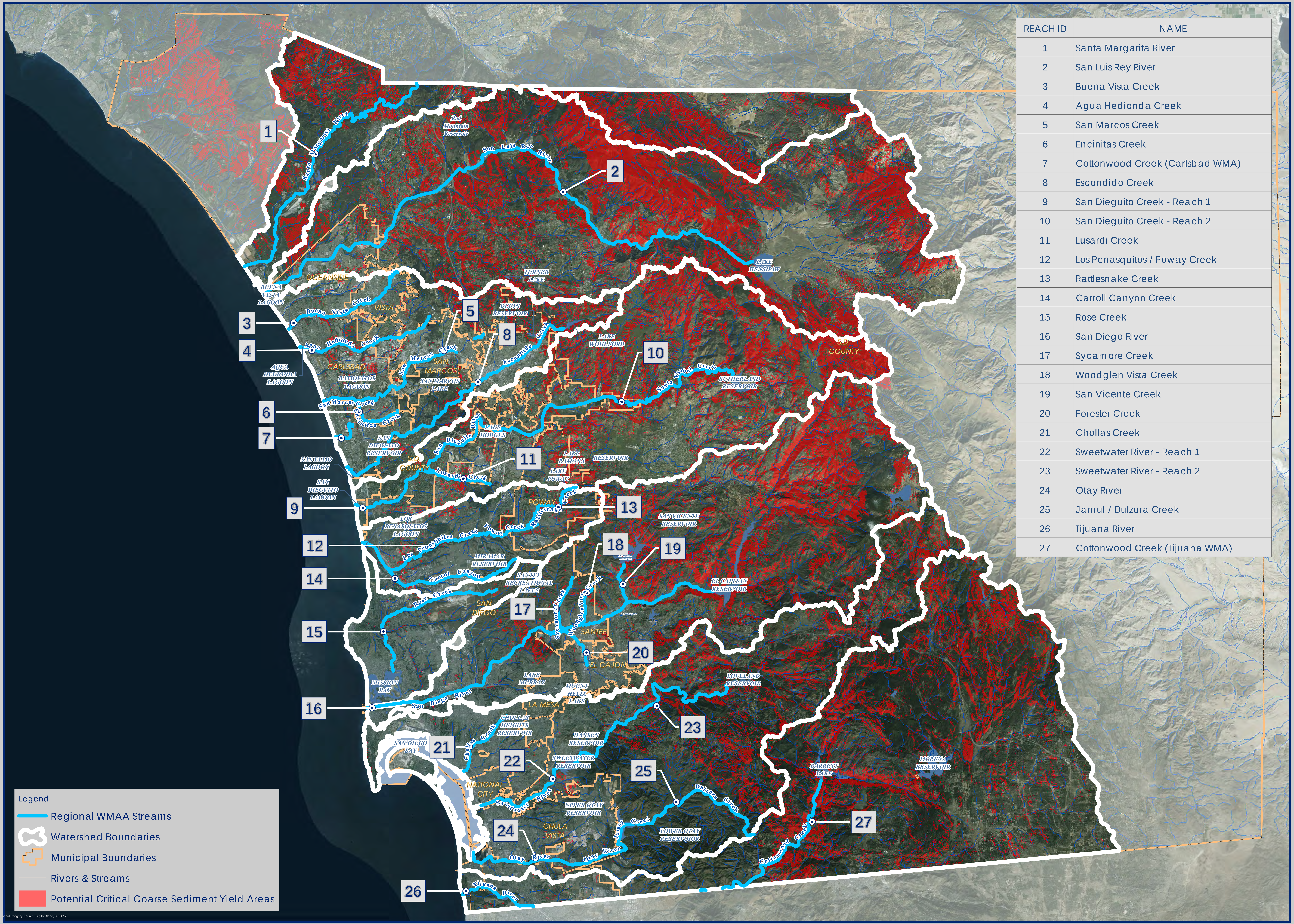
THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SAN PASQUAL VALLEY ROAD

DMA/HMP EXHIBIT

JOB NO.: L321-01 | DATE: 3-02-16

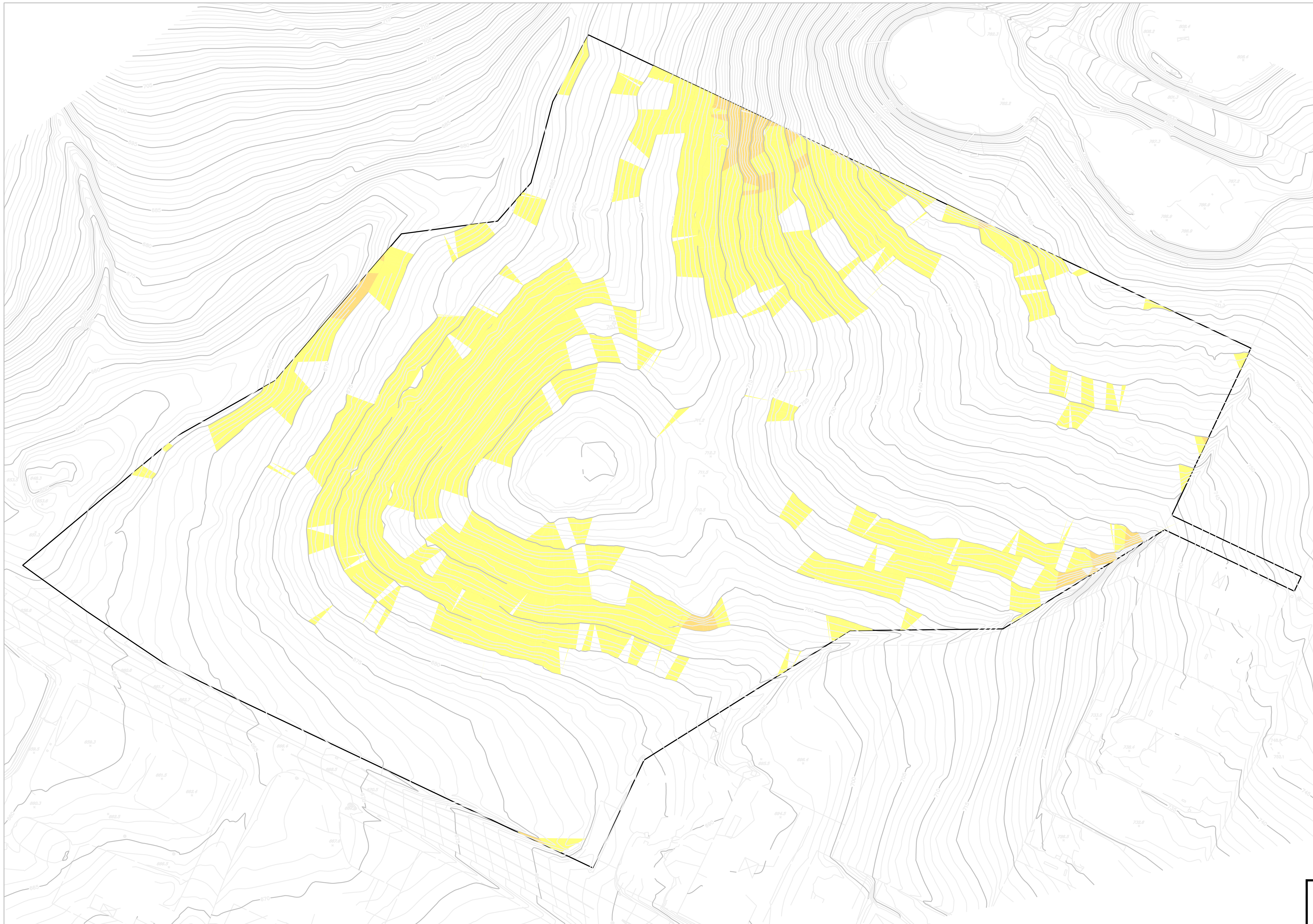


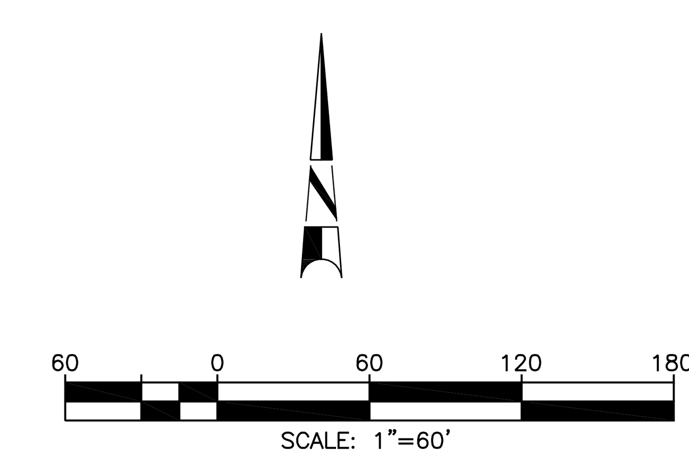
REACH ID	NAME
1	Santa Margarita River
2	San Luis Rey River
3	Buena Vista Creek
4	Agua Hedionda Creek
5	San Marcos Creek
6	Encinitas Creek
7	Cottonwood Creek (Carlsbad WMA)
8	Escondido Creek
9	San Dieguito Creek - Reach 1
10	San Dieguito Creek - Reach 2
11	Lusardi Creek
12	Los Penasquitos / Poway Creek
13	Rattlesnake Creek
14	Carroll Canyon Creek
15	Rose Creek
16	San Diego River
17	Sycamore Creek
18	Woodglen Vista Creek
19	San Vicente Creek
20	Forester Creek
21	Chollas Creek
22	Sweetwater River - Reach 1
23	Sweetwater River - Reach 2
24	Otay River
25	Jamul / Dulzura Creek
26	Tijuana River
27	Cottonwood Creek (Tijuana WMA)

Potential Critical Coarse Sediment Yield Areas

Regional San Diego County Watersheds

Exhibit Date: Sept. 8, 2014





Overall Slope Analysis

Color	Slope Range	Percent	Area
	Less tha 15%	71.8	568395.58
	15% and greater up to 25%	23.5	186227.61
	25% and greater up to 50%	4.7	36608.28
	50% and greater	0.0	0

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Engineering and Surveying, Inc.
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Phone (619) 814-1220 • Fax (619) 641-5910

NO.	REVISIONS	DATE	BY
1	ORIGINAL SUBMITTAL	08/22/17	LES
2			
3			
4			
5			
6			
7			

RESOURCES PROTECTION STUDY
SLOPE ANALYSIS - SLOPE MAP

2260 SAN PASQUAL VALLEY ROAD

COUNTY OF SAN DIEGO, California

SHEET 1 OF 1

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☐ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☒ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☒ How to access the structural BMP(s) to inspect and perform maintenance
- ☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☒ Recommended equipment to perform maintenance
- ☒ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego BMP Design Manual Verification Form	
Project Summary Information	
Project Name	
Record ID (e.g., grading/improvement plan number)	
Project Address	
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
Responsible Party for Construction Phase	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	
Engineer's Phone Number	
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	**Plan Sheet #**	**STRUCT-URAL BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
*All Priority Development Projects (PDPs) require a Structural BMP					

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

County of San Diego BMP Design Manual Verification Form Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

____

Professional Engineer's Signed Name:

____

Date:____________________________________

[SEAL]

County of San Diego BMP Design Manual Verification Form Page 4 of 4

COUNTY - OFFICIAL USE ONLY:

For PDCI: Verification Package #: ___________

PDCI Inspector: ____

Date Project has/expects to close: ____

Date verification received from EOW: _____________________________________

By signing below, PDCI Inspector concurs that every noted Structural BMP has been installed per plan.

PDCI Inspector's Signature: _________________________________ Date: __________________

FOR WPP:

Date Received from PDCI: ____

WPP Submittal Reviewer: ____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: ________________________________ Date: ___________________

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

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 Step 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 County staff
☐ 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 must be provided. Photocopies of general brochures are not acceptable.
☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

TENTATIVE TRACT MAP NO. 5620
2260 SAN PASQUAL VALLEY ROAD
County of San Diego, California

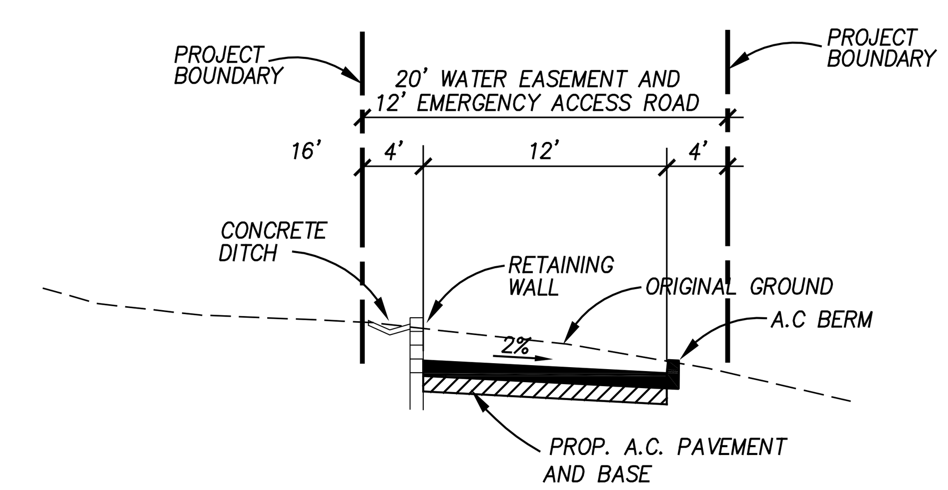
LEGEND

- SUBDIVISION BOUNDARY
- EXISTING TOPO CONTOUR
- SLOPE (2:1 MAX)
- PERCENT OF GRADE
- STREET ELEVATION
- SEWER MAIN (8"*)
- WATER MAIN (8"*)
- FIRE HYDRANT
- STORM DRAIN(18"*)
- RETAINING WALL
- EASEMENT CALL OUT
- EASEMENT LINE
- LIMIT OF INUNDATION
- BIORETENTION BASIN AND DRAINAGE
- LIMIT OF OPEN SPACE

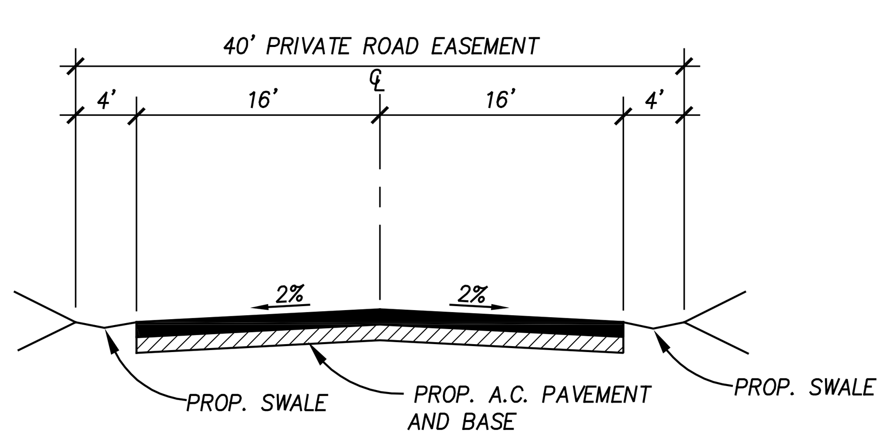
* UNLESS SHOWN OTHERWISE

ABBREVIATIONS

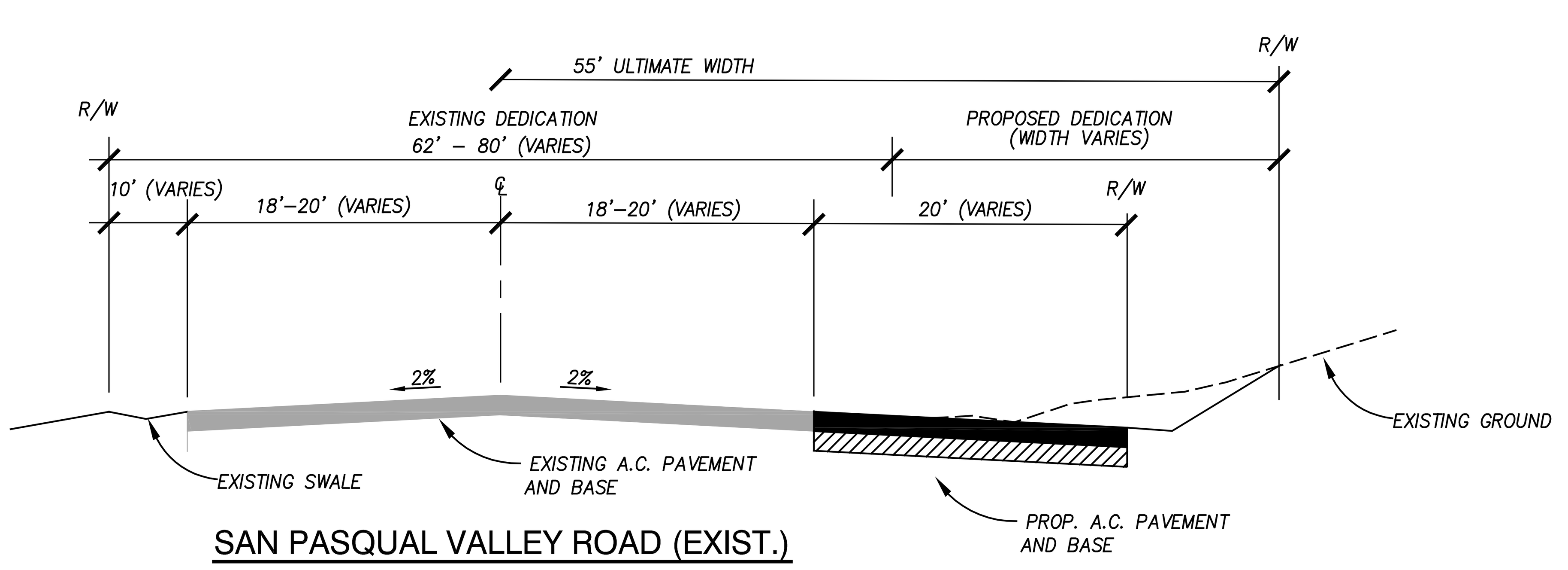
BW	BOTTOM OF WALL
ELEV	ELEVATION
FL	FLOW LINE
FP	FLOOD PLAN
FS	FINISH SURFACE
GB	GRADE BREAK
IE	INVERT ELEVATION
MH	MANHOLE
NTS	NOT TO SCALE
NSF	NET SQ. FT.
P	PAD ELEVATION
PI	POINT OF INTERSECTION (V.C.)
PL	PROPERTY LINE
RW	RECLAIMED WATER
R/W	RIGHT OF WAY
S	SEWER
SD	STORM DRAIN
SF	GROSS SQ. FT.
TF	TOP OF FOOTING
VC	VERTICAL CURVE
W	WATER



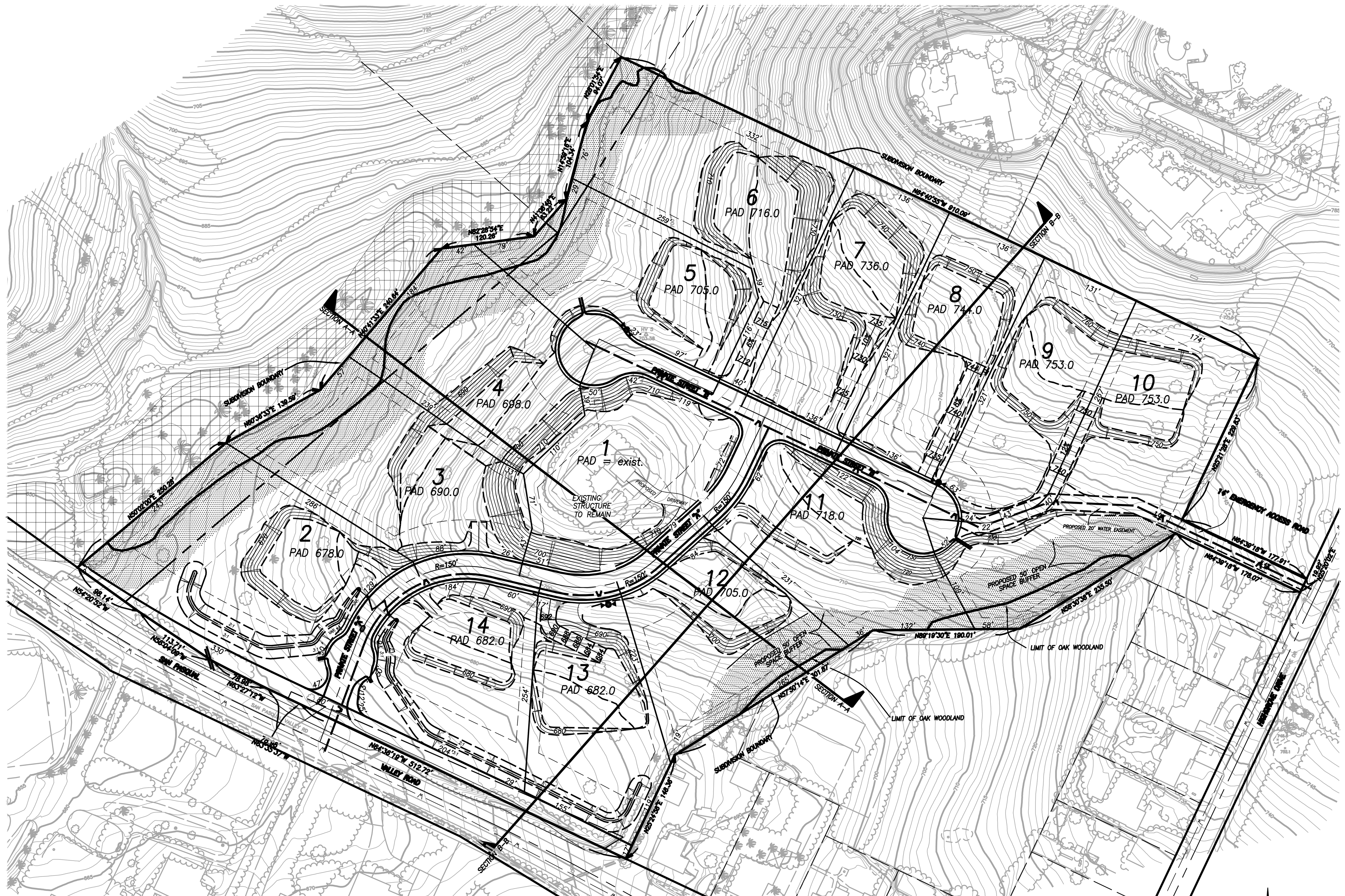
EMERGENCY ACCESS ROAD
NOT TO SCALE



PRIVATE STREETS "A" AND "B"
NOT TO SCALE

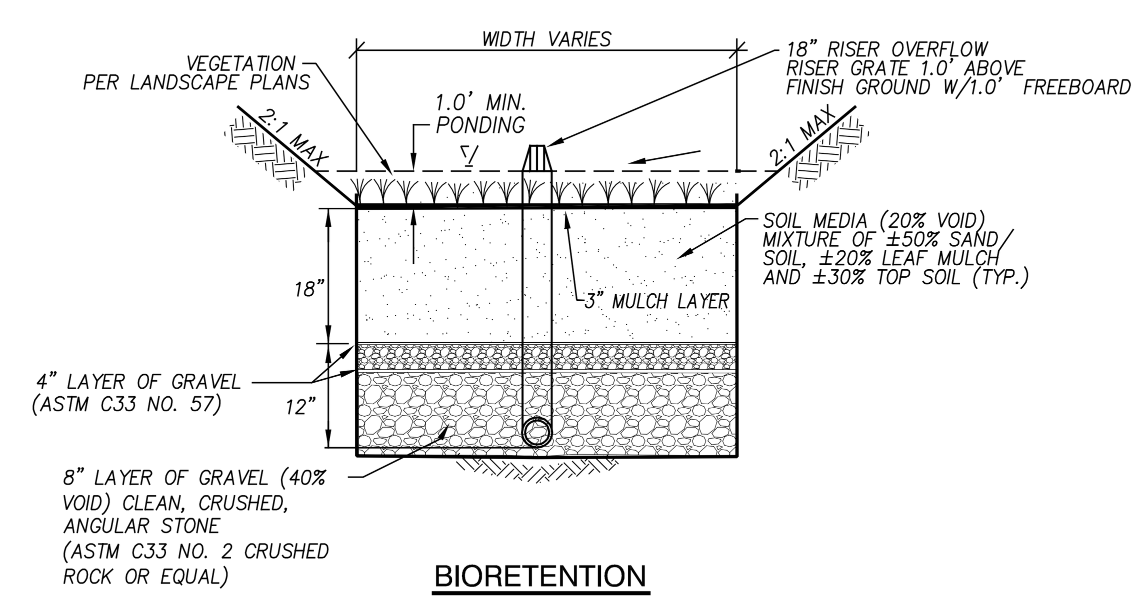


SAN PASQUAL VALLEY ROAD (EXIST.)
"SR-78" CALTRANS FACILITY
PUBLIC ROAD
NOT TO SCALE

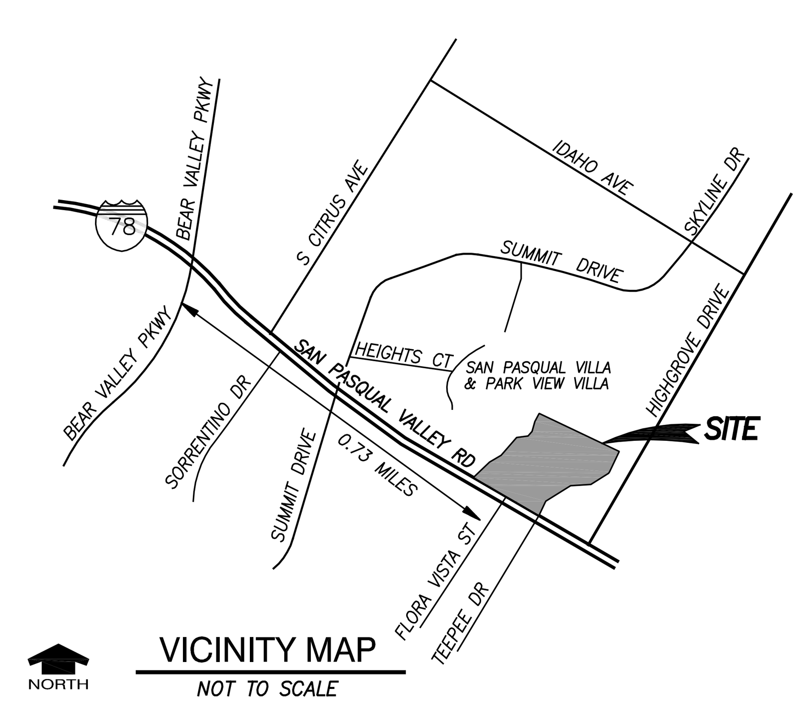


KEY MAP
SCALE: 1"=100'

NOTE
IT IS THE APPLICANT/DEVELOPERS RESPONSIBILITY TO COORDINATE WITH REGIONAL AGENCIES TO DETERMINE IF 401 / 404, WASTE DISCHARGE REQUIREMENTS, AND CALIFORNIA FISH AND WILDLIFE PERMITS ARE REQUIRED.



BIORETENTION
NOT TO SCALE



VICINITY MAP
NOT TO SCALE
THOMAS GUIDE PAGE 1130 5-E

GENERAL NOTES

1. GROSS PROJECT AREA: 18.179 AC.
2. NET PROJECT AREA: 18.179 AC.
3. EXISTING ZONING: A70
4. PROPOSED ZONE: SR-1
5. TOTAL NUMBER OF LOTS: 14. TOTAL NUMBER OF DWELLING UNITS: 14. MINIMUM LOT SIZE: 1 ACRE
6. GROSS DENSITY: 0.8 DU/AC
7. ASSESSOR PARCEL NUMBER: 234-261-23, 234-440-05, AND 234-430-21.
8. PRESENT LAND USE: ONE SINGLE FAMILY DWELLING
9. WATER SYSTEMS TO BE INSTALLED IN ACCORDANCE WITH COUNTY STANDARDS AND THE REQUIREMENTS OF CITY OF EXCONDIDO AND SHALL BE MAINTAINED BY THE CITY.
10. SEWER SYSTEM TO BE ONSITE WITH LEACH FIELDS
11. SOURCE OF TOPOGRAPHY: PHOTOGRAMMETRIC SURVEY DATED 12-10-2015
12. UTILITIES SHALL BE UNDER GROUNDED AND EASEMENTS PROVIDED AS NECESSARY.
13. GRADING AND MODEL UNITS MAY BE CONSTRUCTED PRIOR TO FINAL MAP RECORDATION.
14. UTILITY LAYOUTS SHOWN ARE PRELIMINARY AND MAY BE MODIFIED DURING FINAL DESIGN.
15. TEMPORARY AND PERMANENT STRUCTURAL BEST MANAGEMENT PRACTICES WILL BE INCORPORATED IN THE FINAL DESIGN AND IMPLEMENTATION OF THE DEVELOPMENT.
16. SOLAR ACCESS STATEMENT: ALL LOTS WITHIN THIS SUBDIVISION HAVE A MINIMUM OF 100 SQUARE FEET OF SOLAR ACCESS FOR EACH FUTURE DWELLING UNIT ALLOWED BY THIS SUBDIVISION.
17. ASSESSOR'S TAX RATE AREA: 207.06
18. SPECIAL ASSESSMENT ACT: NONE PROPOSED
19. STREET DEDICATION: ALL STREETS WILL BE PRIVATE STREETS IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY OF SAN DIEGO, AND WILL BE PRIVATELY MAINTAINED BY A HOMEOWNER'S ASSOCIATION.
20. STREET LIGHTS: THE DEVELOPER SHALL COMPLY WITH THE REQUIREMENTS SPECIFIED IN THE COUNTY STANDARDS.
21. PARK FEES: PARK FEE TO BE PAID IN LIEU OF DEDICATION.
22. ALL CUT AND FILL SLOPES WILL BE PROPERLY LANDSCAPED, IRRIGATED AND MAINTAINED IN ACCORDANCE WITH COUNTY STANDARDS.
23. THIS PLAN IS PROVIDED TO ALLOW FOR A FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.
24. BENCH MARK: A STANDARD U.S.C. & G.S. DISK STAMPED "EGC3 1992" SET IN AC PAVEMENT LOCATED AT THE INTERSECTION OF BEAR VALLEY ROAD AND SAN PASQUAL VALLEY ROAD. ELEV 627.71 (NGVD-29).
25. ALL DRAINAGE IMPROVEMENTS TO BE INSTALLED IN ACCORDANCE WITH COUNTY STANDARDS AND SHALL BE MAINTAINED BY THE COUNTY.

PUBLIC UTILITIES/DISTRICTS

SEWER	NO
WATER	CITY OF ESCONDIDO
STORM DRAIN	PRIVATE H.O.A.
GAS AND ELECTRIC	SAN DIEGO GAS & ELECTRIC
TELEPHONE	SBC
STREET LIGHTING	PRIVATE H.O.A.
FIRE	CITY OF ESCONDIDO
SCHOOL	ESCONDIDO UNION SCHOOL DISTRICT
HIGH SCHOOL	ESCONDIDO UNION HIGH SCHOOL DISTRICT

GRADING QUANTITIES
CUT: 26,300 C.Y. FILL: 26,300 C.Y.

LEGAL DESCRIPTION
ALL OF LOT "A" AND PORTIONS OF LOT "B" AND LOT "G" IN THE RESUBDIVISION OF BLOCK 271 AND PORTIONS OF LOT "O" AND LOT "N" IN THE RESUBDIVISIONI OF BLOCK 273 OF THE RANCHO RINCON DEL DIABLO, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 1519, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON JANUARY 21, 1913.

FEMA INFORMATION
WATER COURSE NOT COVERED BY FEMA

SOLAR ACCESS STATEMENT
THIS IS A SOLAR SUBDIVISION AS REQUIRED BY SECTION 81.401 (M) OF THE COUNTY OF SAN DIEGO SUBDIVISION ORDINANCE. ALL RESIDENTIAL UNITS WITHIN THIS SUBDIVISION SHALL HAVE A MINIMUM OF 100 SQUARE FEET OF UNOBSTRUCTED SOLAR ACCESS FOR EACH FUTURE DWELLING UNIT ALLOWED BY THIS SUBDIVISION.

OWNER/SUBDIVIDER
KAE INVESTMENTS, A NEVADA LLC
24 PAINTED FEATHER WAY
LAS VEGAS, NEVADA, 89135

BY: JEFFREY R. LUNDSTROM, AGENT — 8-22-17 DATE

ENGINEER
LUNDSTROM ENGINEERING & SURVEYING
5333 MISSION CENTER ROAD, SUITE 115
SAN DIEGO, CA 92108
TEL. (619) 814-1220

WILLIAM LUNDSTROM — 8-22-17 DATE
R.C.E. 61630
EXPIRES ON 06/30/21

REGISTERED PROFESSIONAL ENGINEER
WILLIAM LUNDSTROM
No. C61630
Expires 6/30/21
CIVIL
STATE OF CALIFORNIA

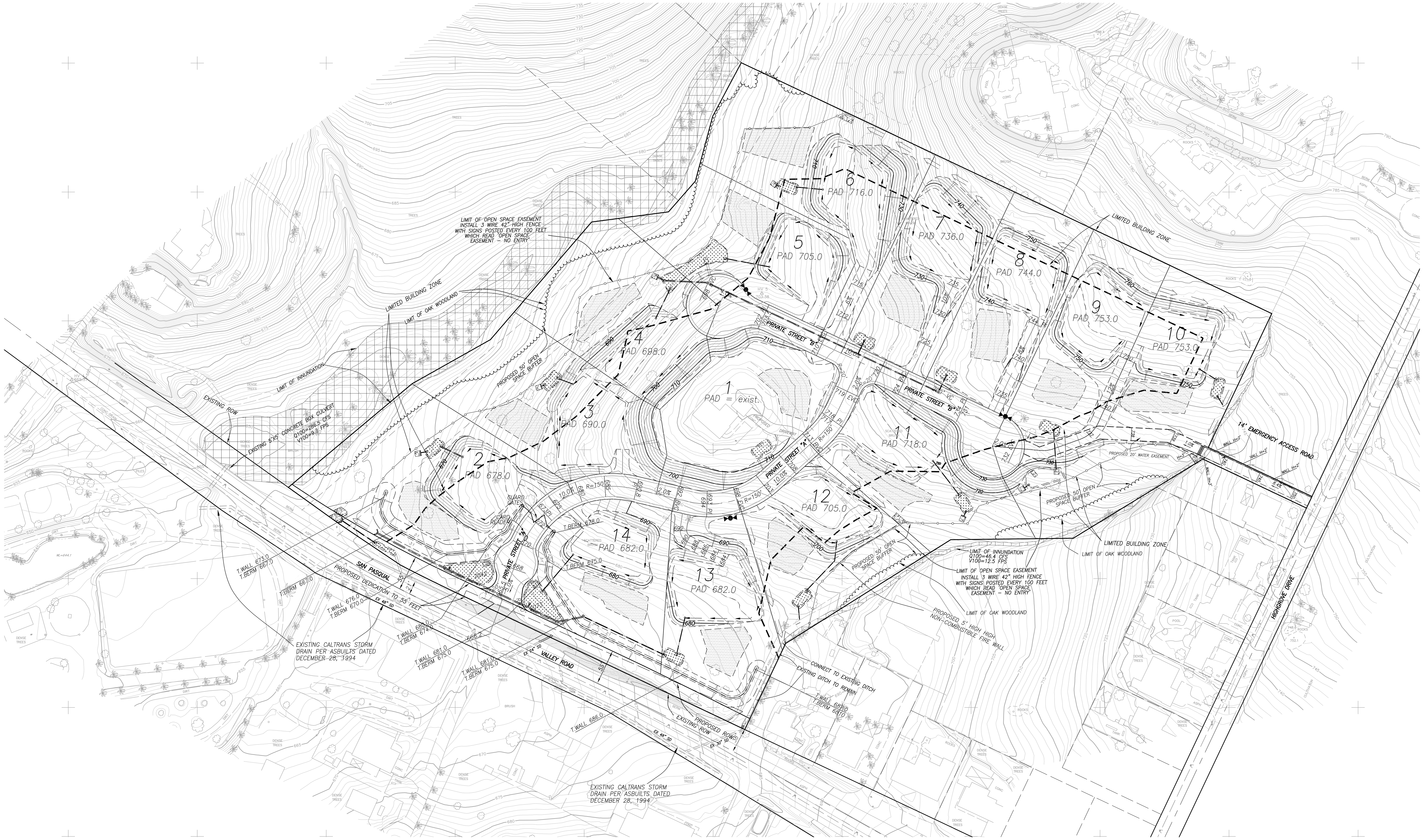
PREPARED BY:

Lundstrom Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

NO.	REVISIONS	DATE	BY
1	ORIGINAL SUBMITTAL	08/22/17	LES
2	1ST RESUBMITTAL	04/26/18	LES
3	2RD RESUBMITTAL	11/19/18	LES
4	3RD RESUBMITTAL	06/26/19	LES
5	4TH RESUBMITTAL	01/02/20	LES
6			
7			

PRELIMINARY GRADING PLAN
TITLE SHEET
2260 SAN PASQUAL VALLEY ROAD
COUNTY OF SAN DIEGO, California

SHEET 1 OF 4



GENERAL NOTES:

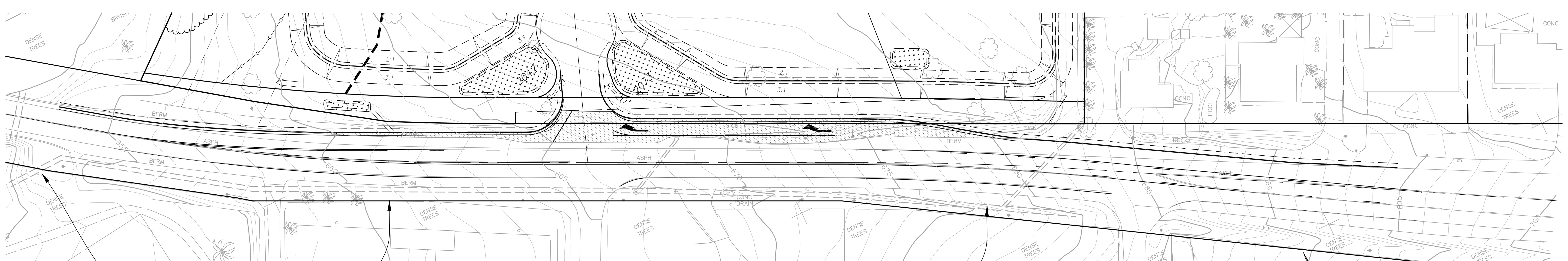
NOTICE:
THE SUBJECT PARCEL CONTAINS WATERWAYS AND WETLANDS. THE APPLICANT MUST PLACE THE FOLLOWING NOTE ON THE GRADING PLANS. PLEASE NOTE IT IS THE APPLICANT/DEVELOPERS RESPONSIBILITY TO COORDINATE WITH REGIONAL AGENCIES TO DETERMINE IF 401/404, WASTE DISCHARGE REQUIREMENTS, AND CALIFORNIA FISH AND WILDLIFE PERMITS ARE REQUIRED. THE APPLICANT SHOULD COORDINATE WITH THE AGENCIES EARLY IN THE CEQA PROCESS AS OBTAINING AGENCY PERMITS COULD TAKE YEARS.

NOTICE:
THE SUBJECT PROPERTY CONTAINS WETLANDS, A LAKE, A STREAM, AND/OR WATERS OF THE U.S. AND/OR STATE WHICH MAY BE SUBJECT TO REGULATION BY STATE AND/OR FEDERAL AGENCIES, INCLUDING BUT NOT LIMITED TO, THE REGIONAL WATER QUALITY CONTROL BOARD, U.S. ARMY CORPS OF ENGINEERS AND THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE. IT IS THE APPLICANT'S RESPONSIBILITY TO CONSULT WITH EACH AGENCY TO DETERMINE IF A PERMIT, AGREEMENT OR OTHER APPROVAL IS REQUIRED AND TO OBTAIN ALL NECESSARY PERMITS, AGREEMENTS OR APPROVALS BEFORE COMMENCING ANY ACTIVITY WHICH COULD IMPACT THE WETLANDS, LAKE, STREAM, AND/OR WATERS OF THE U.S. LOCATED ON THE SUBJECT PROPERTY.

U.S. ARMY CORPS OF ENGINEERS: 915 WILSHIRE BLVD., SUITE 1101, LOS ANGELES, CA 90017; (213) 542–3333; HTTP://WWW.USACE.ARMY.MIL/
REGIONAL WATER QUALITY CONTROL BOARD: 2375 NORTHSIDE DRIVE, SUITE, SAN DIEGO, CA, CA 92108 HTTP://WWW.WATERBOARDS.CA.GOV/SANDIEGO/
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE: 3883 RUFFIN RD., SAN DIEGO, CA 92123: (858) 636–3160: ASKR5@WILDLIFE.CA.GOV HTTP://DFG.CA.GOV?

80 0 80 160 240
SCALE: 1"=80'

INDICATES AREA OF PROPOSED WIDENING



PROPOSED CHANNELIZATION ALONG PROJECT FRONTAGE

SCALE: 1"=60'

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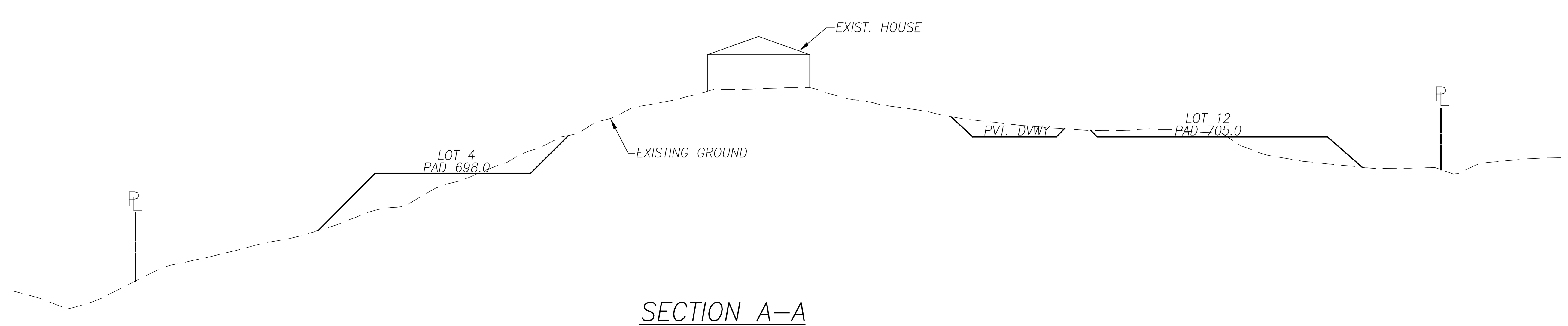
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

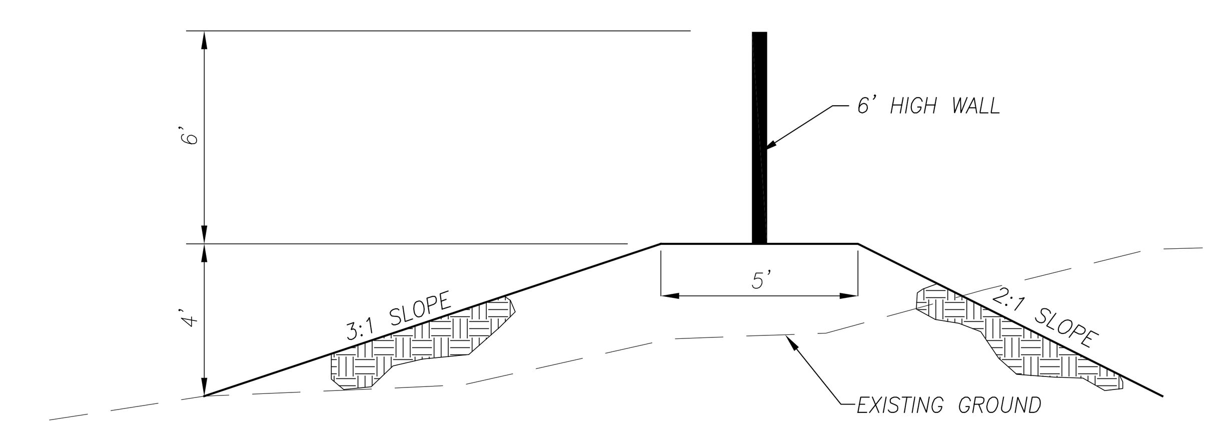
NO.	REVISIONS	DATE	BY
1	ORIGINAL SUBMITTAL	08/22/17	LES
2	1ST RESUBMITTAL	04/26/18	LES
3	2RD RESUBMITTAL	11/19/18	LES
4	3RD RESUBMITTAL	06/26/19	LES
5	4TH RESUBMITTAL	01/02/20	LES
6			
7			

PRELIMINARY GRADING PLAN
PRELIMINARY GRADING PLAN
2260 SAN PASQUAL VALLEY ROAD
COUNTY OF SAN DIEGO, California

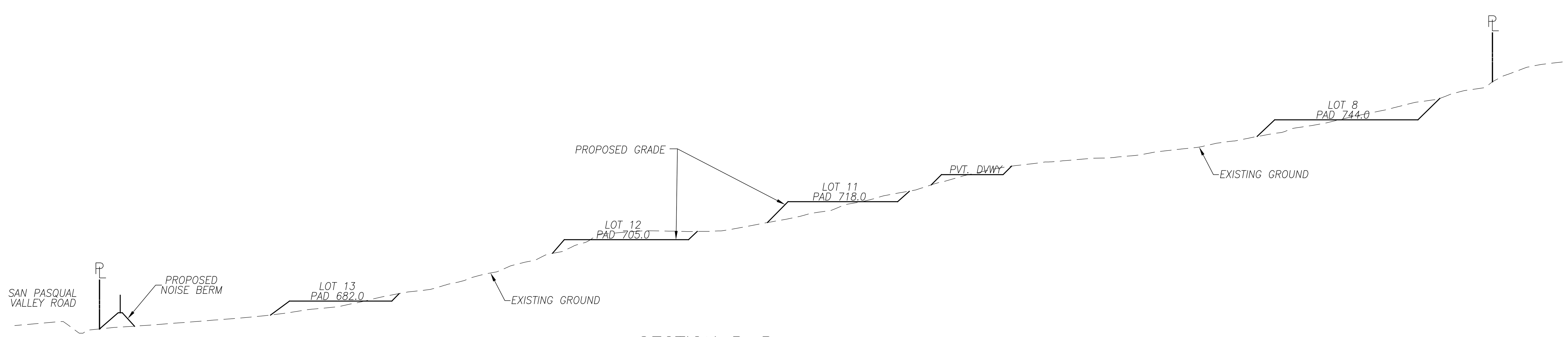
SHEET 2 OF 4



SECTION A–A
SCALE: 1"=50' HORIZ.
1"=25' VERT.



10' NOISE BERM DETAIL
N.T.S.



SECTION B–B
SCALE: 1"=50' HORIZ.
1"=25' VERT.

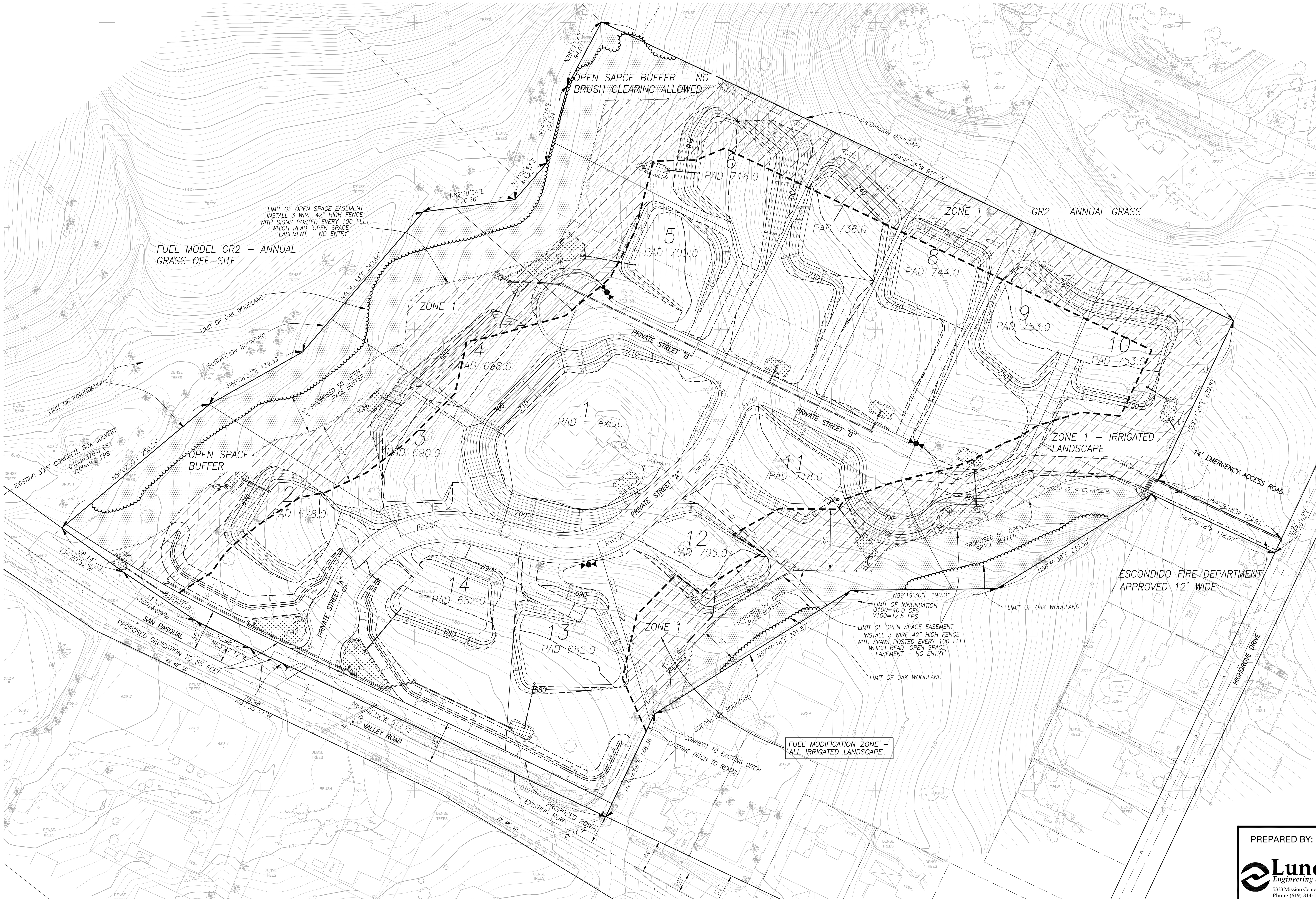
PREPARED BY:

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

NO.	REVISIONS	DATE	BY
1	ORIGINAL SUBMITTAL	08/22/17	LES
2	1ST RESUBMITTAL	04/26/18	LES
3	2RD RESUBMITTAL	11/19/18	LES
4	3RD RESUBMITTAL	06/26/19	LES
5	4TH RESUBMITTAL	01/02/20	LES
6			
7			

PRELIMINARY GRADING PLAN
SITE CROSS-SECTIONS
2260 SAN PASQUAL VALLEY ROAD
COUNTY OF SAN DIEGO, California

SHEET 3 OF 4



LEGEND

- LIMIT OF OAK WOODLAND
- LIMIT OF FUEL MODIFICATION ZONE
- LIMIT OF OPEN SPACE EASEMENT
- PROPOSED FUEL MODIFICATION ZONE
- PROPOSED OPEN SPACE EASEMENT

60 0 60 120 180

SCALE: 1"=60'

PREPARED BY:

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

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4	3RD RESUBMITTAL	06/26/19	LES
5	4TH RESUBMITTAL	01/02/20	LES
6			
7			

PRELIMINARY GRADING PLAN
FUEL MODIFICATION ZONE MAP
2260 SAN PASQUAL VALLEY ROAD
COUNTY OF SAN DIEGO, California

SHEET 4 OF 4

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ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

This page was left intentionally blank.

Drainage Study

San Pasqual Valley Road

April 7, 2020

PREPARED FOR

KAE Investments, LLC

9970 W. Cheyenne
Las Vegas, CA 89129

William Lundstrom, R.C.E.
Lundstrom Engineering & Surveying
5333 Mission Center Road, Suite 115
San Diego, California 92108
(619) 814-1220

SDC PDS RCVD 01-07-20
TM5620

Declaration of Responsible Charge

I hereby declare that I am the 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 standards.

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

William Lundstrom Registered Civil Engineer 61630 Exp. Date: 06/30/21	Date

Table of Contents

Table of Exhibits

List of Tables

Table of Appendices

Introduction

Purpose and Scope

To provide guidelines for preparation and review of preliminary hydrology/drainage study associated with discretionary projects under various County of San Diego Ordinances.

Development of permanent improved drainage facilities relies in part, on early identification of any adverse drainage conditions that are caused or worsened by new development projects. To avoid sub-standard drainage facilities, (difficult and costly to replace) sufficient information is needed early, when the project is being considered for approval. The County's application process requires a hydrology/ drainage study on all development projects at the time of application. This study provides the needed information to ensure that the proposed drainage facilities are located appropriately.

The study compares storm runoff under existing conditions versus proposed conditions (100 year event) and identifies existing drainage problems that may be caused, or aggravated, by project development. The study is further used to determine impacts that might be caused downstream (erosion) and to identify proposed mitigation measures.

Section 1. Project Information

1.1.Project Description

1.1.1 Project Location

The project site is located in the County of San Diego, California. The project is located northwest of the intersection of San Pasqual Valley Road and Highgrove Drive. **Exhibit B** provides a location map for the site.

1.1.2 Project Activities Description

The proposed project is on an 18-acres parcel in the County of San Diego. The project will consist of the grading of the site into fourteen single family residential pads, a private road for access and necessary utility and street improvements.

1.2.Hydrologic Setting

This section summarizes the project's size and location in the context of the larger watershed perspective, topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.

1.2.1 Topography

The site is bounded to the south by San Pasqual Valley Road (Highway 78), to the west by a southwesterly trending drainage channel, and to the north and east by existing single-family residential properties. In general, the site exhibits moderately sloping topography toward the south and west, with a hill in the central portion of the site. Approximate elevations within the overall site limits range from a low elevation of 655 msl at the southwesterly boundary to a high of 770 msl near the northeasterly boundary. The site currently supports an existing single-family residence on the hill in the central portion of the site, and the rest of the site is currently vacant and undeveloped with the exception of a few dirt roads. The site is covered with a light to moderate growth of weeds and grass with localized small trees and bushes. Runoff generated on site is conveyed naturally via overland flow to an existing drainage channel. The natural drainage channel flows in a southwesterly direction along the westerly property line.

1.2.2 FEMA Flood Insurance Rate Map

The project site is located in Zone X of the Flood Insurance Rate Map (FIRM) Panel 06073C1081G, effective date May 16, 2012. Zone X is designated to be areas determined to be outside the 500-year floodplain. **Exhibit C** illustrates the project site within Flood Zone X.

1.2.3 Current and Adjacent Land Use

The project site currently consists of one single family house with access to San Pasqual Velley Road through an existing asphalt paved driveway. Adjacent land use are single family residential and agriculture.

1.2.4 Soil and Vegetation Conditions

Geotechnical investigation, "Preliminary Geotechnical Investigation, 2260 San Pasqual Valley Road Project", by AGS, dated July 27, 2016, indicates the site consists of silty fine sand (SM).
Published regional geologic maps indicate the site is underlain by Mid-Cretaceous Granodiorite of Woodson Mountain. For the purposes of this report, the simple nomenclature of "granitic rock" will be used. This unit is mantled by relatively thin veneers of surficial soils including undocumented artificial fill, older alluvium, colluvium and topsoil. The following section contains a summary of the soil and bedrock units encountered onsite.

The project site is categorized as having Diegan Coastal Sage Scrub and non-native vegetation habitat.

1.2.5 Existing Drainage Patterns and Facilities (Narrative)

The site is bounded to the south by San Pasqual Valley Road (Highway 78), to the west by a southwesterly trending drainage channel, and to the north and east by existing single-family residential properties. In general, the site exhibits moderately sloping topography toward the south and west, with a hill in the central portion of the site. Approximate elevations within the overall site limits range from a low elevation of 655 msl at the southwesterly boundary to a high of 770 msl near the northeasterly boundary. The site currently supports an existing single-family residence on the hill in the central portion of the site, and the rest of the site is currently vacant and undeveloped with the exception of a few dirt roads. The site is covered with a light to moderate growth of weeds and grass with localized small trees and bushes. Runoff generated on site is conveyed naturally via overland flow to an existing drainage channel. The natural drainage channel flows in a southwesterly direction along the westerly property line.

1.2.6 Downstream Conditions

Runoff generated from the site is currently conveyed downstream towards Lake Hodges through a serious of drainage channels and public storm drain.

1.3.Proposed Runoff Management Facilities

The proposed facilities managing runoff from the site include:

- Appropriate grading of pads to direct runoff away from future structures on the site.

- Storm drain systems to direct on-site runoff to appropriate outfalls.

Section 2. Design Criteria and Methodology

This section summarizes the design criteria and methodology applied during drainage analysis of the project site. The design criteria and methodology follow the County of San Diego County Hydrology Manual (June 2003), San Diego County Hydraulic Drainage Design Manual (September 2014), and Storm Water Standards as appropriate for the project site.

2.1.Hydrologic Design Methodology

2.1.1 Rational Method: Peak Flow

Runoff calculations for this study were accomplished using the Rational Method. The Rational Method is a physically-based numerical method where runoff is assumed to be directly proportional to rainfall and area, less losses for infiltration and depression storage. Flows were computed based on the Rational formula:

$$Q = C\,i\,A$$

where ...
- $\boldsymbol{Q}$ = Peak discharge (cfs);
- $\boldsymbol{C}$ = runoff coefficient, based on land use and soil type;
- $\boldsymbol{i}$ = rainfall intensity (in/hr);
- $\boldsymbol{A}$ = watershed area (acre)

The runoff coefficient represents the ratio of rainfall that runs off the watershed versus the portion that infiltrates to the soil or is held in depression storage. The runoff coefficient is dependent on the land use coverage and soil type.

For a typical drainage study, rainfall intensity varies with the watershed time of concentration. The watershed time of concentration at any given point is defined as the time it would theoretically take runoff to travel from the most upstream point in the watershed to a concentration point, as calculated by equations in the San Diego County Hydrology Manual.

Table 2-1 Rational Method Runoff Coefficients.

		RUNOFF COEFFICIENT			
	(%)	**Hydrologic Soil Type**			
LAND USE (County Elements)	**Imperv.**	**A**	**B**	**C**	**D**
Permanent Open Space		0.20	0.25	0.30	0.35
Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Neighborhood Commercial	80	0.76	0.77	0.78	0.79
General Commercial	85	0.80	0.80	0.81	0.82
Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Limited Industrial	90	0.83	0.84	0.84	0.85
General Industrial	95	0.87	0.87	0.87	0.87

Rational Method calculations were accomplished using the Advanced Engineering Software Rational Method Analysis (Southern California County Methods) (AES-RATSCx) computer software packages. Peak discharges were computed for 100-year and 50-year storm return frequencies. The final use for this project site is unknown at this time. Therefore, for conservative purposes, a runoff "C" coefficient of 0.90 (paved surface) was used.

2.1.2 Time of Concentration

The Time of Concentration (T_c) is the time required for runoff to flow from the most remote part of the drainage area to the point of interest. The T_c is composed of two components: initial time of concentration (T_i) and the travel time (T_t). The T_i is the time required for runoff to travel across the surface of the most remote subarea in the study, or "initial subarea". Guidelines for designation the initial subarea are provided within the discussion of computation of T_i. The T_i is the time required for the runoff to flow in a watercourse (e.g., swale, channel, gutter, pipe) or series of watercourses from the initial subarea to the point of interest. For the Rational Method, the T_c at any point within the drainage area is given by:

$$T_c = T_i + T_t$$

Methods of calculation differ for natural watersheds (nonurbanized) and for urban drainage systems. When analyzing storm drain systems, the designer must consider the possibility that an existing natural watershed may become urbanized during the useful life of the storm drain system. Future land uses must be used for T_c and runoff calculations, and can be determined from the local Community General Plan.

2.1.3 Initial Time of Concentration

The initial time of concentration is typically based on sheet flow at the upstream end of a drainage basin. The Overland Time of Flow is approximated by an equation developed by the Federal Aviation Agency (FAA) for analyzing flow on runways (FAA, 1970). The usual runway configuration consists of a crown, like most freeways, with sloping pavement that directs flow to either side of the runway. This type of flow is uniform in the direction perpendicular to the velocity and is very shallow. Since these depths are ¼ of an inch in magnitude, the relative roughness is high. Some higher relative roughness values for overland flow are presented in the ***HEC-1 Flood Hydrograph Package User's Manual*** (USACE, 1990).

The sheet flow that is predicted by the FAA equation is limited to conditions that are similar to runway topography. Some considerations that limit the extent to which the FAA equation applies are identified below:

- Urban Areas – This "runway type" runoff includes:
  - Flat roofs, sloping at 1% +/-
  - Parking lots at the extreme upstream drainage basin boundary (at the "ridge" of a catchment area.) Even a parking lot is limited in the amounts of sheet flow. Parked or moving vehicles would "break-up" the sheet flow, concentrating runoff into streams that are not characteristic of sheet flow.
  - Driveways are constructed at the upstream end of catchment areas in some developments. However, if flow from a roof is directed to a driveway through a downspout or other conveyance mechanism, flow would be concentrated.
  - Flat slopes are prone to meandering flow that tends to be disrupted by minor irregularities and obstructions. Maximum Overland Flow lengths are shorter for the flatter slopes.
- Rural or Natural Areas –The FAA equation is applicable to these conditions since (0.5% to 10%) slopes that are uniform in width of flow have slow velocities consistent with the equation. Irregularities in terrain limit the length of application.
  - Most hills and ridge lines have a relatively flat area near the drainage divide. However, with flat slopes of 0.5% +/-, minor irregularities would cause flow to concentrate into streams.

- o Parks, lawns and other vegetated areas would have slow velocities that are consistent with the FAA Equation.

The Initial Time of Concentration is reflective of the general land-use at the upstream end of a drainage basin.

2.1.4 Travel Time

The T_t is the time required for the runoff to flow in a watercourse or series of watercourses from the initial subarea to the point of interest. The T_t is computed by dividing the length of the flow path by the computed flow velocity. Since the velocity normally changes as a result of each change in flow rate or slope, such as at an inlet or grade break, the total T_t must be computed as the sum of the T_t's for each section of the flow path.

2.1.5 Rational Method: Runoff Volume

For designs that are dependent on the total storm volume, a hydrograph must be generated to account for the entire volume of runoff from the 6-hour storm event. The hydrograph for the entire 6-hour storm event is generated by creating a rainfall distribution consisting of blocks of rain, creating an incremental hydrograph for each block of rain, and adding the hydrographs from each block of rain. This process creates a hydrograph that contains runoff from all the blocks of rain and accounts for the entire volume of runoff from the 6-hour storm event. The total volume under the resulting hydrograph is equal to the following equation:

$$VOL = CP_6A$$

Where: VOL = volume of runoff (acres-inches)

P_6 = 6-hour rainfall (inches)

C = runoff coefficient

A = area of the watershed (acres)

Section 3. Characterization of Project Runoff

3.1.Hydrologic Effects of Project

The proposed project will not significantly alter drainage patterns on the site. **Exhibit E** illustrates the proposed condition hydrology map. Table 3-1 summarizes the hydrologic effects of the project.

Table 3-1 Summary of Hydrology Analysis.

EXISTING

NODE	C	TC (MIN.)	INTENSITY (IN/HR)	AREA (ACRES)	VELOCITY (FPS)	RUN-OFF (CFS)
6	0.41	24.2	3.24	215.4	9.20	286.5
10	0.41	16.5	4.14	27.3	9.0	46.4

PROPOSED

NODE	C	TC (MIN.)	INTENSITY (IN/HR)	AREA (ACRES)	VELOCITY (FPS)	MITIGATED RUN-OFF (CFS)	UNMITIGATED RUN-OFF (CFS)
6	0.41	24.2	3.24	215.4	9.20	286.5	288.7
10	0.41	16.5	4.14	27.3	9.0	46.4	47.3

The existing and proposed condition analyses illustrate that there is an increase in the amount of unmitigated runoff generated from the proposed condition. Proposed bioretention basins shall mitigate peak runoff rates from the project site to match exiting runoff rates downstream.

Post construction storm water BMPs for the project are listed below (please see "Storm Water Quality Management Plan for San Pasqual Valley Road Property" for sizing calculations and product performance/manufacturer's specifications):

- Bioretention Basins with HMP Flow Control

Section 4. Summary and Conclusions

This hydrology and hydraulic study has evaluated the potential effects of runoff on the proposed project. In addition, the report has addressed the methodology used to analyze the pre- and post-construction condition, which was based on the San Diego County Hydrology and Design Manual. This section provides a summary discussion that evaluates the potential effects of the proposed project.

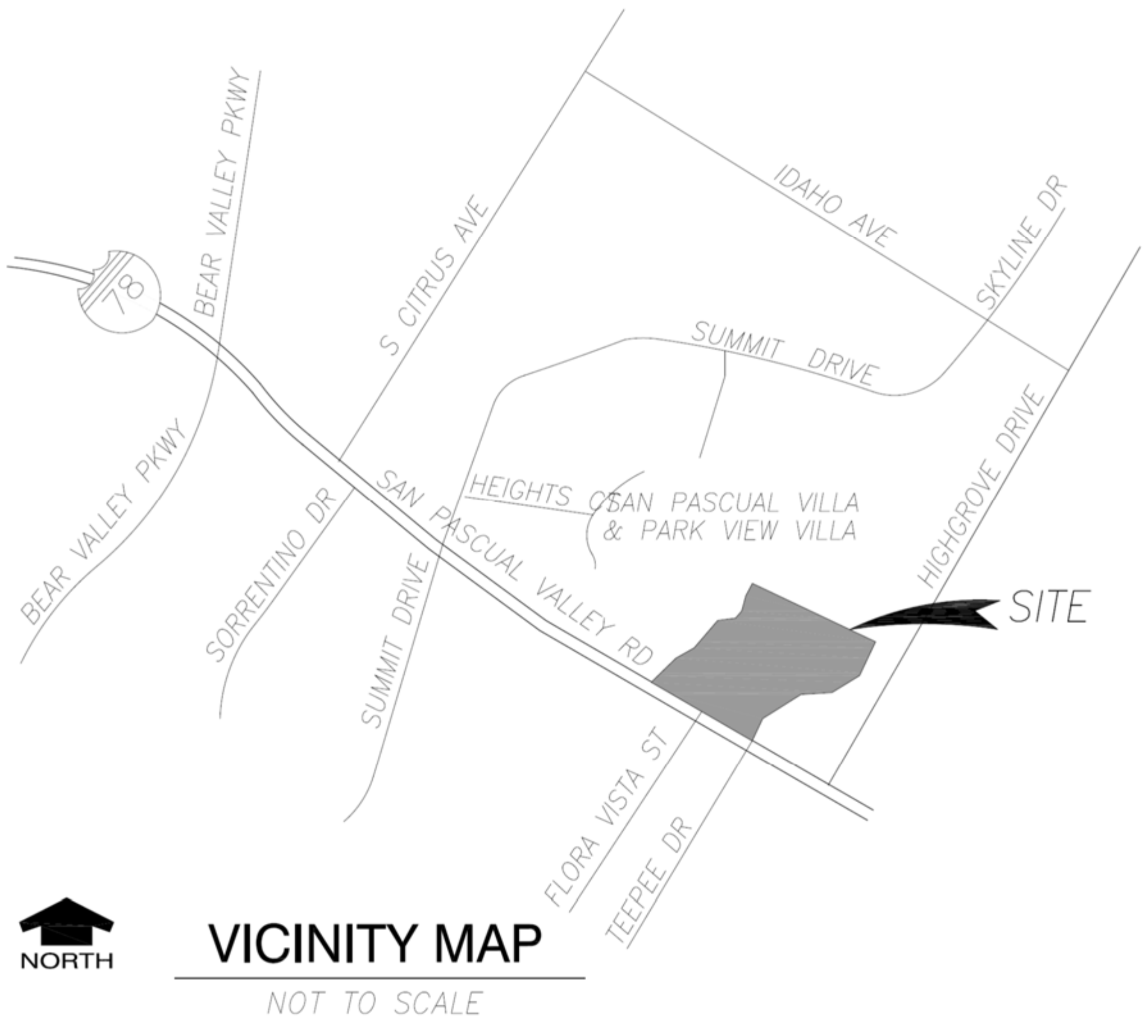
- The proposed project will not substantially alter the existing drainage patterns on the site or area, including through the alteration of the existing drainage course, in which would not result in substantial erosion or siltation on- or off-site and not exceed the capacity of downstream storm drain.
- The proposed project does not place housing or structures within 100-year flood area.
- The proposed project does not expose people or structures to significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam.
- The project will add new impervious area to the site, increasing unmitigated storm water runoff rates and volume from the existing condition. Proposed bioretention basins shall mitigate peak runoff rates from the project site to match exiting runoff rates down stream.
- The proposed emergency access road shall have two 24-inch storm drain culverts to allow drainage to pass under.

E X H I B I T S

Project Vicinity Map

Project Name: [San Pasqual Valley Road]
Record ID: PDS2016-MPA-16-008, PDS2017-REZ-17-001, PDS2017-TM-5620

[



]

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the USDA National Agriculture Imagery Program (NAIP). This information was photogrammetrically compiled at a scale of 1:24,000 from aerial photography dated 2009.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

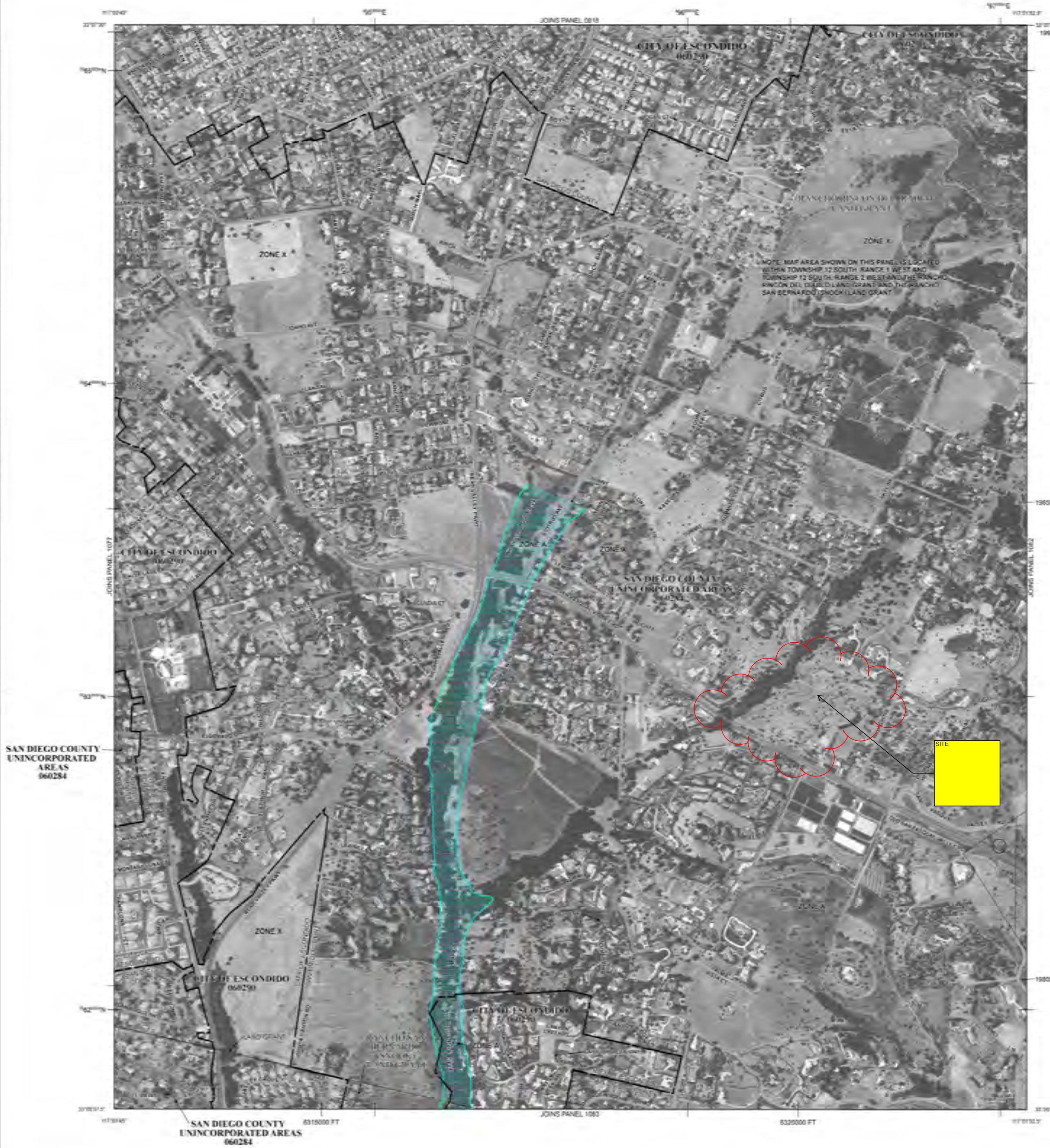
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-877-FEMA MAP (1-877-336-2627) for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The **"profile base lines"** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



SAN DIEGO COUNTY
UNINCORPORATED AREAS
060284

SAN DIEGO COUNTY
UNINCORPORATED AREAS
060284

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)——(A)	Cross section line
(23)- - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{4}75^{000m}$E	1000-meter Universal Transverse Mercator grid ticks, zone 11
6000000 FT	5000-foot grid values: California State Plane coordinate system, zone VI (FIPSZONE – 406), Lambert projection
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 19, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
May 16, 2012 – to update corporate limits, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to update map elevations to North American Vertical Datum of 1988.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1081G

FIRM
FLOOD INSURANCE RATE MAP
SAN DIEGO COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1081 OF 2375
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ESCONDIDO, CITY OF	060290	1081	G
SAN DIEGO COUNTY	060284	1081	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06073C1081G

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SAN PASQUAL VALLEY ROAD

EXISTING WATERSHED MAP

JOB NO.: L321-01

LEGEND

BMP NUMBER — 1 THRU 16

DMA NUMBER — 1 THRU 28

DMA LIMITS

DIRECTION OF FLOW

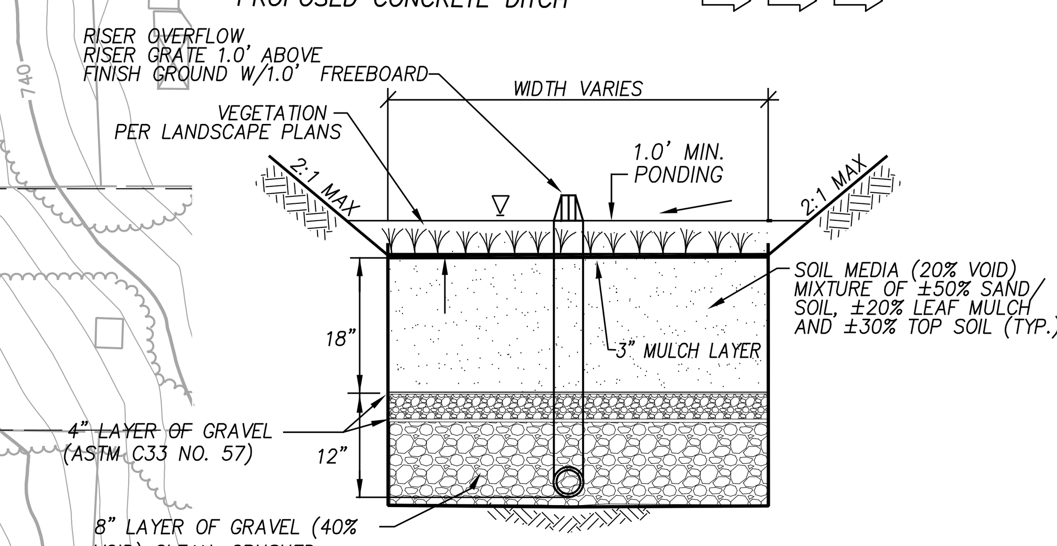
PROPOSED STORM DRAIN

BIORETENTION BASIN

ASPHALT PAVEMENT (IMPERVIOUS)

ROOF AREA (IMPERVIOUS)

PROPOSED CONCRETE DITCH



BIORETENTION

NOT TO SCALE

SOURCE CONTROL BMPs (TABLE 4.2.6 SWQMP)

SOURCE CONTROL BMPS	PROJECT IMPLEMENTATION
STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! DRAINS TO WATERWAYS" IN ENGLISH AND "NO CONTAMINE" IN SPANISH. MAINTAIN AND PERIODICALLY REPLACE INLET MARKINGS. SEE APPLICABLE OPERATIONAL BMPS IN CASQA FACT SHEET SC-44, "DRAINAGE SYSTEM MAINTENANCE."
LANDSCAPE/OUTDOOR PESTICIDE USE	LANDSCAPE HAS BEEN DESIGNED PER CITY OF SAN SAN DIEGO LANDSCAPE STANDARDS TO MINIMIZE IRRIGATION AND RUNOFF, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION. SEE APPLICABLE BMPS IN CASQA FACT SHEETS SC-41, "BUILDING AND GROUNDS MAINTENANCE."
DRIVEWAYS, SIDEWALKS, ROADS	DRIVEWAYS SIDEWALKS, AND ROADS SHALL BE SWEPT REGULARLY AND ONCE PRIOR TO OCTOBER 1ST TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. SEE CASQA FACT SHEET SC-41, "BUILDING AND GROUNDS MAINTENANCE."

SITE DESIGN BMPs (4.3.1 TRHOUGH 4.3.8 SWQMP)

CONSERVE NATURAL DRAINAGE FEATURES & VEGETATION: DRAINAGE COURSE AND VEGETATION WILL BE PRESERVED.

MINIMIZE IMPERVIOUS AREA: RESIDENTIAL STREETS ARE AT THE MINIMUM REQUIRED WIDTH PER COUNTY STANDARDS.

MINIMIZE SOIL COMPACTION: RE-TILL SOILS COMPACTED BY CONSTRUCTION VEHICLES. COLLECT AND RE-USE UPPER SOIL LAYERS DEVELOPMENT SITE CONTAINING ORGANIC MATERIALS.

RUNOFF FROM WALKS AND ROOF DRAIN DOWNSPOUTS SHALL DISCHARGE ONTO SPLASH BLOCKS AND FLOW THROUGH ADJACENT LANDSCAPE AREA BEFORE ENTERING BIORETENTION BASINS

LANDSCAPING WITH DROUGHT TOLERANT SPECIES

HYDROLOGIC SOIL GROUP C

GROUND WATER DEPTH > 20FT

SLEF-MITIGATING DMA's

SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.

SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.

THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.

IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).

THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.

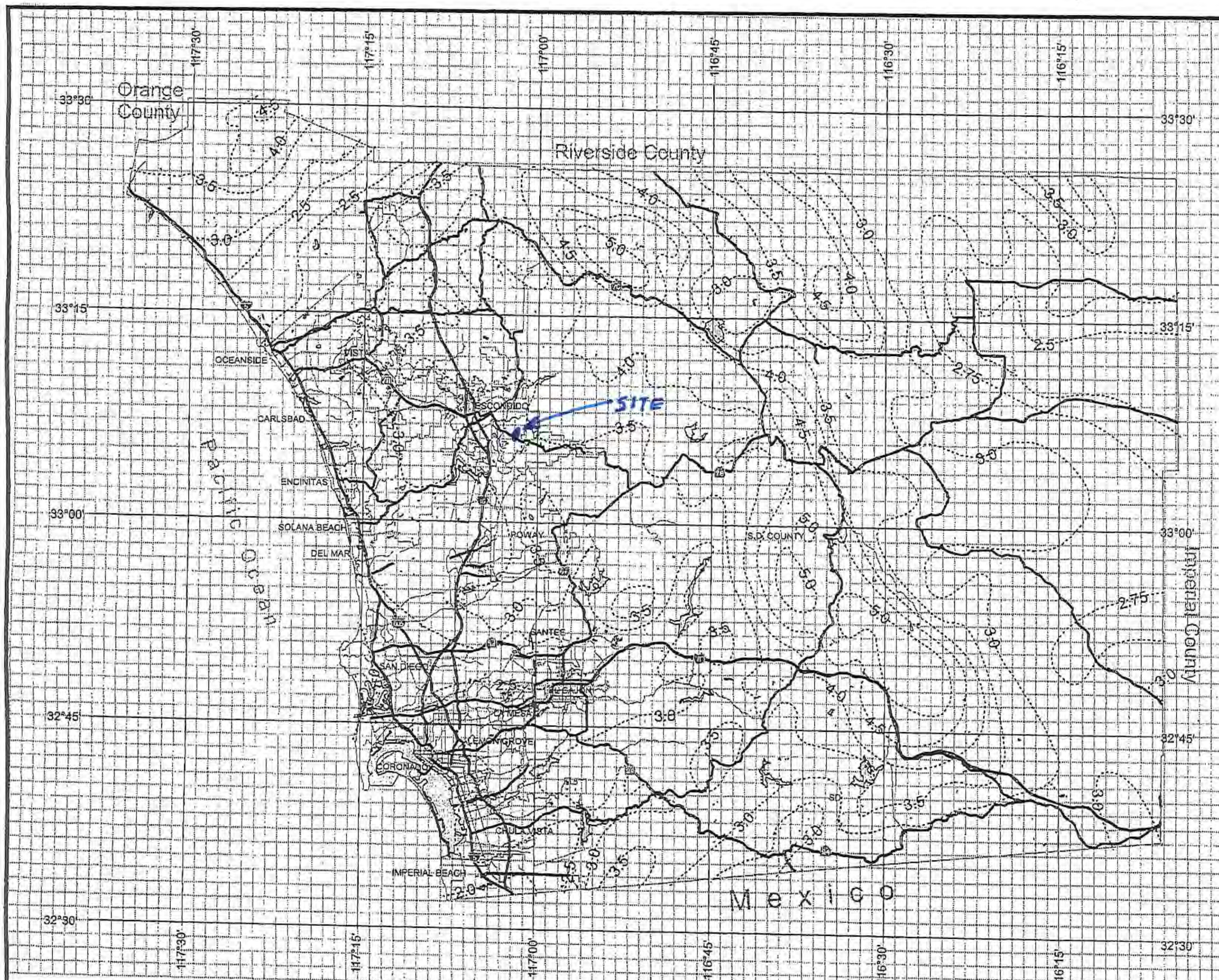
DMA	Post-project Surface Type	DMA Area (SF)	Drains to
1	Asphalt Road	26300	BMP #1
2	Asphalt Road	21020	BMP #2
3	Asphalt Road	29200	BMP #12
4	Asphalt Road	16580	BMP #6
5	Pad with 3500 sf Roof	12725	BMP #1
6	Landscape (self-mitigating)	22260	
7	Landscape (self-mitigating)	20050	
8	Landscape (self-mitigating)	14810	
9	Pad with 3500 sf Roof	21300	BMP #3
10	Pad with 3500 sf Roof	12410	BMP #4
11	Landscape (self-mitigating)	115033	
12	Pad with 3500 sf Roof	13110	BMP #7
13	Pad with 3500 sf Roof	19560	BMP #8
14	Landscape	17780	BMP #8
15	Pad with 3500 sf Roof	18625	BMP #9
16	Landscape	18100	BMP # 9
17	Pad with 3500 sf Roof	22135	BMP #10
18	Landscape	18280	BMP #10
19	Pad with 3500 sf Roof	21730	BMP #11
20	Pad with 3500 sf Roof	14035	BMP #12
21	Landscape (self-mitigating)	222140	
22	Pad with 3500 sf Roof	15420	BMP #12
23	Landscape (self-mitigating)	28880	
24	Pad with 3500 sf Roof	16325	BMP #5
25	Pad with 3500 sf Roof	8200	BMP #15
26	Pad with 3500 sf Roof	21675	BMP #13
27	Pad with 3500 sf Roof	9115	BMP #14
28	San Pasquall Valley Rd	10120	BMP #16

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SAN PASQUAL VALLEY ROAD

DMA/HMP EXHIBIT

JOB NO.: L321-01 DATE: 3-02-16



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

--------	Isopluvial (inches)

$P_{6\,100yr.} = 3.4$ in.

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N S E W

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

P_{24} 100 yr. = 7.0 in.

N W E S

3 0 3 Miles

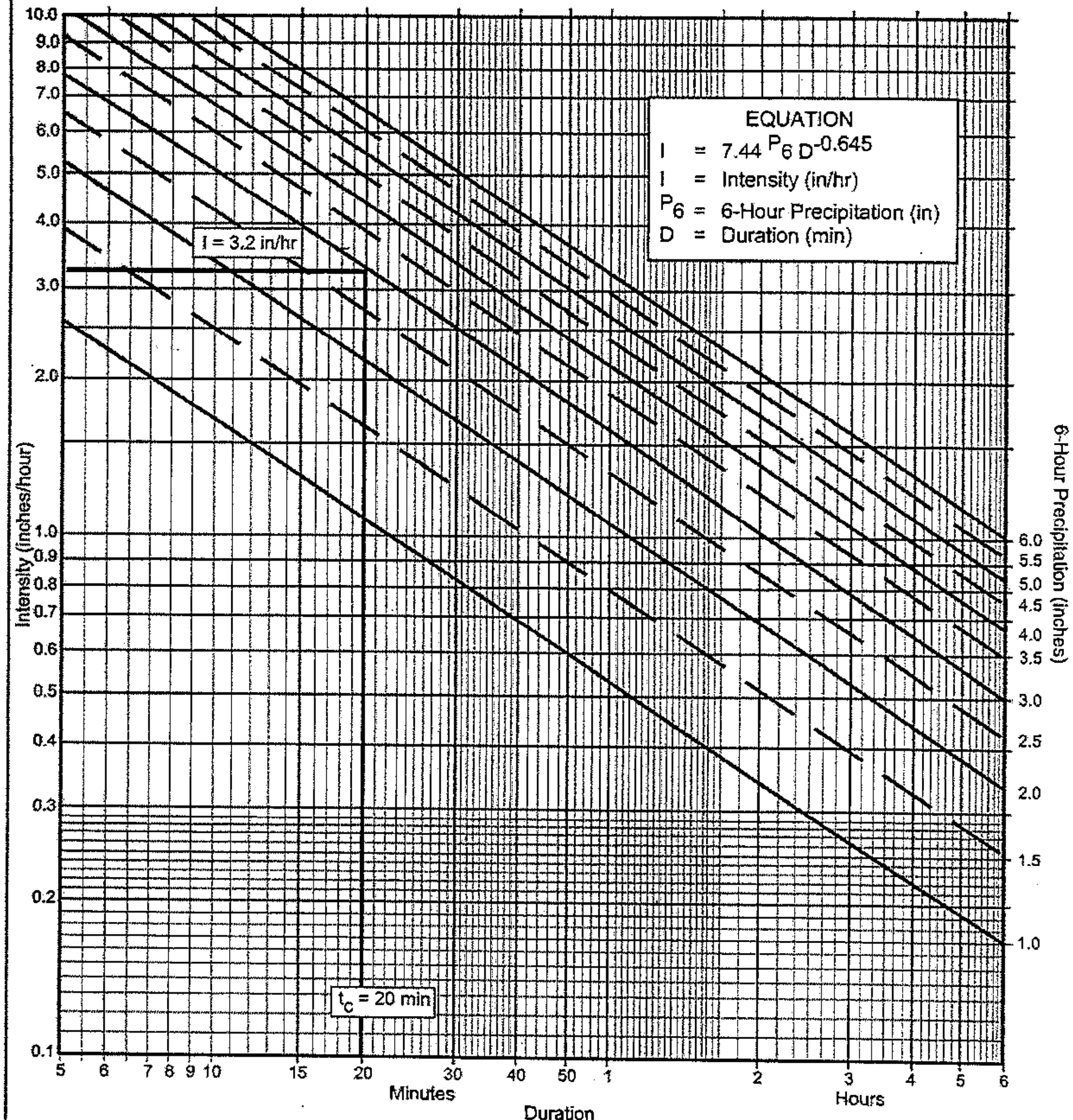
Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

NRCS = National Resources Conservation Service



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 50 year

(b) P_6 = 3 in., P_{24} = 5.5 , $\frac{P_6}{P_{24}}$ = 54.5 %[(2)]

(c) Adjusted $P_6^{(2)}$ = 3 in.

(d) t_x = 20 min.

(e) I = 3.2 in./hr.

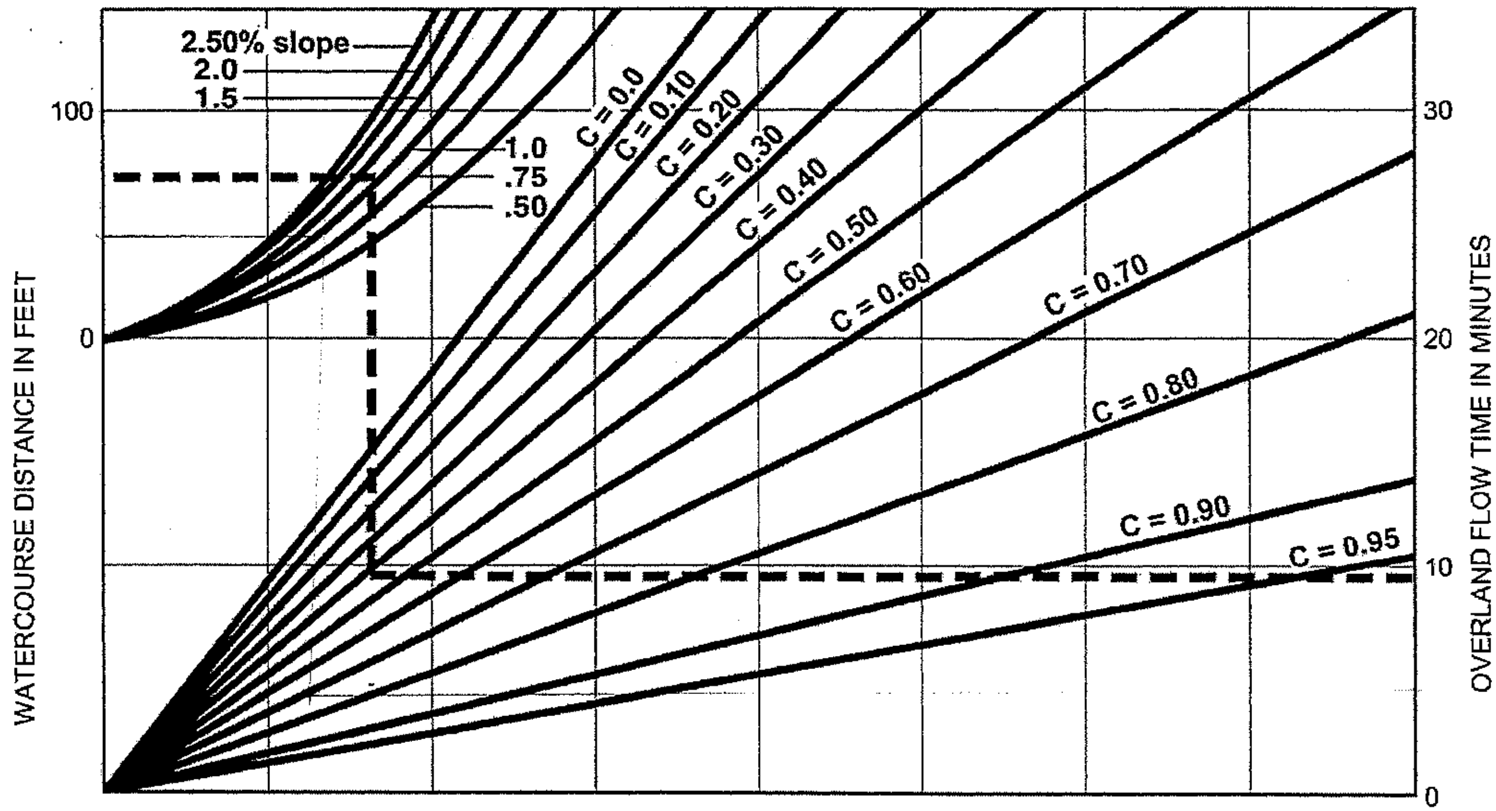
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Example

FIGURE

3-2



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

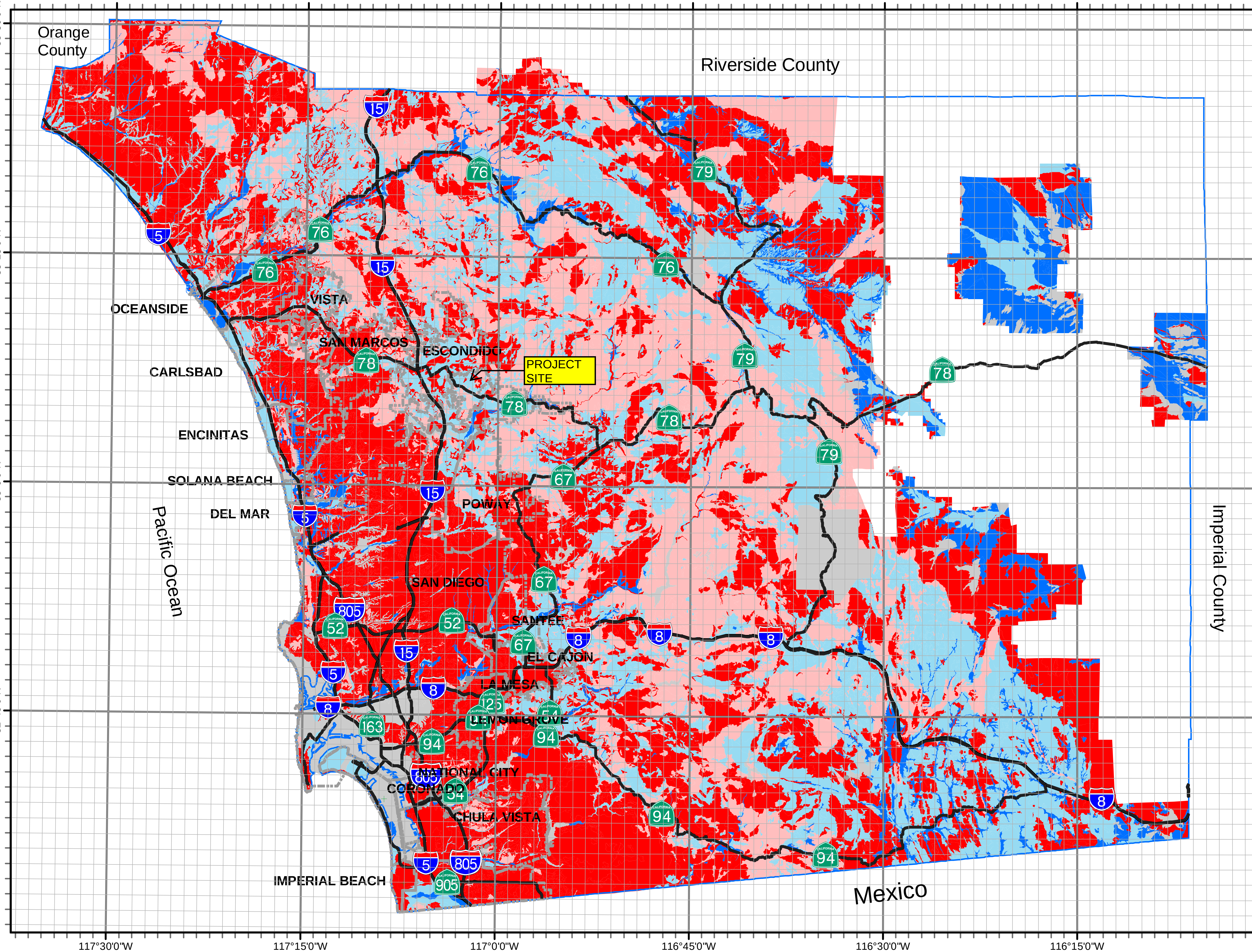
$$T = \frac{1.8\,(1.1 - C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE

3-3



County of San Diego Hydrology Manual Soil Hydrologic Group

Legend

- Major Roads
- Incorporated City Bdy

HYDROLOGIC SOIL GROUP

- Hydrologic Group Undefined
- Hydrologic Group A
- Hydrologic Group B
- Hydrologic Group C
- Hydrologic Group D
- No Soil Data

Note: Soil Data Source
USDA/NRCS
SSURGO Soils 2007

N

3 1.5 0 3 Miles

DPW GIS

SanGIS

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____________________________________________________________________________
___

****************************************************************************
***

             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2006 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 06/01/2005  License ID 1553

                           Analysis prepared by:



                                 LUNDSTROM




  ************************** DESCRIPTION OF STUDY
**************************
 * EXISTING 100 YEAR STORM EVENT
*
 *
*
 *
*

****************************************************************************
*

   FILE NAME: C:\321EX01.DAT
   TIME/DATE OF STUDY: 10:23 12/27/2019
 ---------------------------------------------------------------------------
----
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
----
   2003 SAN DIEGO MANUAL CRITERIA

   USER SPECIFIED STORM EVENT(YEAR) = 100.00
   6-HOUR DURATION PRECIPITATION (INCHES) =   3.400
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
0.01
   SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
```

```
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW
MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:
MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE
FACTOR
 NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)
(n)
 ===  =====  =========  =================  ======  ===== ====== =====
=======
   1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167
0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*


*************************************************************************
***
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 ------------------------------------------------------------------------
----
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=========================================================================
===
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1015.00
   DOWNSTREAM ELEVATION(FEET) =   1014.00
   ELEVATION DIFFERENCE(FEET) =      1.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.391
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    70.00
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.589
   SUBAREA RUNOFF(CFS) =      0.23
   TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.23


*************************************************************************
***
   FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =
845.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1265.00   CHANNEL SLOPE =  0.1336
   NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
   NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
   CHANNEL FLOW THRU SUBAREA(CFS) =       0.23
   FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   4.44   Tc(MIN.) =  14.84
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1365.00
FEET.


**************************************************************************
***
   FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  81
 -------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.442
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   17.00   SUBAREA RUNOFF(CFS) =   30.96
   TOTAL AREA(ACRES) =       17.1   TOTAL RUNOFF(CFS) =      31.14
   TC(MIN.) =  14.84


**************************************************************************
***
   FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  52
 -------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

==========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    845.00  DOWNSTREAM(FEET) =
725.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  2660.00   CHANNEL SLOPE =  0.0451
   CHANNEL FLOW THRU SUBAREA(CFS) =      31.14
   FLOW VELOCITY(FEET/SEC) =   7.19 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   6.17   Tc(MIN.) =  21.00
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =    4025.00
FEET.
```

```
**************************************************************************
***
   FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
 -------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.549
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =  113.00   SUBAREA RUNOFF(CFS) =  164.45
   TOTAL AREA(ACRES) =      130.1   TOTAL RUNOFF(CFS) =     189.33
   TC(MIN.) =  21.00


**************************************************************************
***
   FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  52
 -------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

==========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    725.00  DOWNSTREAM(FEET) =
680.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.00   CHANNEL SLOPE =  0.0409
   CHANNEL FLOW THRU SUBAREA(CFS) =     189.33
   FLOW VELOCITY(FEET/SEC) =  11.66 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =  22.58
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    5125.00
FEET.


**************************************************************************
***
   FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =  81
 -------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.388
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   52.20   SUBAREA RUNOFF(CFS) =   72.51
```

```
   TOTAL AREA(ACRES) =      182.3   TOTAL RUNOFF(CFS) =     253.23
   TC(MIN.) =  22.58


****************************************************************************
***
   FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  52
 ----------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

============================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =
650.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1020.00   CHANNEL SLOPE =  0.0294
   CHANNEL FLOW THRU SUBAREA(CFS) =     253.23
   FLOW VELOCITY(FEET/SEC) =  10.83 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =  24.15
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      6.00 =    6145.00
FEET.


****************************************************************************
***
   FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  81
 ----------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

============================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.244
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   33.10   SUBAREA RUNOFF(CFS) =   44.03
   TOTAL AREA(ACRES) =      215.4   TOTAL RUNOFF(CFS) =     286.51
   TC(MIN.) =  24.15


****************************************************************************
***
   FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  13
 ----------------------------------------------------------------------------
----
   >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<

============================================================================
===
```

```
**********************************************************************
***
   FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
 ---------------------------------------------------------------------
----
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

======================================================================
===
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
   UPSTREAM ELEVATION(FEET) =    851.00
   DOWNSTREAM ELEVATION(FEET) =    850.00
   ELEVATION DIFFERENCE(FEET) =      1.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.971
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.230
   SUBAREA RUNOFF(CFS) =      1.19
   TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.19


**********************************************************************
***
   FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  52
 ---------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

======================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =
750.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1760.00   CHANNEL SLOPE =  0.0568
   CHANNEL FLOW THRU SUBAREA(CFS) =       1.19
   FLOW VELOCITY(FEET/SEC) =   3.69 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   7.94   Tc(MIN.) =  14.91
   LONGEST FLOWPATH FROM NODE      7.00 TO NODE      9.00 =    1810.00
FEET.


**********************************************************************
***
   FLOW PROCESS FROM NODE      9.00 TO NODE      9.00 IS CODE =  81
 ---------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

======================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.427
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
```

```
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   15.40   SUBAREA RUNOFF(CFS) =   27.95
   TOTAL AREA(ACRES) =       15.8   TOTAL RUNOFF(CFS) =      28.68
   TC(MIN.) =  14.91


*************************************************************************
***
   FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

=========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =
680.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00   CHANNEL SLOPE =  0.0778
   CHANNEL FLOW THRU SUBAREA(CFS) =      28.68
   FLOW VELOCITY(FEET/SEC) =   9.22 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =  16.54
   LONGEST FLOWPATH FROM NODE      7.00 TO NODE     10.00 =    2710.00
FEET.


*************************************************************************
***
   FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
 ------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.141
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   11.50   SUBAREA RUNOFF(CFS) =   19.52
   TOTAL AREA(ACRES) =       27.3   TOTAL RUNOFF(CFS) =      46.35
   TC(MIN.) =  16.54

=========================================================================
===
   END OF STUDY SUMMARY:
   TOTAL AREA(ACRES)     =       27.3  TC(MIN.) =     16.54
   PEAK FLOW RATE(CFS)   =      46.35

=========================================================================
===
```

==
===

END OF RATIONAL METHOD ANALYSIS

Proposed Condition Analysis

```
____________________________________________________________________________
___

****************************************************************************
***

             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2006 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 06/01/2005  License ID 1553

                           Analysis prepared by:



                                 LUNDSTROM





  ************************** DESCRIPTION OF STUDY
**************************
 * PROPOSED 100 YEAR STORM.
*
 *
*
 *
*

****************************************************************************
*

   FILE NAME: C:\321PR100.DAT
   TIME/DATE OF STUDY: 11:01 12/30/2019
 ---------------------------------------------------------------------------
----
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
----
   2003 SAN DIEGO MANUAL CRITERIA

   USER SPECIFIED STORM EVENT(YEAR) = 100.00
   6-HOUR DURATION PRECIPITATION (INCHES) =   3.400
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
0.01
   SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
```

```
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW
MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:
MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE
FACTOR
 NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)
(n)
 ===  =====  =========  =================  ======  ===== ====== =====
=======
   1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167
0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*


*************************************************************************
***
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 ------------------------------------------------------------------------
----
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=========================================================================
===
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
   UPSTREAM ELEVATION(FEET) =   1015.00
   DOWNSTREAM ELEVATION(FEET) =   1014.00
   ELEVATION DIFFERENCE(FEET) =      1.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.391
   WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
            THE MAXIMUM OVERLAND FLOW LENGTH =    70.00
            (Reference: Table 3-1B of Hydrology Manual)
            THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.589
   SUBAREA RUNOFF(CFS) =      0.23
   TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.23


*************************************************************************
***
   FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =   1014.00  DOWNSTREAM(FEET) =
845.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1265.00   CHANNEL SLOPE =  0.1336
   NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
   NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
   CHANNEL FLOW THRU SUBAREA(CFS) =       0.23
   FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   4.44   Tc(MIN.) =  14.84
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1365.00
FEET.


**************************************************************************
***
   FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  81
 -------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.442
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   17.00   SUBAREA RUNOFF(CFS) =   30.96
   TOTAL AREA(ACRES) =       17.1   TOTAL RUNOFF(CFS) =      31.14
   TC(MIN.) =  14.84


**************************************************************************
***
   FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  52
 -------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

==========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    845.00  DOWNSTREAM(FEET) =
725.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  2660.00   CHANNEL SLOPE =  0.0451
   CHANNEL FLOW THRU SUBAREA(CFS) =      31.14
   FLOW VELOCITY(FEET/SEC) =   7.19 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   6.17   Tc(MIN.) =  21.00
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =    4025.00
FEET.
```

```
**********************************************************************
***
   FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
 ---------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

======================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.549
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =  113.00   SUBAREA RUNOFF(CFS) =  164.45
   TOTAL AREA(ACRES) =      130.1   TOTAL RUNOFF(CFS) =     189.33
   TC(MIN.) =  21.00


**********************************************************************
***
   FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  52
 ---------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

======================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    725.00  DOWNSTREAM(FEET) =
680.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.00   CHANNEL SLOPE =  0.0409
   CHANNEL FLOW THRU SUBAREA(CFS) =     189.33
   FLOW VELOCITY(FEET/SEC) =  11.66 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =  22.58
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    5125.00
FEET.


**********************************************************************
***
   FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =  81
 ---------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

======================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.388
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   52.20   SUBAREA RUNOFF(CFS) =   72.51
```

```
   TOTAL AREA(ACRES) =      182.3   TOTAL RUNOFF(CFS) =     253.23
   TC(MIN.) =  22.58

*************************************************************************
***
   FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

=========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =
650.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1020.00   CHANNEL SLOPE =  0.0294
   CHANNEL FLOW THRU SUBAREA(CFS) =     253.23
   FLOW VELOCITY(FEET/SEC) =  10.83 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =  24.15
   LONGEST FLOWPATH FROM NODE      1.00 TO NODE      6.00 =    6145.00
FEET.

*************************************************************************
***
   FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  81
 ------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.244
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   19.60   SUBAREA RUNOFF(CFS) =   26.07
   TOTAL AREA(ACRES) =      201.9   TOTAL RUNOFF(CFS) =     268.55
   TC(MIN.) =  24.15

*************************************************************************
***
   FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  81
 ------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.244
   USER-SPECIFIED RUNOFF COEFFICIENT = .4600
```

```
   S.C.S. CURVE NUMBER (AMC II) =  84
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4131
   SUBAREA AREA(ACRES) =   13.50   SUBAREA RUNOFF(CFS) =   20.15
   TOTAL AREA(ACRES) =      215.4   TOTAL RUNOFF(CFS) =     288.70
   TC(MIN.) =  24.15

*************************************************************************
***
   FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  13
 ------------------------------------------------------------------------
----
   >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<

=========================================================================
===


*************************************************************************
***
   FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
 ------------------------------------------------------------------------
----
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=========================================================================
===
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
   UPSTREAM ELEVATION(FEET) =    851.00
   DOWNSTREAM ELEVATION(FEET) =    850.00
   ELEVATION DIFFERENCE(FEET) =      1.00
   SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.971
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.230
   SUBAREA RUNOFF(CFS) =      1.19
   TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.19


*************************************************************************
***
   FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

=========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =
750.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =  1760.00   CHANNEL SLOPE =  0.0568
   CHANNEL FLOW THRU SUBAREA(CFS) =       1.19
```

```
   FLOW VELOCITY(FEET/SEC) =   3.69 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   7.94   Tc(MIN.) =  14.91
   LONGEST FLOWPATH FROM NODE      7.00 TO NODE      9.00 =    1810.00
FEET.


*************************************************************************
***
   FLOW PROCESS FROM NODE      9.00 TO NODE      9.00 IS CODE =  81
 ------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.427
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =   15.40   SUBAREA RUNOFF(CFS) =   27.95
   TOTAL AREA(ACRES) =       15.8   TOTAL RUNOFF(CFS) =      28.68
   TC(MIN.) =  14.91


*************************************************************************
***
   FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  52
 ------------------------------------------------------------------------
----
   >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA<<<<<

=========================================================================
===
   ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =
680.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00   CHANNEL SLOPE =  0.0778
   CHANNEL FLOW THRU SUBAREA(CFS) =      28.68
   FLOW VELOCITY(FEET/SEC) =   9.22 (PER LACFCD/RCFC&WCD HYDROLOGY
MANUAL)
   TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =  16.54
   LONGEST FLOWPATH FROM NODE      7.00 TO NODE     10.00 =    2710.00
FEET.


*************************************************************************
***
   FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
 ------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.141
   USER-SPECIFIED RUNOFF COEFFICIENT = .4100
   S.C.S. CURVE NUMBER (AMC II) =  82
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4100
   SUBAREA AREA(ACRES) =    6.70   SUBAREA RUNOFF(CFS) =   11.38
   TOTAL AREA(ACRES) =       22.5   TOTAL RUNOFF(CFS) =      38.20
   TC(MIN.) =  16.54


**************************************************************************
***
   FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
 -------------------------------------------------------------------------
----
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========================================================================
===
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.141
   USER-SPECIFIED RUNOFF COEFFICIENT = .4600
   S.C.S. CURVE NUMBER (AMC II) =  84
   AREA-AVERAGE RUNOFF COEFFICIENT = 0.4188
   SUBAREA AREA(ACRES) =    4.80   SUBAREA RUNOFF(CFS) =    9.14
   TOTAL AREA(ACRES) =       27.3   TOTAL RUNOFF(CFS) =      47.34
   TC(MIN.) =  16.54

==========================================================================
===
   END OF STUDY SUMMARY:
   TOTAL AREA(ACRES)     =       27.3  TC(MIN.) =     16.54
   PEAK FLOW RATE(CFS)   =      47.34

==========================================================================
===

==========================================================================
===
   END OF RATIONAL METHOD ANALYSIS
```

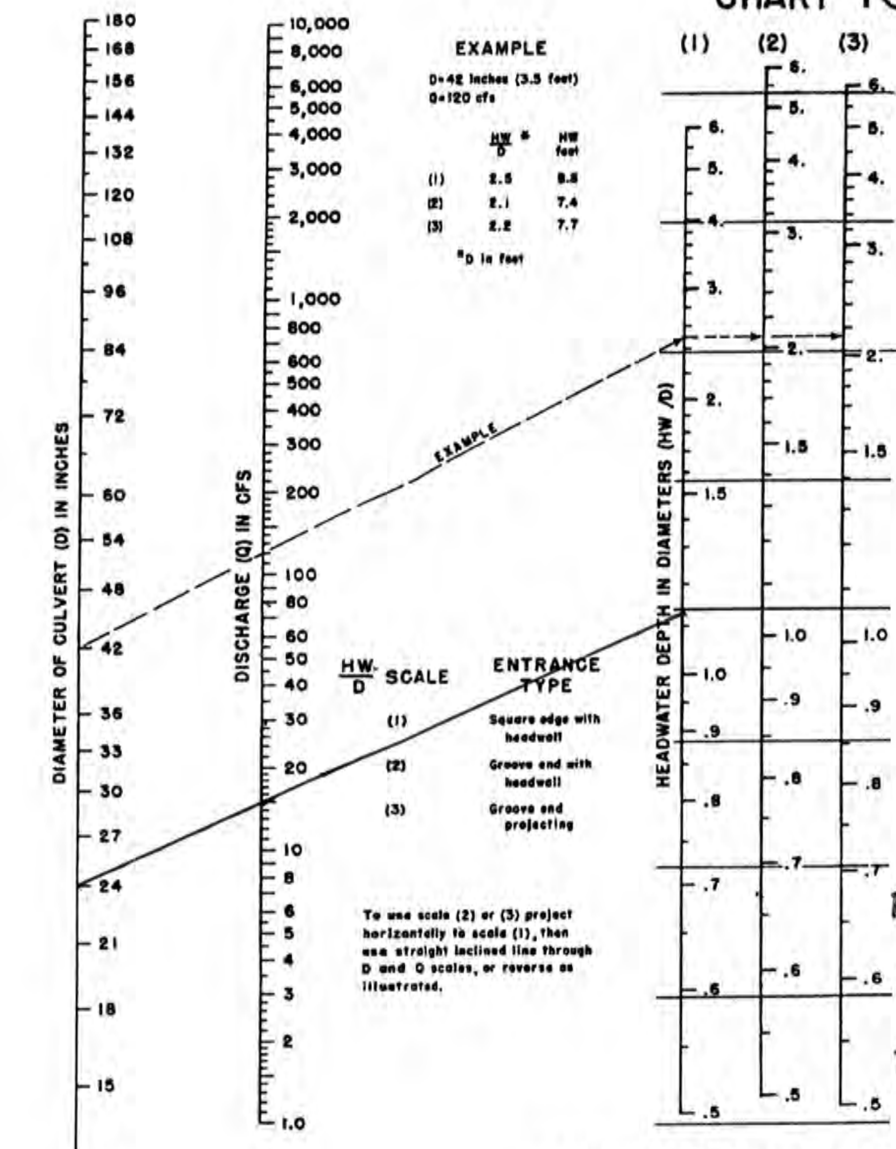
DUAL 24" RCP CULVERT

@ NODE 8, NE EMERGENCY ACCESS ROAD

Q_{100} = 30 cfs

15 cfs per 24" RCP

CHART 1



Hw/D = 1.15

Hw = 2.3'

FL upstream = 735.0

FL downstream = 734.0

Road elev. = 739.0

Hw elev = 737.2

Freeboard = 1.8'

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3 REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

This page was left intentionally blank.

ADVANCED GEOTECHNICAL SOLUTIONS, INC.
485 Corporate Drive, Suite B
Escondido, CA 92029
Telephone: (619) 867-0487

Lundstrom Engineering and Surveying, Inc.
5333 Mission Center Rd. Suite 115
San Diego, CA 92108

July 27, 2016
P/W 1602-06
Report No. 1602-06-B-3

Attention: **Mr. Jeff Lundstrom**

Subject: ***Preliminary Geotechnical Investigation, 2260 San Pasqual Valley Road Project, County of San Diego, California***

References: **See Appendix A**

Gentlemen:

Pursuant to your request Advanced Geotechnical Solutions, Inc. (AGS) has prepared this preliminary geotechnical investigation of the 2260 San Pasqual Valley Road Project, located in San Diego County, California. Based upon our conversations, review of available documents and plans, AGS understands that the project will be developed to support fourteen single-family residences.

The recommendations presented herein are based on a review of available geologic and geotechnical literature and maps pertinent to the proposed construction, the results of our recent subsurface exploration at the project site, associated laboratory testing, and our general experience in the area. Included in this report are: 1) engineering characteristics of the onsite soils; 2) discussion of the onsite geologic units; 3) limited geologic hazard analysis; 4) grading recommendations; and 5) geotechnical design recommendations for the proposed building, retaining walls and associated surface improvements.

AGS appreciates the opportunity to provide you with geotechnical consulting services and professional opinions. If you have any questions, please contact the undersigned at (619) 867-0487.

Respectfully Submitted,

PHILLIP W. MADRID, EIT
Staff Engineer

JOHN J. DONOVAN, Vice President
RCE 65051 / RGE 2790, Reg. Exp. 6-30-17

PAUL J. DERISI, Vice President
CEG 2536, Reg. Exp. 5-31-17

Distribution: (3) Addressee
Attachments:
Figure 1 – Site Location Map
Plate 1– Geologic Map and Exploration Location Plan

Appendix A – References
Appendix B – Field Data
Appendix C - Laboratory Data
Appendix D – Percolation Test Data
Appendix E – General Earthwork Specifications & Grading Details
Appendix F – Homeowners Maintenance Guidelines

Preliminary Geotechnical Investigation
2260 San Pasqual Valley Road Project
County Of San Diego, California

1.0 SCOPE OF SERVICES

This study is aimed at providing geotechnical information as it relates to: 1) existing site soil conditions; 2) discussion of the geologic units onsite; 3) limited geologic hazard analysis; 4) engineering characteristics of the onsite soils; 5) excavation characteristics of earth materials; 6) preliminary geotechnical design for the proposed structures and associated improvements.

The scope of our study included the following tasks:

- Review of pertinent published and unpublished geologic and geotechnical literature, maps, and aerial photographs.
- Excavate, log and sample twelve excavator test pits (T-1 through T-12) at selected locations within the limits of the proposed development.
- Excavate fourteen percolation test borings (P-1 through P-14) utilizing a backhoe with flight auger attachment and conduct percolation tests to evaluate the feasibility of onsite wastewater disposal systems.
- Laboratory testing including maximum density, expansion potential, grain size analysis, and remolded shear strength testing.
- Prepare a plan depicting the onsite geologic contacts, percolation test boring and excavator pit locations, utilizing the 80-scale Preliminary Design Study plan prepared by Lundstrom Engineering and Surveying, Inc. (Plate 1).
- Conduct a geotechnical and geologic hazard analysis of the site.
- Develop general remedial grading recommendations for unsuitable soils and determine overexcavation recommendations for cut/bedrock areas.
- Evaluate presence of suitable capping materials and rippability of onsite bedrock.
- Conduct a limited seismicity analysis.
- Determine site specific seismic design parameters for use in the structural design.
- Determine design parameters of onsite soils as a foundation medium including bearing and friction values for foundation soils.
- Preparation of this geotechnical report with exhibits summarizing our findings. This report is suitable for design, contractor bidding, and regulatory review.

2.0 GEOTECHNICAL STUDY LIMITATIONS

The conclusions and recommendations in this report are professional opinions based on the data developed during this study.

The materials immediately adjacent to or beneath those observed may have different characteristics than those observed. No representations are made as to the quality or extent of materials not observed. Any evaluation regarding the presence or absence of hazardous material is beyond the scope of this firm's services.

3.0 SITE LOCATION AND DESCRIPTION

The irregular shaped site encompasses approximately 17 acres and is located in the County of San Diego, California. The site is bounded to the south by San Pasqual Valley Road (Highway 78), to the west by a southwesterly trending drainage, and to the north and east by existing single-family residential properties. In general, the site exhibits moderately sloping topography toward the south and west, with a hill in the central portion of the site. Approximate elevations within the overall site limits range from a low elevation of 655 msl at the southwesterly boundary to a high of 770 msl near the northeasterly boundary. The site currently supports an existing single-family residence on the hill in the central portion of the site, and the rest of the site is currently vacant and undeveloped with the exception of a few dirt roads. The site is covered with a light to moderate growth of weeds and grass with localized small trees and bushes. Evidence of previous agricultural use was noted during our field explorations.

4.0 PROPOSED DEVELOPMENT

Current conceptual plans by Lundstrom Engineering and Surveying, Inc., call for the site to be graded to fourteen (14) lots for single-family residences along with associated streets and improvements. Based on these plans and our conversations with the civil engineer, the maximum heights of cut slopes and fill slopes are anticipated to be on the order of 10 feet. The highest proposed cuts and fills are anticipated to be on the order of 15 feet.

5.0 FIELD AND LABORATORY INVESTIGATION

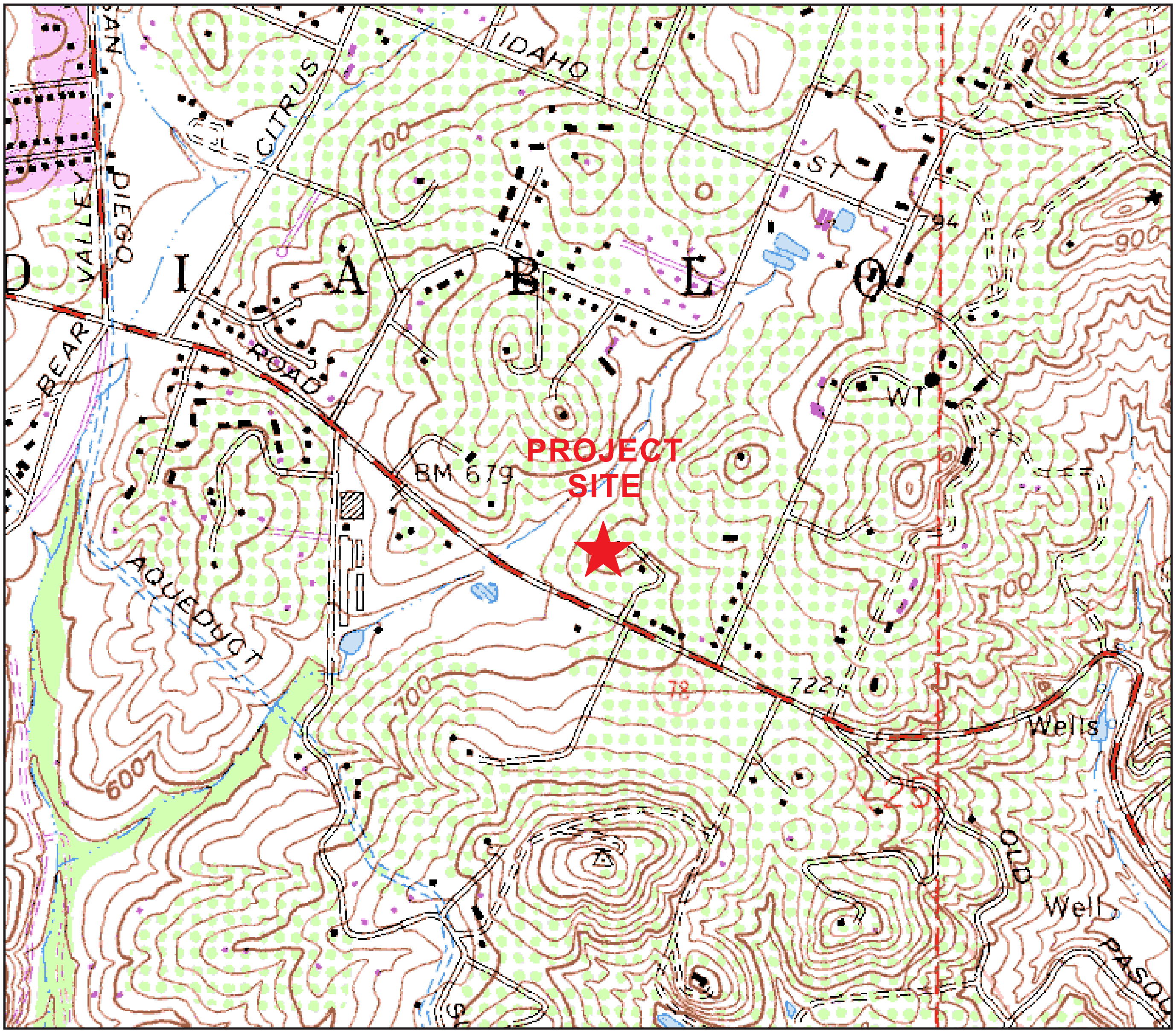
5.1. Current Study

As part of the current study, AGS excavated, logged, and sampled 12 excavator test pits with a Cat 328 excavator (approximate weight of 80,000lb). The depths ranged from 7.5 to 18.5 feet below ground surface. Logs of these test pits are presented in Appendix B.

AGS also excavated 14 percolation test borings with a backhoe equipped with a 12-inch diameter flight auger at predetermined locations onsite, as shown on Plate 1. AGS conducted percolation testing in accordance with the San Diego County Design Manual for Onsite Wastewater Treatment Systems. Results and calculations are presented in Appendix D. A summary of the percolation test results are presented in Section 7.10 below and a separate forthcoming report will present a more detailed discussion of the feasibility of onsite wastewater treatment systems for the proposed development.

5.2. Laboratory Testing

Laboratory testing was conducted on representative bulk samples obtained from the subsurface excavations. Testing consisted of expansion testing, maximum density and optimum moisture content, remolded direct shear strength testing, and grain size analyses. The results of laboratory testing are presented in Appendix C.



SITE LOCATION MAP
2260 SAN PASQUAL VALLEY ROAD
SAN DIEGO COUNTY, CALIFORNIA

N

1" = 100'
(approx.)

P/W 1602-06

FIGURE 1

SOURCE MAP - TOPOGRAPHIC MAP OF THE
ESCONDIDO 7.5 MINUTE QUADRANGLE,
SAN DIEGO COUNTY, CALIFORNIA

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.
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6.0 ENGINEERING GEOLOGY

6.1. Regional Geologic and Geomorphic Setting

The subject site is situated within the western portion of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges province occupies the southwestern portion of California, extending southward from the Transverse Ranges and Los Angeles Basin to the southern tip of Baja California. In general the province consists of young, steeply sloped, northwest trending mountain ranges underlain by Late Jurassic to Early Cretaceous-age metavolcanic and metasedimentary rock and Cretaceous-age igneous plutonic rock of the Peninsular Ranges Batholith. The westernmost portion of the province is predominantly underlain by younger marine and non-marine sedimentary rocks. The Peninsular Ranges' dominant structural feature is northwest-southeast trending crustal blocks bounded by active faults of the San Andreas transform system.

6.2. Site Geology

Published regional geologic maps indicate the site is underlain by Mid-Cretaceous Granodiorite of Woodson Mountain. For the purposes of this report, the simple nomenclature of "granitic rock" will be used. This unit is mantled by relatively thin veneers of surficial soils including undocumented artificial fill, older alluvium, colluvium and topsoil. The following section contains a summary of the soil and bedrock units encountered onsite. The approximate distribution of these units are shown on Plate 1. Description of these geologic units, as observed during our investigation, are presented below. Test pit logs are presented in Appendix B.

6.2.1. Artificial Fill-undocumented (afu)

Undocumented artificial fill soils were encountered in test pit T-12 to a depth of 4.5 feet and are anticipated to exist locally at the site in relation to previous site improvements and agricultural activities.. As encountered these materials can generally be described as dark brown silty sand with some cobbles and small boulders in a generally dry to slightly moist and loose to moderately dense condition.

6.2.2. Topsoil (No map symbol)

A thin veneer of topsoil was encountered in test pits throughout the site. As encountered, these materials can generally be described as brown, silty sand in a dry and loose condition. The topsoil ranged from 0.5 to 1.5 feet in thickness.

6.2.3. Colluvium (Qcol)

A relatively thin veneer colluvium mantles a majority of the project site and was encountered the majority of the test pits. The colluvium can generally be described as reddish brown, silty sand with some gravel and cobble, in a dry to slightly moist and loose to moderately dense condition. The colluvium ranged from 2.5 to 5.5 feet in thickness.

6.2.4. Older Alluvium (Qoa)

Older alluvium was encountered to a depth of 16 feet in test pit T-1 and consisted of dark red brown silty to clayey sand with interbedded sandy clay. As encountered, the older alluvium was slightly moist to moist and moderately dense.

6.2.5. Granitic Rock (Kgr)

Granitic bedrock was encountered at depth across the site. This unit typically exhibited a completely weathered zone of residual soil on the order of 2 to 3 feet thick, becoming less weathered with depth. As encountered, these materials are moderately soft to very hard, generally reducing to soil and gravel-size fragments in the highly weathered zones and 12-inch minus in the moderately weathered zones. The excavator encountered refusal in the granitic rock at depths between 7.5 feet and 17.5 feet during our investigation.

6.3. Groundwater

Groundwater was not encountered in our exploratory excavations, nor was groundwater observed on site. No natural groundwater condition is known to exist at the site that would impact the proposed site development.

It should be noted that localized perched groundwater may develop at a later date, most likely at or near fill/bedrock contacts, due to fluctuations in precipitation, irrigation practices, or factors not evident at the time of our field explorations.

6.4. Geologic Hazards

6.4.1. Landslides

No landslides have been mapped at the site. No topographic features were observed at the site that would indicate existing landslides. In addition, given the hard nature of the granitic rock, the potential for landsliding is considered very low.

6.4.2. Flooding

According to available FEMA maps, the site is not in a FEMA identified flood hazard area.

6.4.3. Subsidence/Ground Fissuring

Due to the presence of the hard underlying granitic rock and the proposed compacted fill that will be placed during grading activities, the potential for subsidence and ground fissuring due to settlement is very low.

6.5. Seismic Hazards

The site is located in the tectonically active Southern California area, and will therefore likely experience shaking effects from earthquakes. The type and severity of seismic hazards affecting the site are to a large degree dependent upon the distance to the causative fault, the intensity of the seismic event, and the underlying soil characteristics. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary, such as liquefaction or dynamic settlement. The following is a site-specific discussion of ground motion parameters, earthquake-induced landslide hazards, settlement, and liquefaction. The purpose of this analysis is to identify potential seismic hazards and propose mitigations, if necessary, to reduce the hazard to an acceptable level of risk.

6.5.1. Surface Fault Rupture

No faults have been mapped within the project site. The nearest known active fault to the site is the Newport-Inglewood-Rose Canyon fault zone which is approximately 18 miles southwest of the project site. Accordingly, the potential for fault surface rupture on the subject site is very low. This conclusion is based on literature review and aerial photographic analysis.

6.5.2. Seismicity

As noted, the site is within the tectonically active southern California area, and is approximately 18 miles from the Newport-Inglewood-Rose Canyon fault zone. The potential exists for strong ground motion that may affect future improvements.

At this point in time, non-critical structures (commercial, residential, and industrial) are usually designed according to the California Building Code (2013) and that of the controlling local agency.

6.5.3. Liquefaction

Due to the hard granitic rock that underlies the site, and given the lack of shallow groundwater at the site, and the dense compacted fill that will be placed during grading, the potential for liquefaction at the site is very low.

6.5.4. Dynamic Settlement

Dynamic settlement occurs in response to an earthquake event in loose sandy earth materials. Given the fact that hard granitic rock underlies the site, and the proposed removals, the potential for dynamic settlement is considered to be remote.

6.5.5. Seismically Induced Landsliding

Evidence of landsliding at the site was not observed during our field explorations, nor were any geomorphic features indicative of landslides noted during our review of aerial photos and published geologic maps. The granitic rock at the site is not usually susceptible to seismically induced landsliding. Therefore, the potential for landslides to impact the proposed development is low.

7.0 GEOTECHNICAL ENGINEERING

Presented herein is a general discussion of the geotechnical properties of the various soil types and the analytic methods used in this report.

7.1. Excavation Characteristics

Based on our subsurface investigation and previous experience with similar projects near the subject site, it is anticipated that excavations within the undocumented artificial fill, topsoil, colluvium, Older Alluvium, and the completely- to highly-weathered portions of the granitic bedrock can be accomplished with conventional equipment. It is likely that oversized "float" will be encountered in surface outcrops and shallow cuts which will require special handling. Deeper cuts within the granitic rock will require specialized equipment, such as large excavators equipped with hoe rams, D-9 bulldozer with a single shank ripper and/or blasting to efficiently excavate to the proposed grades and overexcavation grades. In addition, where proposed underground utilities are located in hard rock areas, overexcavation during grading is recommended to facilitate the installation of wet and dry utilities.

7.1.1. Rippability

As a means to characterize the excavateability/rippability of the granitic bedrock, twelve (12) test pits (T-1 through T-12) were excavated with a Caterpillar 328 tracked excavator (~80,000 lbs.). Logs of these excavations are presented in Appendix B. Based on these excavator test pit excavations and AGS's experience with grading of other sites in similar bedrock, the hard rock conditions encountered at the project site will likely require very heavy ripping, specialized grading techniques (Hoe-Rams, Breakers, etc.) and/or localized blasting at depths where the excavator encountered refusal. Typically this depth ranges from seven and one-half (7.5) to seventeen and one-half (17.5) feet below existing ground surface. The shallowest refusal depths encountered were in test pits T-3 and T-6 located in the westerly and northerly portions of the site. In addition, several hard rock outcrops were observed in the northerly and northwesterly portions of the site.

Oversized materials will be generated from cuts in the bedrock and these oversized materials should be handled as discussed in Section 8.4. Recommended undercuts to remove hard rock from the near pad grade and within utility alignments are presented in Section 8.5.

7.2. Groundwater

Groundwater is not anticipated to impact the proposed site improvements.

7.3. Compressibility

Onsite the undocumented artificial fill, topsoil, colluvium, weathered older alluvium, and highly weathered formational materials are considered to be moderately compressible in their present condition. These materials should be removed and recompacted within structural fill areas. The proposed compacted fill will have low compressibility.

7.4. Earthwork Adjustments

Table 7.4 summarizes estimated bulk/shrink factors which should be used by the design engineer for earthwork balance estimates. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in progress and actual conditions are better defined.

TABLE 7.4 Earthwork Adjustment Factors	
Geologic Unit	**Adjustment Factor**
Undocumented Artificial Fill/Topsoil	Shrink 5%-10%
Colluvium/Weathered Older Alluvium	Shrink 5%-10%
Granitic Rock	Bulk 15 to 20%

7.5. Collapse Potential/Hydro-Consolidation

Given the hard and dense granitic rock below the site and the fact that the topsoil, colluvium, and undocumented artificial fill will be removed, the potential for hydro-consolidation is considered remote at the subject site.

7.6. Expansion Potential

As part of our investigation, representative bulk samples of near surface soils were collected and tested to evaluate their potential for expansion. Testing was performed in general accordance with ASTM D 4829. Test results by AGS indicate that the soils tested possess an expansion index (EI) within the range of 14 to 55, which corresponds to a "Low" to "Medium" expansion potential. Post-grading testing should be conducted to define as-graded expansive soil characteristics. The results of those tests and the final as-graded conditions will govern design of foundations and street pavement sections.

7.7. Shear Strength

Shear strength testing was conducted on "re-molded" samples of the onsite soils. Based upon our test results and familiarity with the onsite geologic units, AGS has summarizes the recommended shear strengths in Table 7.7 for the various geologic units and compacted fill onsite.

TABLE 7.7 SHEAR STRENGTH		
Material	**Cohesion (psf)**	**Friction Angle (degrees)**
Compacted Fill	100	32
Older Alluvium	200	30
Granitic Rock	400	36

7.8. Chemical/Resistivity Test Results

Corrosivity testing was not performed as part of this investigation. Based on our observations and experience with similar projects, the onsite soils are anticipated to possess a "negligible" sulfate exposure condition when classified in accordance with ACI 318-11 Table 4.2.1 (per 2013 CBC). The soils are also anticipated to be “low to moderately” corrosive to metals in contact with those soils. Final determination should be based upon post-graded testing of near-surface soils. Determination as to the need and specification for protection of metal construction materials should be determined by engineers(s) specializing in corrosion analysis.

7.9. Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formulas presented in *NAVFAC DM-7.1*. Allowable bearing was determined by applying a factor of safety of at least three (3) to the ultimate bearing capacity.

Static lateral earth pressures were calculated using *Rankine* methods for active and passive cases. If it is desired to use *Coulomb* forces, a separate analysis specific to the application can be conducted.

7.10. Permeability/Percolation Characteristics

AGS conducted a limited percolation study to evaluate the feasibility of the site for use of onsite wastewater treatment systems. Testing was conducted in general conformance with the San Diego County DEH Design Manual (2013).

One percolation test hole was excavated at each lot (P-1 through P-14) at the approximate locations depicted on Plate 1. Holes were approximately twelve inches in diameter and three to four feet deep. The sides and bottoms of the holes were cleaned and pre-soaked overnight. Holes were filled with approximately 12 to 14 inches of water and allowed to drop for 30 minutes. Testing continued with readings every 30 minutes for approximately 4 hours until rates stabilized.

Preliminary percolation rates ranged from 8 to 48 minutes per inch. A summary of results is presented in Table 7.10 below.

TABLE 7.10
Preliminary Percolation Rates

Percolation Test Boring	Percolation Rate (minutes per inch)		Percolation Test Boring	Percolation Rate (minutes per inch)
P-1	13		P-8	8
P-2	10		P-9	18
P-3	48		P-10	18
P-4	12		P-11	13
P-5	11		P-12	26
P-6	20		P-13	8
P-7	9		P-14	10

8.0 GRADING RECOMMENDATIONS

Based on the information presented it is the opinion of AGS that the proposed development is feasible from a geotechnical point of view. All grading shall be accomplished under the observation and testing of the project Geotechnical Consultant in accordance with the recommendations contained herein, the current codes practiced by the County of San Diego and this firm's Earthwork Specifications (Appendix E).

8.1. Site Preparation

Existing vegetation, trash, debris, and other deleterious materials should be removed and wasted from the site prior to commencing removal of unsuitable soils and placement of compacted fill materials.

8.2. Unsuitable Soils Removals

All topsoil/residual soil, colluvium, and highly weathered formational materials, and any undocumented fill will require removal in structural areas. It is anticipated that the depth of removals across the site will generally range from a 4 to 6 feet. Localized areas may require deeper removals. Minimally the removals should extend a lateral distance of at least 5 feet beyond the limits of settlement sensitive structures or the building pad, whichever is greater. If deeper removals are performed, the removals should extend a lateral distance equal to the depth of removal beyond the improvement limits. Removal bottoms should expose competent formational materials in a firm and unyielding condition. The resulting removal bottoms should be observed by a representative of AGS to verify that adequate removal of unsuitable materials have been conducted prior to fill placement.

In general, soils removed during remedial grading will be suitable for reuse in compacted fills, provided they are properly moisture conditioned and do not contain deleterious materials. Grading shall be accomplished under the observation and testing of the project soils engineer and engineering geologist or their authorized representative in accordance with the recommendations contained herein, the current grading ordinance of the County of San Diego.

8.3. Earthwork Considerations

8.3.1. Compaction Standards

All fills should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557. Prior to the placement of fill, the upper 6 to 8 inches should be ripped, moisture conditioned to optimum moisture or slightly above optimum, and compacted to a minimum of 90 percent of the maximum dry density (ASTM D1557). For roadways/driveway areas and other flatwork subjected to vehicular loading, a minimum compaction standard of 95 percent of the laboratory maximum dry density should be used within the upper 12 inches.

8.3.2. Treatment of Removal Bottoms

At the completion of unsuitable soil removals, the exposed bottom should be scarified to a minimum depth of eight inches, moisture conditioned to above optimum moisture and compacted in-place to the standards set forth in this report.

8.3.3. Fill Placement

Fill should be placed in thin lifts (eight-inch bulk), moisture conditioned to at or slightly above the optimum moisture content, uniformly mixed, and compacted by the use of both wheel rolling and kneading type (sheep's foot) compaction equipment until the designed grades are achieved.

8.3.4. Benching

Where the natural slope is steeper than 5-horizontal to 1-vertical and where determined by the project Geotechnical Engineer or Engineering Geologist, compacted fill material shall be keyed and benched into competent materials.

8.3.5. Mixing and Moisture Control

In order to prevent layering of different soil types and/or different moisture contents, mixing and moisture control of materials will be necessary. The preparation of the earth materials through mixing and moisture control should be accomplished prior to and as part of the compaction of each fill lift. Water trucks or other water delivery means may be necessary for moisture control. Discing may be required when either excessively dry or wet materials are encountered.

8.3.6. Haul Roads

All haul roads, ramp fills, and tailing areas shall be removed prior to engineered fill placement.

8.3.7. Compaction Equipment

Compaction equipment on the project should include a combination of rubber-tired and sheepsfoot rollers to achieve proper compaction. Adequate water trucks/pulls should be available to provide sufficient moisture and dust control.

8.4. Oversized Materials

Oversized rock material [i.e., rock fragments greater than eight (8) inches] will likely be produced during the excavation of the design cuts and undercuts. Provided that the procedure is acceptable to the developer and governing agency, this rock may be incorporated into the compacted fill section to within three (3) feet of finish grade within residential areas and to one (1) foot below the deepest utility in street and house utility connection areas. Maximum rock size in the upper portion of the hold-down zone is restricted to eight (8) inches. Disclosure of the above rock hold-down zone should be made to prospective homebuyers explaining that excavations to accommodate swimming pools, spas, and other appurtenances will likely encounter oversize rock [i.e., rocks greater than eight (8) inches] below three (3) feet. Rock disposal details are presented on Detail 10, Appendix E. Rocks in excess of eight (8) inches in maximum dimension may be placed within the deeper fills, provided rock fills are handled in a manner described below. In order to separate oversized materials from the rock hold-down zones, the use of a rock rake may be necessary

8.4.1. Rock Blankets

Rock blankets consisting of a mixture of gravel, sand and rock to a maximum dimension of two (2) feet may be constructed. The rocks should be placed on prepared grade, mixed with sand and gravel, watered and worked forward with bulldozers and pneumatic compaction equipment such that the resulting fill is comprised of a mixture of the various particle sizes, contains no significant voids, and forms a dense, compact, fill matrix.

Rock blankets may be extended to the slope face provided the following additional conditions are met: 1) no rocks greater than twelve (12) inches in diameter are allowed within six (6) horizontal feet of the slope face; 2) 50 percent (by volume) of the material is three-quarter- (3/4) inch minus; and 3) backrolling of the slope face is conducted at four- (4) foot vertical intervals and satisfies project compaction specifications..

8.4.2. Rock Windrows

Rocks to maximum dimension of four (4) feet may be placed in windrows in deeper fill areas in accordance with Detail 10 (Appendix E). The base of the windrow should be excavated an equipment-width into the compacted fill core with rocks placed in single file within the excavation. Sands and gravels should be added and thoroughly flooded and tracked until voids are filled. Windrows should be separated horizontally by at least fifteen (15) feet of compacted fill, be staggered vertically, and separated by at least four (4) vertical feet of compacted fill. Windrows should not be placed within ten (10) feet of finish grade, within two (2) vertical feet of the lowest buried utility conduit in structural fills, or within fifteen (15) feet of the finish slope surface unless specifically approved by the developer, geotechnical consultant, and governing agency.

8.4.3. Individual Rock Burial

Rocks in excess of four (4) feet, but no greater than eight (8) feet may be buried in the compacted fill mass on an individual basis. Rocks of this size may be buried separately within the compacted fill by excavating a trench and covering the rock with sand/gravel, and compacting the fines surrounding the rock. Distances from slope face, utilities, and building pad areas (i.e., hold-down depth) should be the same as windrows.

8.4.4. Rock Disposal Logistics

The grading contractor should consider the amount of available rock disposal volume afforded by the design when excavation techniques and grading logistics are formulated. Rock disposal techniques should be discussed and approved by the geotechnical consultant and developer prior to implementation.

8.5. Overexcavation of Building Pads and Streets

8.5.1. Cut/Fill Transition Lots

Where design grades and/or remedial grading activities create a cut/fill transition, the cut and shallow fill portions of the building pad shall be overexcavated a minimum depth of three feet or 18 inches below the bottom of the proposed footings (whichever is deeper) and replaced with compacted fill. These remedial grading measures are recommended in order to minimize the potential for differential settlements between cut and fill areas. The undercut should be graded such that a gradient of at least one percent is maintained toward deeper fill areas or the front of the lot.

8.5.2. Cut Lots

It is recommended that for cut lots founded in hard bedrock, the bedrock should be overexcavated a minimum of 3 feet and replaced with compacted fill to facilitate utility and foundation construction. The bottom of the overexcavation should be graded such that a gradient of at least one percent is maintained toward the front of the lot.

8.5.3. Overexcavation of Streets/Driveways

Street/Driveway undercuts in hard rock areas should be based on depth of utilities within “right of way". The depth of undercut for streets should be at least one (1) foot below the deepest utility. In lieu of street undercutting and replacement with select soil, the streets can be line shot should hard rock be encountered.

8.6. Slope Stability

Cut and fill slopes on the order of 10 feet are proposed. As currently proposed, cut and fill slopes are anticipated to be globally and surficially stable, provided they are properly constructed and maintained. The highest cut and fill slopes should be analyzed when final grading plans are made available.

8.7. Seepage

Although not anticipated, if seepage is encountered during grading, it should be evaluated by the Geotechnical Consultant. If seepage is excessive, remedial measures such as horizontal drains or under drains may need to be installed.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Development of the site for the proposed residential structures is considered feasible, from a geotechnical standpoint, provided that the conclusions and recommendations presented herein are incorporated into the design and construction of the project. As with all projects, changes in observed conditions may result in alternative construction techniques and/or possible delays. The contractor should be aware of these possibilities and provide contingencies in his bids to account for them.

9.1. Preliminary Foundation Design

The proposed structures can be supported on conventional or post-tensioned shallow foundations and slab-on-grade systems. The expansion potential of the underlying soils is classified as "Low" to "Medium". The design of foundation systems should be based on as-graded conditions as determined after the completion of grading.

Foundations may be designed using the values provided in the following table. These values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building code and structural design considerations may govern depth and reinforcement requirements and should be evaluated.

TABLE 9.1
CONVENTIONAL FOUNDATION DESIGN PARAMETERS

Allowable Bearing		2,000 psf, based on a minimum width and depth	
Lateral Bearing (Level Condition)		250 psf/foot of depth to a maximum of 2,000 psf	
Lateral Bearing (Descending 2:1 Slope)		125 psf/foot of depth to a maximum of 1,500 psf	
Sliding Coefficient		0.35	
Expansion Index		**"Low"**	**"Medium"**
Soil Category**		**I**	**II**
Continuous Footings			
Footing Width	One-Story	12 inches	12 inches
	Two-Story	15 inches	15 inches
Footing Depth*	One-Story	12 inches	18 inches
	Two-Story	18 inches	18 inches
Reinforcement		No. 4 rebar - 1 on top, 1 on bottom	No. 4 rebar - 2 on top, 2 on bottom OR No. 5 rebar - 1 on top and 1 on bottom
Spread Footings			
Footing Width		24 inches	24 inches
Footing Depth*		18 inches	18 inches
Reinforcement		Per structural engineer	
Slab-on-Grade			
Minimum Slab Thickness		4 inches (actual)	
Minimum Slab Reinforcement		No. 3 rebar spaced 18 inches on center (maximum), each way	
Moisture Barrier		An approved moisture and vapor barrier should be placed below all slabs-on-grade within living and moisture sensitive areas as discussed in Section 9.2	
Slab Subgrade Moisture		Minimum of 110 percent of optimum moisture to a depth of 12 inches prior to placing concrete	Minimum of 120 percent of optimum moisture to a depth of 12 inches prior to placing concrete

***Notes on Footing Embedment:** Depth of embedment should be measured below lowest adjacent finish grade.

Footings Adjacent to Swales and Slopes: If exterior footings adjacent to drainage swales are to exist within 5 feet horizontally of the swale, the footing should be embedded sufficiently to assure embedment below the swale bottom is maintained. Footings adjacent to slopes should be embedded such that at least 5 feet is provided horizontally from edge of the footing to the face of the slope.

**Final design parameters should be provided in a final grading report and should be based on as-graded soil conditions. For budgeting purposes, a Soil Category of II may be assumed.

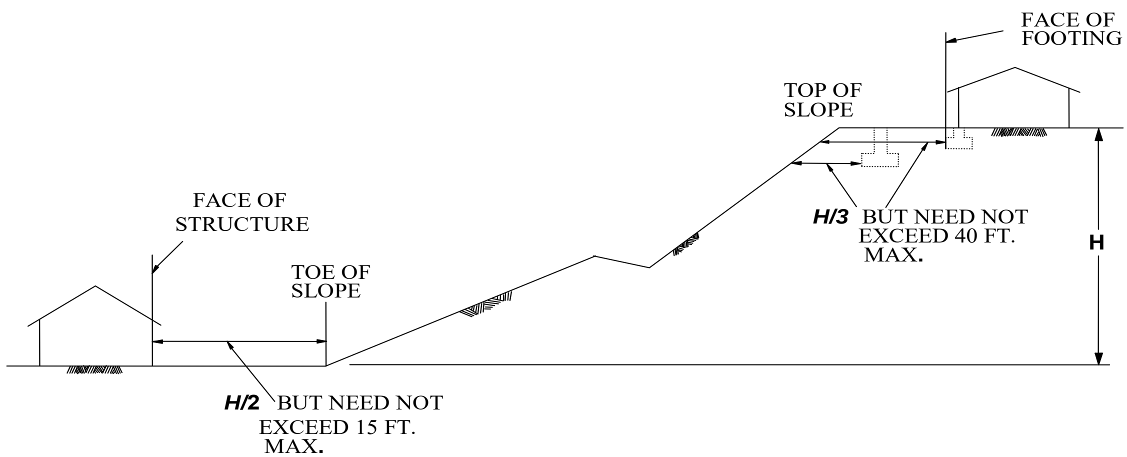
9.2. Moisture Barrier

A moisture and vapor retarding system should be placed below the slabs-on-grade in portions of the structure considered to be moisture sensitive. The retarder should be of suitable composition, thickness, strength and low permeance to effectively prevent the migration of water and reduce the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic membrane, such as *Visqueen*, placed between one to four inches of clean sand, has been used for this purpose. More recently Stego® Wrap or similar underlayments have been used to lower permeance to effectively prevent the migration of water and reduce the transmission of water vapor to acceptable levels. The use of this system or other systems, materials or techniques can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

9.3. Deepened Footings and Structural Setbacks

It is generally recognized that improvements constructed in proximity to natural slopes or properly constructed, manufactured slopes can, over a period of time, be affected by natural processes including gravity forces, weathering of surficial soils and long-term (secondary) settlement. Most building codes, including the California Building Code (CBC), require that structures be set back or footings deepened, where subject to the influence of these natural processes.

For the subject site, where foundations for residential structures are to exist in proximity to



9.4. Concrete Design

Testing was not conducted, however it is anticipated that soils will exhibit "negligible" sulfate exposure when classified in accordance with ACI 318-11 Table 4.2.1 (per 2013 CBC). It should be noted that some fertilizers have been known to leach sulfates into soils otherwise containing "negligible" sulfate concentrations and increase the sulfate concentrations to potentially detrimental levels. It is incumbent upon the owner to determine whether additional protective measures are warranted to mitigate the potential for increased sulfate concentrations to onsite soils as a result of the future homeowner's actions.

9.5. Seismic Design Parameters

The following seismic design parameters are presented to be code compliant to the California Building Code (2013). The site is underlain with competent rock with minor to moderate fracturing and weathering, corresponding to a Site Class B. A Site Class C has been assigned to lots where 10 feet of fill soils are present between the bottom of the footing and underlying rock, in accordance with ASCE 7-10, Chapter 20.1. Lots should be categorized at the conclusion of grading, and seismic design recommendations should be provided on a lot by lot basis in the rough grading report. The site is located at Latitude 33.1053˚ N and Longitude 117.0391˚ W. Utilizing this information, the United States Geological Survey (USGS) web tool (http://earthquake.usgs.gov/designmaps) and ASCE 7 criterion, the mapped seismic acceleration parameters S_S, for 0.2 seconds and S_1, for 1.0 second period (CBC, 2013, 1613.3.1) for Risk-Targeted Maximum Considered Earthquake (MCE_R) can be determined. The mapped acceleration parameters are provided for Site Class "B". Adjustments for other Site Classes are made, as needed, by utilizing Site Coefficients F_a and F_v for determination of MCE_R spectral response acceleration parameters S_{MS} for short periods and S_{M1} for 1.0 second period (CBC, 2013 1613.3.3). Five-percent damped design spectral response acceleration parameters S_{DS} for short periods and S_{D1} for 1.0 second period can be determined from the equations in CBC, 2013, Section 1613.3.4.

TABLE 9.5
Seismic Design Criteria

Site Class	Seismic Design Category	Mapped Spectral Response Values		Spectral Response Accelerations		Design Spectral Response Accelerations	
		S_s (g) at 0.2 s	S_1 (g) at 1.0 s	S_{MS} (g) at 0.2 s	S_{M1} (g) at 1.0 s	S_{DS} (g) at 0.2 s	S_{D1} (g) at 1.0 s
B (Rock)	D	1.032	0.396	1.032	0.396	0.688	0.264
C (Dense Soil/ Soft Rock)	D	1.032	0.396	1.032	0.556	0.688	0.371

Using the United States Geological Survey (USGS) web-based ground motion calculator, the site class modified PGA_M (F_{PGA}*PGA) was determined to be 0.386g for Site Class B and 0.391g for Site Class C. This value does not include near-source factors that may be applicable to the design of structures on site.

9.6. Conventional Retaining Walls

The following earth pressures are recommended for the preliminary design of conventional retaining walls onsite:

Static Case

Level Backfill	Rankine Coefficients	Equivalent Fluid Pressure (psf/lin.ft.)
Coefficient of Active Pressure:	$K_a = 0.31$	40
Coefficient of Passive Pressure:	$K_p = 3.25$	423
Coefficient of at Rest Pressure:	$K_o = 0.47$	61

2 : 1 Backfill	Rankine Coefficients	Equivalent Fluid Pressure (psf/lin.ft.)
Coefficient of Active Pressure:	$K_a = 0.41$	54
Coefficient of Passive Pressure:		
Descending	K_p (-) $= 2.41$	313
Coefficient of At Rest Pressure:	$K_o = 0.68$	88

Seismic Case

In addition to the above static pressures, unrestrained retaining walls should be designed to resist seismic loading. In order to be considered unrestrained, retaining walls should be allowed to rotate a minimum of roughly 0.004 times the wall height. The seismic load can be modeled as a thrust load applied at a point 0.6H above the base of the wall, where H is equal to the height of the wall. This seismic load (in pounds per lineal foot of wall) is represented by the following equation:

$$Pe = \tfrac{3}{8} * \gamma * H^2 * k_h$$

Where:

H = Height of the wall (feet)

γ = soil density = 130 pounds per cubic foot (pcf)

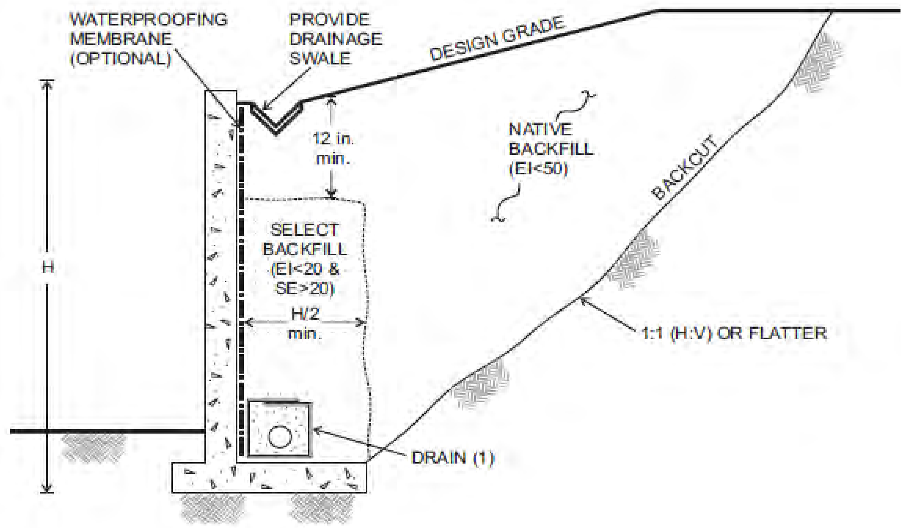
k_h = seismic pseudostatic coefficient = 0.5* peak horizontal ground acceleration / g

Peak ground acceleration onsite is estimated at 0.39g.

Walls should be designed to resist the combined effects of static pressures and the above seismic thrust load.

The foundations for retaining walls of appurtenant structures structurally separated from the building structures, may bear on properly compacted fill. A bearing value of 2,000 psf may be used for design of retaining walls. Retaining wall footings should be designed to resist the lateral forces by passive soil resistance and/or base friction as recommended for foundation lateral resistance. To relieve the potential for hydrostatic pressure wall backfill should consist of a free draining backfill (sand equivalent "SE" >20) and a heel drain should be constructed. The heel drain should be place at the heel of the wall and should consist of a 4-inch diameter perforated pipe (SDR35 or SCHD 40) surrounded by 4 cubic feet of crushed rock (3/4-inch) per lineal foot, wrapped in filter fabric (Mirafi® 140N or equivalent).

Proper drainage devices should be installed along the top of the wall backfill, which should be properly sloped to prevent surface water ponding adjacent to the wall. In addition to the wall drainage system, for building perimeter walls extending below the finished grade, the wall should be waterproofed and/or damp-proofed to effectively seal the wall from moisture infiltration through the wall section to the interior wall face.



NOTES: (1) DRAIN: 4-INCH PERFORATED ABS OR PVC PIPE OR APPROVED EQUIVALENT SUBSTITUTE PLACED PERFORATIONS DOWN AND SURROUNDED BY A MINIMUM OF 1 CUBIC FEET OF 3/4 INCH ROCK OR APPROVED EQUIVALENT SUBSTITUTE AND WRAPPED IN MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT SUBSTITUTE

The wall should be backfilled with granular soils placed in loose lifts no greater than 8-inches thick, at or near optimum moisture content, and mechanically compacted to a minimum 90 percent relative compaction as determined by ASTM Test Method D1557. Flooding or jetting of backfill materials generally do not result in the required degree and uniformity of compaction and, therefore, is not recommended. The soils engineer or his representative should observe the retaining wall footings, backdrain installation and be present during placement of the wall backfill to confirm that the walls are properly backfilled and compacted.

9.7. Utility Trench Excavation

All utility trenches should be shored or laid back in accordance with applicable OSHA standards. Excavations in bedrock areas should be made in consideration of underlying geologic structure. AGS should be consulted on these issues during construction.

9.8. Utility Trench Excavation

Mainline and lateral utility trench backfill should be compacted to at least 90 percent of maximum dry density as determined by ASTM D 1557. Onsite soils will not be suitable for use as bedding material but will be suitable for use in backfill, provided oversized materials are removed. No surcharge loads should be imposed above excavations. This includes spoil piles, lumber, concrete trucks or other construction materials and equipment. Drainage above excavations should be directed away from the banks. Care should be taken to avoid saturation of the soils.

Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable.

9.9. Exterior Slabs and Walkway

The subgrade below exterior slabs, sidewalks, driveways, patios, etc. should be moisture conditioned to a minimum of 110 (low expansive soils), 120 (medium expansive soils) percent of optimum moisture content prior to concrete placement, dependent upon the expansion potential of the subgrade soils.

9.9.1. Slab Thickness

Concrete flatwork and driveways should be designed utilizing four-inch minimum thickness.

9.9.2. Control Joints

Weakened plane joints should be installed on walkways at intervals of approximately eight to ten feet. Exterior slabs should be designed to withstand shrinkage of the concrete.

9.9.3. Flatwork Reinforcement

Consideration should be given to reinforcing any exterior flatwork.

9.9.4. Thickened Edge

Consideration should be given to construct a thickened edge (scoop footing) at the perimeter of slabs and walkways adjacent to landscape areas to minimize moisture variation below these improvements. The thickened edge (scoop footing) should extend approximately eight inches below concrete slabs and should be a minimum of six inches wide.

9.10. Onsite Wastewater Treatment

Based our preliminary percolation rates ranging from approximately 7 to 48 minutes per inch, onsite wastewater treatment is feasible.

No groundwater was encountered onsite during excavations, nor is groundwater anticipated to affect the feasibility of onsite wastewater disposal. Dependent upon final design, shallow granitic rock could impact the design and placement of onsite wastewater treatment systems.

9.11. Plan Review

Once final grading plans become available, they should be reviewed by AGS to verify that the design recommendations presented are consistent with the proposed construction.

9.12. Geotechnical Review

As is the case in any grading project, multiple working hypotheses are established utilizing the available data, and the most probable model is used for the analysis. Information collected during the grading and construction operations is intended to evaluate the hypotheses, and some of the assumptions summarized herein may need to be changed as more information becomes available. Some modification of the grading and construction recommendations may become necessary, should the conditions encountered in the field differ significantly than those hypothesized to exist.

10.0 SLOPE AND LOT MAINTENANCE

Maintenance of improvements is essential to the long-term performance of structures and slopes. Although the design and construction during mass grading is planned to create slopes that are both grossly and surficially stable, certain factors are beyond the control of the soil engineer and geologist. The homeowners must implement certain maintenance procedures.

In addition to the appended Homeowners Maintenance Guidelines, the following recommendations should be implemented.

10.1. Slope Planting

Slope planting should consist of ground cover, shrubs and trees that possess deep, dense root structures and require a minimum of irrigation. The resident should be advised of their responsibility to maintain such planting.

10.2. Lot Drainage

Roof, pad and lot drainage should be collected and directed away from structures and slopes and toward approved disposal areas. Design fine-grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures and slopes. Residents should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains and other devices that have been installed to promote structure and slope stability.

10.3. Slope Irrigation

The resident, homeowner and Homeowner Association should be advised of their responsibility to maintain irrigation systems. Leaks should be repaired immediately. Sprinklers should be adjusted to provide maximum uniform coverage with a minimum of water usage and overlap.

Overwatering with consequent wasteful run-off and ground saturation should be avoided. If automatic sprinkler systems are installed, their use must be adjusted to account for natural rainfall conditions.

10.4. Burrowing Animals

Residents or homeowners should undertake a program for the elimination of burrowing animals. This should be an ongoing program in order to maintain slope stability.

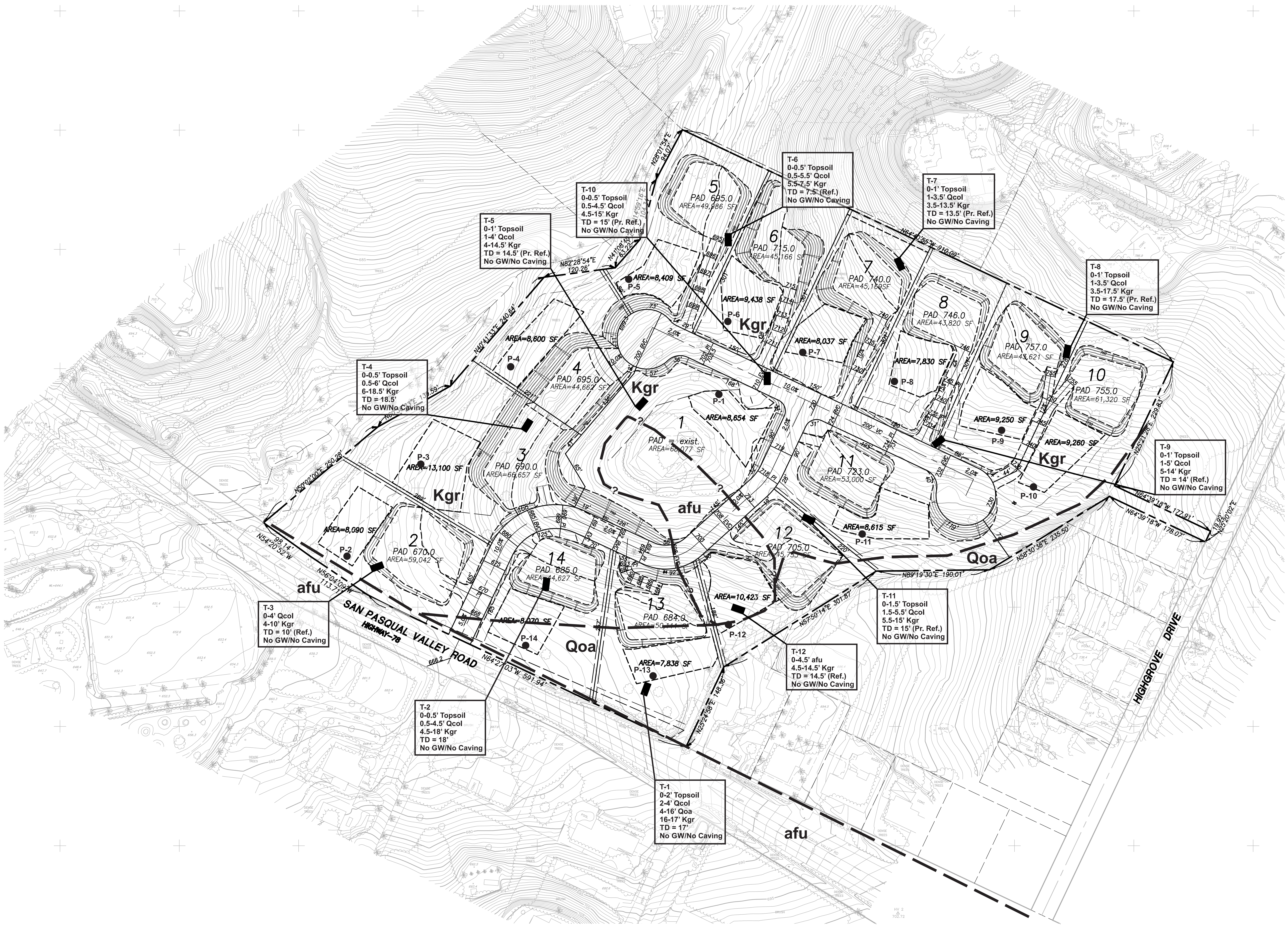
11.0 LIMITATIONS

This report is based on the project as described and the information obtained from the excavations at the approximate locations indicated on the Plate 1. The findings are based on the results of the field, laboratory, and office investigations combined with an interpolation and extrapolation of conditions between and beyond the excavation locations. The results reflect an interpretation of the direct evidence obtained. Services performed by AGS have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by geotechnical engineers and engineering geologists who are familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report. AGS should be notified of any pertinent changes in the project plans or if subsurface conditions are found to vary from those described herein. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations of this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location, and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of AGS.

AGS has no responsibility for construction means, methods, techniques, sequences, or procedures, or for safety precautions or programs in connection with the construction, for the acts or omissions of the CONTRACTOR, or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.



Geotechnical Legend:

T-1	Approximate Location of Exploratory Test Pit (AGS 2016)
P-2	Approximate Location of Percolation Test Boring (AGS 2016)
	Geologic Contact (Queried where uncertain, dotted where buried)
afu	Artificial Fill (documentation unavailable)
Qcol	Colluvium
Qoa	Older Alluvium (Bracketed where buried)
Kgr	Granitic Rock (Bracketed where buried)

SCALE: 1"=80'

Plate 1
Geologic Map and Exploration Location Plan

AGS
ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Project:	Report:	Date:
P/W 1602-06	1602-06-B-3	July 2016

Lundstrom
Engineering and Surveying, Inc.
5333 Mission Center Road, #115 • San Diego, CA 92108
Phone (619) 814-1220 • Fax (619) 641-5910

SAN PASQUAL VALLEY ROAD
SITE ADDRESS
PRELIMINARY DESIGN STUDY
APN:

JOB NO.: L321-01 | DATE: 3-02-16 | SCALE: 1"=80' | SHEET: 2 OF 2

Appendix A

References

References

American Society for Testing and Materials (2008), *Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, Soil and Rock (I)*, ASTM International, West Conshohocken, Pennsylvania.

California Code of Regulation, Title 24, *2013 California Building Code*, 3 Volumes.

County of San Diego, Department of Environmental Health, Design Manual for Onsite Wastewater Treatment Systems, Updated November 25, 2013.

Jennings, C.W., and Bryant, W.A., 2010, Fault Activity Map of California: California Geological Survey, California Geologic Data Map No. 6, Scale 1:750,000.

Kennedy, M.P. and Tan, S.S. (2007). Geologic Map of the Oceanside 30' x 60' Quadrangle, California, 1:100,000 Scale.

Lundstrom Engineering and Surveying, Inc., (2016). 80-scale Preliminary Design Study for San Pasqual Valley Road, California, dated March 2, 2016.

United States Geological Survey, 2010 Ground Motion Parameter Calculator v. 5.1.0., World Wide Web, http://earthquake.usgs.gov/designmaps/us/application.php.

Appendix B

Field Data

Project San Pasqual
Date Excavated 5/23/16
Logged by PJD
Equipment Cat 328

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
T-1	0.0 – 2.0	SM	**Topsoil** SILTY SAND, brown to reddish brown, dry, loose.
	2.0 – 4.0	SC	**Colluvium (Qcol)** SILTY SAND, fine to coarse grained, reddish brown, dry to slightly moist, loose to moderately dense; weakly cemented, porous.
	4.0 – 16.0		**Older Alluvium** SILTY to CLAYEY SAND interbedded with SANDY CLAY, dark red brown, slightly moist to moist, moderately dense. @ 6' Dense
	16.0 – 17.0		**Granitic Bedrock (Kgr):** Highly weathered, moderately hard, friable, breaks into dark olive brown, fine to coarse grained SILTY SAND
			TOTAL DEPTH 17.0 FT. NO WATER, NO CAVING
T-2	0.0 – 0.5	SM	**Topsoil:** SILTY SAND, fine to coarse grained, brown, dry, loose; abundant roots.
	0.5 – 4.5	SM	**Colluvium (Qcol):** SILTY SAND, fine to coarse grained, reddish brown, dry, medium dense; occasional angular gravel; trace clay; porous.
	4.5 – 18.0		**Granitic Bedrock (Kgr):** RESIDUAL SOIL, completely weathered to SILTY TO CLAYEY SAND, fine to coarse grained, reddish brown, dry to slightly moist, medium dense. @7 ft. Highly weathered, moderately hard, friable, breaks into olive brown, fine to coarse grained SILTY SAND. @9 ft. Hard. @13 ft. Larger cobble-size chunks. @15 ft. Slow digging.
			TOTAL DEPTH 18.0 FT. NO WATER, NO CAVING

Test Pit No.	Depth (ft.)	USCS	Description
T-3	0.0 – 4.0	SM	**Colluvium (Qcol)** SILTY SAND, fine to coarse grained, reddish brown, dry, loose. @1.5 ft. Medium dense; porous; few large boulders to 3 ft. diameter.
	4.0 – 10.0		**Granitic Bedrock (Kgr):** Highly weathered, hard, breaks into fine to coarse grained SAND with SILT. @6 to 6.5' Very hard; freshening with depth. @8 ft. Very slow digging. TOTAL DEPTH 10.0 FT. (REFUSAL) NO WATER, NO CAVING
T-4	0.0 – 0.5	SM	**Topsoil:** SILTY SAND, brown to reddish brown, dry, loose.
	0.5 – 6.0	SM	**Colluvium (Qcol):** SILTY SAND with CLAY, fine to coarse grained, reddish brown, dry, loose to moderately dense. @3 ft. Weakly cemented; porous.
	6.0 – 18.5		**Granitic Bedrock (Kgr):** RESIDUAL SOIL, completely weathered to SILTY to CLAYEY SAND, fine to coarse grained, reddish brown, dry, medium dense. @6.5 ft. Weathered, olive brown to yellowish brown, moderately hard; breaks into fine to coarse grained SAND with SILT and small GRAVEL. @8 ft. Hard. @13 ft. Very hard; slow digging. @14 ft. Dark olive gray; breaks into very coarse SAND with small GRAVEL. @17 ft. Very slow digging. TOTAL DEPTH 18.5 FT. NO WATER, NO CAVING

Test Pit No.	Depth (ft.)	USCS	Description
T-5	0.0 – 1.0	SM	**Topsoil** SILTY SAND, brown, dry, loose.
	1.0 – 4.0	SM	**Colluvium (Qcol)** SILTY SAND, fine to coarse grained, reddish brown, dry, loose to moderately dense; with occasional gravel and small angular cobble.
	4.0 – 14.5		**Granitic Bedrock (Kgr):** RESIDUAL SOIL, completely weathered to SILTY to CLAYEY SAND with small GRAVEL, orange brown, moderately hard. @6 ft. Weathered, olive brown, hard, breaks into fine to coarse grained SAND with small GRAVEL. @9 ft. Olive brown to gray. @11 ft. Very hard, slow digging.
			TOTAL DEPTH 14.5 FT. (PRACTICAL REFUSAL) NO WATER, NO CAVING
T-6	0.0 – 0.5	SM	**Topsoil:** SILTY SAND, brown, dry, loose.
	0.5 – 5.5	SM	**Colluvium (Qcol):** SILTY SAND, reddish brown, loose to medium dense; with occasional gravel and cobble; weakly cemented; porous; roots to 24" deep.
	5.5 – 7.5		**Granitic Bedrock (Kgr):** Weathered, moderately hard to hard, olive brown; breaks into fine to coarse grained SILTY SAND with small GRAVEL. @6.5 ft. Freshens, hard; slow digging.
			TOTAL DEPTH 7.5 FT. (REFUSAL) NO WATER, NO CAVING

Test Pit No.	Depth (ft.)	USCS	Description
T-7	0.0 – 1.0	SM	**Topsoil** SILTY SAND, brown, dry, loose.
	1.0 – 3.5	SM	**Colluvium (Qcol)** SILTY SAND, fine to coarse grained, reddish brown, dry, loose to moderately dense.
	3.5 – 13.5		**Granitic Bedrock (Kgr):** RESIDUAL SOIL, completely weathered to SILTY SAND with CLAY, fine to coarse grained, reddish brown, moderately hard. @5 ft. Hard, orange brown; breaks into fine to coarse grained SILTY SAND with small GRAVEL. @8 ft. Freshens, yellowish brown to orange brown. @10 ft. Very hard; slow digging. @11.5 ft. Very slow digging. TOTAL DEPTH 13.5 FT. (PRACTICAL REFUSAL) NO WATER, NO CAVING
T-8	0.0 – 1.0	SM	**Topsoil:** SILTY SAND, brown, dry, loose.
	1.0 – 3.5	SM	**Colluvium (Qcol):** SILTY SAND with CLAY, reddish brown, dry, loose to moderately dense.
	3.5 – 17.5		**Granitic Bedrock (Kgr):** RESIDUAL SOIL, completely weathered to SILTY SAND with CLAY, fine to coarse grained, reddish brown, dry to slightly moist, medium dense to dense. @5 ft. Weathered, orange brown, hard; breaks into fine to coarse grained SILTY SAND with small GRAVEL. @9 ft. Olive brown, slow digging. @12 ft. Orange brown, breaks into fine to coarse grained SAND with hard cobble size chunks. @14.5 ft. Very hard; very slow digging. TOTAL DEPTH 17.5 FT. (PRACTICAL REFUSAL) NO WATER, NO CAVING

Test Pit No.	Depth (ft.)	USCS	Description
T-9	0.0 – 1.0	SM	**Topsoil** SILTY SAND, brown, dry, loose.
	1.0 – 5.0	SM	**Colluvium (Qcol)** SILTY SAND, reddish brown, dry to slightly moist, loose to moderately dense; weakly cemented; porous.
	5.0 – 14.0		**Granitic Bedrock (Kgr):** Completely to highly weathered, olive brown, hard; breaks into fine to coarse grained SILTY SAND with GRAVEL. @7 ft. Some cobble size non-friable chunks. @10 ft. Slow digging. @12 ft. Very hard; very slow digging.
			TOTAL DEPTH 14.0 FT. (REFUSAL) NO WATER, NO CAVING
T-10	0.0 – 0.5	SM	**Topsoil:** SILTY SAND, brown, dry, loose.
	0.5 – 4.5	SM	**Colluvium (Qcol):** SILTY SAND, fine to coarse grained, reddish brown, dry to slightly moist; with occasional gravel. @3 ft. Slightly moist.
	4.5 – 15.0		**Granitic Bedrock (Kgr):** Completely weathered, olive brown, moderately hard; breaks into fine to coarse grained SILTY SAND with GRAVEL. @7 ft. Hard. @9 ft. Hard cobble-size chunks. @10 ft. Slow digging. @12 ft. Larger chunks up to 15” (tabular) @13 ft. Very hard; very slow digging.
			TOTAL DEPTH 15.0 FT. (PRACTICAL REFUSAL) NO WATER, NO CAVING

Test Pit No.	Depth (ft.)	USCS	Description
T-11	0.0 – 1.5	SM	**Topsoil** SILTY SAND, brown, dry, loose; with roots.
	1.5 – 5.5	SM	**Colluvium (Qcol)** SILTY SAND, fine to coarse grained, reddish brown, dry to slightly moist, loose to moderately dense. @2.5 to 3 ft. Slightly moist, medium dense; weakly cemented; porous.
	5.5 – 15.0		**Granitic Bedrock (Kgr):** Completely weathered, hard, orange brown; breaks into fine to coarse grained SILTY SAND with small gravel. @7.5 ft. Olive brown, hard; freshens with depth. @10 ft. Olive gray; slow digging. @12 ft. Very slow digging. @13.5 ft. Very hard. TOTAL DEPTH 15.0 FT. (PRACTICAL REFUSAL) NO WATER, NO CAVING
T-12	0.0 – 4.5	SM	**Artificial Fill – Undocumented (afu):** SILTY SAND, dark brown, dry to slightly moist, loose; with cobbles and small boulders to 15”. @1.5 ft. Moist, loose to moderately dense.
	4.5 – 14.5		**Granitic Bedrock (Kgr):** Completely weathered, moderately hard, olive brown; breaks into fine to coarse grained SILTY SAND with small GRAVEL. @7.5 ft. Hard. @12 ft. Very hard. TOTAL DEPTH 14.5 FT. (REFUSAL) NO WATER, NO CAVING

Appendix C

Laboratory Data

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

EXPANSION INDEX - ASTM D4829

Project Name: San Pasqual Valley Rd
Location: Escondido Area, CA
File No: 1602-06
Date: 5/30/16

Excavation: TP-4
Depth: 2-4'
Description:

By: H - M

Expansion Index - ASTM D4829

Initial Dry Density (pcf):	118.0
Initial Moisture Content (%):	8.0
Initial Saturation (%):	50.5
Final Dry Density (pcf):	116.4
Final Moisture Content (%):	15.8
Final Saturation (%):	99.4
Expansion Index:	14
Potential Expansion:	Very Low

ASTM D4829 - Table 5.3

Expansion Index	Potential Expansion
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

EXPANSION INDEX - ASTM D4829

Project Name:	San Pasqual Valley Rd	Excavation:	TP-13
Location:	Escondido Area, CA	Depth:	4-6 '
File No:	1602-06	Description:	
Date:	6/1/16		
		By:	H - M

Expansion Index - ASTM D4829	
Initial Dry Density (pcf):	108.0
Initial Moisture Content (%):	10.0
Initial Saturation (%):	48.2
Final Dry Density (pcf):	102.4
Final Moisture Content (%):	20.4
Final Saturation (%):	98.2
Expansion Index:	55
Potential Expansion:	Medium

ASTM D4829 - Table 5.3	
Expansion Index	Potential Expansion
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

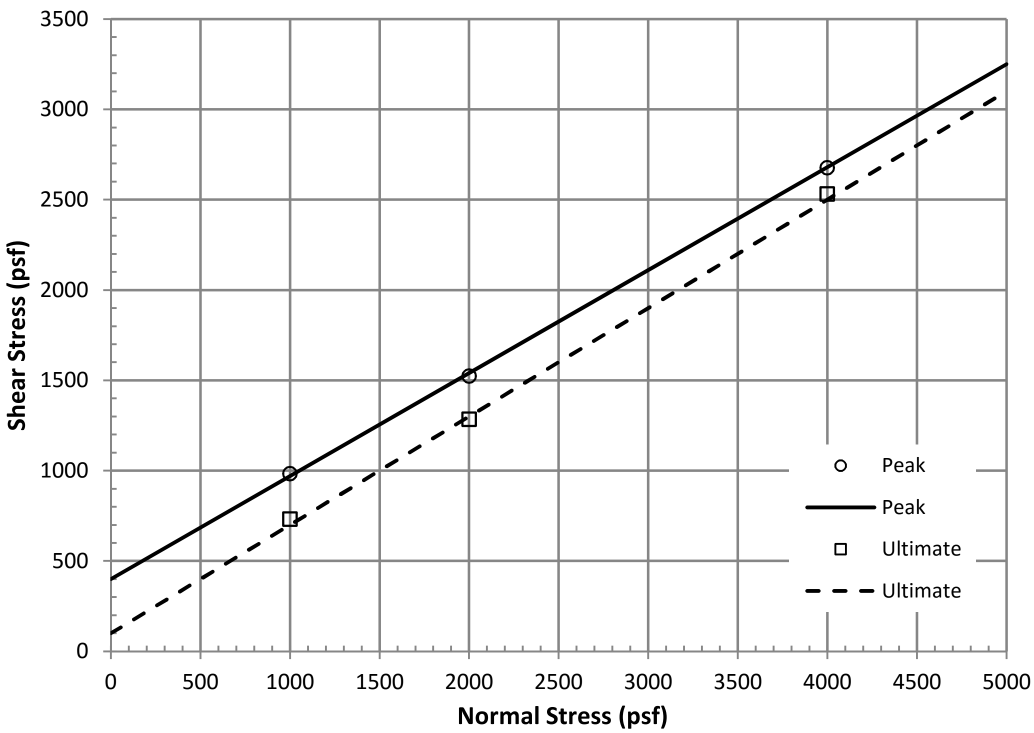
DIRECT SHEAR - ASTM D3080

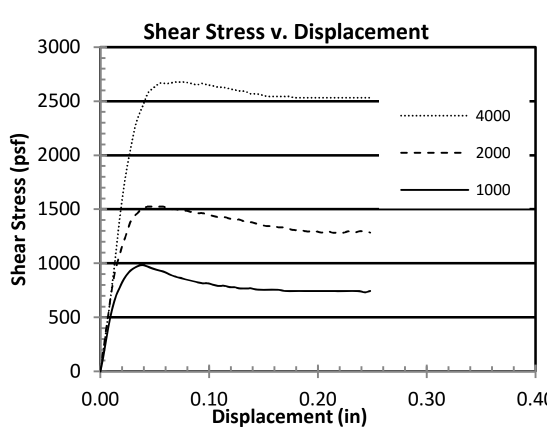
Project Name:	San Pasqual Valley	Excavation:	TP-2
Location:	San Diego County	Depth:	0-3
Project No.:	1602-06	Sample Type:	Remolded to 90%
Date:	6/8/16	By:	SD

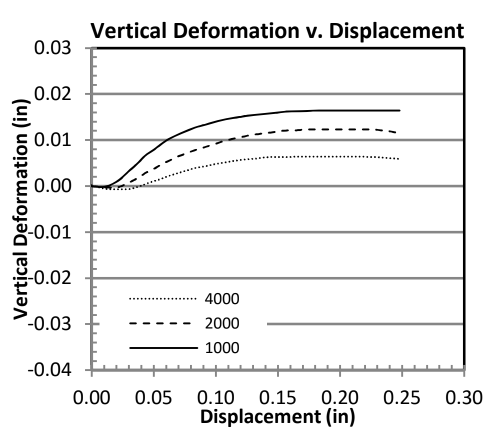
Samples Tested	1	2	3
Normal Stress (psf)	1000	2000	4000
Maximum Shear Stress (psf)	984	1524	2676
Ultimate Shear Stress (psf)	732	1284	2532
Initial Moisture Content (%)	9.0	9.0	9.0
Initial Dry Density (pcf)	116.1	116.1	116.1

Method:	Drained
Consolidation:	Yes
Saturation:	Yes
Shearing Rate (in/min):	0.05

	Peak	Ultimate
Friction Angle, phi (deg)	30	31
Cohesion (psf)	400	100







ADVANCED GEOTECHNICAL SOLUTIONS, INC.

DIRECT SHEAR - ASTM D3080

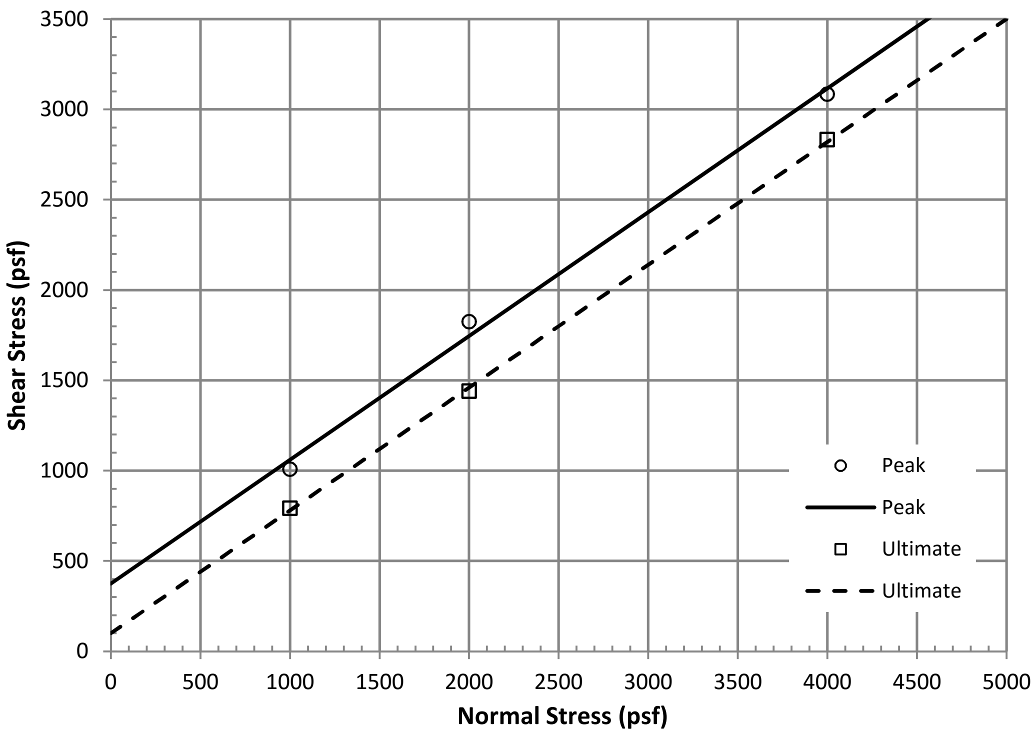
Project Name: San Pasqual Valley Rd
Location: San Diego County
Project No.: 1602-06
Date: 6/7/16

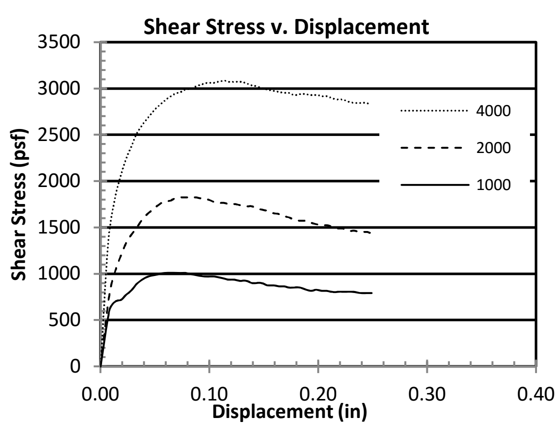
Excavation: TP-8
Depth: 3-5'
Sample Type: Remolded to 90%
By: FV

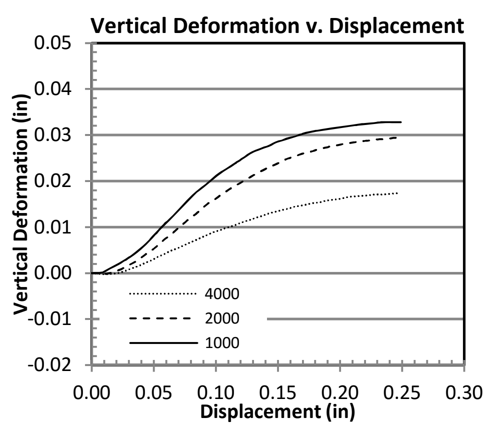
Samples Tested	1	2	3
Normal Stress (psf)	1000	2000	4000
Maximum Shear Stress (psf)	1008	1824	3084
Ultimate Shear Stress (psf)	792	1440	2832
Initial Moisture Content (%)	9.0	9.0	9.0
Initial Dry Density (pcf)	117.0	117.0	117.0

Method: Drained
Consolidation: Yes
Saturation: Yes
Shearing Rate (in/min): 0.05

	Peak	Ultimate
Friction Angle, phi (deg)	34	34
Cohesion (psf)	375	100







Advanced Geotechnical Solutions, Inc.

MAXIMUM DENSITY

ASTM D-1557

Project Name: **San Pasqual Valley Rd**
Location: **Escondido Area, CA**
File No: **1602-06**
Date: 5/28/2016

Excavation: **TP-2**
Depth **0-3 '**
Description: Dark Brown Silty Sand Slightly Clay Micaschist

Sieve Size 4
Mold Size 4"
No. of Layers 5

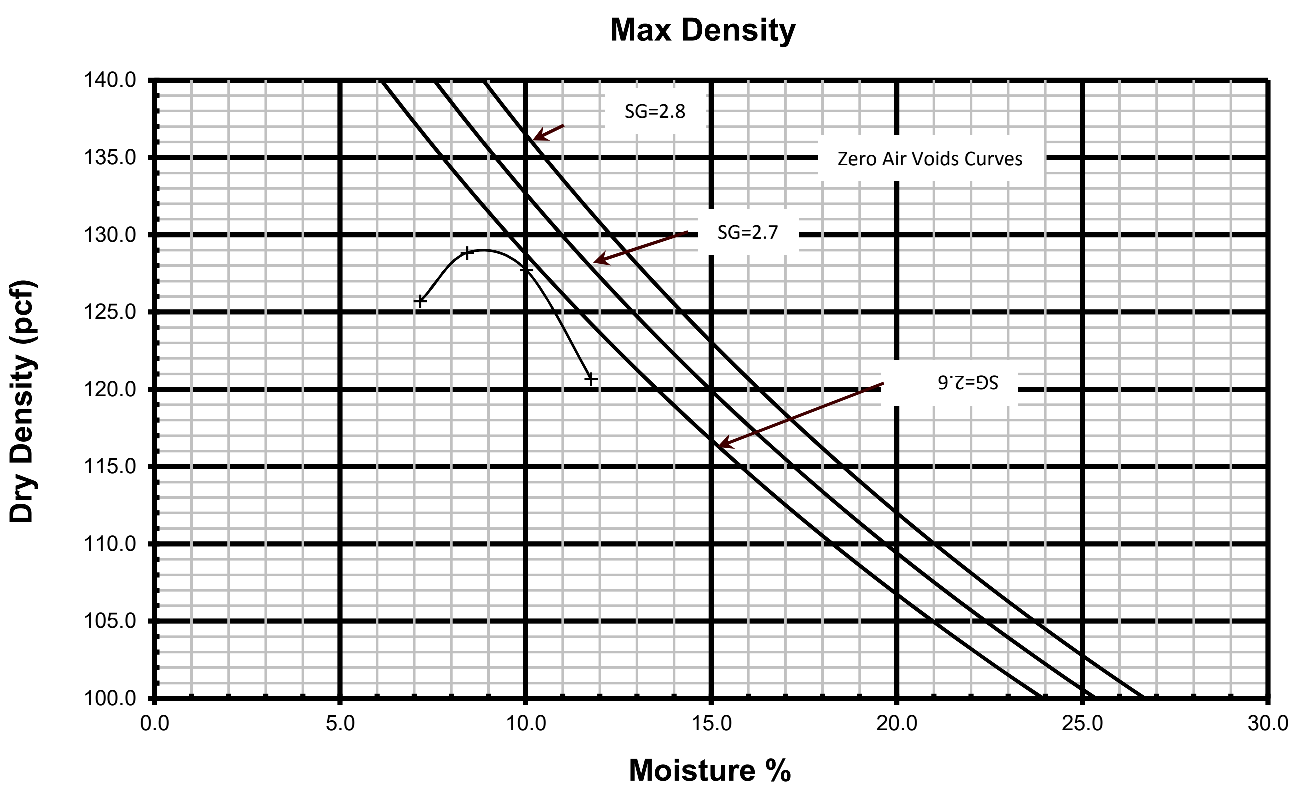
% Retained None
Method A

By: H-M

Test point number		1	2	3	4		
Wt. wet soil + mold	g	3899.8	3975.3	3987.6	3902.4		
Wt. wet soil + mold	lbs	8.59	8.76	8.78	8.60		
Wt. of mold	lbs	4.10	4.10	4.10	4.10		
Wt. wet of soil	lbs	4.49	4.66	4.68	4.50		
Wet density	pcf	134.70	139.69	140.50	134.87		
Dry density	pcf	125.70	128.84	127.71	120.68		

Moisture Determination (Oven)

Container number		5	7	11	18		
Wt. wet of soil+tare	g	263.4	254.8	256.7	245.3		
Dry wt. soil+tare	g	246.4	235.7	234.1	220.4		
Tare wt.	g	8.91	8.87	8.45	8.62		
Wt. of moisture	g	17.00	19.10	22.60	24.90		
Dry wt. of soil	g	237.49	226.83	225.65	211.78		
Moisture Content	g	7.16	8.42	10.02	11.76		



Maximum Density **129.0** pcf

Optimum Moisture **9.0** %

Advanced Geotechnical Solutions, Inc.

MAXIMUM DENSITY

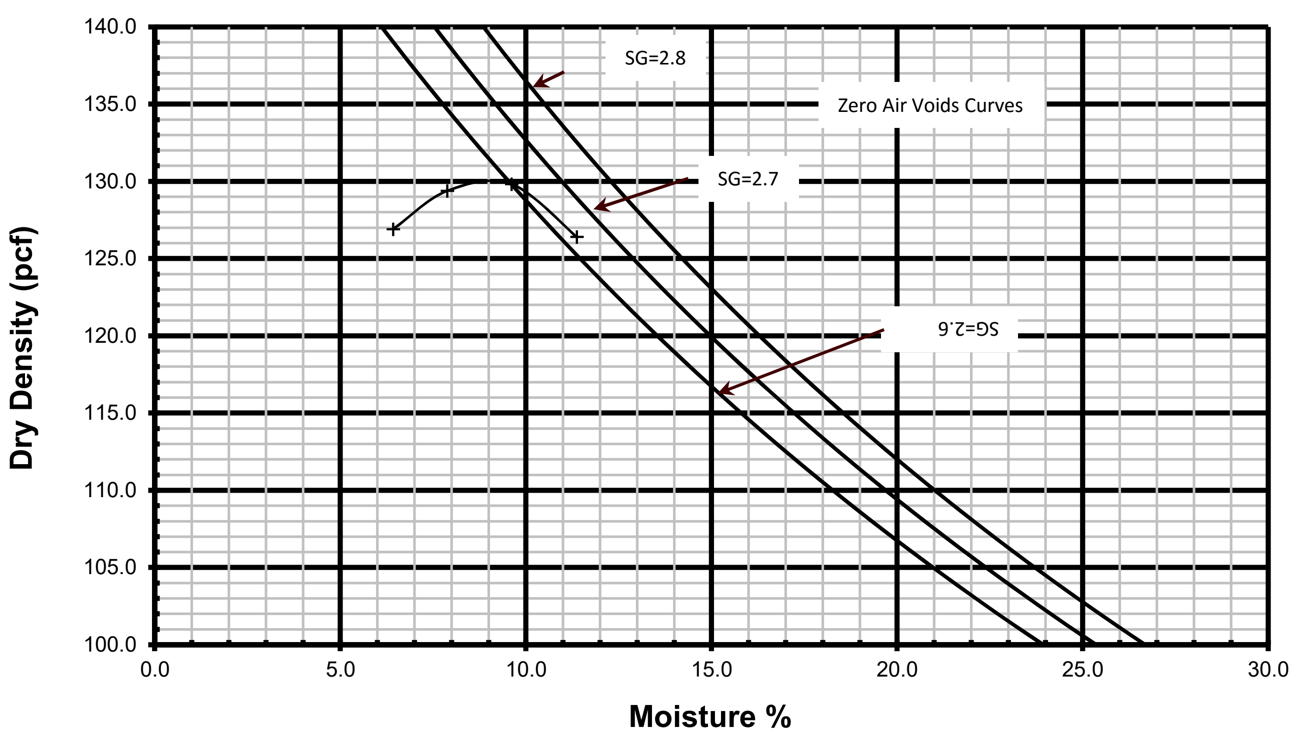
ASTM D-1557

Project Name:	**San Pasqual Valley Rd**	Excavation:	**TP-8**
Location:	**Escondido Area, CA**	Depth	**3-5'**
File No:	**1602-06**	Description:	Dark Brown Silty Sand, DG, With Mica.
Date:	5/31/2016		

Sieve Size	4				
Mold Size	4"	% Retained	3		
No. of Layers	5	Method	A	By:	H-M

Test point number		1	2	3	4		
Wt. wet soil + mold	g	3905.3	3973.7	4014.9	3991.7		
Wt. wet soil + mold	lbs	8.60	8.75	8.84	8.79		
Wt. of mold	lbs	4.10	4.10	4.10	4.10		
Wt. wet of soil	lbs	4.50	4.65	4.74	4.69		
Wet density	pcf	135.06	139.58	142.30	140.77		
Dry density	pcf	126.91	129.38	129.82	126.40		
Moisture Determination (Oven)							
Container number		18	11	7	32		
Wt. wet of soil+tare	g	277.3	281.1	274.6	264.3		
Dry wt. soil+tare	g	261.1	261.2	251.3	238.2		
Tare wt.	g	8.81	8.65	8.94	8.62		
Wt. of moisture	g	16.20	19.90	23.30	26.10		
Dry wt. of soil	g	252.29	252.55	242.36	229.58		
Moisture Content	g	6.42	7.88	9.61	11.37		

Max Density

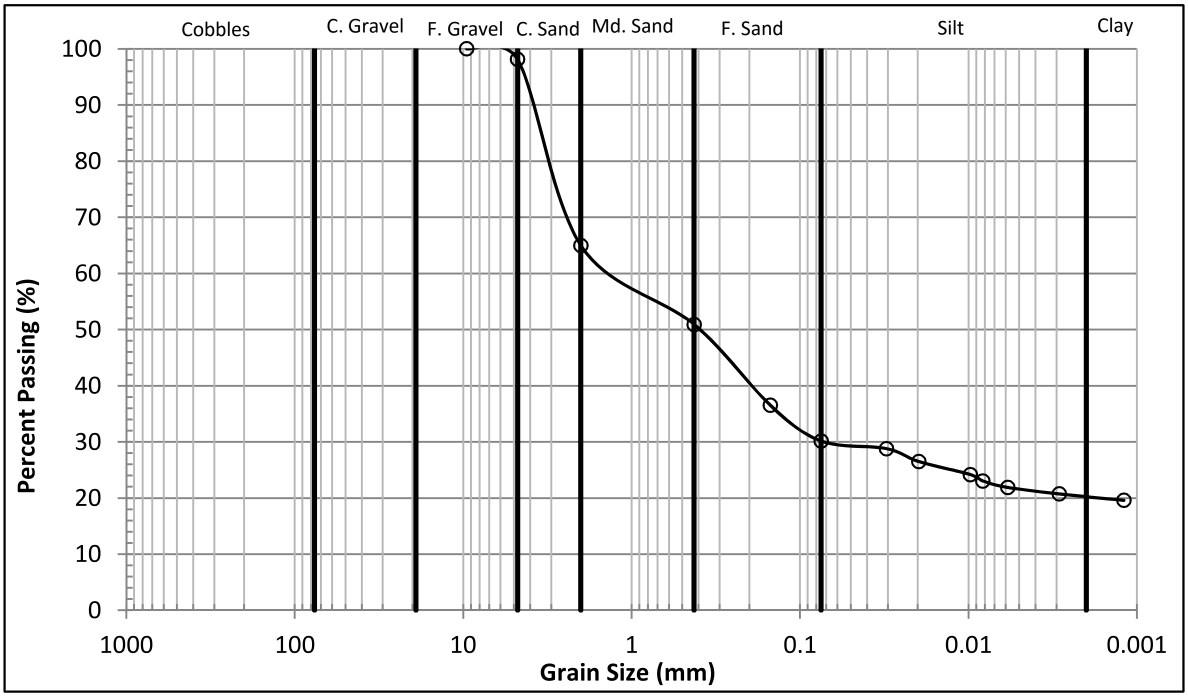


Maximum Density **130.0** pcf   Optimum Moisture **9.0** %

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

PARTICLE SIZE ANALYSIS - ASTM D422

Project Name:	San Pasqual Valley Rd	Excavation:	TP-13
Location:	Escondido Area, CA	Depth:	4-6 '
Project No.:	1602-06	By:	H M
Date:	6/1/16		



Grain Size (in/#)	Grain Size (mm)	Amount Passing (%)
3 "	76.20	
2 1/2 "	63.50	
2 "	50.80	
1 1/2 "	38.10	
1 "	25.40	
3/4 "	19.05	
1/2 "	12.70	
3/8 "	9.53	100.00
# 4	4.75	98.12
# 10	2.00	64.98
# 20	0.85	#N/A
# 30	0.60	#N/A
# 40	0.425	50.92
# 50	0.30	#N/A
# 60	0.212	#N/A
# 100	0.15	36.52
# 200	0.075	30.17
Hydro	0.0307	28.80
Hydro	0.0197	26.49
Hydro	0.0098	24.19
Hydro	0.0082	23.04
Hydro	0.0058	21.89
Hydro	0.0029	20.73
Hydro	0.0012	19.58

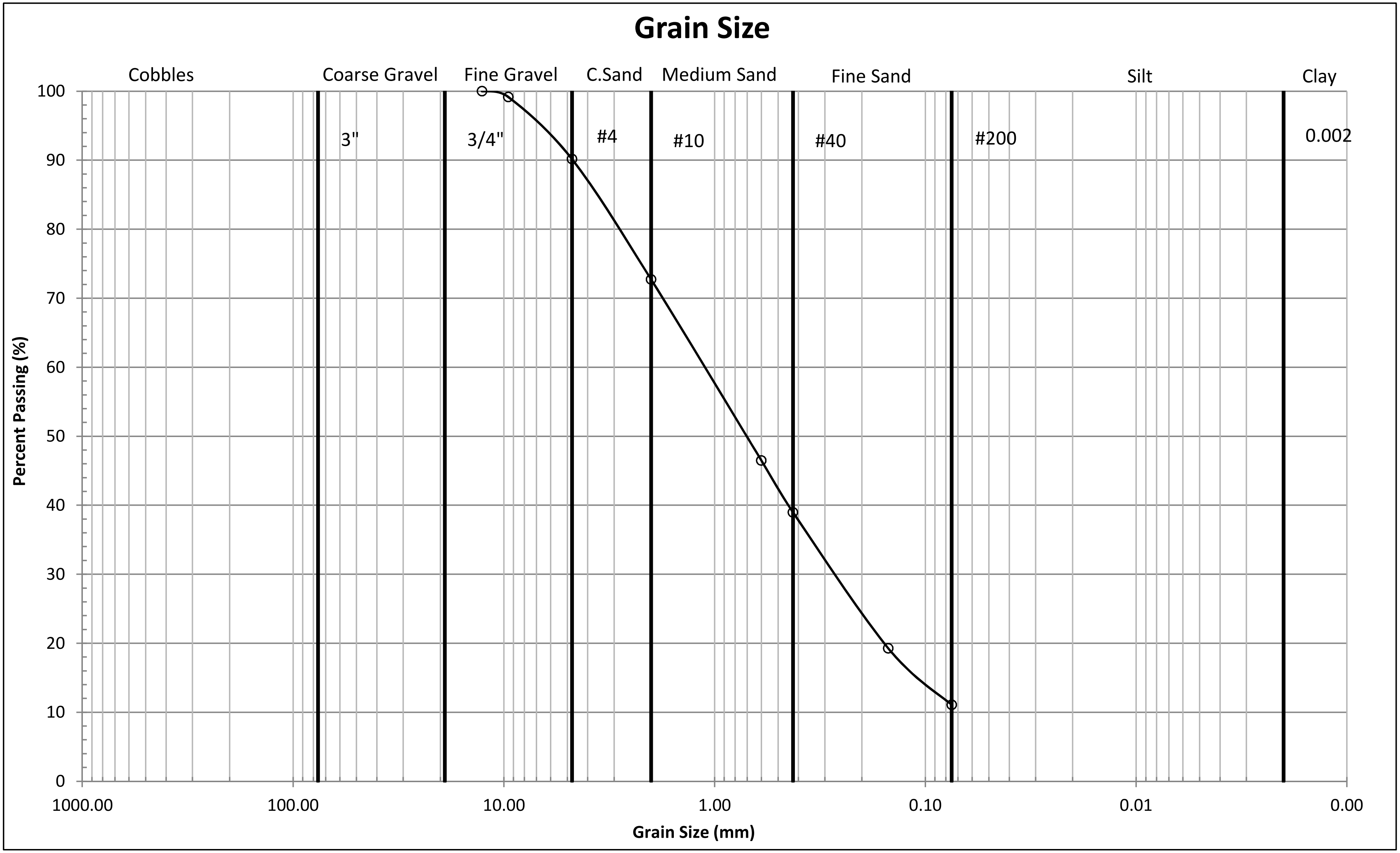
Summary	
% Gravel =	1.9
% Sand =	68.0
% Fines =	30.2
Sum =	100.0

LL= ____________

PL= ____________

PI= ____________

Soil Type: ____________



Project Name:	**San Pasqual Valley Rd**
Location:	Escondido Area, CA
File No:	1602-06
Date:	6/4/2016
Excavation:	TP-5
Depth:	4-6'
By:	HM

Gravel	9.8
Sand	79.2
Passing No. 200	11.0
Total	100.0

LL= ________ PL= ________ PI= ________

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Appendix D

Percolation Test Data

PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-1 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 36" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	8:12	8:42	30	8.81	5.88	2.94	10	
2	8:43	9:13	30	10.38	7.38	3.00	10	
3	9:14	9:44	30	9.00	6.63	2.38	13	
4	9:50	10:20	30	9.00	6.69	2.31	13	
5	10:56	11:26	30	9.00	6.81	2.19	14	
6	11:27	11:57	30	9.00	6.69	2.31	13	
7	11:58	12:28	30	9.00	6.69	2.31	13	
8	12:29	12:59	30	9.00	6.69	2.31	13	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual

Project No.: 1602-06

Date: 5/25/2016

Test Hole No.: P-2

Tested By: PWM

Water Temp.: 65

Depth of Test Hole: 34"

USCS : SM

Air Temp.: 70

Test Hole Dimensions (Inches)

Length 34"

Width

Diameter 12"

Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time	Stop Time	Time Interval	(Piezometric Surface in inches)			Perc Rate	Notes
	(hr and min)	(hr and min)	(min.)	Start Depth	End Depth	Depth Change	(min./in.)	
1	10:26	10:56	30	10.50	6.56	3.94	8	
2	10:57	11:27	30	11.56	7.25	4.31	7	
3	12:56	13:26	30	5.25	3.88	1.38	22	
4	13:28	13:58	30	10.19	6.31	3.88	8	
5	13:59	14:29	30	9.19	6.06	3.13	10	
6	14:30	15:00	30	9.19	6.13	3.06	10	
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PERCOLATION TEST DATA SHEET

Project Name:	San Pasqual	Project No.:	1602-06	Date:	5/25/2016
Test Hole No.:	P-3	Tested By:	PWM	Water Temp.:	65
Depth of Test Hole:	35"	USCS :	SM	Air Temp.:	70

Test Hole Dimensions (Inches)

Length 35" Width ______ Diameter 12" Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:29	10:59	30	8.50	7.06	1.44	21	
2	11:00	11:30	30	7.06	6.50	0.56	53	
3	11:30	12:00	30	6.50	5.75	0.75	40	
4	12:01	12:31	30	8.50	7.88	0.63	48	
5	12:31	13:01	30	7.88	7.38	0.50	60	
4	13:02	13:32	30	8.50	7.75	0.75	40	
5	13:32	14:02	30	7.75	7.13	0.63	48	
6	14:03	14:33	30	8.25	7.63	0.63	48	
7	14:33	15:03	30	7.63	7.00	0.63	48	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/25/2016

Test Hole No.: P-4 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 36" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:35	11:05	30	6.13	1.44	4.69	6	
2	11:06	11:36	30	4.94	1.44	3.50	9	
3	13:04	13:34	30	4.69	2.56	2.13	14	
4	13:35	14:05	30	6.06	3.31	2.75	11	
5	14:06	14:35	29	6.31	3.81	2.50	12	
6	14:37	15:07	30	6.88	4.31	2.56	12	
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PERCOLATION TEST DATA SHEET

Project Name:	San Pasqual	Project No.:	1602-06	Date:	5/25/2016
Test Hole No.:	P-5	Tested By:	PWM	Water Temp.:	65
Depth of Test Hole:	32"	USCS :	SM	Air Temp.:	70

Test Hole Dimensions (Inches)

Length 32" Width Diameter 12" Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:39	11:09	30	24.88	29.25	4.38	7	
2	11:10	11:40	30	26.88	29.38	2.50	12	
3	13:07	13:37	30	28.25	29.44	1.19	25	
4	13:38	14:09	31	24.38	27.00	2.63	12	
5	14:10	14:40	30	22.94	25.75	2.81	11	
6	14:40	15:10	30	22.81	25.56	2.75	11	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual — Project No.: 1602-06 — Date: 5/25/2016

Test Hole No.: P-6 — Tested By: PWM — Water Temp.: 65

Depth of Test Hole: 36" — USCS : SM — Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" — Width — Diameter 12" — Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:42	11:12	30	7.63	5.13	2.50	12	
2	11:13	11:43	30	10.88	7.63	3.25	9	
3	11:43	13:10	87	7.63	4.06	3.56	24	
4	13:12	13:42	30	9.50	7.63	1.88	16	
5	13:43	14:13	30	13.19	10.50	2.69	11	
6	14:13	14:44	31	10.50	8.75	1.75	18	
7	14:44	15:14	30	8.81	7.25	1.56	19	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-7 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 36" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	8:17	8:47	30	7.94	3.44	4.50	7	
2	8:48	9:18	30	7.94	3.75	4.19	7	
3	9:19	9:49	30	7.94	3.69	4.25	7	
4	9:50	10:59	69	7.94	0.63	7.31	9	
5	11:01	11:31	30	7.94	4.13	3.81	8	
6	11:32	12:02	30	7.94	4.44	3.50	9	
7	12:03	12:33	30	8.06	4.56	3.50	9	
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PERCOLATION TEST DATA SHEET

Project Name:	San Pasqual	Project No.:	1602-06	Date:	5/27/2016
Test Hole No.:	P-8	Tested By:	FE	Water Temp.:	65
Depth of Test Hole:	39"	USCS :	SM	Air Temp.:	70

Test Hole Dimensions (Inches)

Length	39"	Width		Diameter	12"	Avg. Water Column	12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	8:15	8:45	30	26.75	31.25	4.50	7	
2	8:46	9:16	30	27.13	30.50	3.38	9	
3	9:17	9:47	30	25.00	29.50	4.50	7	
4	9:48	10:18	30	26.13	29.13	3.00	10	
5	10:20	10:50	30	23.88	28.00	4.13	7	
6	10:52	11:22	30	24.00	27.00	3.00	10	
7	11:23	11:53	30	21.13	26.00	4.88	6	
8	11:54	12:24	30	22.50	26.00	3.50	9	
9	12:26	12:56	30	23.00	26.50	3.50	9	
10	13:04	13:34	30	19.13	23.00	3.88	8	
11	13:36	14:06	30	22.25	26.13	3.88	8	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-9 | Tested By: FE | Water Temp.: 65

Depth of Test Hole: 34" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 34" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	8:07	8:37	30	24.00	25.75	1.75	17	
2	8:38	9:08	30	23.13	24.75	1.63	18	
3	9:09	9:39	30	21.13	23.75	2.63	11	
4	9:39	10:09	30	23.75	25.50	1.75	17	
5	10:10	10:40	30	23.25	25.25	2.00	15	
6	10:44	11:14	30	20.75	22.13	1.38	22	
7	11:16	11:46	30	22.13	24.75	2.63	11	
8	11:47	12:17	30	21.00	23.50	2.50	12	
9	12:18	12:48	30	23.50	25.25	1.75	17	
10	12:49	13:19	30	23.13	24.88	1.75	17	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-10 | Tested By: FE | Water Temp.: 65

Depth of Test Hole: 39" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 39" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time	Stop Time	Time Interval	(Piezometric Surface in inches)			Perc Rate	Notes
	(hr and min)	(hr and min)	(min.)	Start Depth	End Depth	Depth Change	(min./in.)	
1	8:00	8:30	30	24.75	26.75	2.00	15	
2	8:31	9:01	30	25.75	27.25	1.50	20	
3	9:02	9:32	30	23.75	26.00	2.25	13	
4	9:33	10:03	30	24.13	25.63	1.50	20	
5	10:04	10:34	30	24.00	26.00	2.00	15	
6	10:37	11:07	30	23.88	25.75	1.88	16	
7	11:08	11:38	30	25.25	27.00	1.75	17	
8	11:39	12:09	30	24.50	26.25	1.75	17	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-11 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 36" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Piezometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	8:21	8:51	30	32.13	34.81	2.69	11	
2	8:52	9:22	30	32.38	34.88	2.50	12	
3	9:23	9:53	30	32.88	35.06	2.19	14	
4	9:54	10:24	30	32.00	34.25	2.25	13	
5	10:30	11:03	33	31.50	33.75	2.25	15	
6	11:04	11:34	30	32.50	34.38	1.88	16	
7	11:36	12:06	30	31.19	33.63	2.44	12	
8	12:08	12:38	30	31.25	33.63	2.38	13	
9	12:39	13:09	30	32.00	34.31	2.31	13	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/27/2016

Test Hole No.: P-12 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 35" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 35" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches)			Perc Rate (min./in.)	Notes
				Start Depth	End Depth	Depth Change		
1	8:26	8:56	30	6.69	5.69	1.00	30	
2	8:57	9:27	30	6.69	5.44	1.25	24	
3	9:28	9:58	30	6.69	5.44	1.25	24	
4	10:00	11:06	66	6.81	4.38	2.44	27	
5	11:07	11:37	30	6.69	5.56	1.13	27	
6	11:38	12:10	32	7.56	6.25	1.31	24	
7	12:13	12:43	30	7.94	6.81	1.13	27	
8	12:44	13:14	30	7.94	6.75	1.19	25	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual — Project No.: 1602-06 — Date: 5/25/2016

Test Hole No.: P-13 — Tested By: PWM — Water Temp.: 65

Depth of Test Hole: 36" — USCS : SM — Air Temp.: 70

Test Hole Dimensions (Inches)

Length 36" — Width — Diameter 12" — Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:14	10:44	30	9.69	1.13	8.56	4	
2	10:46	11:16	30	7.00	1.19	5.81	5	
3	12:48	13:18	30	6.13	2.56	3.56	8	
4	13:19	13:49	30	6.94	2.13	4.81	6	
5	13:50	14:20	30	6.19	2.25	3.94	8	
6	14:21	14:51	30	6.19	2.25	3.94	8	
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PERCOLATION TEST DATA SHEET

Project Name: San Pasqual | Project No.: 1602-06 | Date: 5/25/2016

Test Hole No.: P-14 | Tested By: PWM | Water Temp.: 65

Depth of Test Hole: 35" | USCS : SM | Air Temp.: 70

Test Hole Dimensions (Inches)

Length 35" | Width | Diameter 12" | Avg. Water Column 12-14"

Infiltration Test

Trial No.	Start Time (hr and min)	Stop Time (hr and min)	Time Interval (min.)	(Pieziometric Surface in inches) Start Depth	End Depth	Depth Change	Perc Rate (min./in.)	Notes
1	10:19	10:49	30	8.44	1.88	6.56	5	
2	10:50	11:20	30	7.63	2.88	4.75	6	
3	12:52	13:22	30	8.00	5.13	2.88	10	
4	13:23	13:53	30	7.69	5.06	2.63	11	
5	13:55	14:23	28	8.50	5.25	3.25	9	
6	14:25	14:55	30	9.19	5.88	3.31	9	
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Appendix E

General Earthwork Specifications and Grading Details

GENERAL EARTHWORK SPECIFICATIONS

I. General

A. General procedures and requirements for earthwork and grading are presented herein. The earthwork and grading recommendations provided in the geotechnical report are considered part of these specifications, and where the general specifications provided herein conflict with those provided in the geotechnical report, the recommendations in the geotechnical report shall govern. Recommendations provided herein and in the geotechnical report may need to be modified depending on the conditions encountered during grading.

B. The contractor is responsible for the satisfactory completion of all earthwork in accordance with the project plans, specifications, applicable building codes, and local governing agency requirements. Where these requirements conflict, the stricter requirements shall govern.

C. It is the contractor's responsibility to read and understand the guidelines presented herein and in the geotechnical report as well as the project plans and specifications. Information presented in the geotechnical report is subject to verification during grading. The information presented on the exploration logs depicts conditions at the particular time of excavation and at the location of the excavation. Subsurface conditions present at other locations may differ, and the passage of time may result in different subsurface conditions being encountered at the locations of the exploratory excavations. The contractor shall perform an independent investigation and evaluate the nature of the surface and subsurface conditions to be encountered and the procedures and equipment to be used in performing his work.

D. The contractor shall have the responsibility to provide adequate equipment and procedures to accomplish the earthwork in accordance with applicable requirements. When the quality of work is less than that required, the Geotechnical Consultant may reject the work and may recommend that the operations be suspended until the conditions are corrected.

E. Prior to the start of grading, a qualified Geotechnical Consultant should be employed to observe grading procedures and provide testing of the fills for conformance with the project specifications, approved grading plan, and guidelines presented herein. All remedial removals, clean-outs, removal bottoms, keyways, and subdrain installations should be observed and documented by the Geotechnical Consultant prior to placing fill. It is the contractor's responsibility to apprise the Geotechnical Consultant of their schedules and notify the Geotechnical Consultant when those areas are ready for observation.

F. The contractor is responsible for providing a safe environment for the Geotechnical Consultant to observe grading and conduct tests.

II. Site Preparation

A. Clearing and Grubbing: Excessive vegetation and other deleterious material shall be sufficiently removed as required by the Geotechnical Consultant, and such materials shall be properly disposed of offsite in a method acceptable to the owner and governing agencies. Where applicable, the contractor may obtain permission from the Geotechnical Consultant, owner, and governing agencies to dispose of vegetation and other deleterious materials in designated areas onsite.

B. Unsuitable Soils Removals: Earth materials that are deemed unsuitable for the support of fill shall be removed as necessary to the satisfaction of the Geotechnical Consultant.

C. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines, other utilities, or other structures located within the limits of grading shall be removed and/or abandoned in accordance with the requirements of the governing agency and to the satisfaction of the Geotechnical Consultant.

D. Preparation of Areas to Receive Fill: After removals are completed, the exposed surfaces shall be scarified to a depth of approximately 8 inches, watered or dried, as needed, to achieve a generally uniform moisture content that is at or near optimum moisture content. The scarified materials shall then be compacted to the project requirements and tested as specified.

E. All areas receiving fill shall be observed and approved by the Geotechnical Consultant prior to the placement of fill. A licensed surveyor shall provide survey control for determining elevations of processed areas and keyways.

III. Placement of Fill

A. Suitability of fill materials: Any materials, derived onsite or imported, may be utilized as fill provided that the materials have been determined to be suitable by the Geotechnical Consultant. Such materials shall be essentially free of organic matter and other deleterious materials, and be of a gradation, expansion potential, and/or strength that is acceptable to the Geotechnical Consultant. Fill materials shall be tested in a laboratory approved by the Geotechnical Consultant, and import materials shall be tested and approved prior to being imported.

B. Generally, different fill materials shall be thoroughly mixed to provide a relatively uniform blend of materials and prevent abrupt changes in material type. Fill materials derived from benching should be dispersed throughout the fill area instead of placing the materials within only an equipment-width from the cut/fill contact.

C. Oversize Materials: Rocks greater than 8 inches in largest dimension shall be disposed of offsite or be placed in accordance with the recommendations by the Geotechnical Consultant in the areas that are designated as suitable for oversize rock placement. Rocks that are smaller than 8 inches in largest dimension may be utilized in the fill provided that they are not nested and are their quantity and distribution are acceptable to the Geotechnical Consultant.

D. The fill materials shall be placed in thin, horizontal layers such that, when compacted, shall not exceed 6 inches. Each layer shall be spread evenly and shall be thoroughly mixed to obtain near uniform moisture content and uniform blend of materials.

E. Moisture Content: Fill materials shall be placed at or above the optimum moisture content or as recommended by the geotechnical report. Where the moisture content of the engineered fill is less than recommended, water shall be added, and the fill materials shall be blended so that near uniform moisture content is achieved. If the moisture content is above the limits specified by the Geotechnical Consultant, the fill materials shall be aerated by discing, blading, or other methods until the moisture content is acceptable.

F. Each layer of fill shall be compacted to the project standards in accordance to the project specifications and recommendations of the Geotechnical Consultant. Unless otherwise specified by the Geotechnical Consultant, the fill shall be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method: D1557-09.

G. Benching: Where placing fill on a slope exceeding a ratio of 5 to 1 (horizontal to vertical), the ground should be keyed or benched. The keyways and benches shall extend through all unsuitable materials into suitable materials such as firm materials or sound bedrock or as recommended by the Geotechnical Consultant. The minimum keyway width shall be 15 feet and extend into suitable materials, or as recommended by the geotechnical report and approved by the Geotechnical Consultant. The minimum keyway width for fill over cut slopes is also 15 feet, or as recommended by the geotechnical report and approved by the Geotechnical Consultant. As a general rule, unless otherwise recommended by the Geotechnical Consultant, the minimum width of the keyway shall be equal to 1/2 the height of the fill slope.

H. Slope Face: The specified minimum relative compaction shall be maintained out to the finish face of fill and stabilization fill slopes. Generally, this may be achieved by overbuilding the slope and cutting back to the compacted core. The actual amount of overbuilding may vary as field conditions dictate. Alternately, this may be achieved by back rolling the slope face with suitable equipment or other methods that produce the designated result. Loose soil should not be allowed to build up on the slope face. If present, loose soils shall be trimmed to expose the compacted slope face.

I. Slope Ratio: Unless otherwise approved by the Geotechnical Consultant and governing agencies, permanent fill slopes shall be designed and constructed no steeper than 2 to 1 (horizontal to vertical).

J. Natural Ground and Cut Areas: Design grades that are in natural ground or in cuts should be evaluated by the Geotechnical Consultant to determine whether scarification and processing of the ground and/or overexcavation is needed.

K. Fill materials shall not be placed, spread, or compacted during unfavorable weather conditions. When grading is interrupted by rain, filing operations shall not resume until the Geotechnical Consultant approves the moisture and density of the previously placed compacted fill.

IV. Cut Slopes

A. The Geotechnical Consultant shall inspect all cut slopes, including fill over cut slopes, and shall be notified by the contractor when cut slopes are started.

B. If adverse or potentially adverse conditions are encountered during grading; the Geotechnical Consultant shall investigate, evaluate, and make recommendations to mitigate the adverse conditions.

C. Unless otherwise stated in the geotechnical report, cut slopes shall not be excavated higher or steeper than the requirements of the local governing agencies. Short-term stability of the cut slopes and other excavations is the contractor's responsibility.

V. Drainage

A. Back drains and Subdrains: Back drains and subdrains shall be provided in fill as recommended by the Geotechnical Consultant and shall be constructed in accordance with the governing agency and/or recommendations of the Geotechnical Consultant. The location of subdrains, especially outlets, shall be surveyed and recorded by the Civil Engineer.

B. Top-of-slope Drainage: Positive drainage shall be established away from the top of slope. Site drainage shall not be permitted to flow over the tops of slopes.

C. Drainage terraces shall be constructed in compliance with the governing agency requirements and/or in accordance with the recommendations of the Geotechnical Consultant.

D. Non-erodible interceptor swales shall be placed at the top of cut slopes that face the same direction as the prevailing drainage.

VI. Erosion Control

A. All finish cut and fill slopes shall be protected from erosion and/or planted in accordance with the project specifications and/or landscape architect's recommendations. Such measures to protect the slope face shall be undertaken as soon as practical after completion of grading.

B. During construction, the contractor shall maintain proper drainage and prevent the ponding of water. The contractor shall take remedial measures to prevent the erosion of graded areas until permanent drainage and erosion control measures have been installed.

VII. Trench Excavation and Backfill

A. Safety: The contractor shall follow all OSHA requirements for safety of trench excavations. Knowing and following these requirements is the contractor's responsibility. All trench excavations or open cuts in excess of 5 feet in depth shall be shored or laid back. Trench excavations and open cuts exposing adverse geologic conditions may require further evaluation by the Geotechnical Consultant. If a contractor fails to provide safe access for compaction testing, backfill not tested due to safety concerns may be subject to removal.

B. Bedding: Bedding materials shall be non-expansive and have a Sand Equivalent greater than 30. Where permitted by the Geotechnical Consultant, the bedding materials can be densified by jetting.

C. Backfill: Jetting of backfill materials is generally not acceptable. Where permitted by the Geotechnical Consultant, the bedding materials can be densified by jetting provided the backfill materials are granular, free-draining and have a Sand Equivalent greater than 30.

VIII. Geotechnical Observation and Testing During Grading

A. Compaction Testing: Fill shall be tested by the Geotechnical Consultant for evaluation of general compliance with the recommended compaction and moisture conditions. The tests shall be taken in the compacted soils beneath the surface if the surficial materials are disturbed. The contractor shall assist the Geotechnical Consultant by excavating suitable test pits for testing of compacted fill.

B. Where tests indicate that the density of a layer of fill is less than required, or the moisture content not within specifications, the Geotechnical Consultant shall notify the contractor of the unsatisfactory conditions of the fill. The portions of the fill that are not within specifications shall be reworked until the required density and/or moisture content has been attained. No additional fill shall be placed until the last lift of fill is tested and found to meet the project specifications and approved by the Geotechnical Consultant.

C. If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as adverse weather, excessive rock or deleterious materials being placed in the fill, insufficient equipment, excessive rate of fill placement, results in a quality of work that is unacceptable, the consultant shall notify the contractor, and the contractor shall rectify the conditions, and if necessary, stop work until conditions are satisfactory.

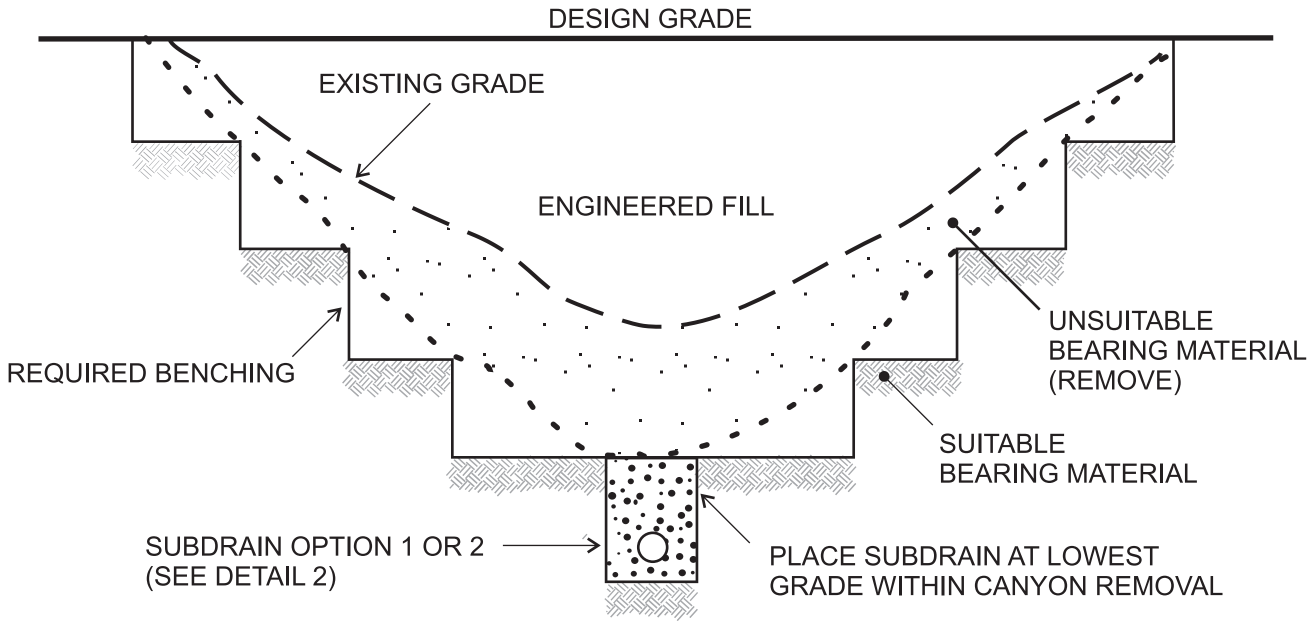
D. Frequency of Compaction Testing: The location and frequency of tests shall be at the Geotechnical Consultant's discretion. Generally, compaction tests shall be taken at intervals not exceeding two feet in fill height and 1,000 cubic yards of fill materials placed.

E. Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of the compaction test locations. The contractor shall coordinate with the surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations. Alternately, the test locations can be surveyed and the results provided to the Geotechnical Consultant.

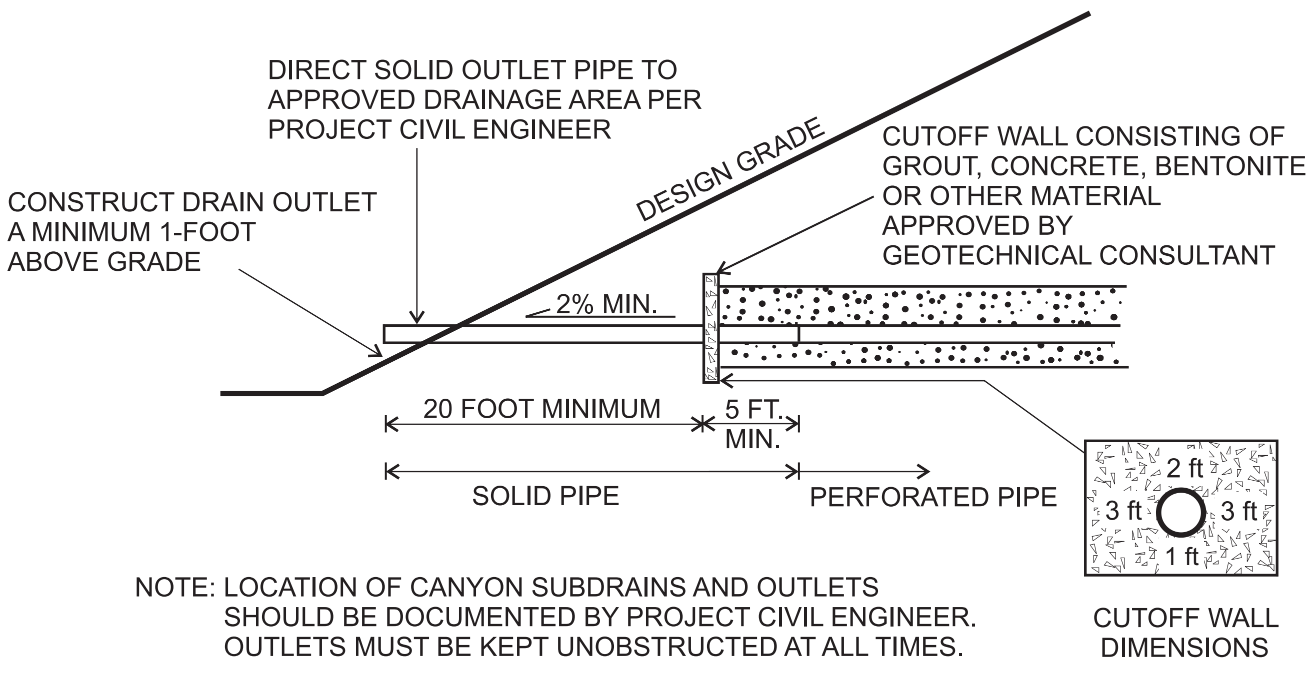
F. Areas of fill that have not been observed or tested by the Geotechnical Consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removals will be determined by the Geotechnical Consultant.

G. Observation and testing by the Geotechnical Consultant shall be conducted during grading in order for the Geotechnical Consultant to state that, in his opinion, grading has been completed in accordance with the approved geotechnical report and project specifications.

H. Reporting of Test Results: After completion of grading operations, the Geotechnical Consultant shall submit reports documenting their observations during construction and test results. These reports may be subject to review by the local governing agencies.



CANYON SUBDRAIN PROFILE



NOTE: LOCATION OF CANYON SUBDRAINS AND OUTLETS SHOULD BE DOCUMENTED BY PROJECT CIVIL ENGINEER. OUTLETS MUST BE KEPT UNOBSTRUCTED AT ALL TIMES.

CANYON SUBDRAIN TERMINUS

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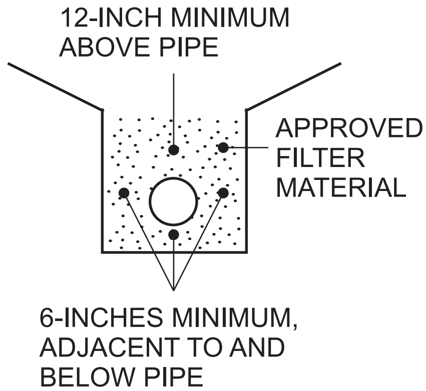
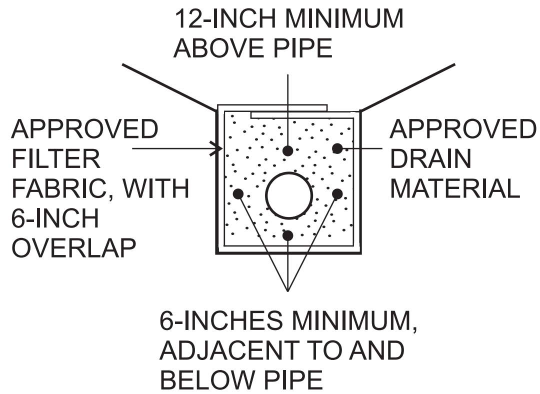
AGS ADVANCED GEOTECHNICAL SOLUTIONS	CANYON SUBDRAIN	DETAIL 1



OPTION 1

FILTER MATERIAL: MINIMUM VOLUME OF 9 CUBIC FEET PER LINEAL FOOT OF CALTRANS CLASS 2 PERMEABLE MATERIAL



OPTION 2

DRAIN MATERIAL: MINIMUM VOLUME OF 9 CUBIC FEET PER LINEAL FOOT OF 3/4-INCH MAX ROCK OR APPROVED EQUIVALENT SUBSTITUTE

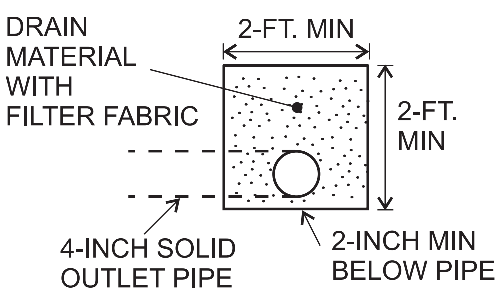
FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT SUBSTITUTE

PIPE: 6 OR 8-INCH ABS OR PVC PIPE OR APPROVED SUBSTITUTE WITH A MINIMUM OF 8 PERFORATIONS (1/4-INCH DIAMETER) PER LINEAL FOOT IN BOTTOM HALF OF PIPE

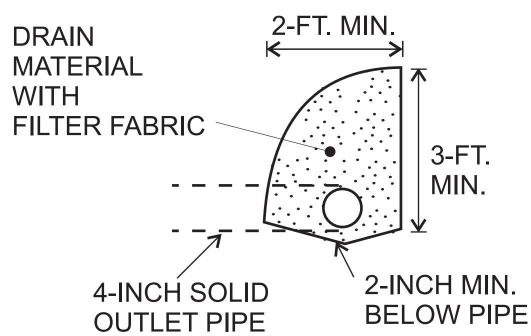
(ASTM D2751, SDR-35 OR ASTM D3034, SDR-35
ASTM D1527, SCHD. 40 OR ASTM D1785, SCHD. 40)

NOTE: CONTINUOUS RUN IN EXCESS OF 5OO FEET REQUIRES 8-INCH DIAMETER PIPE (ASTM D3034, SDR-35, OR ASTM D1785, SCHD. 40)

CANYON SUBDRAIN



OPTION 1



OPTION 2

DRAIN MATERIAL: GRAVEL TRENCH TO BE FILLED WITH 3/4-INCH MAX ROCK OR APPROVED EQUIVALENT SUBSTITUTE

FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR EQUIVALENT SUBSTITUTE WITH A MINIMUM 6-INCH OVERLAP

PIPE: 4-INCH ABS OR PVC PIPE OR APPROVED EQUIVALENT SUBSTITUTE WITH A MINIMUM OF 8 PERFORATIONS (1/4-INCH DIAMETER) PER LINEAL FOOT IN BOTTOM HALF OF PIPE

(ASTM D2751, SDR-35 OR ASTM D3034, SDR-35
ASTM D1527, SCHD. 40 OR ASTM D1785, SCHD. 40)

BUTTRESS/STABILIZATION DRAIN

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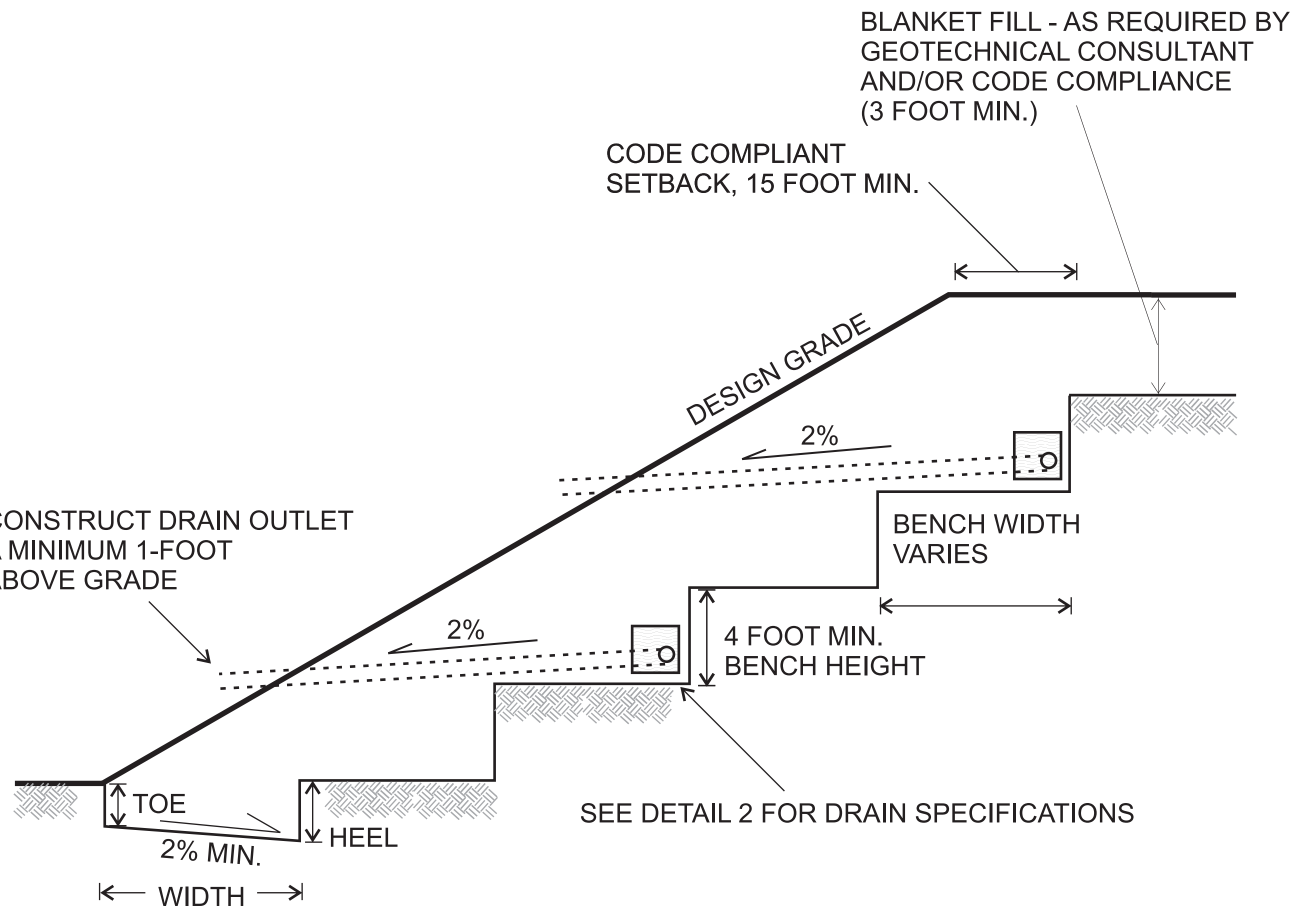
ADVANCED GEOTECHNICAL SOLUTIONS

DRAIN SPECIFICATIONS

DETAIL 2



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE 2 FOOT MIN.
HEEL 3 FOOT MIN.
WIDTH 15 FOOT MIN.

NOTES:

1. DRAIN OUTLETS TO BE PROVIDED EVERY 100 FEET CONNECT TO PERFORATED DRAIN PIPE BY “L” OR “T” AT A MINIMUM 2% GRADIENT.

2. THE NECESSITY AND LOCATION OF ADDITIONAL DRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT. UPPER STAGE OUTLETS SHOULD BE EMPTIED ONTO CONCRETE TERRACE DRAINS.

3. DRAIN PIPE TO EXTEND FULL LENGTH OF STABILIZATION/BUTTRESS WITH A MINIMUM GRADIENT OF 2% TO SOLID OUTLET PIPES.

4. LOCATION OF DRAINS AND OUTLETS SHOULD BE DOCUMENTED BY PROJECT CIVIL ENGINEER. OUTLETS MUST BE KEPT UNOBSTRUCTED AT ALL TIMES.

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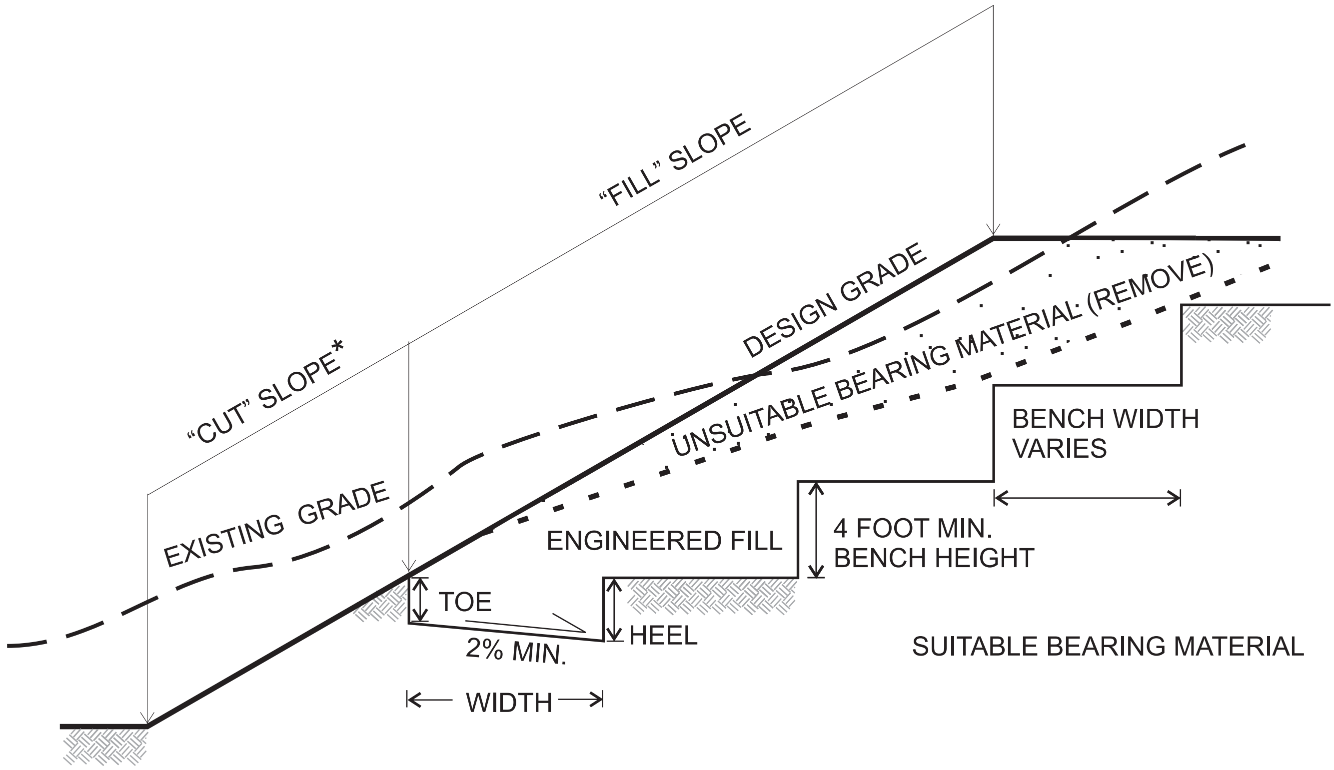
AGS ADVANCED GEOTECHNICAL SOLUTIONS	STABILIZATION/BUTTRESS FILL	DETAIL 3

* THE “CUT” PORTION OF THE SLOPE SHALL BE EXCAVATED AND EVALUATED BY THE GEOTECHNICAL CONSULTANT PRIOR TO CONSTRUCTING THE “FILL” PORTION



SUITABLE
BEARING MATERIAL

CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. THE NECESSITY AND LOCATION OF DRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT

2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

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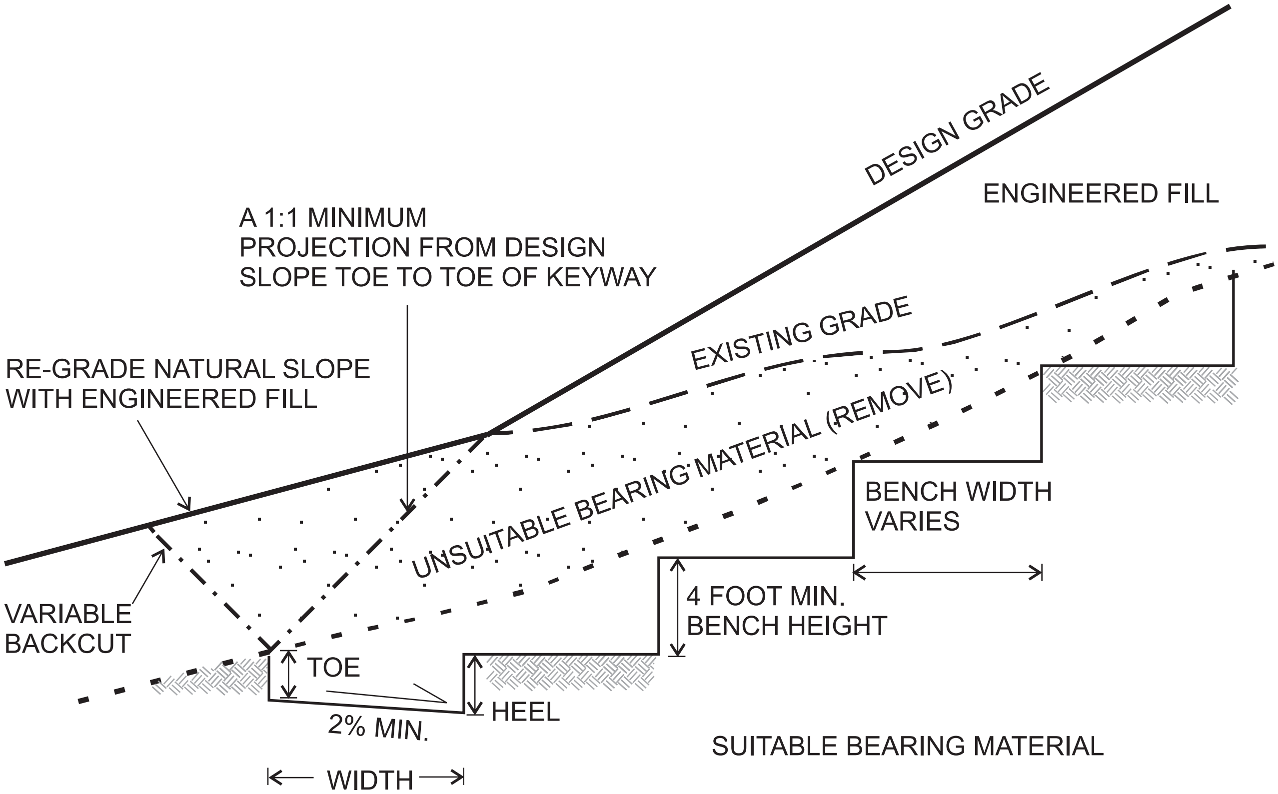
ADVANCED GEOTECHNICAL SOLUTIONS

FILL OVER CUT SLOPE

DETAIL 4



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. WHEN THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN GRADE SLOPE RATIO, SPECIAL RECOMMENDATIONS ARE NECESSARY BY THE GEOTECHNICAL CONSULTANT

2. THE GEOTECHNICAL CONSULTANT WILL DETERMINE THE REQUIREMENT FOR AND LOCATION OF SUBSURFACE DRAINAGE SYSTEMS.

3. MAINTAIN MINIMUM 15 FOOT HORIZONTAL WIDTH FROM FACE OF SLOPE TO BENCH/BACKCUT

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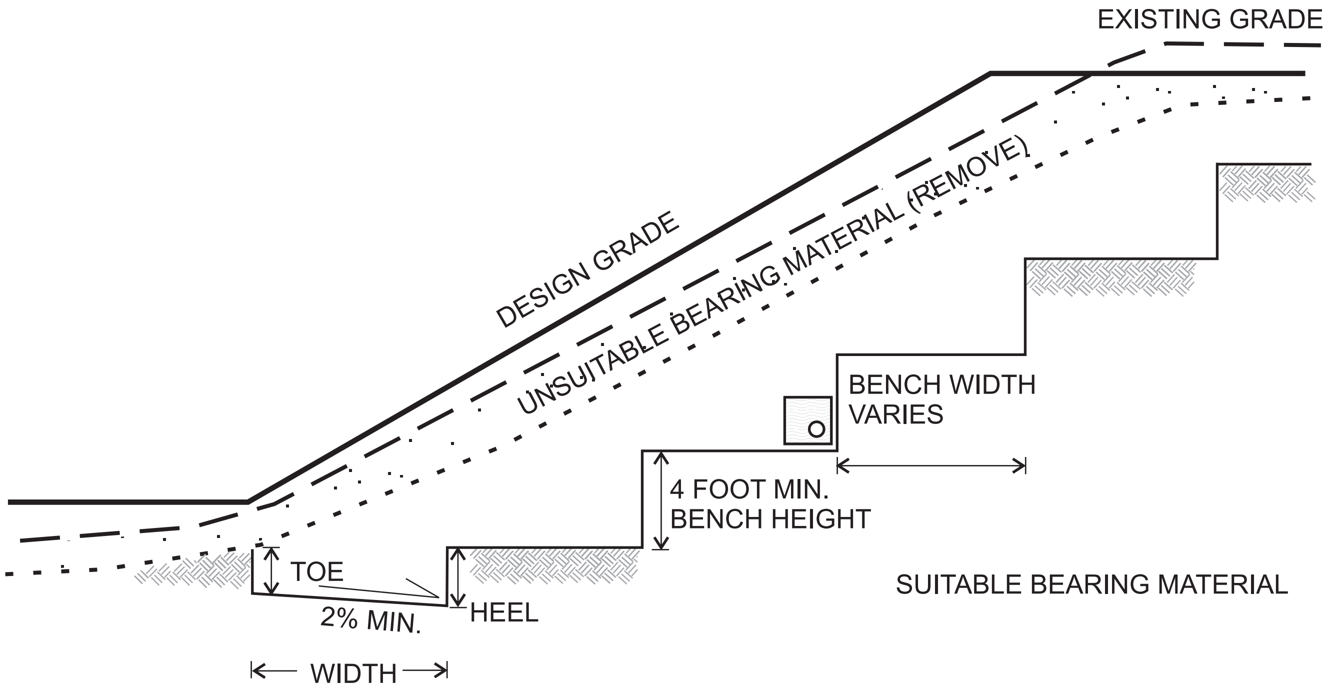
FILL OVER NATURAL SLOPE

DETAIL 5



CODE COMPLIANT KEYWAY
WITH MINIMUM DIMENSIONS:

TOE: 2 FOOT MIN.
HEEL: 3 FOOT MIN.
WIDTH: 15 FOOT MIN.

NOTES:

1. MAINTAIN MINIMUM 15 FOOT HORIZONTAL WIDTH FROM FACE OF SLOPE TO BENCH/BACKCUT

2. SEE DETAIL 2 FOR DRAIN SPECIFICATIONS

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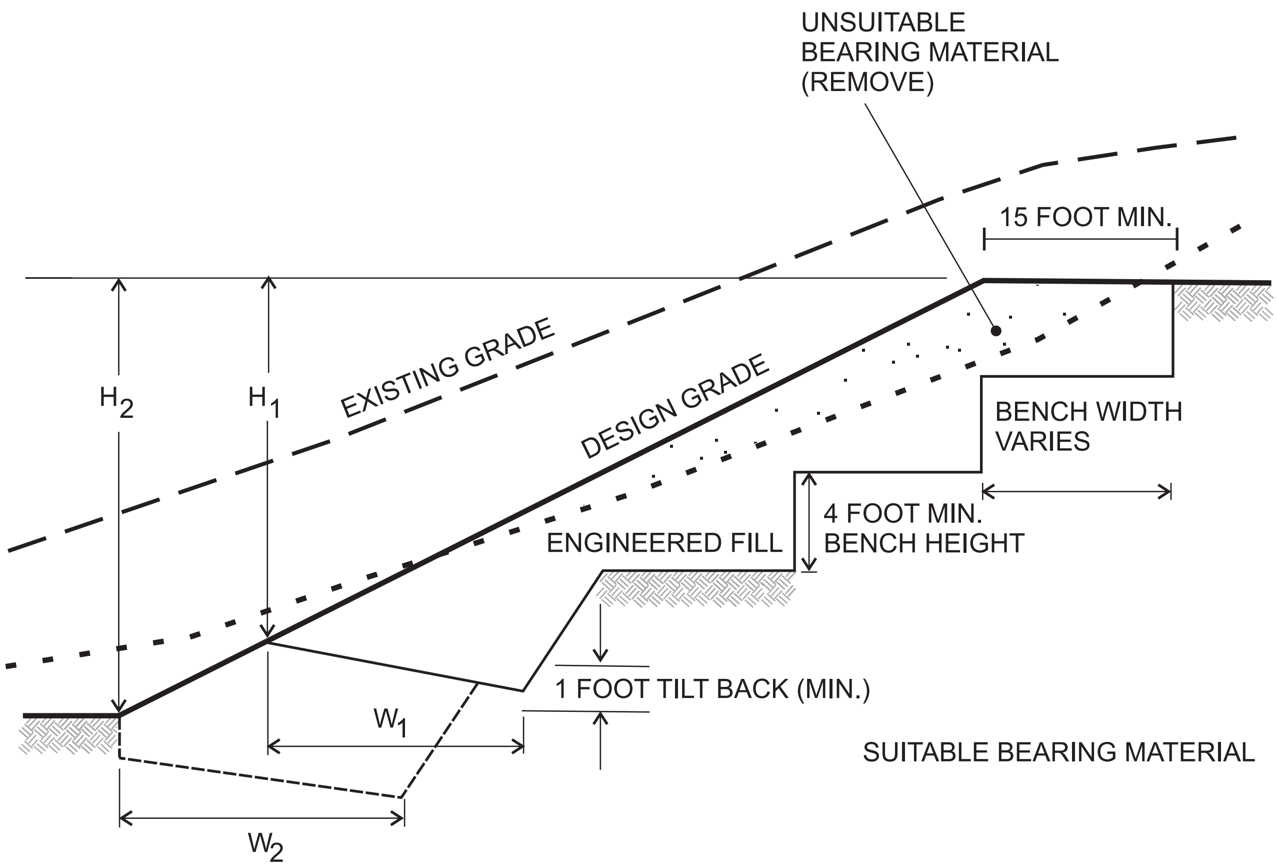
SKIN FILL CONDITION

DETAIL 6



NOTES:

1. IF RECOMMENDED BY THE GEOTECHNICAL CONSULTANT, THE REMAINING CUT PORTION OF THE SLOPE MAY REQUIRE REMOVAL AND REPLACEMENT WITH AN ENGINEERED FILL

2. “W” SHALL BE EQUIPMENT WIDTH (15 FEET) FOR SLOPE HEIGHT LESS THAN 25 FEET. FOR SLOPES GREATER THAN 25 FEET, “W” SHALL BE DETERMINED BY THE GEOTECHNICAL CONSULTANT. AT NO TIME SHALL “W” BE LESS THAN H/2

3. DRAINS WILL BE REQUIRED (SEE DETAIL 2)

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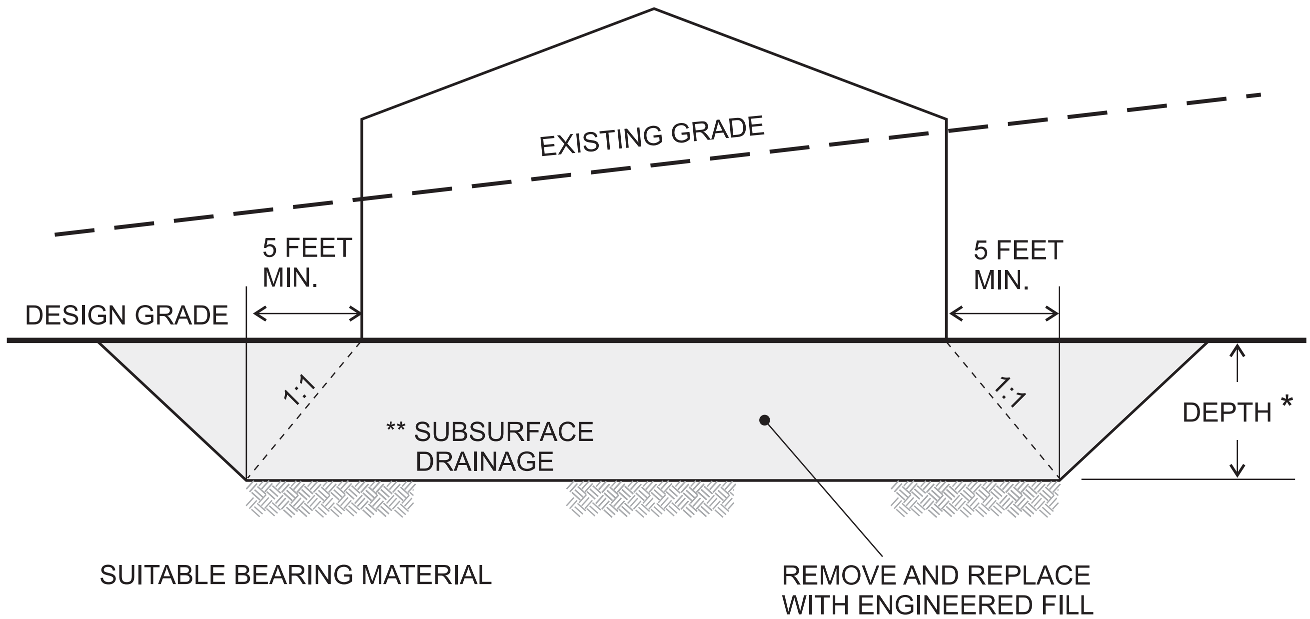
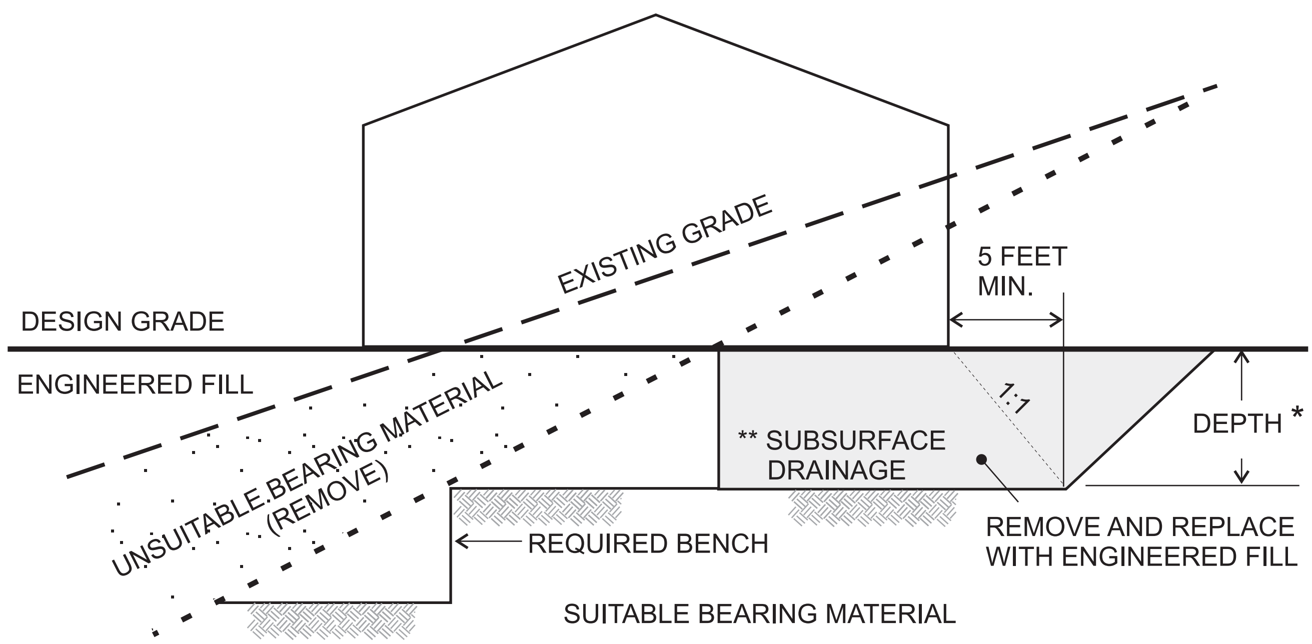
PARTIAL CUT SLOPE STABILIZATION

DETAIL 7



CUT LOT OVEREXCAVATION



CUT-FILL LOT OVEREXCAVATION

NOTES:

* SEE REPORT FOR RECOMMENDED DEPTHS, DEEPER OVEREXCAVATION MAY BE REQUIRED BY THE GEOTECHNICAL CONSULTANT BASED ON EXPOSED FIELD CONDITIONS

** CONSTRUCT EXCAVATION TO PROVIDE FOR POSITIVE DRAINAGE TOWARDS STREETS, DEEPER FILL AREAS OR APPROVED DRAINAGE DEVICES BASED ON FIELD CONDITIONS

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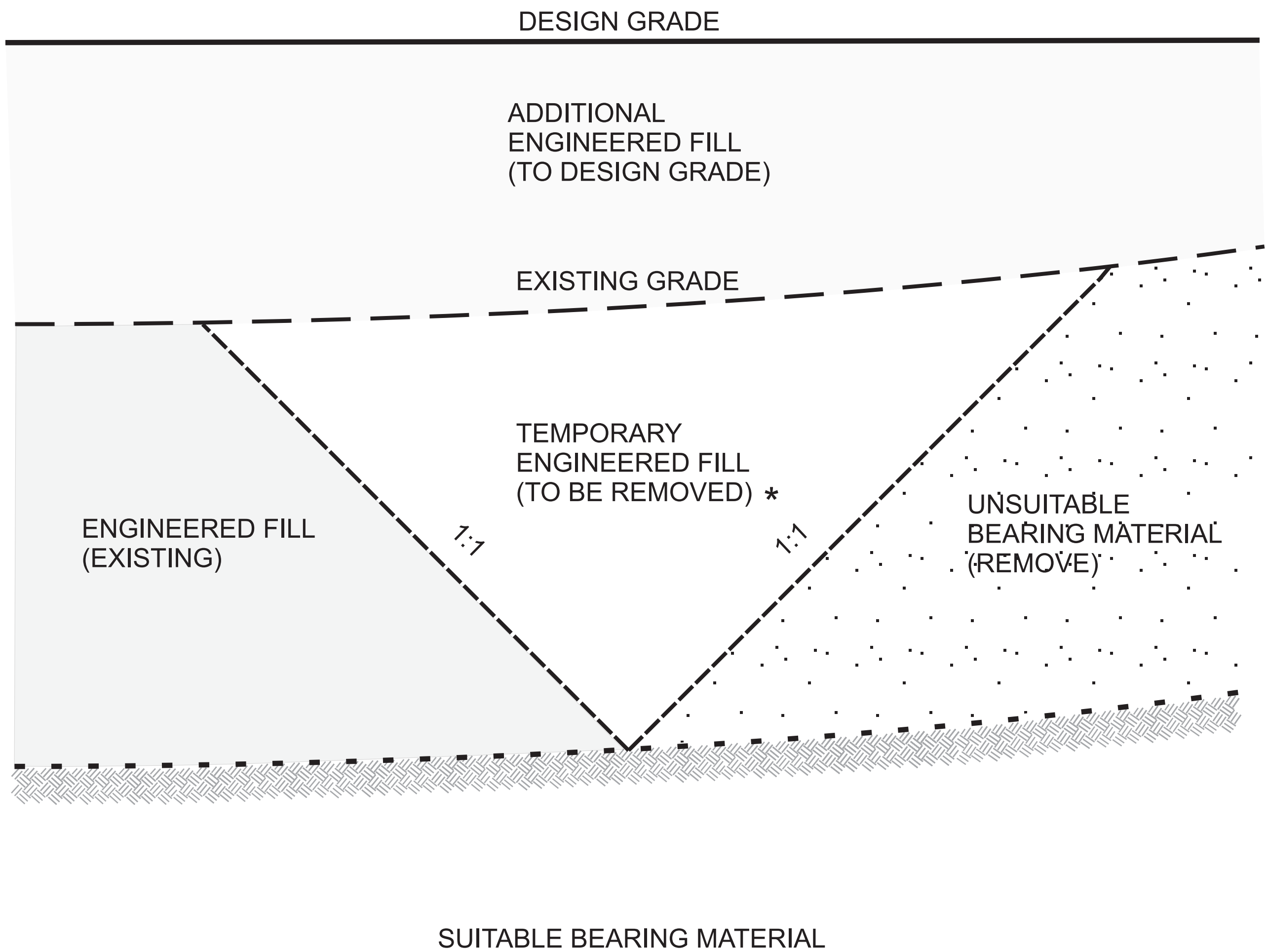
AGS ADVANCED GEOTECHNICAL SOLUTIONS	CUT & CUT-FILL LOT OVEREXCAVATION	DETAIL 8



* REMOVE BEFORE PLACING ADDITIONAL ENGINEERED FILL

TYPICAL UP-CANYON PROFILE

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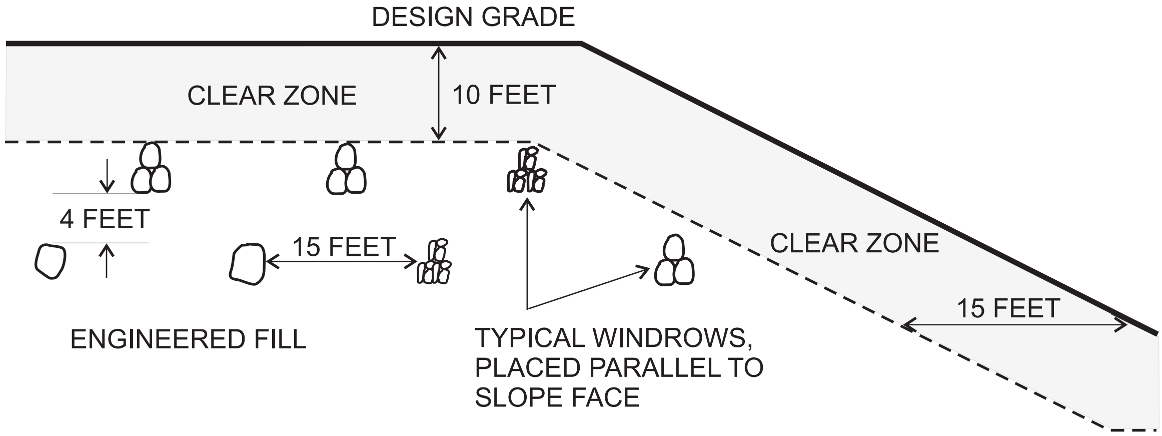
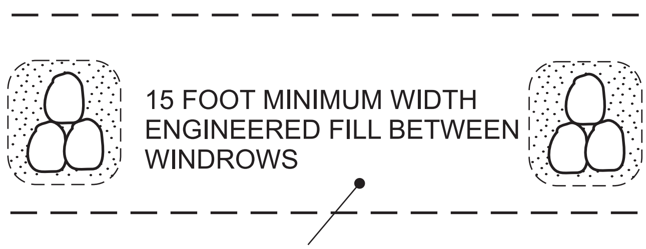
AGS ADVANCED GEOTECHNICAL SOLUTIONS	REMOVAL ADJACENT TO EXISTING FILL	DETAIL 9



CLEAR ZONE DIMENSIONS FOR REFERENCE ONLY, ACTUAL DEPTH, WIDTH, WINDROW LENGTH, ETC. TO BE BASED ON ELEVATIONS OF FOUNDATIONS, UTILITIES OR OTHER STRUCTURES PER THE GEOTECHNICAL CONSULTANT OR GOVERNING AGENCY APPROVAL

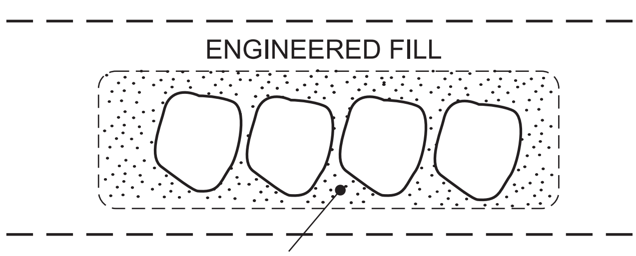
OVERSIZED MATERIAL DISPOSAL PROFILE



HORIZONTALLY PLACED ENGINEERED FILL, FREE OF OVERSIZED MATERIALS AND COMPACTED TO MINIMUM PROJECT STANDARDS

COMPACT ENGINEERED FILL ABOVE OVERSIZED MATERIALS TO FACILITATE "TRENCH" CONDITION PRIOR TO FLOODING GRANULAR MATERIALS

WINDROW CROSS-SECTION



GRANULAR MATERIAL APPROVED BY THE GEOTECHNICAL CONSULTANT AND CONSOLIDATED IN-PLACE BY FLOODING

WINDROW PROFILE

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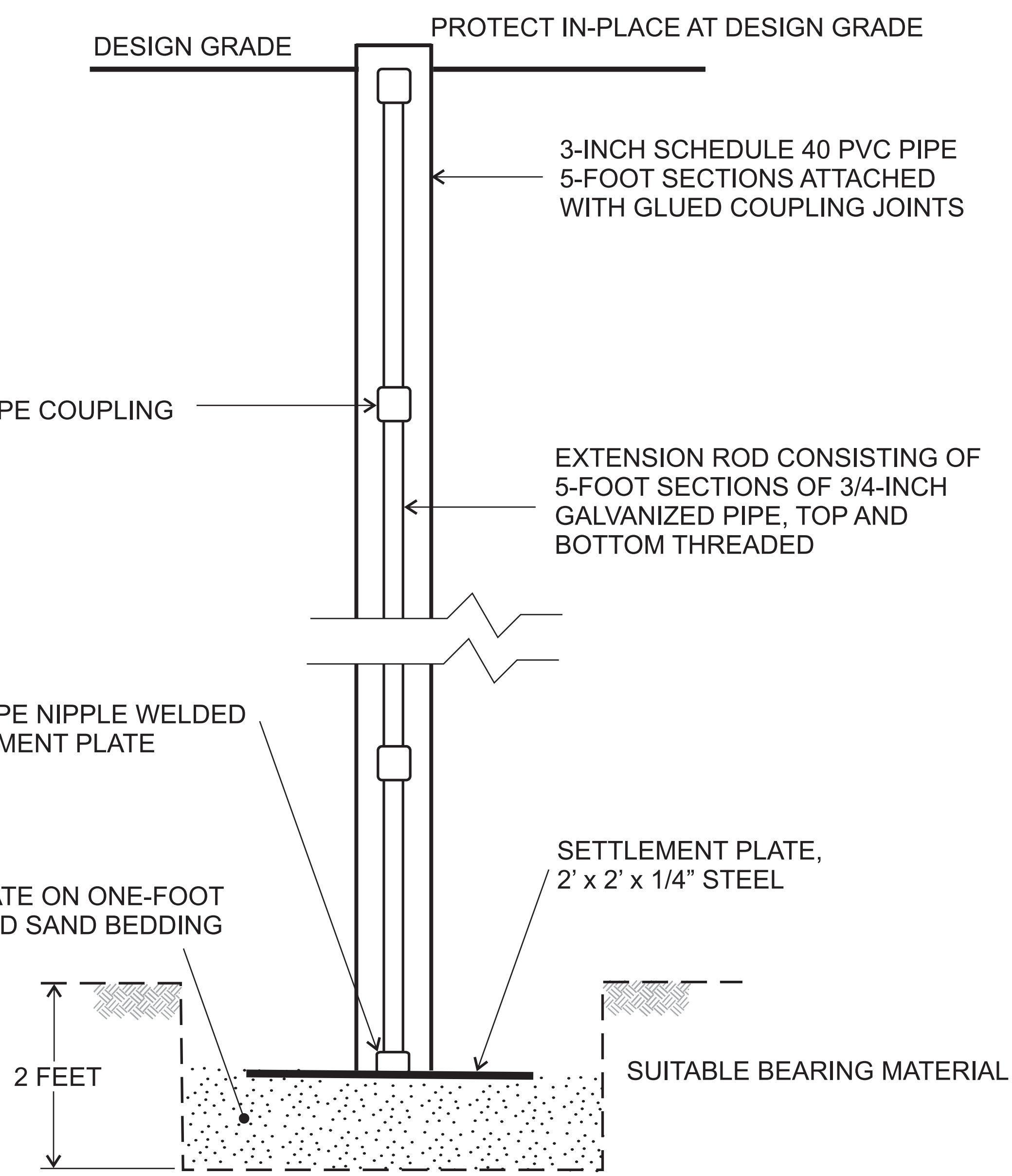
AGS ADVANCED GEOTECHNICAL SOLUTIONS	OVERSIZED MATERIAL DISPOSAL CRITERIA	DETAIL 10



NOTES:

1. SETTLEMENT PLATE LOCATIONS SHALL BE SUFFICIENTLY IDENTIFIED BY THE CONTRACTOR AND BE READILY VISIBLE TO EQUIPMENT OPERATORS.

2. CONTRACTOR SHALL MAINTAIN ADEQUATE HORIZONTAL CLEARANCE FOR EQUIPMENT OPERATION AND SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO SETTLEMENT PLATE DURING SITE CONSTRUCTION.

3. A MINIMUM 5-FOOT ZONE ADJACENT TO SETTLEMENT PLATE/EXTENSION RODS SHALL BE ESTABLISHED FOR HAND-HELD MECHANICAL COMPACTION OF ENGINEERED FILL. ENGINEERED FILL SHALL BE COMPACTED TO MINIMUM PROJECT STANDARD.

4. ELEVATIONS OF SETTLEMENT PLATE AND ALL EXTENSION ROD PLACEMENT SHALL BE DOCUMENTED BY PROJECT CIVIL ENGINEER OR SURVEYOR.

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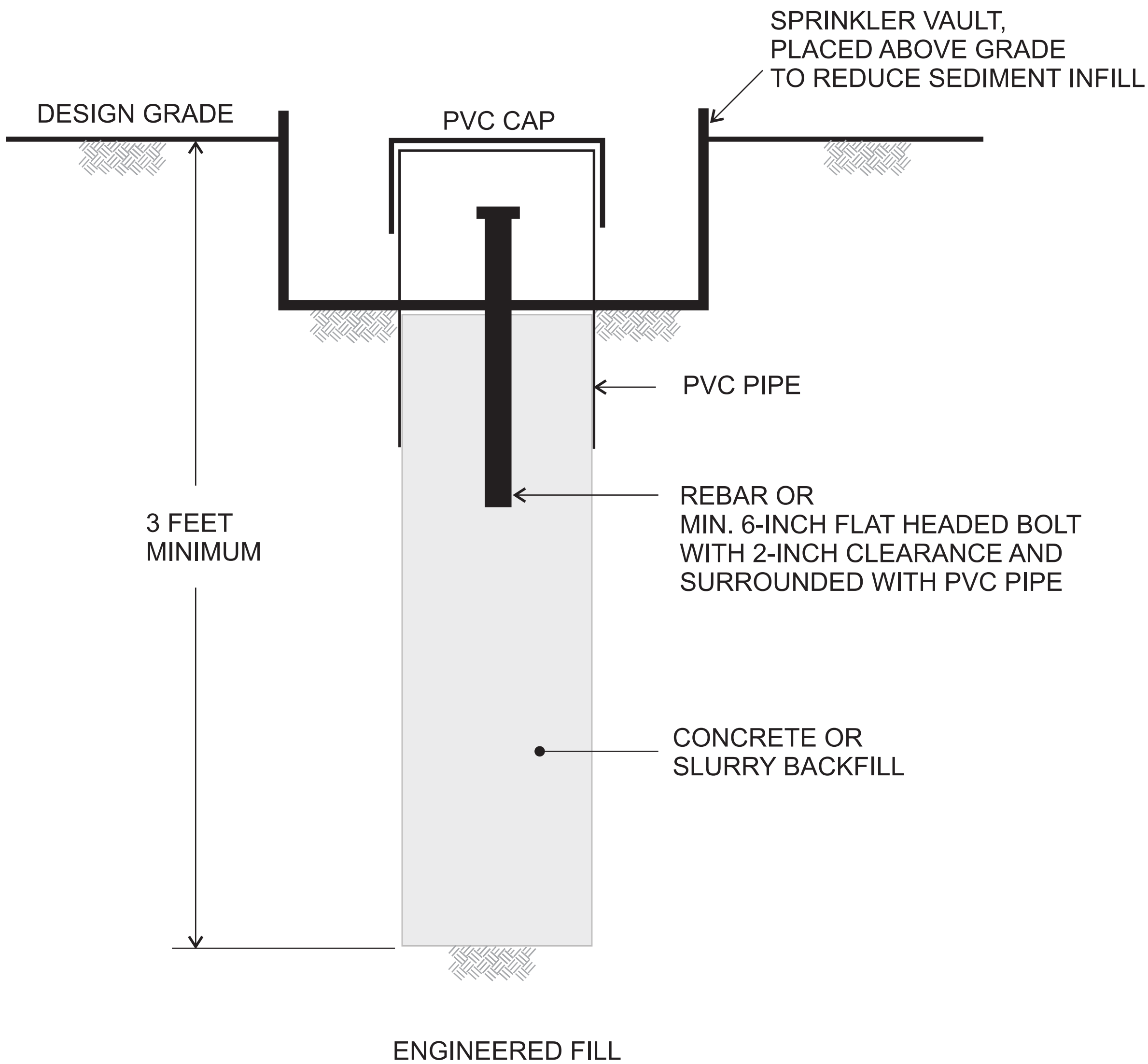
SETTLEMENT PLATE

DETAIL 11



NOTES:

1. SETTLEMENT MONUMENT LOCATIONS SHALL BE SUFFICIENTLY IDENTIFIED AND BE READILY VISIBLE TO EQUIPMENT OPERATORS.

2. ELEVATIONS OF SURFACE MONUMENTS SHALL BE DOCUMENTED BY PROJECT CIVIL ENGINEER OR SURVEYOR.

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AGS ADVANCED GEOTECHNICAL SOLUTIONS	SETTLEMENT MONUMENT	DETAIL 12

Appendix F

Homeowner Maintenance Guidelines

HOMEOWNER MAINTENANCE AND IMPROVEMENT CONSIDERATIONS

Homeowners are accustomed to maintaining their homes. They expect to paint their houses periodically, replace wiring, clean out clogged plumbing, and repair roofs. Maintenance of the home site, particularly on hillsides, should be considered on the same basis or even on a more serious basis because neglect can result in serious consequences. In most cases, lot and site maintenance can be taken care of along with landscaping, and can be carried out more economically than repair after neglect.

Most slope and hillside lot problems are associated with water. Uncontrolled water from a broken pipe, cesspool, or wet weather causes most damage. Wet weather is the largest cause of slope problems, particularly in California where rain is intermittent, but may be torrential. Therefore, drainage and erosion control are the most important aspects of home site stability; these provisions must not be altered without competent professional advice. Further, maintenance must be carried out to assure their continued operation.

As geotechnical engineers concerned with the problems of building sites in hillside developments, we offer the following list of recommended home protection measures as a guide to homeowners.

Expansive Soils

Some of the earth materials on site have been identified as being expansive in nature. As such, these materials are susceptible to volume changes with variations in their moisture content. These soils will swell upon the introduction of water and shrink upon drying. The forces associated with these volume changes can have significant negative impacts (in the form of differential movement) on foundations, walkways, patios, and other lot improvements. In recognition of this, the project developer has constructed homes on these lots on post-tensioned or mat slabs with pier and grade beam foundation systems, intended to help reduce the potential adverse effects of these expansive materials on the residential structures within the project. Such foundation systems are not intended to offset the forces (and associated movement) related to expansive soil, but are intended to help soften their effects on the structures constructed thereon.

Homeowners purchasing property and living in an area containing expansive soils must assume a certain degree of responsibility for homeowner improvements as well as for maintaining conditions around their home. Provisions should be incorporated into the design and construction of homeowner improvements to account for the expansive nature of the onsite soils material. Lot maintenance and landscaping should also be conducted in consideration of the expansive soil characteristics. Of primary importance is minimizing the moisture variation below all lot improvements. Such design, construction and homeowner maintenance provisions should include:

- Employing contractors for homeowner improvements who design and build in recognition of local building code and site specific soils conditions.
- Establishing and maintaining positive drainage away from all foundations, walkways, driveways, patios, and other hardscape improvements.
- Avoiding the construction of planters adjacent to structural improvements. Alternatively, planter sides/bottoms can be sealed with an impermeable membrane and drained away from the improvements via subdrains into approved disposal areas.
- Sealing and maintaining construction/control joints within concrete slabs and walkways to reduce the potential for moisture infiltration into the subgrade soils.

- ❖ Utilizing landscaping schemes with vegetation that requires minimal watering. Alternatively, watering should be done in a uniform manner as equally as possible on all sides of the foundation, keeping the soil "moist" but not allowing the soil to become saturated.
- ❖ Maintaining positive drainage away from structures and providing roof gutters on all structures with downspouts installed to carry roof runoff directly into area drains or discharged well away from the structures.
- ❖ Avoiding the placement of trees closer to the proposed structures than a distance of one-half the mature height of the tree.
- ❖ Observation of the soil conditions around the perimeter of the structure during extremely hot/dry or unusually wet weather conditions so that modifications can be made in irrigation programs to maintain relatively constant moisture conditions.

Sulfates

Homeowners should be cautioned against the import and use of certain fertilizers, soil amendments, and/or other soils from offsite sources in the absence of specific information relating to their chemical composition. Some fertilizers have been known to leach sulfate compounds into soils otherwise containing "negligible" sulfate concentrations and increase the sulfate concentrations in near-surface soils to "moderate" or "severe" levels. In some cases, concrete improvements constructed in soils containing high levels of soluble sulfates may be affected by deterioration and loss of strength.

Water - Natural and Man Induced

Water in concert with the reaction of various natural and man-made elements, can cause detrimental effects to your structure and surrounding property. Rain water and flowing water erodes and saturates the ground and changes the engineering characteristics of the underlying earth materials upon saturation. Excessive irrigation in concert with a rainy period is commonly associated with shallow slope failures and deep seated landslides, saturation of near structure soils, local ponding of water, and transportation of water soluble substances that are deleterious to building materials including concrete, steel, wood, and stucco.

Water interacting with the near surface and subsurface soils can initiate several other potentially detrimental phenomena other than slope stability issues. These may include expansion/contraction cycles, liquefaction potential increase, hydro-collapse of soils, ground surface settlement, earth material consolidation, and introduction of deleterious substances.

The homeowners should be made aware of the potential problems which may develop when drainage is altered through construction of retaining walls, swimming pools, paved walkways and patios. Ponded water, drainage over the slope face, leaking irrigation systems, over-watering or other conditions which could lead to ground saturation must be avoided.

- ❖ Before the rainy season arrives, check and clear roof drains, gutters and down spouts of all accumulated debris. Roof gutters are an important element in your arsenal against rain damage. If you do not have roof gutters and down spouts, you may elect to install them. Roofs, with their, wide, flat area can shed tremendous quantities of water. Without gutters or other adequate drainage, water falling from the eaves collects against foundation and basement walls.
- ❖ Make sure to clear surface and terrace drainage ditches, and check them frequently during the rainy season. This task is a community responsibility.
- ❖ Test all drainage ditches for functioning outlet drains. This should be tested with a hose and done before the rainy season. All blockages should be removed.

- Check all drains at top of slopes to be sure they are clear and that water will not overflow the slope itself, causing erosion.
- Keep subsurface drain openings (weep-holes) clear of debris and other material which could block them in a storm.
- Check for loose fill above and below your property if you live on a slope or terrace.
- Monitor hoses and sprinklers. During the rainy season, little, if any, irrigation is required. Oversaturation of the ground is unnecessary, increases watering costs, and can cause subsurface drainage.
- Watch for water backup of drains inside the house and toilets during the rainy season, as this may indicate drain or sewer blockage.
- Never block terrace drains and brow ditches on slopes or at the tops of cut or fill slopes. These are designed to carry away runoff to a place where it can be safely distributed.
- Maintain the ground surface upslope of lined ditches to ensure that surface water is collected in the ditch and is not permitted to be trapped behind or under the lining.
- Do not permit water to collect or pond on your home site. Water gathering here will tend to either seep into the ground (loosening or expanding fill or natural ground), or will overflow into the slope and begin erosion. Once erosion is started, it is difficult to control and severe damage may result rather quickly.
- Never connect roof drains, gutters, or down spouts to subsurface drains. Rather, arrange them so that water either flows off your property in a specially designed pipe or flows out into a paved driveway or street. The water then may be dissipated over a wide surface or, preferably, may be carried away in a paved gutter or storm drain. Subdrains are constructed to take care of ordinary subsurface water and cannot handle the overload from roofs during a heavy rain.
- Never permit water to spill over slopes, even where this may seem to be a good way to prevent ponding. This tends to cause erosion and, in the case of fill slopes, can eat away carefully designed and constructed sites.
- Do not cast loose soil or debris over slopes. Loose soil soaks up water more readily than compacted fill. It is not compacted to the same strength as the slope itself and will tend to slide when laden with water; this may even affect the soil beneath the loose soil. The sliding may clog terrace drains below or may cause additional damage in weakening the slope. If you live below a slope, try to be sure that loose fill is not dumped above your property.
- Never discharge water into subsurface blanket drains close to slopes. Trench drains are sometimes used to get rid of excess water when other means of disposing of water are not readily available. Overloading these drains saturates the ground and, if located close to slopes, may cause slope failure in their vicinity.
- Do not discharge surface water into septic tanks or leaching fields. Not only are septic tanks constructed for a different purpose, but they will tend, because of their construction, to naturally accumulate additional water from the ground during a heavy rain. Overloading them artificially during the rainy season is bad for the same reason as subsurface subdrains, and is doubly dangerous since their overflow can pose a serious health hazard. In many areas, the use of septic tanks should be discontinued as soon as sewers are made available.
- Practice responsible irrigation practices and do not over-irrigate slopes. Naturally, ground cover of ice plant and other vegetation will require some moisture during the hot summer months, but during the wet season, irrigation can cause ice plant and other heavy ground cover to pull loose. This not only destroys the cover, but also starts serious erosion. In some areas, ice plant and other heavy cover can cause surface sloughing when saturated due to the increase in weight and weakening of the near-surface soil. Planted slopes should be planned where possible to acquire sufficient moisture when it rains.
- Do not let water gather against foundations, retaining walls, and basement walls. These walls are built to withstand the ordinary moisture in the ground and are, where necessary, accompanied by

subdrains to carry off the excess. If water is permitted to pond against them, it may seep through the wall, causing dampness and leakage inside the basement. Further, it may cause the foundation to swell up, or the water pressure could cause structural damage to walls.

- Do not try to compact soil behind walls or in trenches by flooding with water. Not only is flooding the least efficient way of compacting fine-grained soil, but it could damage the wall foundation or saturate the subsoil.
- Never leave a hose and sprinkler running on or near a slope, particularly during the rainy season. This will enhance ground saturation which may cause damage.
- Never block ditches which have been graded around your house or the lot pad. These shallow ditches have been put there for the purpose of quickly removing water toward the driveway, street or other positive outlet. By all means, do not let water become ponded above slopes by blocked ditches.
- Seeding and planting of the slopes should be planned to achieve, as rapidly as possible, a well-established and deep-rooted vegetal cover requiring minimal watering.
- It should be the responsibility of the landscape architect to provide such plants initially and of the residents to maintain such planting. Alteration of such a planting scheme is at the resident's risk.
- The resident is responsible for proper irrigation and for maintenance and repair of properly installed irrigation systems. Leaks should be fixed immediately. Residents must undertake a program to eliminate burrowing animals. This must be an ongoing program in order to promote slope stability. The burrowing animal control program should be conducted by a licensed exterminator and/or landscape professional with expertise in hill side maintenance.

Geotechnical Review

Due to the fact that soil types may vary with depth, it is recommended that plans for the construction of rear yard improvements (swimming pools, spas, barbecue pits, patios, etc.), be reviewed by a geotechnical engineer who is familiar with local conditions and the current standard of practice in the vicinity of your home.

In conclusion, your neighbor’s slope, above or below your property, is as important to you as the slope that is within your property lines. For this reason, it is desirable to develop a cooperative attitude regarding hillside maintenance, and we recommend developing a “good neighbor” policy. Should conditions develop off your property, which are undesirable from indications given above, necessary action should be taken by you to insure that prompt remedial measures are taken. Landscaping of your property is important to enhance slope and foundation stability and to prevent erosion of the near surface soils. In addition, landscape improvements should provide for efficient drainage to a controlled discharge location downhill of residential improvements and soil slopes.

Additionally, recommendations contained in the Geotechnical Engineering Study report apply to all future residential site improvements, and we advise that you include consultation with a qualified professional in planning, design, and construction of any improvements. Such improvements include patios, swimming pools, decks, etc., as well as building structures and all changes in the site configuration requiring earth cut or fill construction.