Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PROJECT SPECIFIC PRELIMINARY WATER QUALITY MANAGEMENT PLAN (P-WQMP)

FOR:
TEMESCAL VALLEY COMMERCE CENTER
TEMESCAL CANYON ROAD AND DAWSON CANYON ROAD
COUNTY OF RIVERSIDE, CALIFORNIA 92883
APNs: 283-160-046 & 283-190-044

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AUGUST 22, 2022
NOVEMBER 15, 2023
MAY 2, 2024
MARCH 13, 2025

JOB NO. 3905

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FOR

"TEMESCAL VALLEY COMMERCE CENTER"



PREPARED BY LUIS PRADO
UNDER THE SUPERVISION OF:

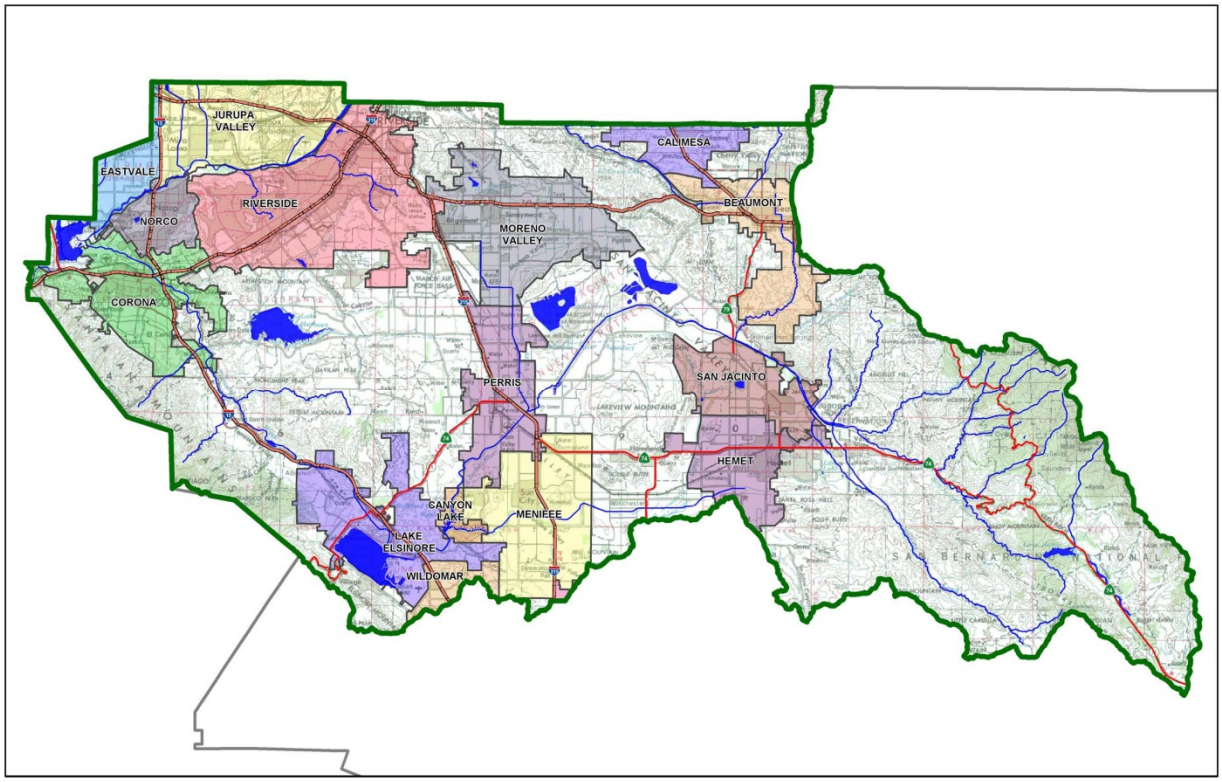
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Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Temescal Valley Commerce Center
Development No: A.P.N. 283-160-046 & 283-190-044
Design Review/Case No: Planning Case PAR19-00052 / PPT220039 / TPM38551



☒ **Preliminary**
☐ **Final**

Original Date Prepared: August 22, 2022

Revision Date(s): November 15, 2023
May 2, 2024
March 13, 2025

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

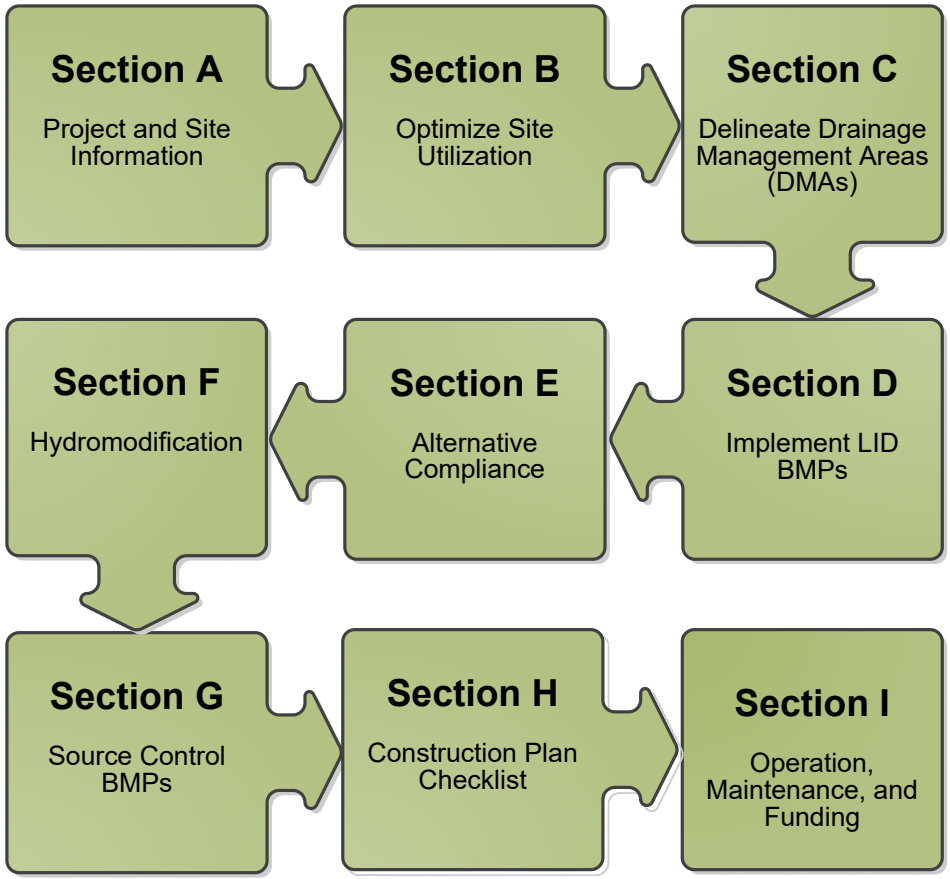
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A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for **Dawson Canyon, LLC** by **Thienes Engineering, Inc.** for the **Temescal Valley Commerce Center** project.

This WQMP is intended to comply with the requirements of **County of Riverside** for **Ordinance No. 754** which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under **County of Riverside** Ordinance **No. 754**.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Matt Englhard	
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
Reinhard Stenzel	Director of Engineering
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Light Industrial Warehouse
Planning Area:	Light Industrial/Business Park
Community Name:	N/A
Development Name:	Temescal Valley Commerce Center
PROJECT LOCATION	
Latitude & Longitude (GIS): 33.781405, -117.484502	
Project Watershed and Sub-Watershed: Santa Ana River & San Jacinto	
APN(s): 283-160-046 & 283-190-044	
Map Book and Page No.: Assessor's Map BK283 Pages 16 and 19	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Light Industrial
Proposed or Potential SIC Code(s)	4225
Area of Existing Impervious Project Footprint (SF)	0
Total Area of <u>proposed</u> Impervious Surfaces within the Project Limits (SF)/or Replacement	2,104,671 (48.317 acres) total 296,644 (6.81 acres) new channel 1,468,843 (33.72 acres) onsite 339,184 (7.787 acres) offsite Impervious 1,370,833 (31.47 acres) onsite 322,225 (7.397 acres) offsite
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of <u>existing</u> Impervious Surfaces within the project limits (SF)	0
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	Soil/Infiltration Report Available
What is the Water Quality Design Storm Depth for the project?	0.85

<u>Project Description</u>:

The overall project encompasses approximately 48.317 acres of improvements, which includes 33.72 acres of onsite improvements, 6.81 acres of Coldwater Canyon Wash realignment improvements, and 7.787 acres of offsite improvements. Proposed improvements include seven light industrial warehouses, each with their individual loading docks and vehicular parking areas. Landscape will be located throughout the site and along the perimeters.

Per the soils engineer, infiltration is feasible therefore underground infiltration chambers will be proposed to retain the runoff produced by the 85th percentile storm rainfall depth. Additional storage in the underground chambers will be provided to mitigate hydrologic conditions of concern (HCOC). DCV mitigation for the street widening improvements on the surrounding streets will be provided onsite via six separate underground infiltration chambers (located onsite).

<u>Existing Site</u>:

The project site is currently unpaved and barren. The site generally surface drains to the north and appears to pond stormwater prior to discharging into the Temescal Wash.

Stormwater is currently draining onto the site from offsite portions of the previous larger development and the bordering hillside to the southeast. Run-on surface drains to the north, down the vegetated slopes, and enters the site through the compacted surface of the neighboring southerly property. A gutter is proposed along the southerly property line to intercept and convey offsite run-on northeast, to the Temescal Wash.

Hydrology (see Hydrology map in Appendix 1 for visual):

In the proposed condition, the site will drain to the easterly portion of the double 12'W x 7'H RCB northeast of the Temescal Canyon Road and Dawson Canyon Road intersection.

The southerly portion of Building 5, southerly drive aisle and easterly vehicle parking area (Nodes 100-103) will drain to catch basins located in the drive aisles. Flows will be conveyed northerly around Building 5 and into the Building 6 truck yard via a proposed onsite storm drain system, Line "A". Flows from the northerly portion of Building 5, Building 6 and both truck yards (Nodes 110-114) will be collected with catch basins in the Building 6 truck yard and confluenced in Line "A". The storm drain system will continue westerly.

Flows from the drive aisle and parking areas east of Building 4 (Nodes 200-203) will be collected in a separate storm drain system, Line "D", and travel southerly. Flows will ultimately discharge into Line "A" in the Building 4 easterly drive aisle (Node 204) and continue westerly. The drive aisle and parking area west of Building 5, northerly portion of Building 3, Building 4 and both truck yards (Nodes 210-213) will drain to catch basins located in the Building 4 truck yard. Flows will confluence in Line "A" and continue southerly toward Building 2.

The parking area north of Building 2 and drive aisle west of Building 4 (Nodes 300-302) will drain to catch basins in the parking area. A proposed storm drain system, Line "C" will convey flows southerly and discharge into Line "A" (Node 303). Flows will continue southerly in the drive aisle between Building 1 and Building 3 (Node 407).

The southerly portion of Building 3, Building 3 southerly drive aisle, Building 3 easterly drive aisle and a portion of the Building 1 southerly drive aisle (Nodes 400-405). A proposed onsite storm drain system, Line "B", will convey flows westerly around Building 3 and northerly through the drive aisle. Flows will discharge into Line "A" in the drive aisle (Node 407) and continue westerly in Line "A".

Building 1, Building 2 and their truck yards (Nodes 500-502) will drain to a catch basin in the Building 2 truck yard. Flows will discharge into Line "A" and continue southerly down the Building 1 westerly drive aisle. Flows will ultimately discharge into the existing double 12'W x 7'H RCB.

Building 7 and its driveway entrance (Nodes 600-601) will be collected in a proposed onsite system, Line "E".

Runoff from approximately 0.68 acres of landscaping and some driveways (DMAs E, F and G) will sheet flow offsite onto Dawson Canyon Road and commingle with runoff from DMAs 2.1, 3.1 and 3.2 (offsite DMAs depicted in Appendix 1's offsite WQMP exhibit, prepared by Rick Engineering and dated September 7, 2023). To accommodate the additional volume generated by DMAs E, F, and G, increased storage capacity will be provided in STC "2.1", "3.1", and "3.2".

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, and the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Temescal Creek, Reach 2	None	AGR, IND, GWR, REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
Temescal Creek, Reach 1	pH	REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
Santa Ana River, Reach 3	Nitrate, Pathogens, Copper, and Lead	AGR, GWR, REC1, REC2, WARM, WILD, RARE	46 miles
The Prado Basin Management Zone	None	REC1, REC2, WARM, WILD, RARE	46 miles
Santa Ana River, Reach 2	Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, RARE	51 miles
Santa Ana River, Reach 1	None	REC1, REC2, WARM, WILD	Not classified as a RARE waterbody.
Tidal Prism of Santa Ana River and Newport Slough	Enterococcus, Fecal Coliform, Total Coliform	REC1, REC2, COMM, WILD, RARE, MAR	77 miles
Pacific Ocean Near shore Zone	None	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR, SHEL	77 miles

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☒ Y	☐ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* County of Riverside Grading Permit	☒ Y	☐ N
Other *(please list in the space below as required)* County of Riverside Building Permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

- *There are no creeks, wetlands, or riparian habitats nearby.*
- *Existing drainage patterns generally flow northerly before discharging into the Temescal Wash. Proposed condition drainage patterns mimic pre-development conditions. The proposed onsite storm drain will discharge into the proposed public storm drain in Temescal Canyon Road before discharging to the Temescal Wash.*

Did you identify and protect existing vegetation? If so, how? If not, why?

- *Not applicable, there are no sensitive areas.*
- *No applicable, there are no existing trees or vegetation to preserve.*

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

- *Infiltration capacity has been identified through infiltration tests within the project (see Appendix 3 for infiltration results).*

Did you identify and minimize impervious area? If so, how? If not, why?

- *Impervious area on the site has been minimized to City standards.*
- *Due to the nature of the project site (large trucks), substitution of pavement for landscaping is not feasible. The project does not propose overflow parking where substitution of pavement for landscaping would be optimal. Landscaping has been provided wherever applicable and to the maximum extent practicable.*

- *The entire Design Capture Volume (DCV) is handled by the proposed underground infiltration chambers.*

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

- *Roof runoff is directed to the underground infiltration chambers for treatment.*
- *The site is not on a hillside.*

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	Area (Acres)	DMA Type
A-1	Concrete or Asphalt	169,448	3.89	Type D
A-2	Ornamental Landscaping	9,148	0.21	Type D
B-1	Concrete or Asphalt	696,960	16.00	Type D
B-2	Ornamental Landscaping	36,590	0.84	Type D
C-1	Roofs/Conc/Asphalt	121,532	2.79	Type D
C-2	Ornamental Landscaping	6,534	0.15	Type D
D-1	Roofs/Conc/Asphalt	378,972	8.70	Type D
D-2	Ornamental Landscaping	20,038	0.46	Type D
E-1	Concrete or Asphalt	1,307	0.03	Type D
E-2	Ornamental Landscaping	11,761	0.27	Type D
F-1	Concrete or Asphalt	871	0.02	Type D
F-2	Ornamental Landscaping	6,970	0.16	Type D
G-1	Concrete or Asphalt	1,742	0.04	Type D
G-2	Ornamental Landscaping	6,970	0.16	Type D
H	Natural (B Soil)	296,644	6.81	Type A
1.1	Mixed Surface Types	139,609	3.20	Type D
1.3	Mixed Surface Types	110,953	2.55	Type D
2.1	Mixed Surface Types	39,197	0.90	Type D
3.1	Mixed Surface Types	10,234	0.23	Type D
3.2	Mixed Surface Types	26,633	0.61	Type D
3.3	Mixed Surface Types	12,558	0.29	Type D

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column.*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA H	296,644	Natural (B Soil)	N/A

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Type/ID	**Post-Project Surface Type**	**Area (square feet)**	**Storm Depth (inches)**	**DMA Type/ID**	**[C] from Table C.4**	***Required Retention Depth (inches)***
		[A]	[B]		[C]	[D] = [B] + ([B]*[C]/[A])

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Type/ID	**Area (square feet)**	**Post-Project Surface Type**	**Impervious Fraction**	**Product**	**DMA Type/ID**	**Area (square feet)**	**Ratio**
	[A]		[B]	[C] = [A] x [B]		[D]	[C] / [D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
A-1	Underground Infiltration System (STC "A")
A-2	Underground Infiltration System (STC "A")
B-1	Underground Infiltration System (STC "B")
B-2	Underground Infiltration System (STC "B")
C-1	Underground Infiltration System (STC "C")
C-2	Underground Infiltration System (STC "C")
D-1	Underground Infiltration System (STC "D")
D-2	Underground Infiltration System (STC "D")
E-1	Underground Infiltration System (STC "2.1")
E-2	Underground Infiltration System (STC "2.1")
F-1	Underground Infiltration System (STC "3.1")
F-2	Underground Infiltration System (STC "3.1")
G-1	Underground Infiltration System (STC "3.2")
G-2	Underground Infiltration System (STC "3.2")
1.1	Underground Infiltration System (STC "1.1")
1.3	Underground Infiltration System (STC "1.3")
2.1	Underground Infiltration System (STC "2.1")
3.1	Underground Infiltration System (STC "3.1")
3.2	Underground Infiltration System (STC "3.2")
3.3	Underground Infiltration System (STC "3.3")

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☒ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: N/A

Type of Landscaping (Conservation Design or Active Turf): N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: N/A

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: N/A

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
N/A	N/A

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: N/A

Project Type: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-2 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: N/A

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: N/A

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
N/A	N/A

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: N/A

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: N/A

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	N/A

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☐ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

☒ Not applicable

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				Alternative Compliance	Site Design (Type A, B, C)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment		
A-1	☒	☐	☐	☐	☐	☐
A-2	☒	☐	☐	☐	☐	☐
B-1	☒	☐	☐	☐	☐	☐
B-2	☒	☐	☐	☐	☐	☐
C-1	☒	☐	☐	☐	☐	☐
C-2	☒	☐	☐	☐	☐	☐
D-1	☒	☐	☐	☐	☐	☐
D-2	☒	☐	☐	☐	☐	☐
E-1	☒	☐	☐	☐	☐	☐
E-2	☒	☐	☐	☐	☐	☐
F-1	☒	☐	☐	☐	☐	☐
F-2	☒	☐	☐	☐	☐	☐
G-1	☒	☐	☐	☐	☐	☐
G-2	☒	☐	☐	☐	☐	☐
H	☐	☐	☐	☐	☐	☒
1.1	☒	☐	☐	☐	☐	☐
1.3	☒	☐	☐	☐	☐	☐
2.1	☒	☐	☐	☐	☐	☐
3.1	☒	☐	☐	☐	☐	☐
3.2	☒	☐	☐	☐	☐	☐
3.3	☒	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs (DMA A)

DMA A - Underground Infiltration System (STC "A")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
A-1	169,448	Concrete or Asphalt	*1.00*	*0.89*	*151,148.0*	*0.85*	*10706.3*	*21,637.0*
A-2	9,148	Ornamental Landscaping	*0.10*	*0.11*	*1,010.4*	*0.85*	*71.6*	
	178,596				*152,158*	0.85	10,777.9	21,637

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Table D.4 DCV Calculations for LID BMPs (DMA B)

DMA B - Underground Infiltration System (STC "B")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
B-1	696,960	Concrete or Asphalt	*1.00*	*0.89*	*621,688.3*	*0.85*	*44036.3*	*88,499.0*
B-2	36,590	Ornamental Landscaping	*0.10*	*0.11*	*4,041.7*	*0.85*	*286.3*	
	733,550				*625,730*	0.85	44,322.6	88,499

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Table D.5 DCV Calculations for LID BMPs (DMA C)

DMA C - Underground Infiltration System (STC "C")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
C-1	121,532	Roofs/Conc/Asphalt	*1.00*	*0.89*	*108,406.9*	*0.85*	*7678.8*	*15,629.0*
C-2	6,534	Ornamental Landscaping	*0.10*	*0.11*	*721.7*	*0.85*	*51.1*	
	128,066				*109,129*	0.85	7,729.9	15,629

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Table D.6 DCV Calculations for LID BMPs (DMA D)

DMA D - Underground Infiltration System (STC "D")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
D-1	378,972	Roofs/Conc/Asphalt	*1.00*	*0.89*	*338,043.0*	*0.85*	*23944.7*	*48,177.0*
D-2	20,038	Ornamental Landscaping	*0.10*	*0.11*	*2,213.3*	*0.85*	*156.8*	
	399,010				*340,256*	0.85	24,101.5	48,177

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMA 1.1 (Offsite Improvements) - Underground Infiltration System (STC "1.1")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
1.1	139,609	Mixed Surface Types	*0.98*	*0.86*	*119,638.0*	*0.85*	*8474.4*	*10,181.0*
	139,609				*119,638*	0.85	8,474.4	10,181

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMA 1.3 (Offsite Improvements) - Underground Infiltration System (STC "1.3")								
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	[A]		[B]	[C]	[A] x [C]			
1.3	110,953	Mixed Surface Types	*0.97*	*0.84*	*93,195.1*	*0.85*	*6601.3*	*11,627.0*
	110,953				*93,195*	0.85	6,601.3	11,627

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMAs 2.1 (Offsite Improvements), E-1 and E-2 - Underground Infiltration System (STC "2.1")								
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	[A]		[B]	[C]	[A] x [C]			
2.1	39,197	Mixed Surface Types	*0.97*	*0.84*	*32,923.6*	*0.85*	*2332.1*	*2757*
E-1	1,307	Concrete or Asphalt	*1.00*	*0.89*	*1,165.7*	*0.85*	*82.6*	
E-2	11,761	Ornamental Landscaping	*0.10*	*0.11*	*1,299.1*	*0.85*	*92*	
	52,265				*35,388*	0.85	2,506.7	2,757

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMAs 3.1 (Offsite Improvements), F-1 and F-2 - Underground Infiltration System (STC "3.1")								
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	[A]		[B]	[C]	[A] x [C]			
3.1	10,234	Mixed Surface Types	*0.97*	*0.84*	*8,596.1*	*0.85*	*608.9*	*790*
F-1	871	Concrete or Asphalt	*1.00*	*0.89*	*777.1*	*0.85*	*55*	
F-2	6,970	Ornamental Landscaping	*0.10*	*0.11*	*769.8*	*0.85*	*54.5*	
	18,075				*10,143*	0.85	718.4	790

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMAs 3.2 (Offsite Improvements), G-1 and G-2 - Underground Infiltration System (STC "3.1")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
3.2	26,633	Mixed Surface Types	*0.97*	*0.84*	*22,370.4*	*0.85*	*1584.6*	*1790*
G-1	1,742	Concrete or Asphalt	*1.00*	*0.89*	*1,554.2*	*0.85*	*110.1*	
G-2	6,970	Ornamental Landscaping	*0.10*	*0.11*	*769.8*	*0.85*	*54.5*	
	35,345				*24,694*	0.85	1,749.2	1,790

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

DMA 3.3 (Offsite Improvements) - Underground Infiltration System (STC "3.3")								
DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Design Storm Depth (in)***	***Design Capture Volume, V_{BMP} (cubic feet)***	***Proposed Volume on Plans (cubic feet)***
	[A]		[B]	[C]	[A] x [C]			
3.3	12,558	Mixed Surface Types	*0.97*	*0.84*	*10,548.1*	*0.85*	*747.2*	*790.0*
	12,558				*10,548*	0.85	747.2	790

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- Or -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☐	☐	☒	☐	☒	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imp Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor				
	[A]		[B]	[C]	[A] x [C]				
N/A	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*Design Storm Depth (in)*	*Minimum Design Capture Volume (cubic feet)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
N/A		
N/A		

[1] *Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.*
[2] *Cross Reference Table E.1 above to populate this column.*
[3] *As documented in a Co-Permittee Approved Study and provided in Appendix 6.*

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐Y ☒N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐Y ☒ N

If yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration (min)			
Volume (cubic-feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Pre-development 2-year, 24-hour volume = 42,485 cu-ft
Post-development 2-year, 24-hour volume = 218,110 cu-ft
HCOC mitigation volume = 218,110 cu-ft – (42,485 cu-ft x 1.05[1]) = 173,501 cu-ft
[1]Per TGD, a difference of 5 percent or less is not considered significant.

The HCOC mitigation volume for DMAs A through G is distributed among DMAs A, B, C and D using an area-weighted average. Storage provided in DMAs A through D for HCOC mitigation can be found in the table below.

DMA ID	DMA AREA (AC)	DCV (CF)	AREA-WEIGHTED RATIO	HCOC MITIGATION VOL. (CF)	TOTAL VOL. PROVIDED IN UNDEGROUND CHAMBERS (CF)	# OF CHAMBERS PROVIDED	DEPTH WHERE DCV IS ACHIEVED (IN)
DMA A	4.10	10,778	0.12	21,530	21,637	85	50
DMA B	16.84	44,323	0.51	88,431	88,499	342	50
DMA C	2.94	7,730	0.09	15,439	15,629	61	50
DMA D	9.16	24,102	0.28	48,101	48,177	203	50
TOTAL	**33.04**	**86,933**	**1.00**	**173,501**	**173,942**	**691**	**---**

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain inlets	• Mark all inlets with the words "Only Rain Down the Storm Drain" or similar.	• Maintain and periodically repaint or replace inlet markings annually. • Provide stormwater pollution prevention information to new site owners, lessees, or operators upon occupancy and annually thereafter. • See CASQA fact sheet SC-44 for "Drainage System Maintenance," included in Appendix of this document. • Include the following lease agreements: "Tenant shall not allow anyone to discharge anything to storm drain or to store or deposit materials so as to create a potential discharge to storm drains."

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
B. Interior floor drains and elevator shaft sump pumps	• Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	• Inspect and maintain drains semi-annually to prevent blockages and overflow.
D2. Landscape / Outdoor Pesticide Use	• Landscape plans will minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. • Pest-resistant plans will be used adjacent to hardscape. • The landscape plans will consider plants appropriate to the site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	• Maintain landscaping only using minimum pesticides, when needed. • See Appendix 10 for "Landscape and Gardening" brochure by RCFlood. • Provide Integrated Pest Management (IPM) information to new owners, lessees and operators upon occupancy and annually thereafter. IPM is an effective and environmentally sensitive approach to pest management.
G. Refuse Areas	• Site refuse will be handled by contractor on a weekly basis. • Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	• A minimum of two receptacles will be provided and located indoors. Receptacles are to be inspected daily and repairs or replacements to leaky receptacles will be completed immediately. Receptacles are to remain covered when not in use. Dumping of liquid or hazardous wastes is prohibited. A "no hazardous materials" sign will be posted. Spills will be cleaned immediately upon discovery. Spill control materials will be available onsite. See Appendix 10 for CASQA fact sheet SC-34 for "Waste Handling and Disposal."
H. Industrial processes	• All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.	• See Appendix 10 for CASQA fact sheet SC-10 for "Non-Stormwater Discharges"
M. Loading Docks	• Spills will be cleaned up immediately and disposed of properly.	• Move loaded and unloaded items indoors as soon as possible. • See Appendix 10 for CASQA fact sheet SC-30 for "Outdoor Loading and Unloading"
P. Plazas, sidewalks, and parking lots		• Sweep plazas, sidewalks, and parking lots monthly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	Latitude	Longitude
A	On-site storm drain inlets	Conceptual Grading Plans	---	---
B	Interior floor drains and elevator shaft sump pumps	N/A	---	---
D2	Landscape / Outdoor Pesticide Use	On-site Landscape Improvement Plans	---	---
G	Refuse Areas	Conceptual Grading Plans	---	---
H	Industrial processes	Conceptual Grading Plans (indoors, if any)	---	---
M	Loading Docks	Conceptual Grading Plans	---	---
P	Plazas, sidewalks, and parking lots	Conceptual Grading Plans	---	---
STC "A"	Underground Infiltration System	Conceptual Grading Plans	33.783151	-117.487290
STC "B"	Underground Infiltration System	Conceptual Grading Plans	33.782264	-117.486124
STC "C"	Underground Infiltration System	Conceptual Grading Plans	33.781522	-117.483882
STC "D"	Underground Infiltration System	Conceptual Grading Plans	33.780473	-117.484752
STC "1.1"	Underground Infiltration System	Conceptual Grading Plans	33.780627	-117.485890
STC "1.3"	Underground Infiltration System	Conceptual Grading Plans	33.782894 33.783249	-117.488290 -117.488149
STC "2.1"	Underground Infiltration System	Conceptual Grading Plans	33.783688	-117.487343
STC "3.1"	Underground Infiltration System	Conceptual Grading Plans	33.783935	-117.486748
STC "3.2"	Underground Infiltration System	Conceptual Grading Plans	33.783084	-117.485272
STC "3.3"	Underground Infiltration System	Conceptual Grading Plans	33.782558	-117.483793

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Maintenance will be funded by the owner. Owner is responsible for BMP maintenance per the recorded County of Riverside Covenant and Agreement. A recorded copy should be kept within Appendix 3 of Appendix 9's Operation and Maintenance Plan, within this WQMP report.

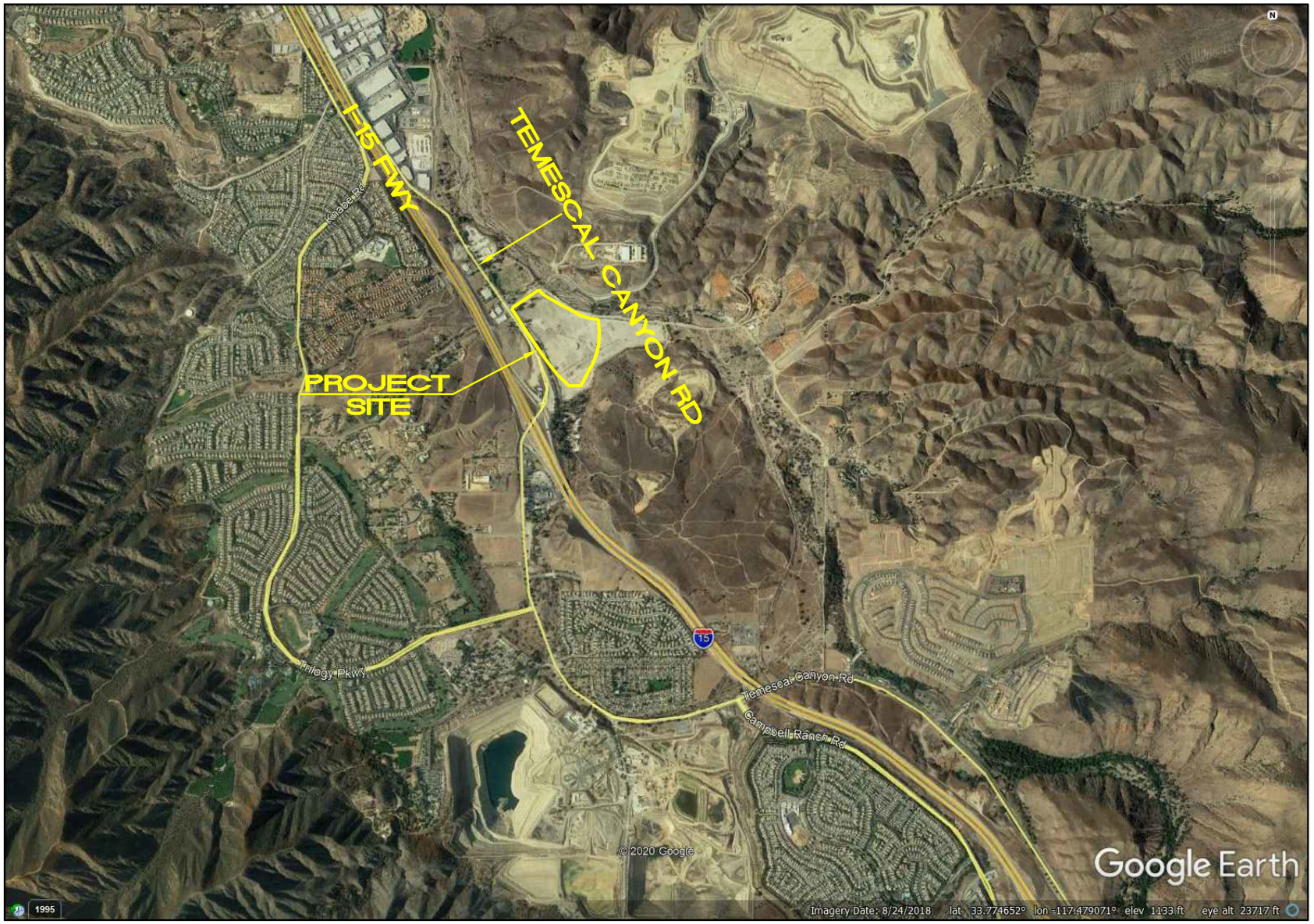
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



Last Update:11/15/23
O:\3900-3999\3905\3905Vicinity_Map.dwg

VICINITY MAP

FOR

TEMESCAL VALLEY COMMERCE CENTER

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173



Last Update:11/15/23
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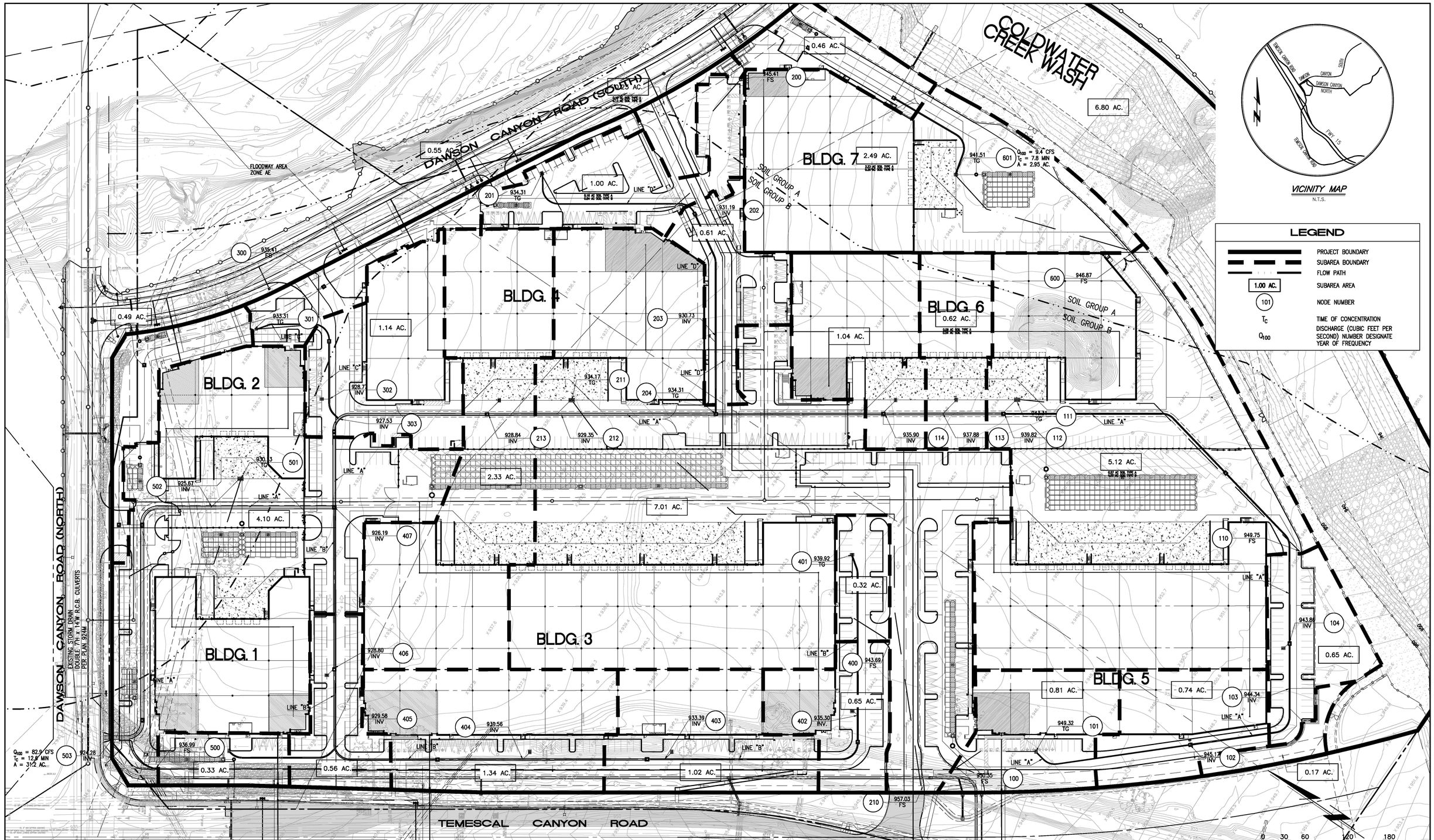
FLOW

RECEIVING WATERS MAP

FOR

TEMESCAL VALLEY COMMERCE CENTER

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173



VICINITY MAP
N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 1.00 AC. — SUBAREA AREA
- 101 — NODE NUMBER
- T_C — TIME OF CONCENTRATION
- Q_{100} — DISCHARGE (CUBIC FEET PER SECOND) NUMBER DESIGNATE YEAR OF FREQUENCY

IP: XXXXXX BGR: XXXXXX
BMP: XXXXXX WDID NO: XXXXXXXXXX

SOILS ENGINEER:
NORCAL ENGINEERING
10641 HUMBOLT STREET
LOS ALAMITOS, CA. 90720
PHONE: 799-9469

OWNER:
DAWSON CANYON, LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA 92612
PHONE: (949) 842-3074

COUNTY OF RIVERSIDE – PLANNING
APPROVED _____ DATE _____

CALL BEFORE YOU DIG
Underground Service Alert
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

PRIVATE ENGINEERING NOTE
CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

REGISTERED PROFESSIONAL ENGINEER
REINHARD STENZEL
R.C.E. NO. 56155
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA

PREPARED UNDER THE DIRECTION OF:
_____ DATE
REINHARD STENZEL
R.C.E. 56155 – EXP. 12/31/22

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

AS SHOWN
DATE

MARK	REVISIONS	APPR.	DATE

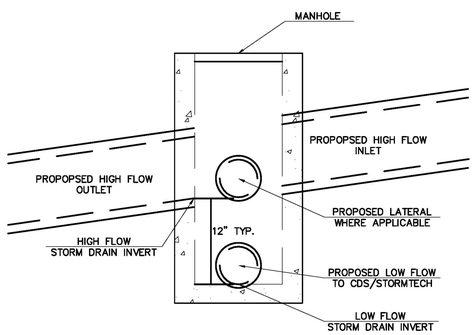
DESIGNED BY _____ DRAWN BY JP CHECKED BY RS

COUNTY OF RIVERSIDE– PLANNING
APPROVED _____ DATE _____

COUNTY OF RIVERSIDE
PROPOSED CONDITION HYDROLOGY MAP
FOR
23200 TEMESCAL CANYON RD
FOR: *PROFICIENCY CAPITAL, LLC*

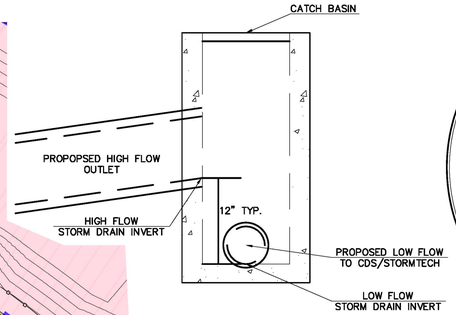
PROJECT NO.

SHEET 1 OF 1

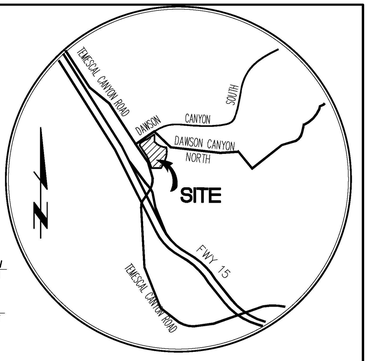


8 DIVERSION STRUCTURE
N.T.S.

0 30 60 120 180
SCALE: 1"=60'



9 DIVERSION STRUCTURE
N.T.S.



VICINITY MAP
N.T.S.

DAWSON CANYON RD (SOUTH)
DAWSON CANYON RD (NORTH)
TEMESCAL CANYON RD
COLDWATER CREEK WASH PER SEPARATE PLANS

BLDG. 1
BLDG. 2
BLDG. 3
BLDG. 4
BLDG. 5
BLDG. 6
BLDG. 7

DMA A-1 3.89 AC.
DMA A-2 0.21 AC.
DMA B-1 16.00 AC.
DMA B-2 0.84 AC.
DMA C-1 2.79 AC.
DMA C-2 0.15 AC.
DMA D-1 8.70 AC.
DMA D-2 0.46 AC.
DMA E-1 0.03 AC.
DMA E-2 0.27 AC.
DMA F-1 0.02 AC.
DMA F-2 0.16 AC.
DMA G-1 0.04 AC.
DMA G-2 0.16 AC.
DMA H 6.81 AC.

CDS "1.1" CDS "1.3" CDS "2.1" CDS "3.1" CDS "3.2" CDS "3.3" CDS "A" CDS "B" CDS "C" CDS "D"
STC "1.1" STC "1.3" STC "2.1" STC "3.1" STC "3.2" STC "3.3" STC "A" STC "B" STC "C" STC "D"

LINE "A" LINE "B" LINE "C" LINE "D" LINE "E"

RD

PROP. PUBLIC STORM DRAIN BY OTHERS

EX. 12'X7' SD. CULVERT
OVERFLOW CONNECTION TO EX. PUBLIC STORM DRAIN
EX. 66"W X 32"H SD CMP
EX. 24" CMP PUBLIC SD

LEGEND

1. LOADING/UNLOADING TRUCK DOCKS
2. EDUCATIONAL MATERIAL/OFFICE
3. INLET – STORM DRAIN STENCIL
4. UNDERGROUND INFILTRATION CHAMBERS
5. TRASH ENCLOSURE
6. PARKING LOT MAINTENANCE (SWEEPING)
7. CDS UNIT – PRETREATMENT WITH OIL BAFFLE APPROVED FTC DEVICE
8. DIVERSION STRUCTURE – MANHOLE
9. DIVERSION STRUCTURE – CATCH BASIN
10. OFFSITE – UNDERGROUND INFILTRATION CHAMBERS REFER TO APPENDIX 1 FOR OFFSITE MAP AND APPENDIX 6 FOR CALCULATIONS
11. OFFSITE – CDS UNIT REFER TO APPENDIX 1 FOR OFFSITE MAP AND APPENDIX 6 FOR CALCULATIONS

NOTE:

- BOUNDARY
- SUBAREAS (TRIBUTARY TO STC)
- FLOW LINE
- SD FLOW LINE
- LANDSCAPE/EFFICIENT IRRIGATION
- RD ROOF DRAIN
- STC STORMTECH CHAMBERS
- DMA A
- DMA B
- DMA C
- DMA D
- DMA E
- DMA F
- DMA G
- DMA H
- MANHOLE

Last Update: 3/13/25
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COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

WQMP SITE MAP

TEMESCAL VALLEY COMMERCE CENTER

TEMESCAL CANYON ROAD AND DAWNSON CANYON ROAD

PREPARED FOR:
DAWSON CANYON, LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA 92612
PHONE: (949) 842-3074

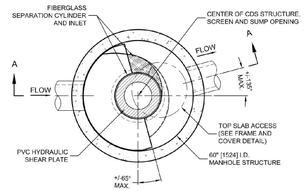
PREPARED BY:
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LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

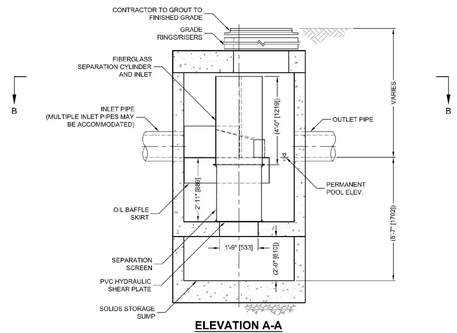
Approved by _____ Date _____
Public Works Director _____ R.C.E. _____

Sheet 1 of 3 Sheets

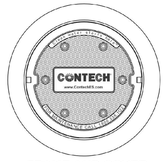
3905/ 1 OF 3 SHEETS



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS2025-5-C DESIGN NOTES
CDS2025-5-C RATED TREATMENT CAPACITY IS 1.6 CFS [45.3 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 14.0 CFS [396 L/s]. IF THE SITE CONDITIONS EXCEED 14.0 CFS [396 L/s], AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. THE STANDARD CDS2025-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE O/L BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

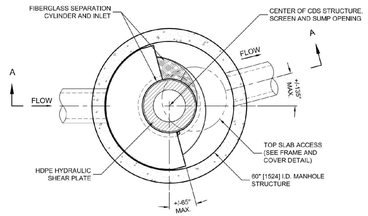
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

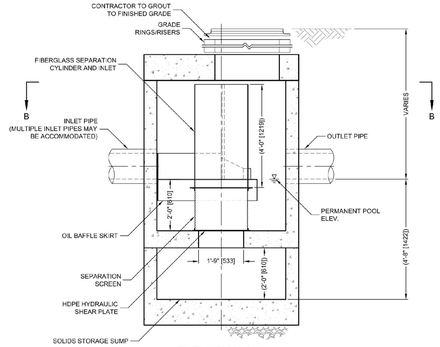
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2025-5-C
INLINE CDS
STANDARD DETAIL

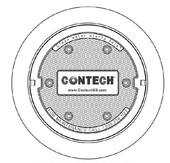
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PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS2015-5-C DESIGN NOTES
CDS2015-5-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [396 L/s]. IF THE SITE CONDITIONS EXCEED 14.0 [396 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. THE STANDARD CDS2015-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE O/L BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

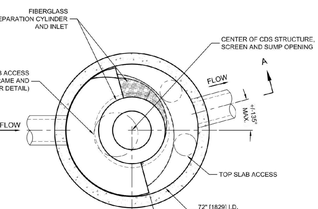
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

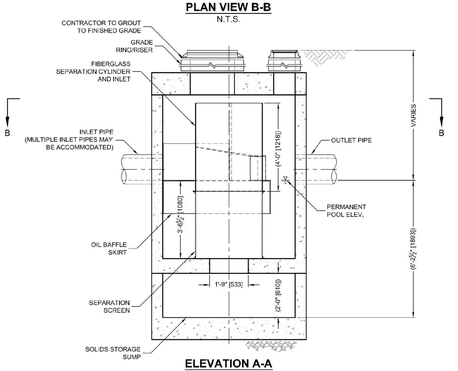
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-5-C
INLINE CDS
STANDARD DETAIL

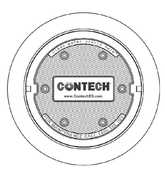
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PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS3030-6-C DESIGN NOTES
CDS3030-6-C RATED TREATMENT CAPACITY IS 3.0 CFS [85.0 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 20.0 CFS [566 L/s]. IF THE SITE CONDITIONS EXCEED 20.0 CFS [566 L/s], AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. THE STANDARD CDS3030-6-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE O/L BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS3030-6-C
INLINE CDS
STANDARD DETAIL

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Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain inlets	• Mark all inlets with the words "Only Rain Down the Storm Drain" or similar.	• Maintain and periodically repaint or replace inlet markings annually. • Provide stormwater pollution prevention information to new site owners, lessees, or operators upon occupancy and annually thereafter. • See CASQA fact sheet SC-44 for "Drainage System Maintenance," included in Appendix of this document. • Include the following lease agreements: "Tenant shall not allow anyone to discharge anything to storm drain or to store or deposit materials so as to create a potential discharge to storm drains."
B. Interior floor drains and elevator shaft sump pumps	• Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	• Inspect and maintain drains semi-annually to prevent blockages and overflow.
D2. Landscape / Outdoor Pesticide Use	• Landscape plans will minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. • Pest-resistant plans will be used adjacent to hardscape. • The landscape plans will consider plants appropriate to the site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	• Maintain landscaping only using minimum pesticides, when needed. • See Appendix 10 for "Landscape and Gardening" brochure by RCFlood. • Provide Integrated Pest Management (IPM) information to new owners, lessees and operators upon occupancy and annually thereafter. IPM is an effective and environmentally sensitive approach to pest management.
G. Refuse Areas	• Site refuse will be handled by contractor on a weekly basis. • Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	• A minimum of two receptacles will be provided and located indoors. Receptacles are to be inspected daily and repairs or replacements to leaky receptacles will be completed immediately. Receptacles are to remain covered when not in use. Dumping of liquid or hazardous wastes is prohibited. A "no hazardous materials" sign will be posted. Spills will be cleaned immediately upon discovery. Spill control materials will be available onsite. See Appendix 10 for CASQA fact sheet SC-34 for "Waste Handling and Disposal."
H. Industrial processes	• All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.	• See Appendix 10 for CASQA fact sheet SC-10 for "Non-Stormwater Discharges"
M. Loading Docks	• Spills will be cleaned up immediately and disposed of properly.	• Move loaded and unloaded items indoors as soon as possible. • See Appendix 10 for CASQA fact sheet SC-30 for "Outdoor Loading and Unloading"

Last Update: 3/13/25
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COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

WQMP SITE MAP

TEMESCAL VALLEY COMMERCE CENTER

TEMESCAL CANYON ROAD AND DAWNSON CANYON ROAD

PREPARED FOR:
DAWSON CANYON, LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA 92612
PHONE: (949) 842-3074

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. _____

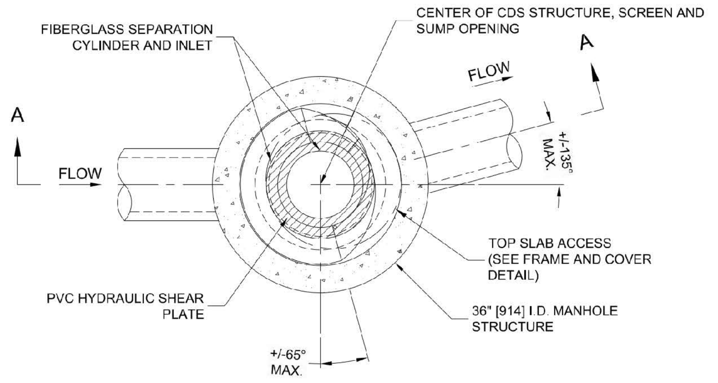
Sheet 2 of 3 Sheets

3905/ 2 OF 3 SHEETS

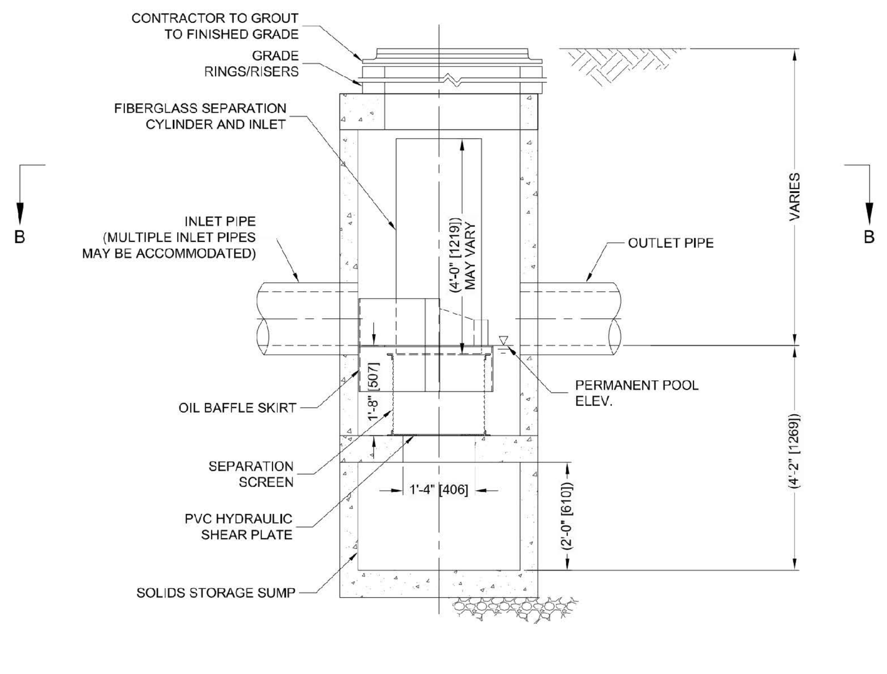
CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 0.50 [14.16 L/s] CFS, OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 6.0 [170 L/s] CFS. IF THE SITE CONDITIONS EXCEED 6.0 [170 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

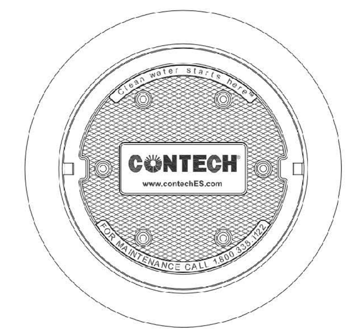
THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS			
STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

I:\COMMON\CAD\TREATMENT\22 CDS\40 STANDARD DRAWINGS\ONLINE (CDS-C)\DWG\CDS1515-3-C-DTL.DWG 2/27/2017 11:46 AM

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

StormTech MC-3500 Specifications

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9 in (230 mm)	12 in (300 mm)	15 in (375 mm)	18 in (450 mm)
Chamber	109.9 (3.11)	175.0 (4.96)	179.9 (5.09)	184.9 (5.24)	189.9 (5.38)
End Cap	14.9 (0.42)	45.1 (1.28)	46.6 (1.32)	48.3 (1.37)	49.9 (1.41)

Note: Assumes 6" (150 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth			
	9 in	12 in	15 in	18 in
Chamber	8.5 (6.0)	9.1 (6.5)	9.7 (6.9)	10.4 (7.4)
End Cap	3.9 (2.8)	4.1 (2.9)	4.3 (3.1)	4.5 (3.2)
Metric Kilograms (m³)	230 mm	300 mm	375 mm	450 mm
Chamber	7711 (4.6)	8255 (5.0)	8800 (5.3)	9435 (5.7)
End Cap	3538 (2.1)	3719 (2.2)	3901 (2.4)	4082 (2.5)

Note: Assumes 12" (300 mm) of stone above and 6" (150 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	9 in (230 mm)	12 in (300 mm)	15 in (375mm)	18 in (450 mm)
Chamber	11.9 (9.1)	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)
End Cap	4.0 (3.1)	4.1 (3.3)	4.3 (3.3)	4.4 (3.4)

Note: Assumes 6" (150 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

Working on a project?
Visit us at adspipe.com/stormtech and utilize the Design Tool

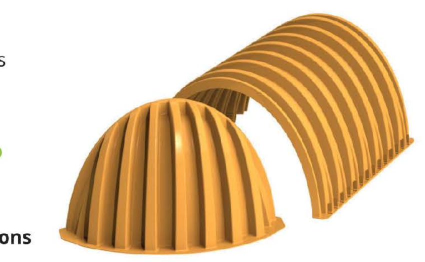
ADS StormTech

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StormTech® is a registered trademark of StormTech, Inc.
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adspipe.com
800-821-6710

StormTech® MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
90" x 77" x 45"
2286 mm x 1956 mm x 1143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
175.0 ft³ (4.96 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 6" (150 mm) of stone between chambers/end caps and 40% stone porosity.

Nominal End Cap Specifications
(not to scale)

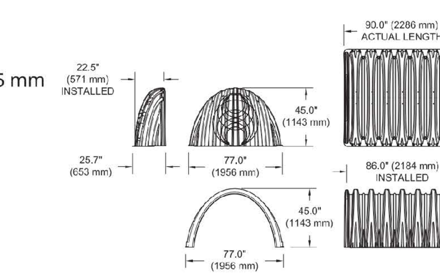
Size (L x W x H)
26.5" x 71" x 45.1"
673 mm x 1803 mm x 1145 mm

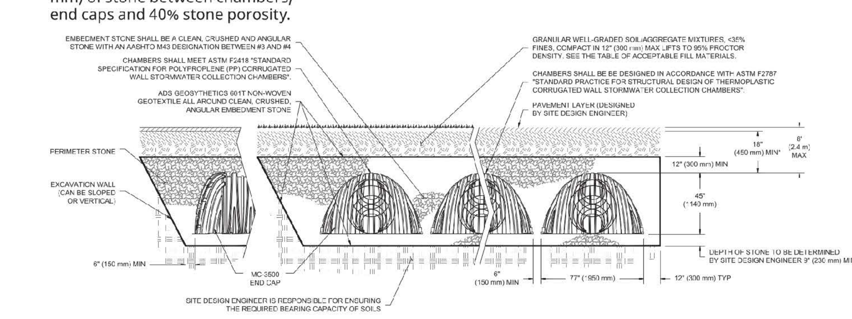
End Cap Storage
14.9 ft³ (0.42 m³)

Min. Installed Storage*
45.1 ft³ (1.28 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 6" (150 mm) of stone perimeter, 6" (150 mm) of stone between chambers/end caps and 40% stone porosity.





ADS StormTech

Last Update: 3/13/25
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COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

WQMP SITE MAP

TEMESCAL VALLEY COMMERCE CENTER

TEMESCAL CANYON ROAD AND DAWNSON CANYON ROAD

3905/ 3 OF 3 SHEETS

PREPARED FOR:

DAWSON CANYON, LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA 92612
PHONE: (949) 842-3074

PREPARED BY:

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by ______	Approved by	Date ______
Date ______		
Checked by ______		
Date ______		
Designed by ______	Public Works Director	R.C.E. ______
Date ______		
Checked by ______	Sheet 3 of 3 Sheets	
Date ______		

SOURCE CONTROL BMP SUMMARY

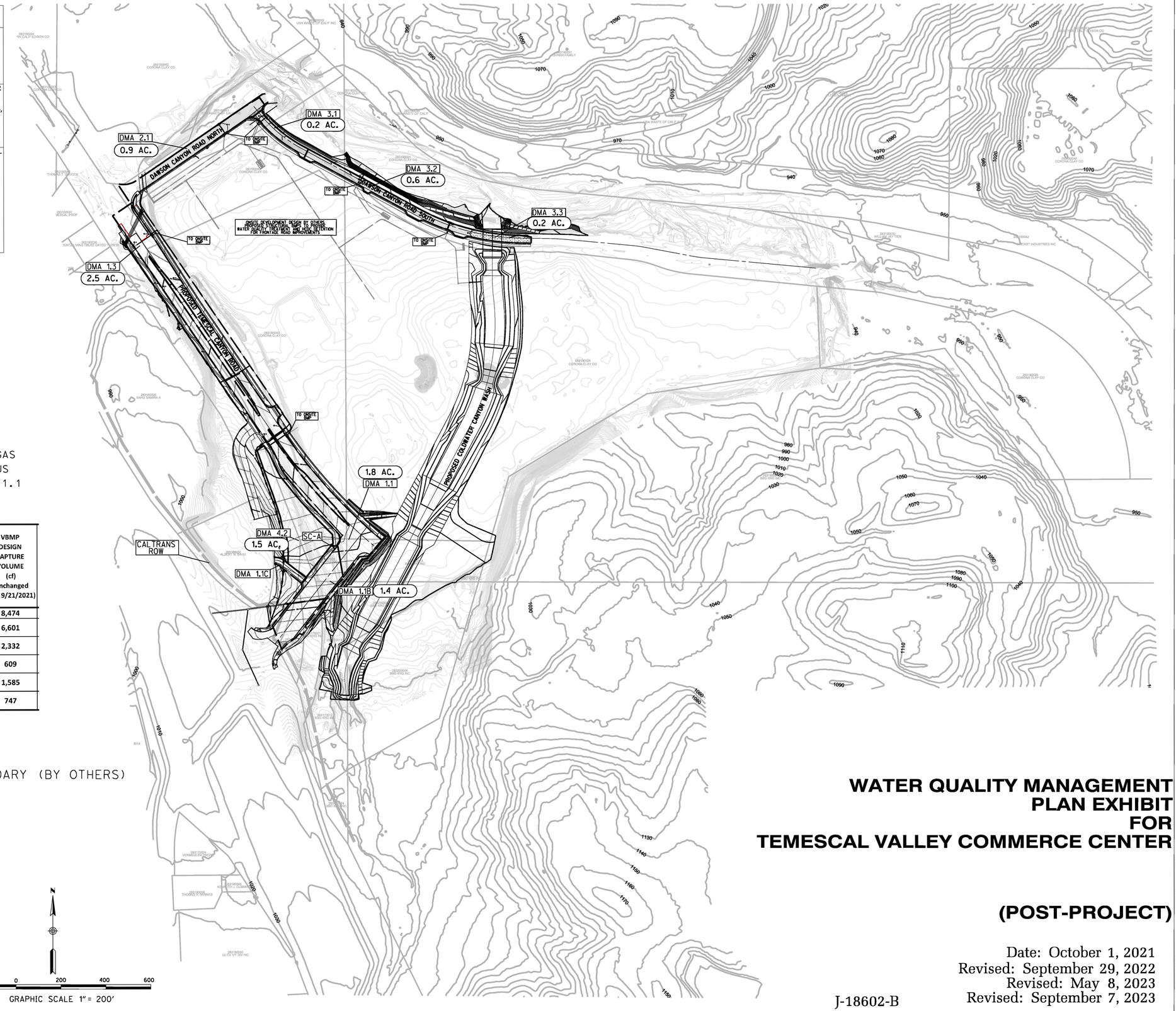
POTENTIAL SOURCES OF RUNOFF POLLUTANTS	STRUCTURAL SOURCE CONTROL BMPS	OPERATIONAL SOURCE CONTROL BMPS
ON-SITE STORM DRAIN INLETS (SC-A)	MARK ALL INLETS WITH THE WORDS "ONLY RAIN DOWN THE STORM DRAIN" OR SIMILAR.	MAINTAIN AND PERIODICALLY REPAINT OR REPLACE INLET MARKINGS. PROVIDE STORMWATER POLLUTION PREVENTION INFORMATION TO NEW SITE OWNERS, LESSEES, OR OPERATORS.
LANDSCAPE/OUTDOOR PESTICIDE USE (SC-D2)	PRESERVE EXISTING NATIVE TREES, SHRUBS, AND GROUND COVER TO THE MAXIMUM EXTENT POSSIBLE. DESIGN LANDSCAPING TO MINIMIZE IRRIGATION AND RUNOFF, TO PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER	MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES. PROVIDE IPM INFORMATION TO NEW OWNERS, LESSEES, AND OPERATORS.
PLAZAS, SIDEWALKS, AND PARKING LOTS (SC-P)	N/A	PLAZAS, SIDEWALKS, AND PARKING LOTS SHALL BE SWEPT REULARLY TO PREVENT THE ACCUMULATION OF LITTER AND DEBRIS. DEBRIS FROM PRESSURE WASHING SHALL BE COLLECTED TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM. WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER SHALL BE COLLECTED AND DISCHARGED TO THE SANITARY SEWER AND NOT DISCHARGED TO A STORM DRAIN.

NOTES:

THIS WATER QUALITY MANAGEMENT PLAN MAP COVERS THE OFFSITE FRONTAGE ROADS TO THE TEMESCAL VALLEY COMMERCE CENTER PROJECT. DESIGN CAPTURE VOLUMES HAVE BEEN CALCULATED AND COORDINATED WITH OTHERS WHO ARE PERFORMING PROPOSED ONSITE DESIGN INCLUDING PERMANENT STRUCTURAL BMPS. WATER QUALITY CALCULATIONS ARE TO BE PROVIDED BY OTHERS AND ADDRESSED IN SEPARATE REPORTS AND SEPARATE EXHIBITS. A SEPARATE REPORT TITLED "HYDRAULIC ANALYSIS REPORT FOR TEMESCAL VALLEY BUSINESS PARK" DATED SEPTEMBER 29, 2022, OR SUBSEQUENT VERSIONS THEREOF, ADDRESSES THE COLDWATER CANYON WASH CHANNEL REALIGNMENT IMPROVEMENTS. DMA 4.1 AND DMA 4.2 DRAINING TO BMP 4 ARE COVERED BY THIS WATER QUALITY MANAGEMENT PLAN. DMA 4.1B DRAINS TO THE ADJACENT GAS STATION, HOWEVER, IT IS STILL INCLUDED IN THE AS IMPERVIOUS AREA IN THE WATER QAULITY CALCULATIONS, AS DENOTED AS DMA 1.1 IN THE SUMMARY TABLE BELOW.

DMA SUMMARY

DMA TYPE/ID	DMA AREA (sf)	*DMA AREA (ac)*	ASSUMED % IMP	EFFECTIVE IMPERIVOUS FRACTION, If	DMA RUNOFF FACTOR	DMA AREAS X RUNOFF FACTOR	STORM DESIGN DEPTH (in)	**VBMP DESIGN CAPTURE VOLUME (cf) (Unchanged from 9/21/2021)**
DMA 1.1	*139,609*	*3.2*	*95*	*0.98*	*0.86*	*119,638*	0.85	**8,474**
DMA 1.3	*110,953*	*2.5*	*95*	*0.97*	*0.84*	*93,195*	0.85	**6,601**
DMA 2.1	*39,197*	*0.9*	*95*	*0.97*	*0.84*	*32,924*	0.85	**2,332**
DMA 3.1	*10,234*	*0.2*	*95*	*0.97*	*0.84*	*8,596*	0.85	**609**
DMA 3.2	*26,633*	*0.6*	*95*	*0.97*	*0.84*	*22,370*	0.85	**1,585**
DMA 3.3	*12,558*	*0.3*	*95*	*0.97*	*0.84*	*10,548*	0.85	**747**



LEGEND:

- DRAINAGE MANAGEMENT AREA BASIN BOUNDARY (BY OTHERS)
- 0.14 AC. — DRAINAGE MANAGEMENT AREA BASIN AREA
- 102 — DRAINAGE MANAGEMENT AREA BASIN ID
- PARCELS BOUNDARY LINE
- CALTRANS RIGHT-OF-WAY LINE

N

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

WATER QUALITY MANAGEMENT PLAN EXHIBIT FOR TEMESCAL VALLEY COMMERCE CENTER

(POST-PROJECT)

Date: October 1, 2021
Revised: September 29, 2022
Revised: May 8, 2023
Revised: September 7, 2023

J-18602-B

RICK ENGINEERING COMPANY
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rickengineering.com
Riverside - Orange - Sacramento - San Luis Obispo - Phoenix - Tucson - Denver
J-18162

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NOT FOR CONSTRUCTION - EXHIBIT FOR DRAINAGE STUDY REPORT ONLY

Appendix 2: Construction Plans

Grading and Drainage Plans

LEGEND

- EXIST. FIRE HYDRANT
- EXIST. WATER METER
- EXIST. WATER VALVE
- EXIST. GAS VALVE
- GUY WIRE/DEADMAN
- EXIST. POWER POLE
- EXIST. TRAFFIC SIGNAL
- EXIST. CROSSWALK SIGNAL
- STREET LIGHTING BOX
- EXIST. STREET LIGHT
- EXIST. STORMDRAIN MANHOLE
- EXIST. SEWER MANHOLE
- EXIST. VAULT
- EXIST. SIGN
- TREE
- EXIST. TRAFFIC SIGNAL BOX
- EXIST. GAS METER
- EXIST. MAIL BOX
- EXIST. TELEPHONE MANHOLE
- X 1854.69 EXIST. GRADE ELEVATION
- EXIST. CABLE TV CONDUIT
- EXIST. EDGE OF A.C. PAVEMENT
- EXIST. CURB AND GUTTER
- EXIST. SANITARY SEWER
- EXIST. STORM DRAIN
- EXIST. GAS LINE
- EXIST. TELEPHONE CONDUIT
- EXIST. WATER LINE
- EXIST. CONTOUR
- NEW PIPE LINE
- PROPERTY LINE
- NEW FIRE HYDRANT
- NEW WATER METER
- NEW WATER VALVE
- NEW THRUST BLOCK
- NEW SEWER MANHOLE
- NEW SEWER CLEAN OUT
- NEW CATCH BASIN
- PROPOSED CONTOUR

LEGAL DESCRIPTION:

THE LAND REFERRED TO IN THIS COMMITMENT IS SITUATED IN THE UNINCORPORATED AREA OF THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 2 OF NOTICE OF LOT LINE ADJUSTMENT NO. LLA200028, RECORDED JUNE 21, 2021 AS INSTRUMENT NO. 2021-0373323 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, BEING THOSE PORTIONS OF THE LAND DESCRIBED IN PARCELS 6, 7 AND 8 OF "CORPORATION GRANT DEED", IN THE EAST HALF OF THE NORTHEAST QUARTER OF SECTION 34, TOWNSHIP 4 SOUTH, RANGE 6 WEST AND THE NORTHWEST QUARTER OF SECTION 35, TOWNSHIP 4 SOUTH, RANGE 6 WEST, SAN BERNARDINO MERIDIAN, IN THE UNINCORPORATED TERRITORY OF THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, RECORDED JUNE 30, 1987 AS INSTRUMENT NO. 186951, OF OFFICIAL RECORDS OF SAID COUNTY, BOUNDED AS FOLLOWS:

ON THE NORTHWEST BY THE SOUTHEASTERLY LINE OF DAWSON CANYON ROAD AS DESCRIBED IN PARCEL 1 OF "CORPORATION QUITCLAIM DEED", RECORDED MAY 03, 2002 AS DOCUMENT NO. 2002-236679, OF OFFICIAL RECORDS OF SAID COUNTY;

AND BOUNDED EASTERLY BY THE FOLLOWING DESCRIBED LINE: COMMENCING AT THE WESTERLY TERMINUS OF THAT CERTAIN MOST SOUTHERLY LINE OF SAID PARCEL 6, DESCRIBED AS HAVING A BEARING AND DISTANCE OF "NORTH 89° 51' 27" EAST, 840.06 FEET", SAID WESTERLY TERMINUS ALSO BEING ON THE EASTERLY LINE OF TEMESCAL CANYON ROAD (40.00 FEET HALF-WIDE) AS SHOWN ON PARCEL MAP NO. 31196, AS PER MAP FILED IN BOOK 208, PAGES 50 THROUGH 53, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY; THENCE ALONG SAID MOST SOUTHERLY LINE OF PARCEL 6, NORTH 89° 51' 27" EAST, 586.31 FEET TO A POINT ON THE MOST SOUTHERLY LINE OF SAID PARCEL 8, SAID POINT BEING THE TRUE POINT OF BEGINNING;
THENCE NORTH 27° 54' 55" EAST 499.99 FEET TO THE BEGINNING OF A TANGENT CURVE, CONCAVE WESTERLY AND HAVING A RADIUS OF 1080.00 FEET; THENCE NORTHERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 31° 44' 51", AN ARC LENGTH OF 598.43 FEET; THENCE TANGENT TO SAID CURVE, NORTH 03° 46' 59" WEST 269.31 FEET TO A POINT ON THAT CERTAIN NORTHERLY CURVED LINE OF SAID PARCEL 8 DESCRIBED AS HAVING A RADIUS OF 700.00 FEET AND A LENGTH OF 143.85 FEET, SAID POINT BEING THE END POINT OF THIS DESCRIPTION.

APN: 283-160-046, AND 283-190-044

UTILITY PROVIDERS:

WATER: TEMESCAL VALLEY WATER DISTRICT, 22646 TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA 92883, PHONE: (951) 277-1414, CONTACT: JEFF R. PAPE

TELEPHONE: AT&T, 3939 E. CORONADO ST., ANAHEIM, CA 92807, PHONE: (714) 227-1431, CONTACT: DOUG DIPAOLO

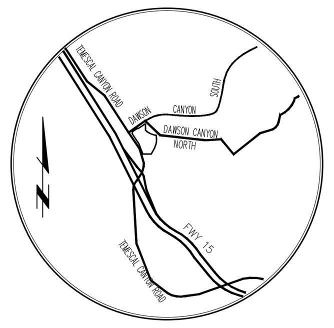
CABLE: CHARTER COMMUNICATIONS, 7337 CENTRAL AVE., RIVERSIDE, CA. 92504, PHONE: (951) 406-1613, CONTACT: CLAUDIA PAYNE

GAS: SO. CALIF. GAS COMPANY, 1981 W. LUGONIA AVENUE, P.O. BOX 3003, REDLANDS, CA 92373-0306, PHONE: (800) 427-2200, CONTACT: NICOLE KIYOHIRO

ELECTRIC: SOCAL EDISION, BLDG. D P.O. BOX 11982, SANTA ANA, CA. 92711-1982, PHONE: (909) 276-9545, CONTACT: JOSE CAMERENA

SEWER: TEMESCAL VALLEY WATER DISTRICT, 22646 TEMESCAL CANYON ROAD, TEMESCAL VALLEY, CA 92883, PHONE: (951) 277-1414, CONTACT: JEFF R. PAPE

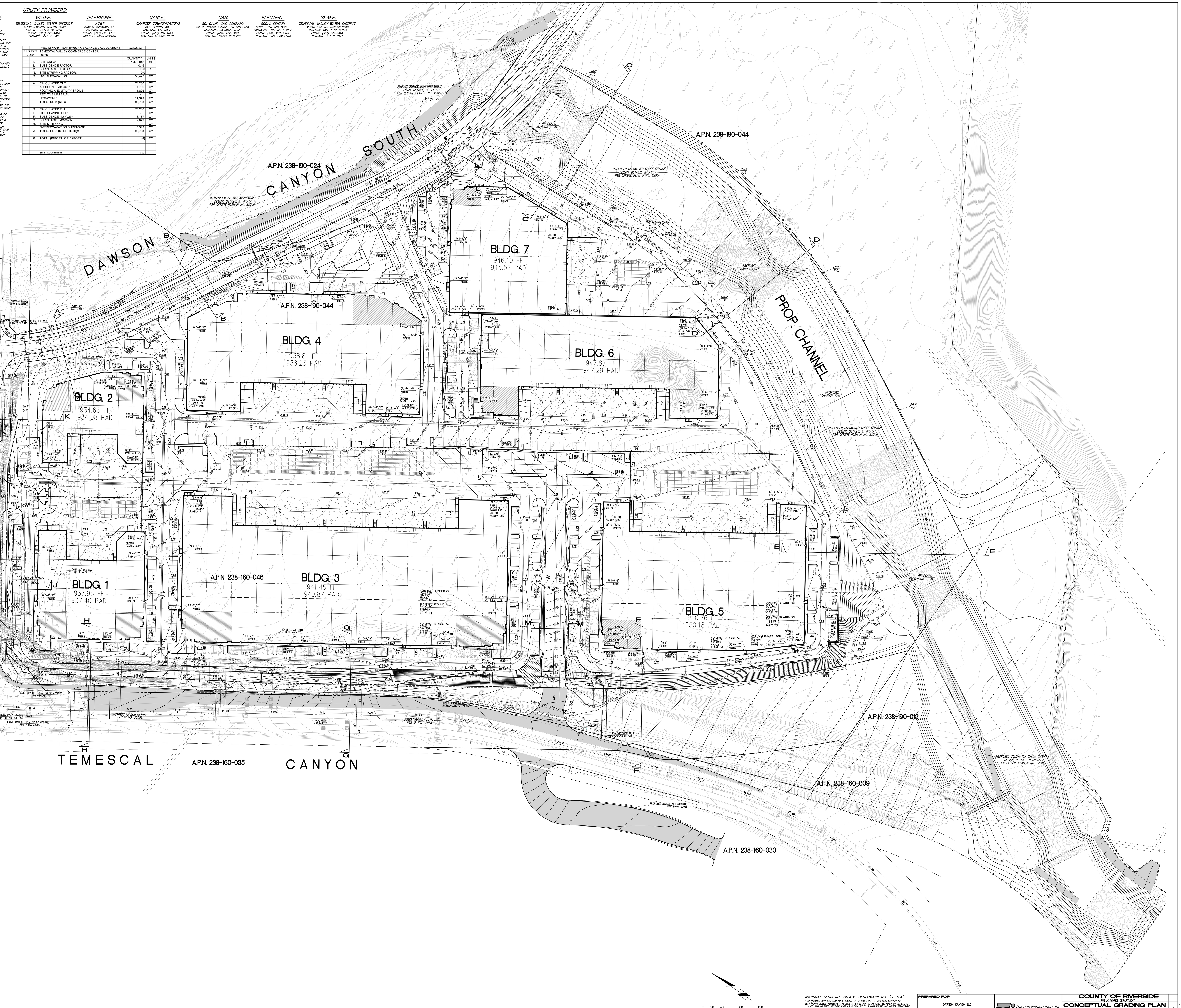
	PRELIMINARY - EARTHWORK BALANCE CALCULATIONS	10/31/2023	
PROJECT:	TEMESCAL VALLEY COMMERCE CENTER		
JOB#	3905b		
		QUANTITY	UNITS
K.	SITE AREA:	1,470,043	SF
L.	SUBSIDENCE FACTOR:	0.15	
M.	SHRINKAGE FACTOR:	10.0	%
N.	SITE STRIPPING FACTOR:	0.0	
O.	OVEREXCAVATION:	55,427	CY
A.	CALCULATED CUT:	74,200	CY
	ADDITION SLAB CUT:	1,750	CY
	FOOTING AND UTILITY SPOILS	7,899	CY
	RECYCLE MATERIAL	-	CY
	UGS-WQMP	14,940	CY
	TOTAL CUT: (A+B)	98,788	CY
D.	CALCULATED FILL:	75,200	CY
E.	LIGHT PAVING FILL:	-	CY
F.	SUBSIDENCE: (LxK)/27=	8,167	CY
G.	SHRINKAGE: (M/100)C=	9,879	CY
H.	SITE STRIPPING	-	CY
I.	OVEREXCAVATION SHRINKAGE	5,543	CY
J.	TOTAL FILL: (D+E+F+G+H)=	98,788	CY
K.	TOTAL (IMPORT) OR EXPORT:	(0)	CY
	SITE ADJUSTMENT	(0.00)	



VICINITY MAP
N.T.S.

ABBREVIATIONS:

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ARCH	ARCHITECTURAL
BCR	BEGIN OF CURB RETURN
BW	BACK OF WALK
BOP	BOTTOM OF PIPE
BOW	BOTTOM OF WALL
BLDG	BUILDING
CAB	CRUSHED AGGREGATE BASE
C&G	CURB AND GUTTER
CLF	CHAIN LINK FENCE
CIP	CAST IRON PIPE
CB	CATCH BASIN
℄,C/L	CENTERLINE
CF	CURB FACE
CMB	CRUSHED MISC. BASE
CO	CLEAN OUT
CONC	CONCRETE
CONST	CONSTRUCT
DWY	DRIVEWAY
DIA	DIAMETER
DOM	DOMESTIC
ECR	END OF CURB RETURN
(0.00)	EXISTING ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FH	FIRE HYDRANT
FG	FINISH GRADE
FO	FIBER OPTIC
FS	FINISH SURFACE
FF	FINISH FLOOR
FL	FLOW LINE
FP	FINISHED PAVEMENT
GB	GRADE BREAK
HC	HANDICAP
H	HEIGHT OF RETAINING
HORIZ	HORIZONTAL
HP	HIGH POINT
INV	INVERT
IRRI,IRR	IRRIGATION
LF	LINEAR FEET
LS	LANDSCAPING
LP	LOW POINT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
NG	NATURAL GRADE
NTS	NOT TO SCALE
OC	ON CURVE
PIP	PROTECT IN PLACE
PCC	PORTLAND CEMENT CONCRETE
PVC	POLYVINYLCHLORIDE
PP	POWER POLE
ℙ, P/L	PROPERTY LINE
PKWY	PARKWAY
PROP	PROPOSED
PT	POINT
PVMT	PAVEMENT
R/W	RIGHT OF WAY
R	RATE OF GRADE
RAD	RADIUS
RD	ROOF DRAIN
RCP	REINFORCED CONCRETE PIPE
STLT	STREET LIGHT
S =	SLOPE
SCO	SEWER CLEAN OUT
SD	STORM DRAIN
SF	SQUARE FEET
SW	SIDEWALK
TC	TOP OF CURB
TCO	TOP OF CLEAN OUT
TS	TOP OF CONCRETE SLAB
TOP	TOP OF PIPE
TF	TOP OF FOOTING
TW	TOP OF WALL
TR	TOP OF RAIL
TG	TOP OF GRATE
TOP	TOP OF SLOPE
TOE	TOE OF SLOPE
TB	TOP OF BERM
TRANS	TRANSFORMER
TSPB	TRAFFIC SIGNAL PULLBOX
TYP	TYPICAL
UG	UNDERGROUND
VAR	VARIABLE
VERT	VERTICAL
VCP	VITRIFIED CLAY PIPE
W=	WIDTH



NATIONAL GEODETIC SURVEY BENCHMARK NO. "LF 124"
I-15 FREEWAY EXIT CAJALCO RD EASTERLY ON CAJALCO RD TO TEMESCAL CANYON RD, LEFT/NORTH ALONG TEMESCAL 0.45 MILE TO LA GLORIA ST 56 FEET WESTERLY OF TEMESCAL CYN RD AND 40 FEET SOUTHERLY OF LA GLORIA ST TO A MWD VALVE AND METER STRUCTURE AT STATION 216+84 ON 2 BY 9.7 FOOT CONCRETE PAD FOR METER BOX SERVICE CONNECTION, 13 FEET EASTERLY OF POWER POLE 569623E AND 10.4 FEET WESTERLY OF MWD MH 216+83. MWDSC 3 INCH BRASS DISK STAMPED LF 124 1995 FLUSH IN THE TOP OF THE NORTHERLY PAD. REF. MWD FB 2016 02 031 AND TB RV CO 774/A4 1996.
ELEVATION = 833.51 FEET (NAVD '88 – AUGUST 1997 ADJ.)

PREPARED FOR:
DAWSON CANYON LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA. 92612
PHONE: (949) 842-3074
EMAIL: MATT@PCLLC.COM

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CIVIL ENGINEERING • LAND SURVEYING
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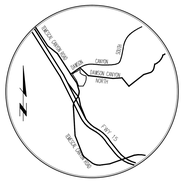
COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CONCEPTUAL GRADING PLAN
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039

Sheet 1 of 6 Sheets

3905b

PLOT DATE: 03/14/2025
Last Update: 03/14/2025
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A.P.N. 238-190-024

A.P.N. 238-190-044

A.P.N. 238-160-045

A.P.N. 238-160-046

A.P.N. 238-160-035

A.P.N. 238-190-013

A.P.N. 238-160-009

A.P.N. 238-160-030

DAWSON CANYON NORTH

DAWSON CANYON SOUTH

TEMESCAL CANYON

BLDG. 1
937.98 FF

BLDG. 2
934.66 FF

BLDG. 3
941.45 FF

BLDG. 4
938.81 FF

BLDG. 5
950.76 FF

BLDG. 6
947.24 FF

BLDG. 7
945.47 FF

0 20 40 80 120
SCALE:1"=40'
(54"X72")

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COUNTY OF RIVERSIDE
T.M.S. MAP SUBMITTAL

CONCEPTUAL UTILITY PLAN
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039

Sheet 2 of 6 Sheets

3505

VICINITY MAP
N.T.S.

A.P.N. 238-190-024

A.P.N. 238-190-044

A.P.N. 238-190-044

A.P.N. 238-160-045

A.P.N. 238-160-046

A.P.N. 238-160-035

A.P.N. 238-190-013

A.P.N. 238-160-009

A.P.N. 238-160-030

DAWSON CANYON

DAWSON CANYON NORTH

TEMESCAL CANYON

SOUTH

BLDG. 1

BLDG. 2

BLDG. 3

BLDG. 4

BLDG. 5

BLDG. 6

BLDG. 7

PROPOSED COLDWATER CREEK CHANNEL DESIGN, DETAILS, & SPECS PER OFFSITE PLAN IP NO. 22056

PROPOSED EMERGENCY WASH IMPROVEMENTS DESIGN, DETAILS, & SPECS PER OFFSITE PLAN IP NO. 22056

FLOOD HAZARD ZONE LIMITS

STREET IMPROVEMENTS PER IP NO. 22056

SCALE: 1"=40'
(54"X72")

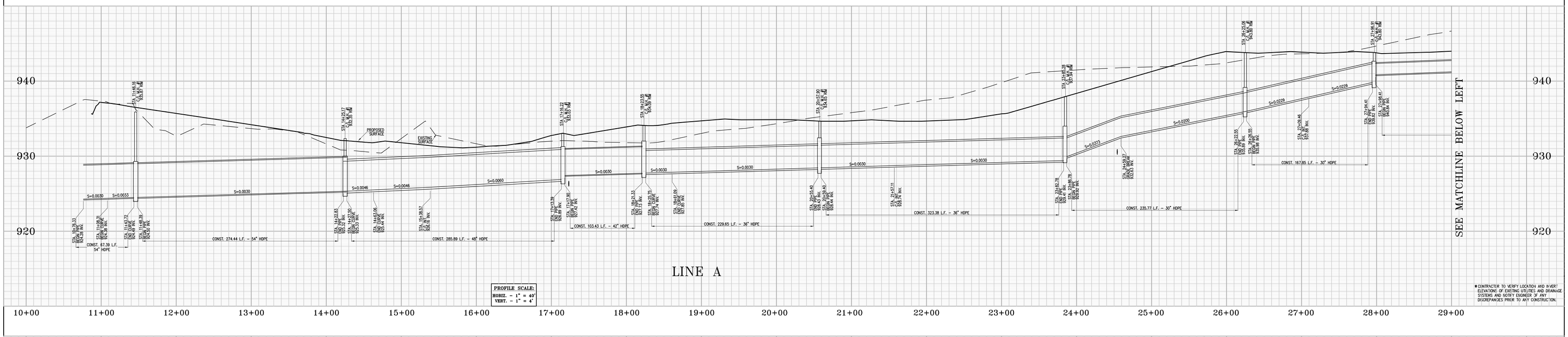
PREPARED FOR:
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CIVIL ENGINEERING / LAND SURVEYING
14 MM PACIFIC ROCK DRIVE, #100
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PH.(760)291-0611 FAX(760)291-0613

COUNTY OF RIVERSIDE
T.L. SUBMITTAL
CONCEPTUAL STORM DRAIN PLAN
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039

Sheet 3 of 6 Sheets

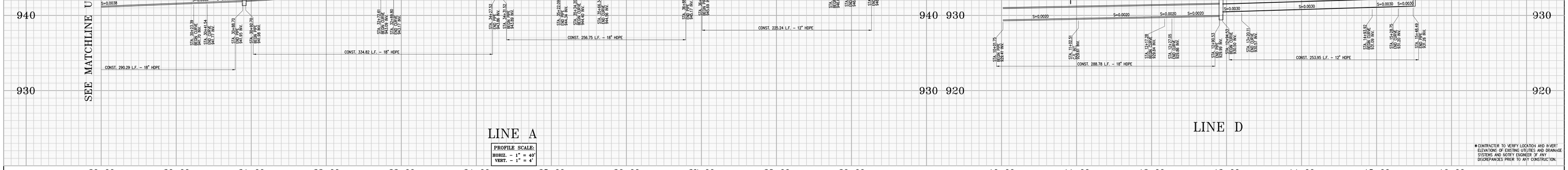
38026



LINE A

PROFILE SCALE:
HORIZ. - 1" = 40'
VERT. - 1" = 4'

*CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.

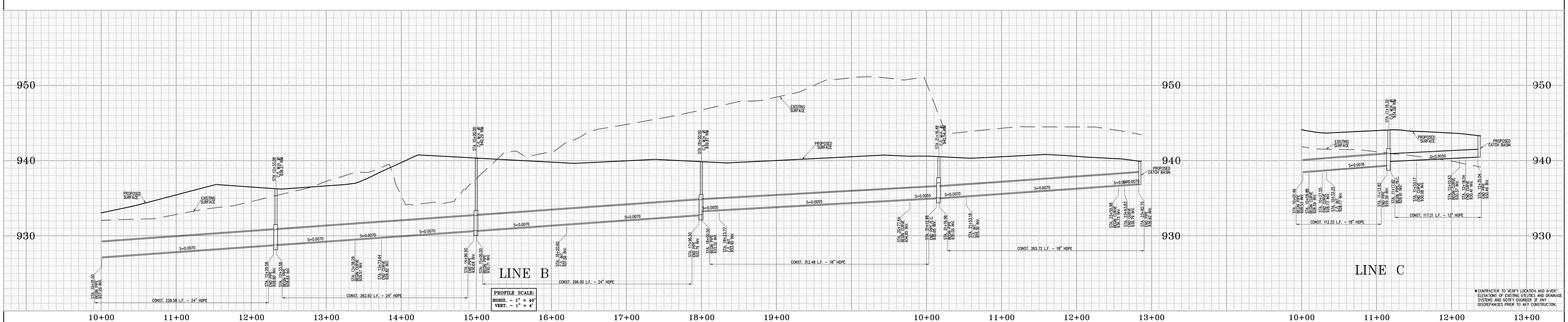


LINE A

PROFILE SCALE:
HORIZ. - 1" = 40'
VERT. - 1" = 4'

LINE D

*CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.



LINE B

PROFILE SCALE:
HORIZ. - 1" = 40'
VERT. - 1" = 4'

LINE C

*CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.

SHEET SIZE 40"X54"

PREPARED FOR:

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IRVINE, CA 92612
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EMAIL: MATT@FCLLC.COM

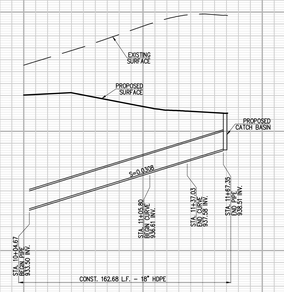
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PH:(714)521-4811 FAX:(714)521-4173

COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

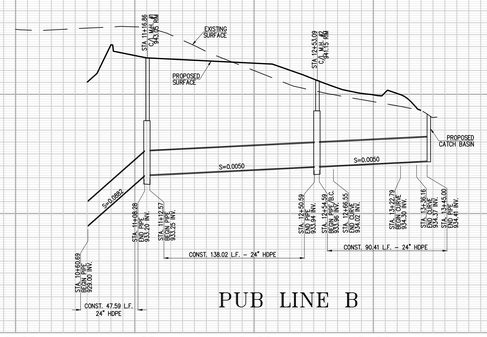
CONCEPTUAL STORM DRAIN PLAN
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039

Sheet 4 of 6 Sheets

Last Update: 07/14/2023
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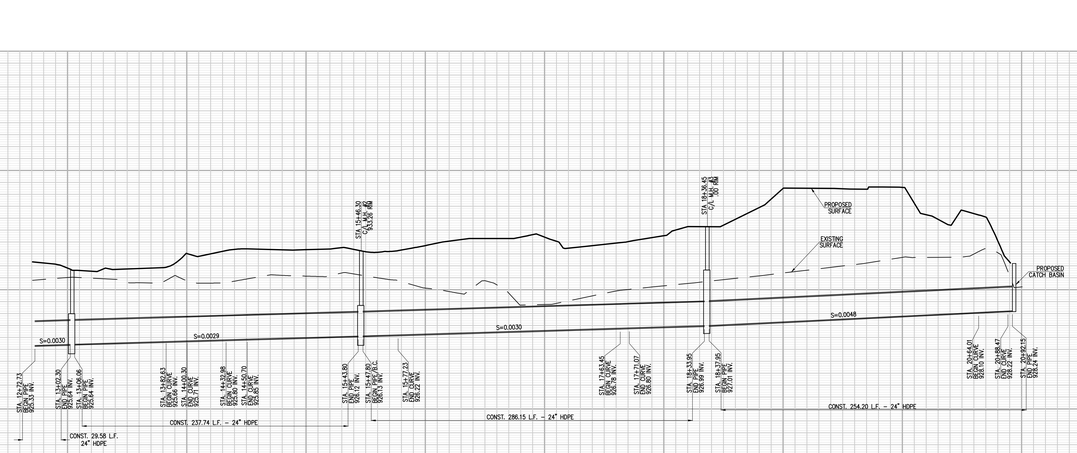
LINE E



PUB LINE B

PROFILE SCALE:
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VERT. – 1" = 4'

* CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.



PUB LINE A

PROFILE SCALE:
HORIZ. – 1" = 40'
VERT. – 1" = 4'

* CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.

SHEET SIZE: 40"X54"

PREPARED FOR:

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IRVINE, CA 92612
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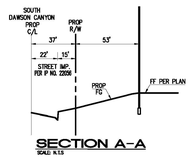
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COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CONCEPTUAL STORM DRAIN PLAN
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039

Sheet 5 of 6 Sheets

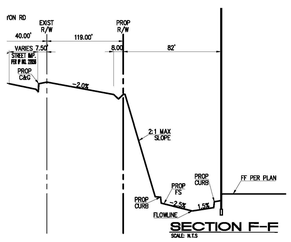
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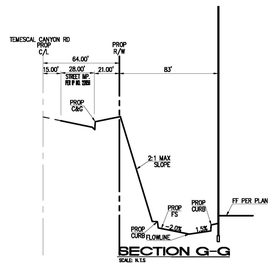
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SECTION B-B
SCALE: N.T.S

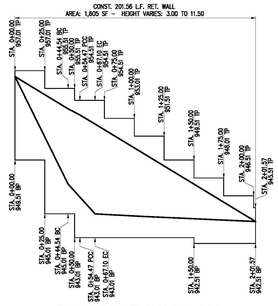
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SCALE: N.T.S



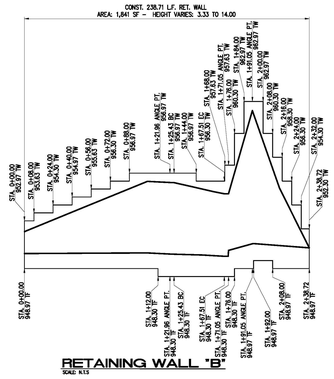
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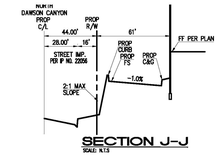
SECTION G-G
SCALE: N.T.S



RETAINING WALL "A"
SCALE: N.T.S



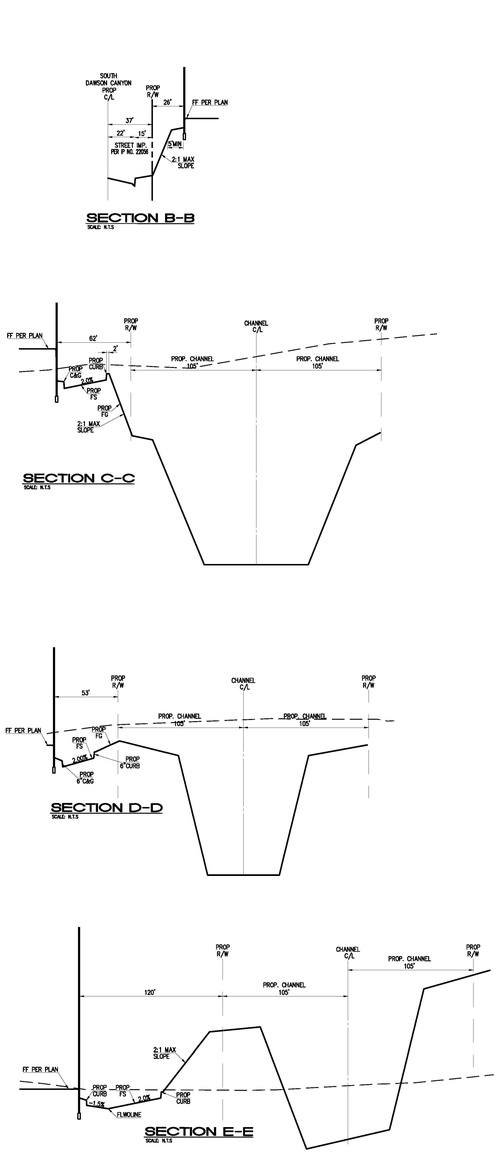
RETAINING WALL "B"
SCALE: N.T.S



SECTION J-J
SCALE: N.T.S

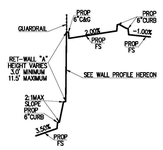
SECTION D-D
SCALE: N.T.S

SECTION K-K
SCALE: N.T.S



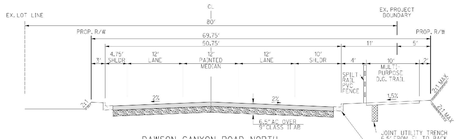
SECTION E-E
SCALE: N.T.S

SECTION L-L
SCALE: N.T.S

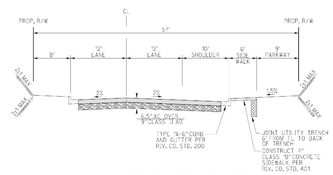


SECTION M-M
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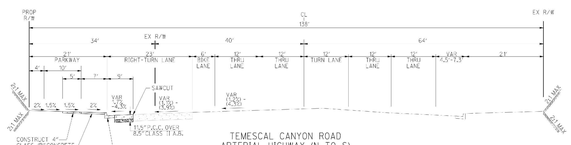
STREET SECTIONS:



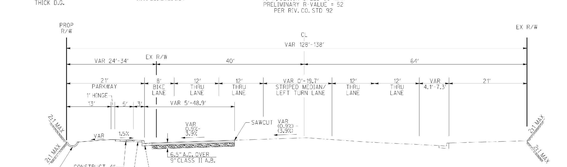
DAWSON CANYON ROAD NORTH
MODIFIED PART WIDTH INDUSTRIAL COLLECTOR STREET
N.T.S
STA. 12+00.00 TO 18+15.63
7'+/- DESIGN SPEED/35 MPH
PRELIMINARY R VALUE = 77
COUNTY OF RIVERSIDE STD. 111 (MODIFIED)



DAWSON CANYON ROAD SOUTH
MODIFIED PART-WIDTH COLLECTOR FRONTAGE ROAD
STA. 10+00.00 TO 21+00.00
7'+/- DESIGN SPEED/35 MPH
PRELIMINARY R VALUE = 72
COUNTY OF RIVERSIDE STD. 127A (MODIFIED)



TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (N TO S)
NOT TO SCALE
STA. 10+97.00 TO 12+12.75
11+7+/- DESIGN SPEED/40 MPH
PRELIMINARY R VALUE = 52
PER RIV. CO. STD '92



TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (N TO S)
NOT TO SCALE
STA. 12+12.75 TO 29+01.74
11+7+/- DESIGN SPEED/40 MPH
PRELIMINARY R VALUE = 52
PER RIV. CO. STD '92

SHEET SIZE 40"X54"

PREPARED FOR:
DAWSON CANYON, LLC
18831 BARDEEN AVENUE, SUITE 201
IRVINE, CA 92612
PHONE: (949) 862-3074
EMAIL: MATT@PCLLC.COM

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638-5539
TEL (714)521-4811 FAX (714)521-4173

COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT
SECTIONS
TEMESCAL VALLEY COMMERCE CENTER
PLANNING CASE NO. PPT220039
Sheet 6 of 6 Sheets

DATE: 05/17/2023
Last Update: 03/14/2023
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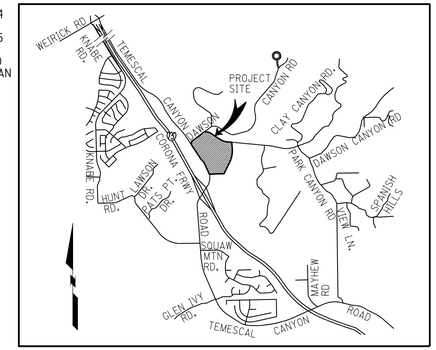
IN THE COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS

TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD

T4S R6W SEC 34
AND
T4S R6W SEC 35

SAN BERNARDINO
PRINCIPAL MERIDIAN

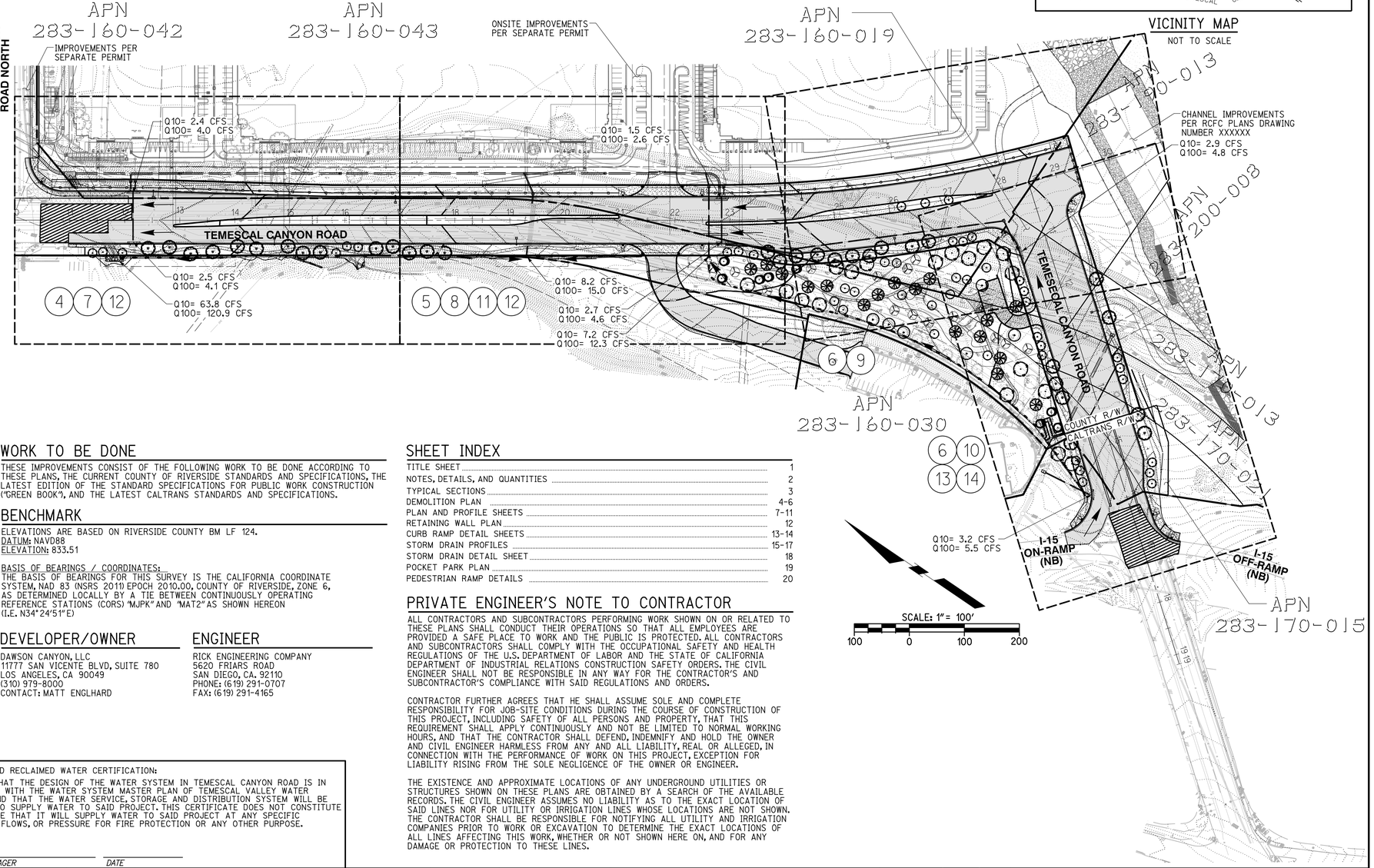


GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. THIS INCLUDES UNDERGROUNDING OF EXISTING OVERHEAD LINES ALONG THE PROJECT FRONTAGE AS REQUIRED BY THE CONDITIONS OF APPROVAL. PERMITTEE MUST INFORM COUNTY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION.
   PHONE: 951-955-6885 FOR PARCEL AND TRACT MAPS
   PHONE: 951-955-6790 FOR PERMIT CASES (CUP, PUP, PP OR VOLUNTARY MS CASES), CABAZON AND AREA WEST
3. THE DEVELOPER WILL INSTALL STREET NAME SIGNS CONFORMING TO COUNTY STANDARD NO. 1220 AND 1221.
4. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, LATEST EDITION, COUNTY ORDINANCE NO. 461 AND SUBSEQUENT AMENDMENTS.
5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO NOTIFY THE ENGINEER TO INSTALL STREET CENTERLINE MONUMENTS AS REQUIRED BY RIVERSIDE COUNTY ORDINANCE NO. 461. IF CONSTRUCTION CENTERLINE DIFFERS, PROVIDE A TIE TO EXISTING CENTERLINE OF RIGHT-OF-WAY. PRIOR TO ROAD CONSTRUCTION, SURVEY MONUMENTS INCLUDING CENTERLINE MONUMENTS, TIE POINTS, PROPERTY CORNERS AND BENCH MARKS SHALL BE REFERENCED OUT AND CORNER RECORDS FILED WITH THE COUNTY SURVEYOR PURSUANT TO SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE. SURVEY POINTS DESTROYED DURING CONSTRUCTION SHALL BE RESET, AND A SECOND CORNER RECORD FILED FOR THOSE POINTS PRIOR TO COMPLETION AND ACCEPTANCE OF THE IMPROVEMENTS.
6. ALL UNDERGROUND FACILITIES, WITH LATERALS, SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, GAS, AND STORM DRAINS.
7. CURB DEPRESSION AND DRIVEWAY APPROACHES WILL BE INSTALLED AND CONSTRUCTED ACCORDING TO COUNTY STANDARD NO. 206 AND/OR NO. 207, AS DIRECTED IN THE FIELD.
8. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN ALL CONSTRUCTION, REGULATORY, GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.
   A TRAFFIC CONTROL PLAN MUST BE SUBMITTED WITH APPROVED STREET PLAN FOR REVIEW TO THE PERMITS SECTION OR INSPECTION SECTION (FOR MAP CASES) PRIOR TO OBTAINING AN ENCROACHMENT PERMIT.
9. ALL STREET SECTIONS ARE TENTATIVE. ADDITIONAL SOIL TESTS SHALL BE TAKEN FOR PERMIT CASES BY THE COUNTY AFTER ROUGH GRADING TO DETERMINE THE EXACT STREET SECTION REQUIREMENTS. USE STANDARD NO. 401 IF EXPANSIVE SOILS ARE ENCOUNTERED.
10. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING. FOG SEAL AND PAINT BINDER SHALL BE APPLIED AT A RATE OF 0.05 AND 0.03 GALLON PER SQUARE YARD RESPECTIVELY. ASPHALTIC EMULSION SHALL CONFORM TO SECTION 37, 39, AND 94 OF THE STATE STANDARD SPECIFICATIONS.
11. INSTALL STREET TREES IN ACCORDANCE WITH ORDINANCE NO. 461, THE COMPREHENSIVE LANDSCAPING GUIDELINES, AND THE LANDSCAPE PLANS. PROPOSED SPECIES INCLUDE: LONDON PLANE, DESERT WILLOW, AND DWARF COAST ROSEMARY.
12. STREET LIGHTS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED STREET LIGHTING PLAN.
13. AS DETERMINED BY THE TRANSPORTATION DIRECTOR, THE DEVELOPER IS RESPONSIBLE AS A MINIMUM FOR ROAD IMPROVEMENTS TO CENTERLINE, AND MAY BE REQUIRED TO RECONSTRUCT EXISTING PAVEMENT, INCLUDING BASE, AND MATCHING OVERLAY REQUIRED TO MEET THE STRUCTURAL STANDARDS FOR THE CURRENT ASSIGNED TRAFFIC INDEX.
14. ONLY LANDSCAPING CONSISTING OF GRASS AND PARKWAY TREES MAY BE INSTALLED WITHIN PARKWAYS ON LOCAL RESIDENTIAL STREETS WITHOUT SEPARATE LANDSCAPE PLANS. ALL OTHER TYPES OF LANDSCAPING IN THESE AREAS, AND ALL LANDSCAPING ON ALL OTHER STREETS, SHALL REQUIRE SEPARATE LANDSCAPING PLANS. ALL LANDSCAPING ENCROACHMENTS SHALL CONFORM TO RIVERSIDE COUNTY COMPREHENSIVE LANDSCAPING GUIDELINES DATED OCTOBER 2009.
15. ANY PRIVATE DRAINAGE FACILITIES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. BY SIGNING THESE IMPROVEMENT PLANS, NO REVIEW OR APPROVAL OF THOSE PRIVATE FACILITIES IS IMPLIED OR INTENDED BY THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT.
16. A. CONSTRUCTION PROJECTS MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND MONITORING PLAN FOR THE SITE.
    B. PRIOR TO ANY CONSTRUCTION, THE DEVELOPER/OWNER SHALL PROVIDE THE COUNTY A COPY OF THE NOTICE OF INTENT (NOI), WITH A VALID W.D.I.D. NUMBER.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ADDITIONAL SIGNS AND MARKINGS NOT INCLUDED IN THE SIGNING AND STRIPING PLAN WITHIN THE PROJECT AREAS, OR ON ROADWAYS ADJACENT TO THE PROJECT BOUNDARIES, UPON THE REQUEST OF THE DIRECTOR OF TRANSPORTATION OR HIS DESIGNEE TO IMPROVE TRAFFIC SAFETY ON THE ROADS UNDER THE JURISDICTION OF THE DEVELOPER.
18. EXISTING STORM DRAIN PIPES/CULVERTS (WHETHER TO BE CONNECTED TO, EXTENDED, ADJUSTED, DRAINED TO, OR JUST IN THE PROJECT VICINITY) MUST BE REPAIRED, AND / OR CLEANED TO MAKE THEM FUNCTIONAL AND ACCEPTABLE AS DIRECTED BY THE TRANSPORTATION DEPARTMENT.
19. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR TO APPLY TO RIVERSIDE COUNTY FLOOD CONTROL (RCFC) FOR PERMITS WHEN ANY STORM DRAIN PIPE NEEDS TO BE CONNECTED WITH A RCFC FACILITY AND ADD PERMIT # _____ ON THE PLAN.
20. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO APPLY TO THE CITY AND OR CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN THEIR RIGHT-OF-WAY.
21. FOR ALL DRIVEWAY RECONSTRUCTION BEYOND RIGHT-OF-WAY, PROOF OF DRIVEWAY OWNER NOTIFICATION IS REQUIRED PRIOR TO CONSTRUCTION.

KEY MAP LEGEND

- (#) SHEET NUMBER
- SHEET BOUNDARY
- DIRECTION OF DRAINAGE



VICINITY MAP

NOT TO SCALE

WORK TO BE DONE

THESE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT COUNTY OF RIVERSIDE STANDARDS AND SPECIFICATIONS, THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION ("GREEN BOOK"), AND THE LATEST CALTRANS STANDARDS AND SPECIFICATIONS.

BENCHMARK

ELEVATIONS ARE BASED ON RIVERSIDE COUNTY BM LF 124.
DATUM: NAVD88
ELEVATION: 833.51

BASIS OF BEARINGS / COORDINATES:
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, NAD 83 (NSRS 2011) EPOCH 2010.00, COUNTY OF RIVERSIDE, ZONE 6, AS DETERMINED LOCALLY BY A TIE BETWEEN CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) "MJPK" AND "MAT2" AS SHOWN HEREON (I.E. N34°24'51"E)

DEVELOPER/OWNER

DAWSON CANYON, LLC
11777 SAN VICENTE BLVD, SUITE 780
LOS ANGELES, CA 90049
(310) 979-8000
CONTACT: MATT ENGLHARD

ENGINEER

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA. 92110
PHONE: (619) 291-0707
FAX: (619) 291-4165

SHEET INDEX

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PEDESTRIAN RAMP DETAILS	20

PRIVATE ENGINEER'S NOTE TO CONTRACTOR

ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING WORK SHOWN ON OR RELATED TO THESE PLANS SHALL CONDUCT THEIR OPERATIONS SO THAT ALL EMPLOYEES ARE PROVIDED A SAFE PLACE TO WORK AND THE PUBLIC IS PROTECTED. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE OCCUPATIONAL SAFETY AND HEALTH REGULATIONS OF THE U.S. DEPARTMENT OF LABOR AND THE STATE OF CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS CONSTRUCTION SAFETY ORDERS. THE CIVIL ENGINEER SHALL NOT BE RESPONSIBLE IN ANY WAY FOR THE CONTRACTOR'S AND SUBCONTRACTOR'S COMPLIANCE WITH SAID REGULATIONS AND ORDERS.

CONTRACTOR FURTHER AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB-SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND CIVIL ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION FOR LIABILITY RISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

THE EXISTENCE AND APPROXIMATE LOCATIONS OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. THE CIVIL ENGINEER ASSUMES NO LIABILITY AS TO THE EXACT LOCATION OF SAID LINES NOR FOR UTILITY OR IRRIGATION LINES WHOSE LOCATIONS ARE NOT SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY AND IRRIGATION COMPANIES PRIOR TO WORK OR EXCAVATION TO DETERMINE THE EXACT LOCATIONS OF ALL LINES AFFECTING THIS WORK, WHETHER OR NOT SHOWN HERE ON, AND FOR ANY DAMAGE OR PROTECTION TO THESE LINES.

CAUTION:
EXACT LOCATION OF EXISTING UNDERGROUND FACILITIES IS UNKNOWN. CONTRACTOR TO VERIFY IN FIELD.

PRELIMINARY
NOT FOR CONSTRUCTION

POTABLE AND RECLAIMED WATER CERTIFICATION:
I CERTIFY THAT THE DESIGN OF THE WATER SYSTEM IN TEMESCAL CANYON ROAD IS IN ACCORDANCE WITH THE WATER SYSTEM MASTER PLAN OF TEMESCAL VALLEY WATER DISTRICT AND THAT THE WATER SERVICE, STORAGE AND DISTRIBUTION SYSTEM WILL BE ADEQUATE TO SUPPLY WATER TO SAID PROJECT. THIS CERTIFICATE DOES NOT CONSTITUTE A GUARANTEE THAT IT WILL SUPPLY WATER TO SAID PROJECT AT ANY SPECIFIC QUANTITIES, FLOWS, OR PRESSURE FOR FIRE PROTECTION OR ANY OTHER PURPOSE.

GENERAL MANAGER _____ DATE _____

DIG ALERT
CALL BEFORE YOU DIG!
1-800-227-2600
UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating.

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY OF DESIGN AND ACCEPTABILITY OF THE WORK HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=100' V: _____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER-
TEMESCAL CANYON ROAD
TITLE SHEET

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 1 OF 20 SHEETS

PLAN CHECK	OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES				

\\cp.rickeng.com\projects\C_RIV_C\18602\18602-B\CIVIL\PlanSets\Phase 2\18602B_01_IMP01_Title_PH2.dgn

CONSTRUCTION NOTES & QUANTITY ESTIMATE

		TOTAL
(1)	PLACE 6.5" A.C. OVER 9" CLASS II A.B.	8,595 TONS 6,120 CY
(2)	PLACE 11.5" P.C.C. OVER 8.5" CLASS II A.B.	44 TONS 35 CY
(3)	2" GRIND AND OVERLAY EXIST. PVMT. PER TYP. JOINT DETAIL ON SHT 2	16,590 SF
(4)	SAWCUT EXIST. A.C. PVMT. SEE TYP. JOINT DETAIL ON SHT 2	735 LF
(5)	CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201	4,550 LF
(6)	CONSTRUCT TYPE "D" CURB AND GUTTER PER RIV. CO. STD. 204	2,700 LF
(7)	CONSTRUCT TYPE "A2-8" CURB AND GUTTER PER CT. STD. A87A	480 LF
(8)	CONSTRUCT SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD.'S 400 & 401	13,090 SF
(9)	CONSTRUCT MEANDERING SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD.404	7,650 SF
(10)	CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD. 405	16,580 SF
(11)	CONSTRUCT LANDSCAPE MEDIAN PER RIV. CO. STD. 113	17,150 SF
(12)	CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403	9 EA
(13)	CONSTRUCT CURB RAMP CASE A PER CT. STD. A88A	3 EA
(14)	CONSTRUCT DETECTABLE WARNING TILES PER RIV. CO. STD. 403	50 SF
(15)	CONSTRUCT COMMERCIAL DRIVEWAY PER RIV. CO. STD. 207A	3,260 SF
(26)	CONSTRUCT RETAINING WALL TYPE 1 (CASE 2) (HEIGHT PER PLAN) PER CT. STD. PLAN B3-1B	1,280 CY
(27)	CONSTRUCT TYPICAL RETAINING WALL GUTTER PER CT. STD. B3-6	474 LF
(31)	CONSTRUCT BARRICADE PER RIV. CO. STD. 810	87 LF
(33)	CONSTRUCT CABLE RAILING PER CT. STD. B11-47	474 LF
(36)	CONSTRUCT TYPE "D" (6" CURB) PER RIV. CO. STD. 204	1,210 LF
(43)	CONSTRUCT RESIDENTIAL DRIVEWAY PER RIV. CO. STD. 207	510 SF
(45)	CONSTRUCT CONCRETE BROW DITCH PER DETAIL ON SHT 12	1,365 LF
(46)	CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD. H-006	1,660 LF
(47)	CONNECT TO ONSITE SIDEWALK	
	ASPHALT EMULSION	75 TON
	JOINT UTILITY TRENCH	2,100 LF
	STREET LIGHT	8 EA
	STREET TREES	
	- LONDON PLANE	18 EA
	- DESERT WILLOW	15 EA

STORM DRAIN CONSTRUCTION NOTES & QUANTITY ESTIMATE

		TOTAL
(16)	CONSTRUCT 18" RCP (D-LOAD PER PROFILE)	910 LF
(17)	CONSTRUCT 24" RCP (D-LOAD PER PROFILE)	38 LF
(18)	CONSTRUCT 36" RCP (D-LOAD PER PROFILE)	1,180 LF
(19)	CONSTRUCT 60" RCP (D-LOAD PER PROFILE)	60 LF
(20)	CONSTRUCT 66"X42" ARCH CMP (.079" THICK)	105 LF
(21)	CONSTRUCT PIPE CULVERT HEADWALL, TYPE B PER CT STD. PLAN D90	7 CY
(22)	CONSTRUCT MANHOLE NO. 1 PER RCFC STD. MH251	6 EA
(23)	CONSTRUCT MANHOLE NO. 2 PER RCFC STD. MH252	6 EA
(24)	CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W= PER PLAN	5 EA
(25)	CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN	5 EA
(28)	CONSTRUCT JUNCTION STRUCTURE NO 2. PER RCFC STD. JS227	2 EA
(29)	CONSTRUCT MODIFIED JUNCTION STRUCTURE PER DETAIL ON SHT. 18	1 EA
(30)	CONSTRUCT MODIFIED TRANSITION STRUCTURE PER DETAIL ON SHT. 18	1 EA
(34)	CONSTRUCT 12" HDPE (D-LOAD PER PROFILE)	30 LF
(37)	CONSTRUCT CAST IN PLACE REINFORCED CONCRETE JUNCTION STRUCTURE PER CT STD. PLAN D91A	3 EA
(38)	CONSTRUCT 54" RCP (D-LOAD PER PROFILE)	185 LF
(39)	CONSTRUCT STRAIGHT HEADWALL PER CT STD. PLAN D89 (L PER PLAN, H PER PLAN)	2 CY
(40)	CONSTRUCT STRAIGHT HEADWALL DOUBLE CMP PER CT STD. PLAN D89A (L PER PLAN, H PER PLAN)	6 CY
(41)	CONSTRUCT 1/4 TON RIP RAP PER CALTRANS. STD. SPEC. SECTION 72 (T=3.0' BACKING CLASS 1) ON T=1.25' NO. 2 BACKING RSP FABRIC TYPE 'A', USING PLACEMENT METHOD B"	40 CY
(42)	CONSTRUCT 24" CMP (D-LOAD PER PROFILE)	35 LF
(44)	CONSTRUCT 8" PVC PIPE	19 LF
(48)	CONSTRUCT TYPE OS INLET PER CSP D72A, W PER PLAN	3 CY
(49)	CONSTRUCT GUTTER DEPRESSION PER CSP D78A	1 EA

LEGEND

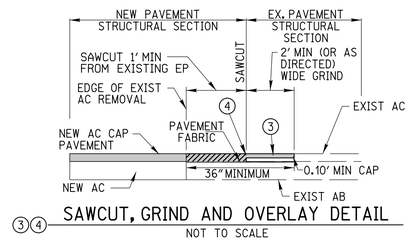
ITEM	SYMBOL
EXISTING IMPROVEMENTS	
EXISTING PROJECT BOUNDARY	
EXISTING LOT LINE/ROW	
EXISTING CENTERLINE	
EXISTING MAJOR CONTOUR	920
EXISTING MINOR CONTOUR	
EXISTING ROAD	
EXISTING EDGE OF PVMT.	
EXISTING TREE OR BUSH	
EXISTING TREE LINE	
EXISTING WATER COURSE	
EXISTING BUILDING OR MANMADE STRUCTURE	
EXISTING CURB	
EXISTING WATER MAIN	W
EXISTING FORCEMAIN WATER	FM
EXISTING RECLAIMED WATER	RW
EXISTING SEWER MAIN	S
EXISTING WATER VALVE AND HYDRANT	
EXISTING OVERHEAD LINES	OHE
EXISTING STORM DRAIN	
EXISTING STORM DRAIN STRUCTURE	SD
EXISTING DRY UTILITIES	TPB
EXISTING FIBER OPTIC, ELEC., COMM. LINES	FO , E , CATV
EXISTING SURVEY MONUMENT, AS NOTED	
EXISTING GUARD RAIL	
EXISTING SIGN	
EXISTING STREET LIGHT	
EXISTING POWER POLE	
EXISTING FENCE	

LEGEND

ITEM	SYMBOL
PROPOSED IMPROVEMENTS	
LOT LINE/ROW	
WRMSHCP CRITERIA	
6" CONCRETE CURB/BERM & GUTTER	
SAWCUT	
SIDEWALK	
ASPHALT PAVING	
D.G. TRAIL	
DIRECTION OF FLOW	1.0%
DAYLIGHT LINE/GRADING LIMIT	
PROPOSED MAJOR CONTOUR	920
PROPOSED MINOR CONTOUR	
STORM DRAIN 18" UNLESS OTHERWISE NOTED	
CURB INLET CATCH BASIN	
CONCRETE DROP INLET W/ CATCH BASIN GRATE	
MANHOLE NO. 1	
MANHOLE NO. 2	
STORM DRAIN HEADWALL	
JUNCTION STRUCTURE	
BARRICADE	
RETAINING WALL	
CURB RAMP CASE A PER CT. STD. A88A	
CURB RAMP CASE A PER RIV. CO. STD. 403	
DRIVEWAY	
SPILT RAIL PVC FENCE	
MODIFIED TRANSITION STRUCTURE	
MODIFIED JUNCTION STRUCTURE	

GEOTECHNICAL NOTES

1. AGGREGATE BASE MATERIAL FOR ASPHALT PAVEMENT SHOULD CONSIST OF CRUSHED AGGREGATE BASE COMPLYING WITH THE SPECIFICATIONS IN SECTION 200-2.2 OF THE CURRENT "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" AND SHOULD BE COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D1557. THE SURFACE OF THE BASE SHOULD EXHIBIT A FIRM AND UNYIELDING CONDITION JUST PRIOR TO THE PLACEMENT OF ASPHALT CONCRETE PAVING. THE ASPHALT CONCRETE SHALL BE COMPACTED TO A MINIMUM OF NINETY-FIVE (95) PERCENT RELATIVE COMPACTION.
2. THE PAVEMENT SUBGRADE SHOULD BE COMPACTED TO AT LEAST NINETY (90) PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D1557 TO A DEPTH OF ONE (1) FOOT.
3. THE R-VALUE AND THE ASSOCIATED PAVEMENT SECTION SHOULD BE CONFIRMED AT COMPLETION OF SITE GRADING.
4. CORROSION TESTS INDICATE ONSITE SOILS ARE MODERATELY CORROSIVE FOR FERROUS METALS EXPOSED TO SITE SOILS.
5. WITHIN THE PROPOSED DEVELOPMENT AND DEMOLITION AREA, ALL FOUNDATIONS, SLAB-ON-GRADE, VAULTS, UTILITY LINES, SURFACE VEGETATION, TREE ROOTS, TRASH, DEMOLITION DEBRIS, ASPHALTIC CONCRETE, AND PORTLAND CEMENT CONCRETE, SHOULD BE CLEARED AND REMOVED FROM THE PROPOSED SITE.
6. DEPRESSIONS RESULTING FROM REMOVAL OF OBJECTS ENCOUNTERED AS MENTIONED ABOVE SHOULD BE BACKFILLED WITH PROPERLY COMPACTED ENGINEERED FILL UNDER THE TESTING AND OBSERVATION OF THE GEOTECHNICAL ENGINEER OF RECORD.
7. EXISTING SITE SOILS MAY BE RE-USED AS ENGINEERED FILL. A MINIMUM OF ONE (1) FOOT OF ENGINEERED FILL SHALL BE USED UNDER PAVEMENT. EXPOSED BOTTOMS SHOULD BE SCARIFIED A MINIMUM OF 6-INCHES, MOISTURE CONDITIONED AND COMPACTED TO A MINIMUM NINETY (90) PERCENT RELATIVE COMPACTION. SUBSEQUENTLY, SITE FILL SOILS SHOULD BE RE-COMPACTED TO A MINIMUM OF NINETY (90) PERCENT RELATIVE COMPACTION AT A MINIMUM OF OPTIMUM MOISTURE CONTENT. DURING EARTHWORK CONSTRUCTION, ALL SITE PREPARATION AND THE GENERAL PROCEDURES OF THE CONTRACT SHOULD BE OBSERVED, AND THE FILL AND BASE SELECTIVELY TESTED BY THE GEOTECHNICAL ENGINEER OF RECORD. IF UNUSUAL OR UNEXPECTED CONDITIONS ARE EXPOSED IN THE FIELD, THEY SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER OF RECORD AND IF WARRANTED, MODIFIED, AND/OR ADDITIONAL RECOMMENDATION WILL BE OFFERED.
8. THE BEDDING MATERIAL SHOULD CONSIST OF CLEAN, WELL-GRADED SAND WITH A SAND EQUIVALENT OF AT LEAST 30. COARSE, UNIFORMLY GRADED BEDDING MATERIAL SHOULD BE AVOIDED AS INTRUSION OF SUCH BEDDING MATERIAL INTO FINE SUBGRADE SOILS, OR MIGRATION OF THE NATURAL SOILS INTO THE VOIDS OF THE COURSE BEDDING MATERIAL ARE UNDESIRABLE AND POTENTIALLY DETRIMENTAL TO THE QUALITY OF THE COMPLETED CONSTRUCTIONS.
9. IN THE EVENT THAT THE SUBGRADE SOILS BELOW THE PROPOSED BOTTOM OF THE PIPE ARE DISTURBED DURING EXCAVATION OR THAT EXCEPTIONALLY SOFT AND WEAK MATERIAL IS ENCOUNTERED, THE UNSUITABLE SOILS SHOULD BE OVER-EXCAVATED TWELVE (12) INCHES OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER. THE OVER EXCAVATED AREAS SHALL BE BACKFILLED USING APPROVED MATERIAL.
10. PRIOR TO ANY FILL PLACEMENT THE GEOTECHNICAL ENGINEER SHOULD OBSERVE THE EXPOSED SURFACE SOILS. THE SITE SOILS MAY BE RE-USED AS ENGINEERED FILL PROVIDED, THEY ARE FREE OF ORGANIC CONTENT AND PARTICLE SIZE GREATER THAN 4-INCHES. ALL PARTICLES GREATER THAN 4-INCHES SHALL BE REMOVED AND DISPOSED OFF-SITE. FILL SHALL BE MOISTURE-CONDITIONED NEAR OPTIMUM AND COMPACTED TO A MINIMUM RELATIVE COMPACTION OF NINETY (90) PERCENT IN ACCORDANCE WITH ASTM D1557. ANY IMPORT SOILS SHALL BE NON-EXPANSIVE AND APPROVED BY THE GEOTECHNICAL ENGINEER.
11. THE SOILS TO BE EXCAVATED FOR THE CULVERT PIPES ARE EXPECTED TO BE GENERALLY ACCEPTABLE FOR USE AS BACKFILL, PROVIDED ANY DEBRIS, ORGANIC MATTER, AND PARTICLES GREATER THAN 4 INCHES ARE REMOVED. IF WET AND PUMPING CONDITIONS OF THE SOIL ARE ENCOUNTERED, DRYING OF THE ON-SITE MATERIALS PRIOR TO PLACEMENT AS BACKFILL SOILS WILL BE ANTICIPATED. SITE SOILS SHALL BE MOISTURE CONDITIONED TO NEAR OPTIMUM MOISTURE CONTENT. THE BACKFILL SOILS SHOULD BE PLACED IN LAYERS, 6 TO 8 INCHES IN THICKNESS, AND BE COMPACTED TO A LEAST NINETY (90) PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM TEST METHOD D1557. COMPACTION OF THE ONSITE SOILS BY FLOODING OR JETTING IS NOT ACCEPTABLE.
12. PRIOR TO FILL PLACEMENT, THE EXPOSED SURFACE SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF SIX (6) INCHES, FILL PLACED IN SIX (6) INCH LOOSE LIFTS, MOISTURE CONDITIONED TO AT LEAST OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A MINIMUM RELATIVE COMPACTION OF NINETY (90) PERCENT IN ACCORDANCE WITH ASTM D1557.
13. ANY IMPORTED SOIL REQUIRED TO COMPLETE GRADING OPERATIONS SHOULD CONSIST OF PREDOMINANTLY GRANULAR MATERIAL WHICH EXHIBITS AN EXPANSION INDEX LESS THAN 20 WHEN TESTED IN ACCORDANCE WITH ASTM D4829, AND SHOULD BE FREE OF DEBRIS, PARTICLES GREATER THAN 4 INCHES IN MAXIMUM DIMENSION, ORGANIC MATTER OR OTHER DELETERIOUS MATERIALS, AND SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER OR A REPRESENTATIVE. FINAL ACCEPTANCE OF ANY IMPORTED SOIL WILL BE BASED UPON REVIEW AND TESTING OF THE SOIL ACTUALLY DELIVERED TO THE SITE.



(3)(4) SAWCUT, GRIND AND OVERLAY DETAIL
NOT TO SCALE

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE COUNTY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF ANY OF THESE NOTES AND THE COUNTY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1. NEITHER THE OWNER, NOR THE ENGINEER OF WORK WILL ENFORCE SAFETY MEASURES OR REGULATIONS, THE CONTRACTOR SHALL DESIGN, CONSTRUCT AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS.
2. CONTRACTOR AGREES THAT THEY SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT ALL SLOPES, STREETS, UTILITIES, AND STORM DRAINS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY ENGINEER OF WORK AT 291-0707. THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT THE PROJECT AND ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, SHORING, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY WHATEVER OWNER, AGENCY OR ASSOCIATION IS TO BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE.
4. CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING UNDER-GROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXISTING FACILITIES.
5. LOCATION AND ELEVATION OF IMPROVEMENT SCALE TO BE MET BY WORK TO BE DONE SHALL BE CONFIRMED BY FIELD MEASUREMENT SCALE PRIOR TO CONSTRUCTION OF NEW WORK.
6. BEFORE EXCAVATING FOR THIS CONTRACT, THE CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND UTILITIES, THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO OTHER EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS.
7. CONTRACTOR SHALL NOTIFY THE ELECTRIC COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. NOTICE: ALL ELECTRICAL AND GAS SERVICES WITHIN THIS SUBDIVISION ARE "UNDERGROUND INSTALLATIONS." FOR LOCATION OF ELECTRICAL CABLES AND GAS PIPING AND APPURTENANCES, CONTACT THE ELECTRIC COMPANY. TELEPHONE: 951-249-8351.
8. CONTRACTOR SHALL NOTIFY THE TELEPHONE COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. NOTICE: ALL TELEPHONE SERVICES WITHIN THIS SUBDIVISION ARE "UNDERGROUND INSTALLATIONS." FOR LOCATION OF CABLES AND APPURTENANCES, CONTACT TELEPHONE COMPANY. TELEPHONE: 714-618-9125.
9. CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. ALL DAMAGES THERETO CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE APPROPRIATE SPECIFICATIONS AND STANDARDS AT THE EXPENSE OF THE CONTRACTOR.

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

CAUTION:
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PRELIMINARY
NOT FOR CONSTRUCTION

DIG ALERT
CALL BEFORE YOU DIG!
1-800-227-2600
UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating.

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THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY OF DESIGN AND ACCEPTABILITY OF THE WORK HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER · NICHOLAS A. DORNER · NO. 83491 · STATE OF CALIFORNIA

RICK
619-291-0707 rickengineering.com
5620 FRIARS ROAD SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK: SEE SHEET 1

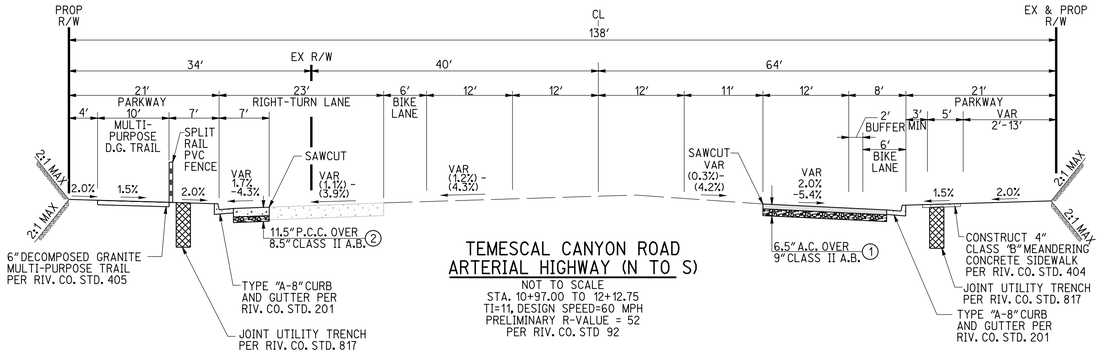
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PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER- TEMESCAL CANYON ROAD NOTES, DETAILS, AND QUANTITIES

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

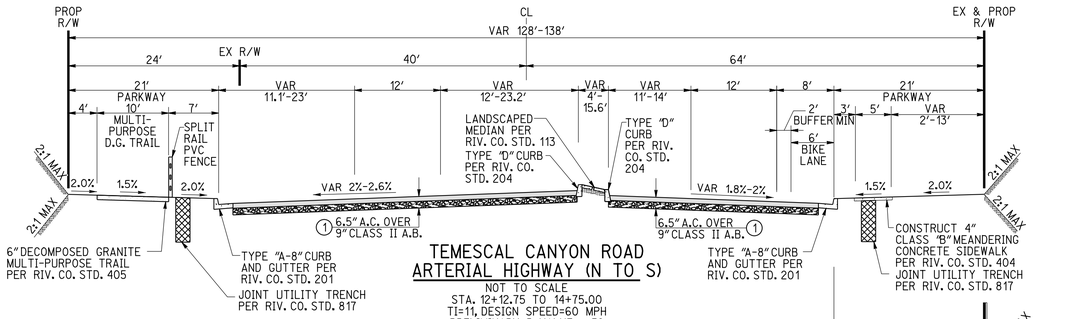
SHEET NO. 2 OF 20 SHEETS

\\cp.rickeng.com\projects\C_RIV_C\18602\18602-B\Civil\PlanSets\Phase 2\18602B_02_IMP01_GeneralNotes_PH2.dgn



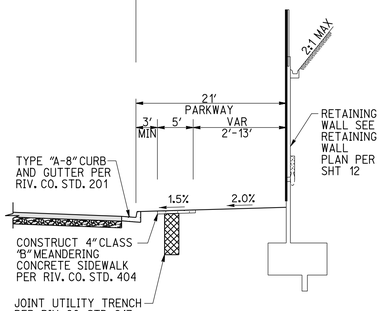
TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (N TO S)

NOT TO SCALE
STA. 10+97.00 TO 12+12.75
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PRELIMINARY R-VALUE = 52
PER RIV. CO. STD 92

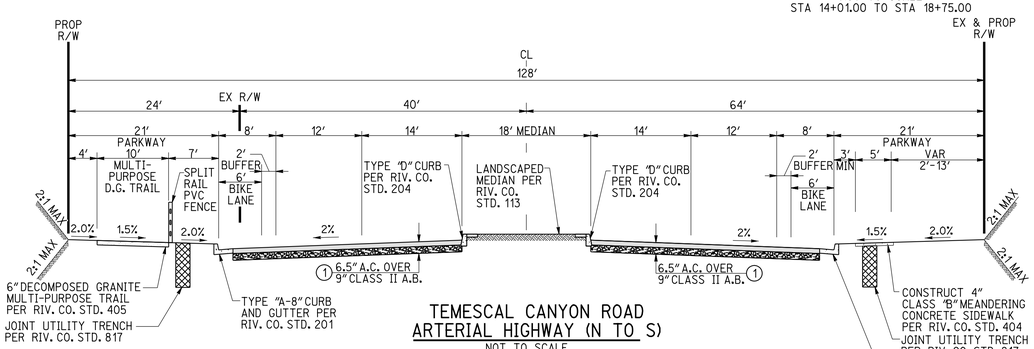


TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (N TO S)

NOT TO SCALE
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PRELIMINARY R-VALUE = 52
PER RIV. CO. STD 92

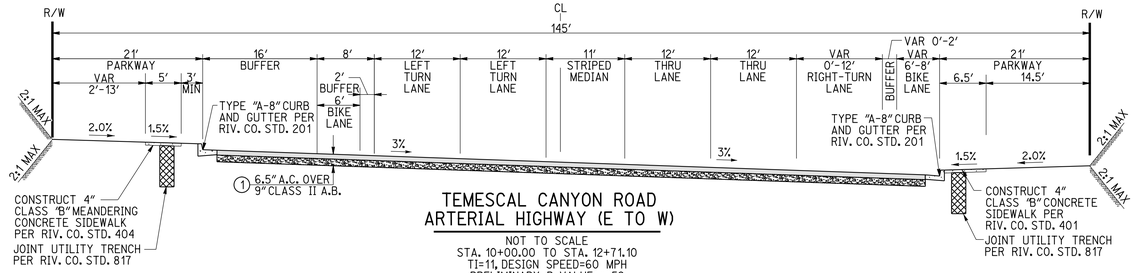


NOT TO SCALE
STA 14+01.00 TO STA 18+75.00



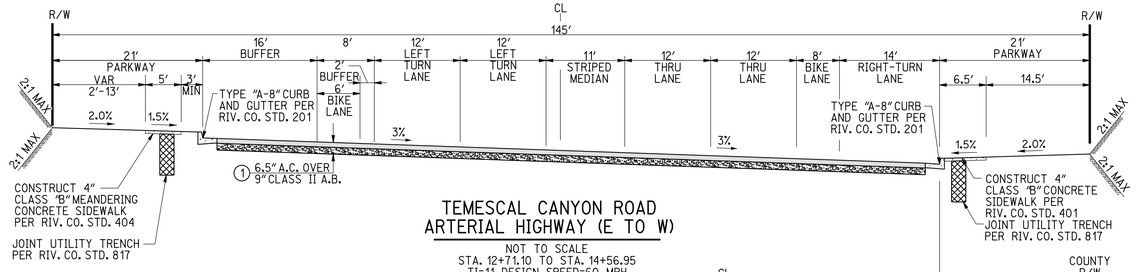
TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (N TO S)

NOT TO SCALE
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PRELIMINARY R-VALUE = 52
PER RIV. CO. STD 92



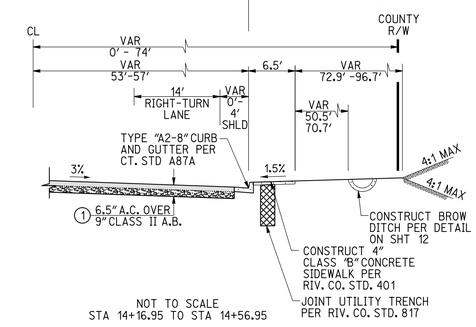
TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (E TO W)

NOT TO SCALE
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TI=11, DESIGN SPEED=60 MPH
PRELIMINARY R-VALUE = 52
PER RIV. CO. STD. 92

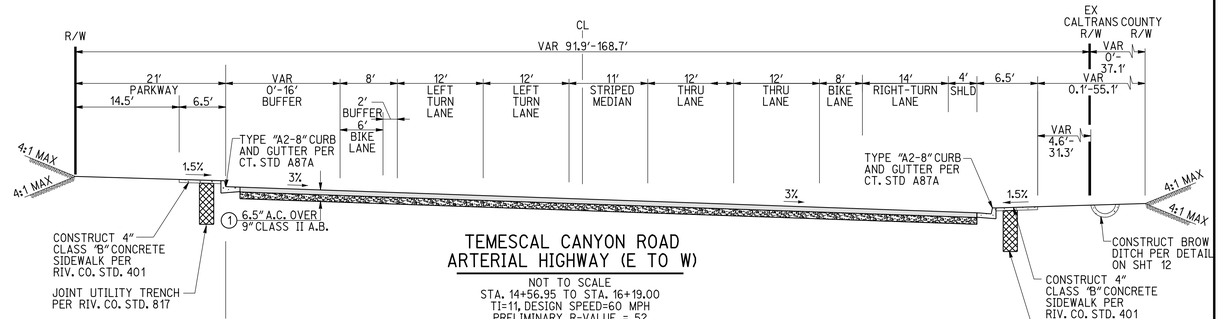


TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (E TO W)

NOT TO SCALE
STA. 12+71.10 TO STA. 14+56.95
TI=11, DESIGN SPEED=60 MPH
PRELIMINARY R-VALUE = 52
PER RIV. CO. STD. 92

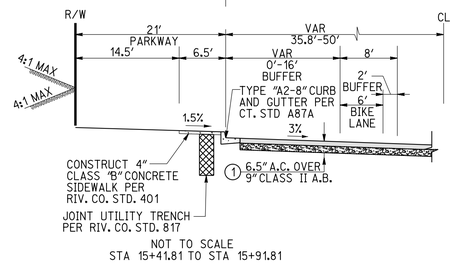


NOT TO SCALE
STA 14+16.95 TO STA 14+56.95



TEMESCAL CANYON ROAD
ARTERIAL HIGHWAY (E TO W)

NOT TO SCALE
STA. 14+56.95 TO STA. 16+19.00
TI=11, DESIGN SPEED=60 MPH
PRELIMINARY R-VALUE = 52
PER RIV. CO. STD. 92



NOT TO SCALE
STA 15+41.81 TO STA 15+91.81

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PRELIMINARY
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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40'
V: _____

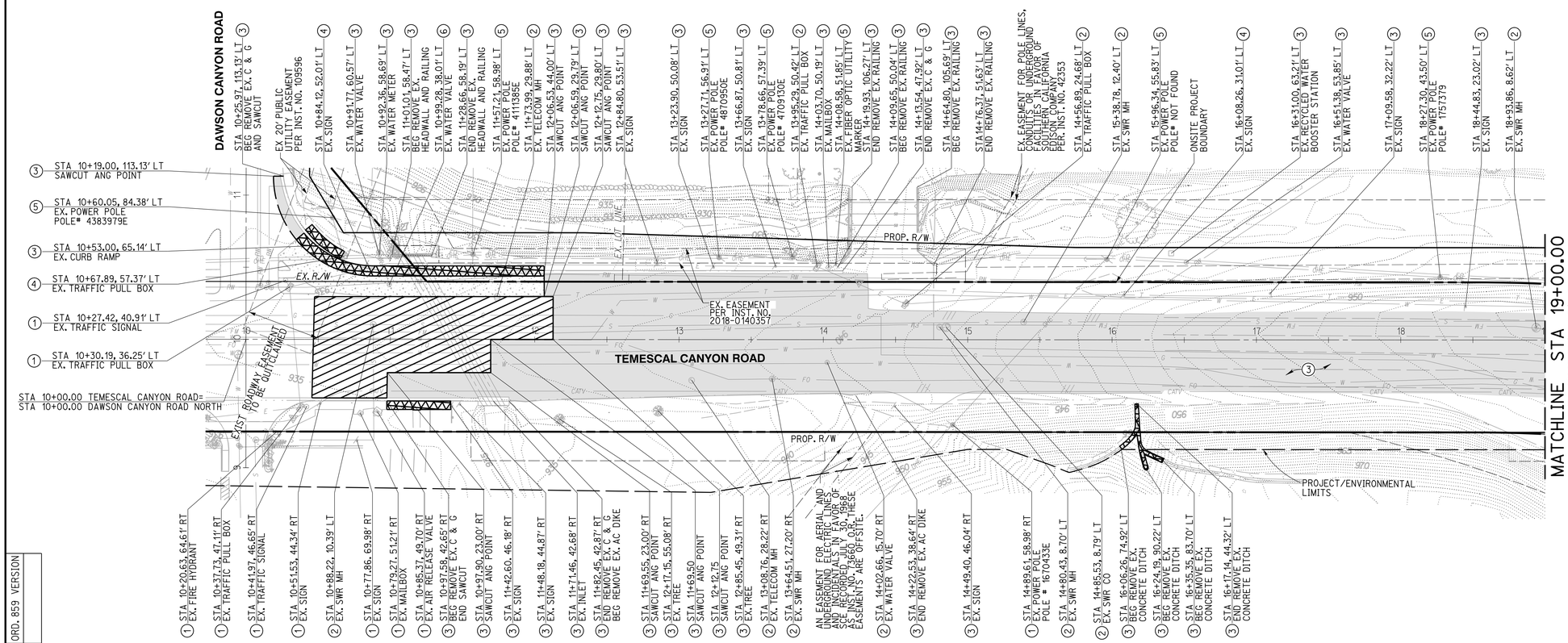
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER-
TEMESCAL CANYON ROAD
TYPICAL SECTIONS

FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

SHEET NO. 3 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES			

C:\RICK\Projects\C_RIV_G\18602\18602-B\Civil\PlanSets\Phase 2\18602B_03_IMP01_Sections_PH2.dgn



DEMOLITION NOTES

1. PROTECT IN PLACE
2. ADJUST TO GRADE
3. REMOVE
4. SALVAGE AND RELOCATE
5. TO BE RELOCATED BY OTHERS
6. ABANDON

LEGEND

- LIMITS OF A.C. PAVEMENT REMOVAL
- LIMITS OF A.C. GRIND AND OVERLAY
- LIMITS OF CONCRETE REMOVAL

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

SCALE: 1"= 40'
40 0 40 80

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V:_____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY BUSINESS PARK -- TEMESCAL CANYON ROAD (N TO S) DEMOLITION PLANS

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 4 OF 20 SHEETS

\\cp.rickeng.com\projects\C_RIV_C\18602\18602-B\Civil\PlanSets\Phase 2\18602B_04_DEM001_PH2.dgn

DEMOLITION NOTES

1. PROTECT IN PLACE
2. ADJUST TO GRADE
3. REMOVE
4. SALVAGE AND RELOCATE
5. TO BE RELOCATED BY OTHERS
6. ABANDON

LEGEND

- LIMITS OF A.C. PAVEMENT REMOVAL
- LIMITS OF A.C. GRIND AND OVERLAY
- LIMITS OF CONCRETE REMOVAL

SEE SHEET NO. 4
MATCHLINE STA 19+00.00

SEE SHEET NO. 6
MATCHLINE STA 27+00.00

APN
283-160-043

TEMESCAL CANYON ROAD

PROP. R/W

EX. R/W

PROJECT/ENVIRONMENTAL LIMITS

EX. EASEMENT FOR POLE LINES, CONDUITS OR UNDERGROUND FACILITIES IN FAVOR OF SOUTHERN CALIFORNIA EDISON COMPANY PER INST. NO. 42353

EX. EASEMENT PER INST. NO. 2016-0140357

EX. TREES TO BE EMOVED

- ① EX. 24" CMP SD
- STA 19+34.95, 47.29' RT ⑥ BEG ABANDON EX. 24" CMP
- STA 19+37.92, 47.56' RT ⑥ BEG ABANDON EX. 24" CMP
- STA 19+38.36, 51.06' RT ③ EX. INLET
- STA 19+49.79, 48.20' RT ③ BEG REMOVE EX. AC DIKE
- STA 19+87.50, 3.28' RT ② EX. WATER VALVE
- STA 19+82.31, 65.37' RT ③ EX. TREE
- STA 19+90.56, 3.33' RT ③ EX. WATER VALVE
- STA 19+43.35, 29.73' LT ③ EX. HEADWALL
- STA 19+43.40 29.97' LT ⑥ END ABANDON EX. 24" CMP
- STA 19+46.63 29.60' LT ⑥ END ABANDON EX. 24" CMP
- STA 19+87.27, 13.28' LT ② EX. SWR MH
- STA 20+25.27, 32.99' LT ⑤ EX. POWER POLE POLE# 1904454E
- STA 20+30.17, 31.98' LT ⑤ EX. POWER POLE POLE# 1904454E
- STA 20+96.08, 9.09' RT ③ EX. SIGN
- STA 21+77.15, 93.13' RT ③ EX. SIGN
- STA 22+37.65, 120.41' RT ⑤ EX. PULL BOX
- STA 22+64.49, 23.88' RT ⑤ EX. POWER POLE POLE# 1757382E
- STA 22+69.26, 25.35' RT ⑤ EX. POWER POLE POLE# NOT FOUND
- STA 23+28.13, 45.74' RT ③ EX. SIGN
- STA 23+70.06, 146.90' RT ③ EX. SIGN
- STA 23+83.77, 148.01' RT ③ END REMOVE EX. AC DIKE BEG REMOVE EX. C & G
- STA 24+04.54, 162.57' RT ③ EX. CURB RAMP
- STA 24+09.02, 169.98' RT ③ END REMOVE EX. C & G BEG REMOVE EX. 6" CURB
- STA 24+16.56, 101.16' RT ③ EX. SWR MH
- STA 24+96.28, 159.11' RT ③ EX. WATER VALVE
- STA 24+91.15, 101.70' RT ② EX. PULL BOX
- STA 25+00.78, 104.30' RT ② EX. PULL BOX
- STA 25+00.06, 94.99' RT ⑤ EX. POWER POLE POLE# 1757383E
- STA 25+13.53, 106.50' RT ⑤ EX. GAS UTILITY MARKER
- STA 25+09.30, 41.58' LT ③ EX. TREE
- STA 25+26.03, 36.47' LT ③ EX. TREE
- EX. TREES TO BE EMOVED
- STA 25+63.36, 142.56' RT ⑤ EX. TELECOMM MH
- STA 25+74.72, 133.07' RT ⑤ EX. PULL BOX
- STA 25+76.36, 140.74' RT ③ EX. SWR MH
- STA 26+22.97, 133.82' RT ① EX. BACKFLOW PREVENTER
- STA 26+16.55, 170.11' RT ③ EX. GAS VALVE

SEE DETAIL "A" THIS SHEET

- STA 24+85.77, 190.41' RT ③ EX. AIR RELEASE VALVE
- STA 24+70.83, 177.56' RT ① EX. UNDERDRAIN
- STA 68.74, 176.90' RT ① EX. S/W
- STA 24+65.68, 176.06 RT ③ BEG REMOVE EX. 6" CURB
- STA 24+58.68, 177.79' RT ③ EX. CURB RAMP
- STA 25+54.41, 183.03' RT ③ BEG REMOVE EX. 6" CURB
- STA 24+54.54, 192.93' RT ③ EX. LIGHT POLE
- STA 24+54.96, 196.50' RT ③ EX. SIGN
- STA 24+74.28, 195.99' RT ④ EX. GAS STATION ENTRANCE SIGN
- STA 24+83.57, 198.24' RT ③ EX. SIGN
- STA 24+71.48, 203.67' RT ④ EX. GAS STATION ENTRANCE SIGN
- STA 24+66.29, 212.14' RT ① EX. IRRIGATION
- STA 24+22.75, 269.31' RT ① EX. PRIVATE SIGN
- STA 24+24.79, 280.72' RT ① EX. PRIVATE SIGN
- STA 24+30.75, 287.96' RT ① EX. PRIVATE SIGN
- STA 24+41.30, 295.73' RT ① EX. PRIVATE SIGN
- STA 24+57.43, 301.04' RT ① EX. PRIVATE SIGN
- STA 24+88.29, 212.01' RT ③ EX. TREE
- STA 24+89.32, 246.51' RT ② EX. LIGHT POLE
- STA 25+34.09, 204.51' RT ① EX. UNDERDRAIN
- STA 25+35.84, 205.20' RT ① EX. UNDERDRAIN
- STA 25+25.19, 214.78' RT ① EX. INLET
- STA 25+48.41, 219.07 RT ③ EX. SIGN
- STA 25+48.73, 227.99' RT ③ EX. SIGN
- STA 25+14.68, 241.77' RT ① EX. IRRIGATION
- STA 25+15.98, 242.66' RT ① EX. IRRIGATION
- STA 25+47.02, 258.48' RT ① EX. LIGHT POLE
- STA 25+15.52, 242.18' RT ① EX. INLET
- STA 25+09.85, 253.68' RT ③ END REMOVE EX. 6" CURB
- STA 24+87.34, 293.49' RT ① EX. MAILBOX
- STA 24+91.00, 299.37' RT ③ END REMOVE EX. 6" CURB
- STA 24+73.68, 298.41' RT ① EX. PRIVATE SIGN

DETAIL "A"
SCALE: 1"=20'

EX. LOT LINE

EX. R/W

PROJECT/ENVIRONMENTAL LIMITS

AN EASEMENT FOR INGRESS TO OR EGRESS FROM RESERVED UNTO THE STATE OF CALIFORNIA, ALSO SUBJECT TO THE RIGHTS OF SO. CAL. GAS CO. AND THE PACIFIC TELEPHONE AND TELEGRAPH CO. FOR EXISTING UNDERGROUND AND/ OR OVERHEAD UTILITY LINES AS SAME AS ARE LOCATED WITHIN PORTIONS OF THE 80' STRIP PER DOCUMENT RECORDED JUNE 5, 1967 AS INST. NO. 47923 O.R.

AN EASEMENT FOR PIPELINES AND INCIDENTALS ALONG WITH INGRESS AND EGRESS TO THE SAME IN FAVOR OF SO. CAL. GAS CO. RECORDED FEB. 21, 1968 AS INST. NO. 16249 O.R

- STA 26+92.12, 168.61' RT ③ EX. UTILITY MARKER
- STA 26+12.75, 227.32' RT ③ EX. WATER VALVE
- STA 26+16.31, 231.28' RT ③ EX. WATER VALVE
- STA 26+17.28, 229.03' RT ③ EX. WATER VALVE
- STA 26+71.28, 211.61' RT ③ EX. SWR MH
- STA 26+72.55, 213.46 RT ③ EX. SWR CO
- STA 26+31.24, 228.02' RT ③ EX. WTR MH
- STA 26+35.59, 229.97' RT ③ EX. WATER VALVE
- STA 26+16.31, 231.28' RT ③ EX. WATER VALVE
- STA 26+16.31, 231.28' RT ③ EX. WATER VALVE
- STA 26+25.98, 241.61' RT ③ EX. WATER VALVE

- ① STA 25+85.13, 279.87 RT EX. IRRIGATION
- ① STA 25+86.31, 280.63' RT EX. IRRIGATION
- ③ STA 25+94.98, 251.78' RT EX. AIR RELEASE VALVE
- ① STA 25+94.54, 284.67' RT EX. LIGHT POLE
- ① STA 25+96.01, 296.39' RT EX. BOLLARDS
- ① STA 25+97.40, 294.88' RT EX. BACKFLOW PREVENTER
- ① STA 26+00.18, 297.08' RT EX. BACKFLOW PREVENTER
- ① STA 25+98.10, 293.58' RT EX. ELEC RISER
- ① STA 26+07.61, 268.07' RT EX. FIRE SERVICE
- ① STA 26+42.57, 325.58' RT EX. LIGHT POLE
- ① STA 26+12.67, 282.80' RT EX. WATER VALVE
- ① STA 26+15.72, 266.06' RT EX. FIRE HYDRANT

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

SCALE: 1"= 40'
40 0 40 80

CAUTION:
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PRELIMINARY
NOT FOR CONSTRUCTION

DIG ALERT
CALL BEFORE YOU DIG!
1-800-227-2600
UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating.

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY OF DESIGN AND ACCEPTABILITY OF THE WORK HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: _____

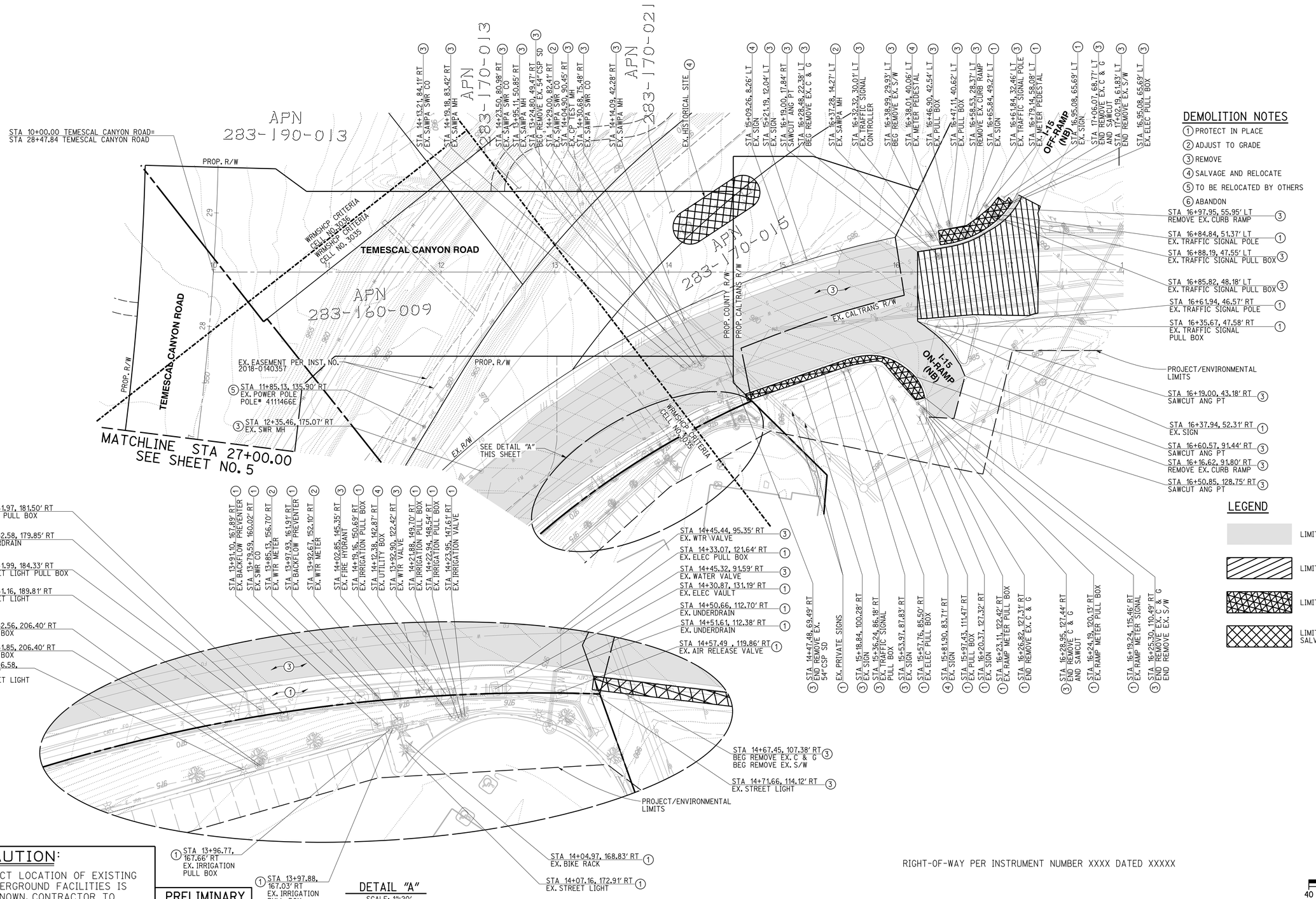
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY BUSINESS PARK - TEMESCAL CANYON ROAD (N TO S)
DEMOLITION PLANS

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 5 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES			

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DEMOLITION NOTES

1. PROTECT IN PLACE
2. ADJUST TO GRADE
3. REMOVE
4. SALVAGE AND RELOCATE
5. TO BE RELOCATED BY OTHERS
6. ABANDON

LEGEND

- LIMITS OF A.C. PVMT. REMOVAL
- LIMITS OF A.C. GRIND AND OVERLAY
- LIMITS OF CONCRETE REMOVAL
- LIMITS OF HISTORICAL SITE SALVAGE AND RELOCATION

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

CAUTION:
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PRELIMINARY
NOT FOR CONSTRUCTION

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UNDERGROUND SERVICE ALERT
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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
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SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:

SEE SHEET 1

SCALE: H: 1"=40' V: _____

PPT220039/TPM38551 IP NO. 220056

COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER- TEMESCAL CANYON ROAD DEMOLITION PLANS

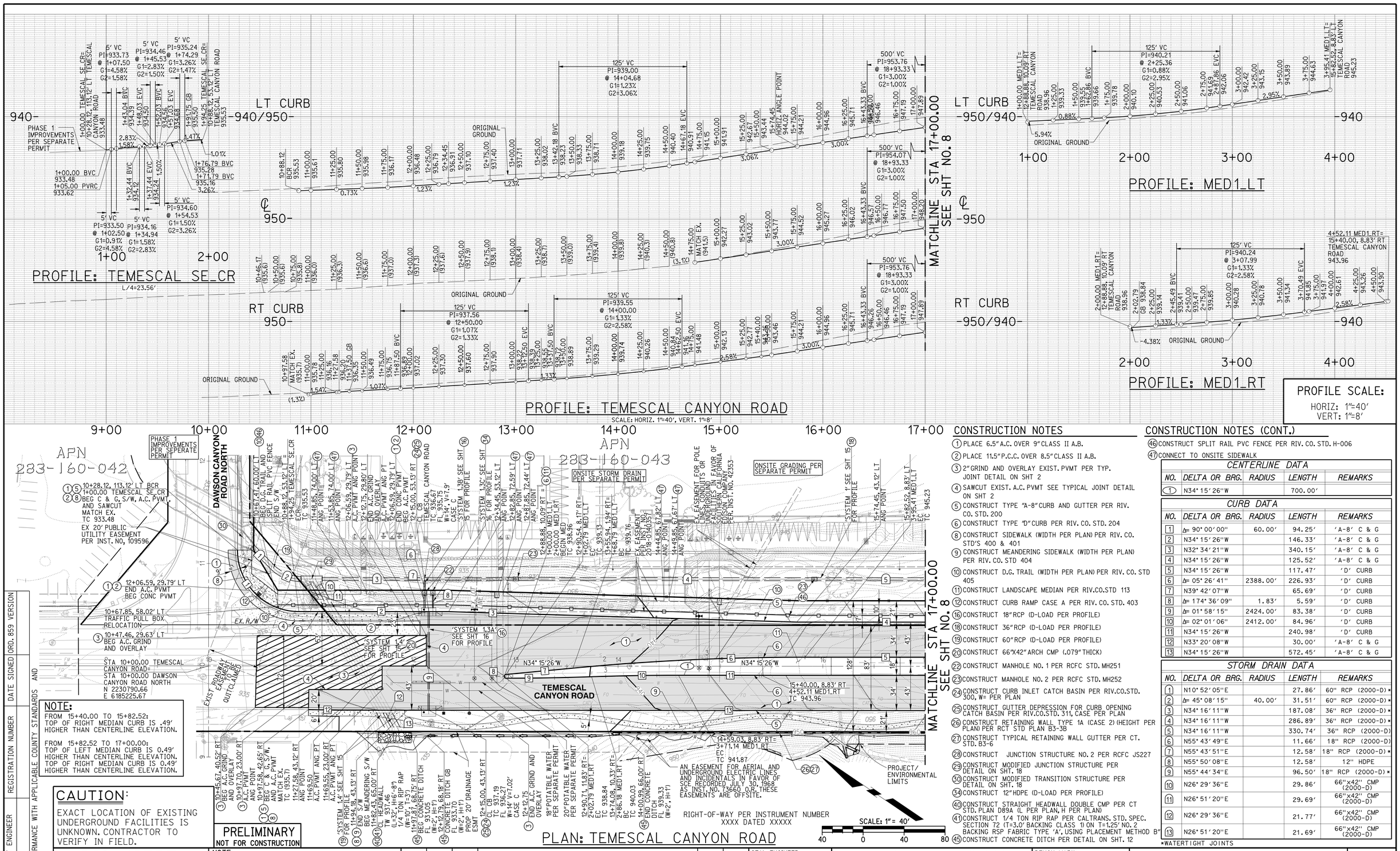
FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 6 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMENDED/APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

C:\RICK\Projects\C_RIV_G\18602\18602-B\Civil\PlanSets\Phase 2\18602B_06_DEM003_PH2.dgn



CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
2. PLACE 11.5" P.C.C. OVER 8.5" CLASS II A.B.
3. 2" GRIND AND OVERLAY EXIST. PVMT PER TYP. JOINT DETAIL ON SHT 2
4. SAWCUT EXIST. A.C. PVMT SEE TYPICAL JOINT DETAIL ON SHT 2
5. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 200
6. CONSTRUCT TYPE "D" CURB PER RIV. CO. STD. 204
8. CONSTRUCT SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD'S 400 & 401
9. CONSTRUCT MEANDERING SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD 404
10. CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD 405
11. CONSTRUCT LANDSCAPE MEDIAN PER RIV.CO.STD 113
12. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
16. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
18. CONSTRUCT 36" RCP (D-LOAD PER PROFILE)
19. CONSTRUCT 60" RCP (D-LOAD PER PROFILE)
20. CONSTRUCT 66"X42" ARCH CMP (.079" THICK)
22. CONSTRUCT MANHOLE NO. 1 PER RCFC STD. MH251
23. CONSTRUCT MANHOLE NO. 2 PER RCFC STD. MH252
24. CONSTRUCT CURB INLET CATCH BASIN PER RIV.CO.STD. 300, W= PER PLAN
25. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV.CO.STD. 311, CASE PER PLAN
26. CONSTRUCT RETAINING WALL TYPE 1A (CASE 2) (HEIGHT PER PLAN) PER RCT STD PLAN B3-3B
27. CONSTRUCT TYPICAL RETAINING WALL GUTTER PER CT. STD. B3-6
28. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFC JS227
29. CONSTRUCT MODIFIED JUNCTION STRUCTURE PER DETAIL ON SHT. 18
30. CONSTRUCT MODIFIED TRANSITION STRUCTURE PER DETAIL ON SHT. 18
34. CONSTRUCT 12" HDPE (D-LOAD PER PROFILE)
40. CONSTRUCT STRAIGHT HEADWALL DOUBLE CMP PER CT STD. PLAN D89A (L PER PLAN, H PER PLAN)
41. CONSTRUCT 1/4 TON RIP RAP PER CALTRANS. STD. SPEC. SECTION 72 (T=3.0' BACKING CLASS 1) ON T=1.25' NO. 2 BACKING RSP FABRIC TYPE 'A', USING PLACEMENT METHOD B"
45. CONSTRUCT CONCRETE DITCH PER DETAIL ON SHT. 12

CONSTRUCTION NOTES (CONT.)

46. CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD. H-006
47. CONNECT TO ONSITE SIDEWALK

CENTERLINE DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N34° 15' 26"W		700.00'	

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ= 90° 00' 00"	60.00'	94.25'	'A-8' C & G
2	N34° 15' 26"W		146.33'	'A-8' C & G
3	N32° 34' 21"W		340.15'	'A-8' C & G
4	N34° 15' 26"W		125.52'	'A-8' C & G
5	N34° 15' 26"W		117.47'	'D' CURB
6	Δ= 05° 26' 41"	2388.00'	226.93'	'D' CURB
7	N39° 42' 07"W		65.69'	'D' CURB
8	Δ= 174° 36' 09"	1.83'	5.59'	'D' CURB
9	Δ= 01° 58' 15"	2424.00'	83.38'	'D' CURB
10	Δ= 02° 01' 06"	2412.00'	84.96'	'D' CURB
11	N34° 15' 26"W		240.98'	'D' CURB
12	N33° 20' 08"W		30.00'	'A-8' C & G
13	N34° 15' 26"W		572.45'	'A-8' C & G

STORM DRAIN DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N10° 52' 05"E		27.86'	60" RCP (2000-D) *
2	Δ= 45° 08' 15"	40.00'	31.51'	60" RCP (2000-D) *
3	N34° 16' 11"W		187.08'	36" RCP (2000-D) *
4	N34° 16' 11"W		286.89'	36" RCP (2000-D) *
5	N34° 16' 11"W		330.74'	36" RCP (2000-D)
6	N55° 43' 49"E		11.66'	18" RCP (2000-D)
7	N55° 43' 51"E		12.58'	18" RCP (2000-D) *
8	N55° 50' 08"E		12.58'	12" HDPE
9	N55° 44' 34"E		96.50'	18" RCP (2000-D) *
10	N26° 29' 36"E		29.86'	66"x42" CMP (2000-D)
11	N26° 51' 20"E		29.69'	66"x42" CMP (2000-D)
12	N26° 29' 36"E		21.77'	66"x42" CMP (2000-D)
13	N26° 51' 20"E		21.69'	66"x42" CMP (2000-D)

*WATERTIGHT JOINTS

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=8'

PHASE 1 IMPROVEMENTS PER SEPERATE PERMIT

NOTE:
FROM 15+40.00 TO 15+82.52:
TOP OF RIGHT MEDIAN CURB IS .49' HIGHER THAN CENTERLINE ELEVATION.

FROM 15+82.52 TO 17+00.00:
TOP OF LEFT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.

CAUTION:
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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMENDED AND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY
DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

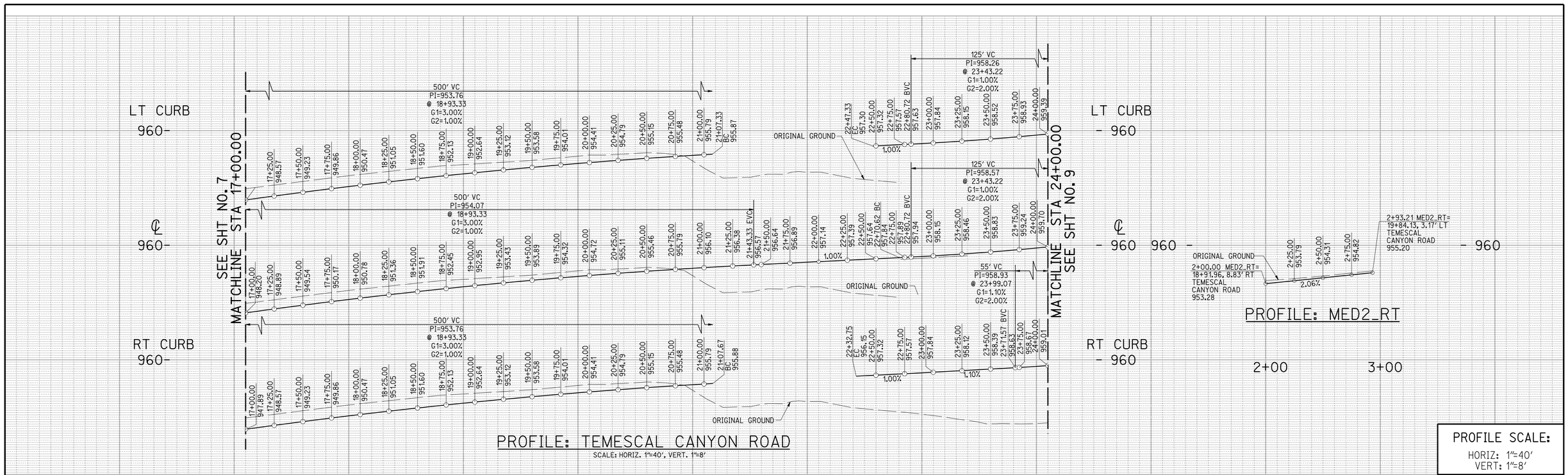
SCALE: H: 1"=40' V: 1"=8'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD STA 10+00.00 TO 17+00.00

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 7 OF 20 SHEETS

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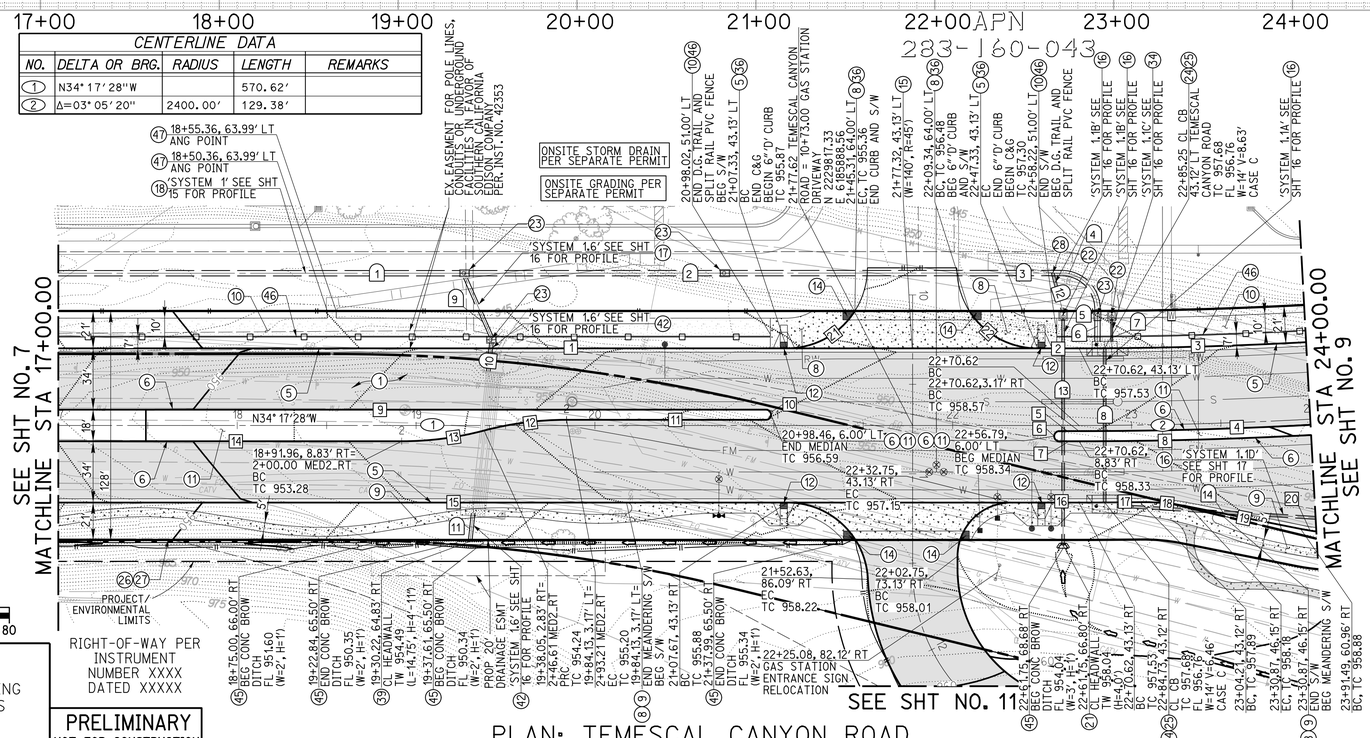


PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=8'

17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

APN 283-160-043

CENTERLINE DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N34° 17' 28"W		570.62'	
2	Δ=03° 05' 20"	2400.00'	129.38'	



NOTE:

FROM 17+00.00 to 18+91.96:
TOP OF LEFT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.

FROM 18+91.96 TO 19+84.13:
TOP OF LEFT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.

FROM 19+84.13 TO 20+98.46:
TOP OF LEFT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB VARIES 0.49'-.73' HIGHER THAN CENTERLINE ELEVATION.

FROM 22+56.79 TO 24+00.00:
TOP OF LEFT MEDIAN CURB VARIES 0.64'-.73' HIGHER THAN THE CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB VARIES 0.49'- 0.64' HIGHER THAN CENTERLINE ELEVATION.

SCALE: 1"= 40'
40 0 40 80

CAUTION:

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PRELIMINARY
NOT FOR CONSTRUCTION

CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
5. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201
6. CONSTRUCT TYPE "D" CURB PER RIV. CO. STD. 204
8. CONSTRUCT SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD'S 400 & 401
9. CONSTRUCT MEANDERING SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD.404
10. CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD 405
11. CONSTRUCT LANDSCAPE MEDIAN PER RIV.CO.STD 113
12. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
14. CONSTRUCT DETECTABLE WARNING TILES PER RIV. CO. STD. 403
15. CONSTRUCT COMMERCIAL DRIVEWAY PER RIV. CO. STD.207A
16. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
17. CONSTRUCT 24" RCP (D-LOAD PER PROFILE)
18. CONSTRUCT 36" RCP (D-LOAD PER PROFILE)
21. CONSTRUCT PIPE CULVERT HEADWALL, TYPE B PER CT STD. PLAN D90
22. CONSTRUCT MANHOLE NO. 1 PER RCFC STD. MH251
23. CONSTRUCT MANHOLE NO. 2 PER RCFC STD. MH252
24. CONSTRUCT CURB INLET CATCH BASIN PER RIV.CO.STD. 300, W= PER PLAN
25. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV.CO.STD. 311, CASE PER PLAN
26. CONSTRUCT RETAINING WALL TYPE 1A (CASE 2) (HEIGHT PER PLAN) PER RCT STD PLAN B3-3B
27. CONSTRUCT TYPICAL RETAINING WALL GUTTER PER CT. STD. B3-6
28. CONSTRUCT JUNCTION STRUCTURE NO 2. PER RCFC STD. JS227
34. CONSTRUCT 12" HDPE (D-LOAD PER PROFILE)
36. CONSTRUCT TYPE "D" (6" CURB) PER RIV. CO. STD. 204
39. CONSTRUCT STRAIGHT HEADWALL PER CT STD. PLAN D89A (L PER PLAN, H PER PLAN)
42. CONSTRUCT 24" CMP (D-LOAD PER PROFILE)
45. CONSTRUCT CONCRETE BROW DITCH PER DETAIL ON SHT 12
46. CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD H-006
47. CONNECT TO ONSITE SIDEWALK

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N34° 15' 26"W		407.33'	'A-8' C & G
2	N34° 15' 26"W		23.29'	'A-8' C & G
3	Δ = 03° 05' 20"	2356.87'	127.06'	'A-8' C & G
4	Δ = 03° 05' 20"	2403.17'	129.55'	'D' CURB
5	N34° 15' 26"W		10.99'	'D' CURB
6	Δ = 180° 00' 00"	2.83'	8.90'	'D' CURB
7	N34° 15' 26"W		10.99'	'D' CURB
8	Δ = 03° 05' 20"	2408.83'	129.86'	'D' CURB
9	N34° 15' 26"W		395.62'	'D' CURB
10	Δ = 180° 00' 00"	2.83'	8.90'	'D' CURB
11	N34° 15' 26"W		111.49'	'D' CURB
12	Δ = 14° 50' 06"	180.00'	46.61'	'D' CURB
13	Δ = 14° 50' 06"	180.00'	46.61'	'D' CURB
14	N34° 15' 26"W		191.96'	'D' CURB
15	N34° 15' 26"W		407.67'	'A-8' C & G
16	N34° 15' 26"W		37.87'	'A-8' C & G
17	Δ = 00° 48' 07"	2443.13'	34.20'	'A-8' C & G
18	Δ = 12° 04' 28"	129.87'	27.37'	'A-8' C & G
19	N22° 59' 05"W		63.72'	'A-8' C & G
20	Δ = 03° 05' 58"	130.12'	8.93'	'A-8' C & G
21	Δ = 90° 00' 45"	45.00'	45.22'	6" 'D' CURB
22	Δ = 89° 59' 15"	45.00'	45.22'	6" 'D' CURB

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N34° 16' 11"W		330.74'	36" RCP (2000-D)
2	N34° 16' 11"W		140.88'	36" RCP (2000-D)
3	N34° 16' 11"W		185.95'	36" RCP (2000-D)
4	Δ = 90° 00' 00"	20.00'	31.42'	36" RCP (2000-D)
5	N55° 43' 49"E		1.62'	36" RCP (2000-D)
6	N55° 43' 16"E		12.17'	36" RCP (2000-D)
7	N55° 43' 17"E		12.59'	12" HDPE
8	N55° 44' 31"E		86.50'	18" RCP (2000-D)
9	N55° 43' 49"E		37.34'	24" RCP (2000-D)
10	N61° 51' 12"E		16.24'	24" CMP (2000-D)
11	N61° 51' 12"E		17.86'	24" CMP (2000-D)
12	N40° 55' 16"E		22.64'	18" RCP (2000-D)
13	N55° 44' 34"E		126.13'	18" RCP (2000-D)
14	S30° 46' 20"E		120.27'	18" RCP (2000-D)

NOTE:

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DIG ALERT
CALL BEFORE YOU DIG!
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UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating.

DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: 1"=8'

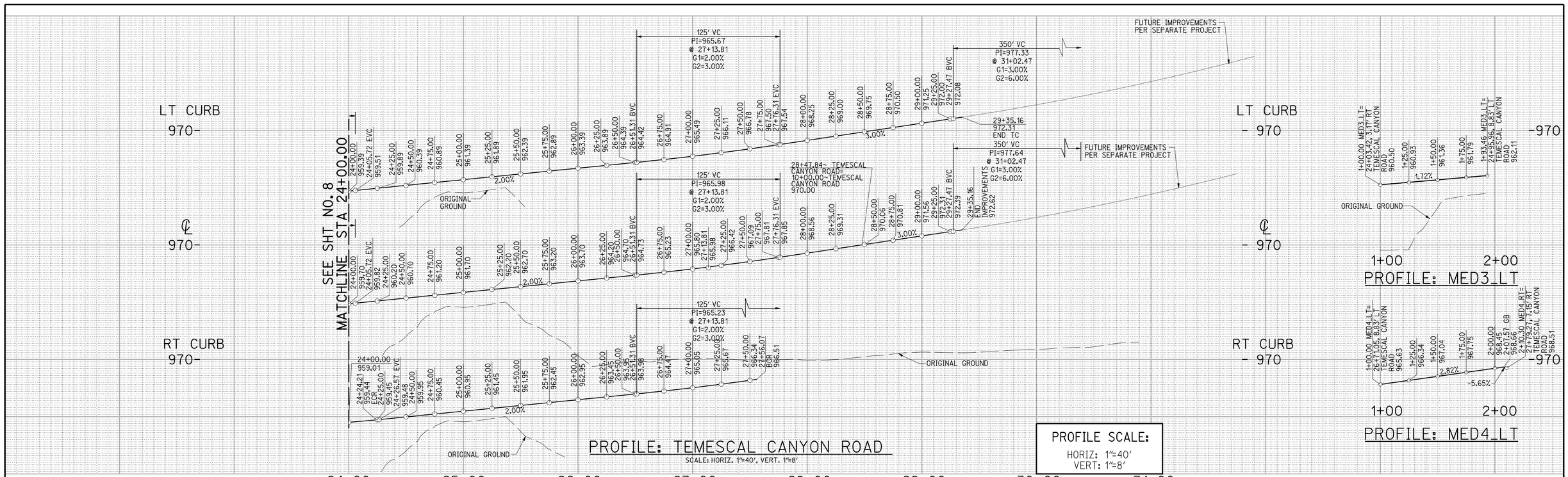
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD STA 17+00.00 TO 24+00.00

SHEET NO. 8 OF 20 SHEETS

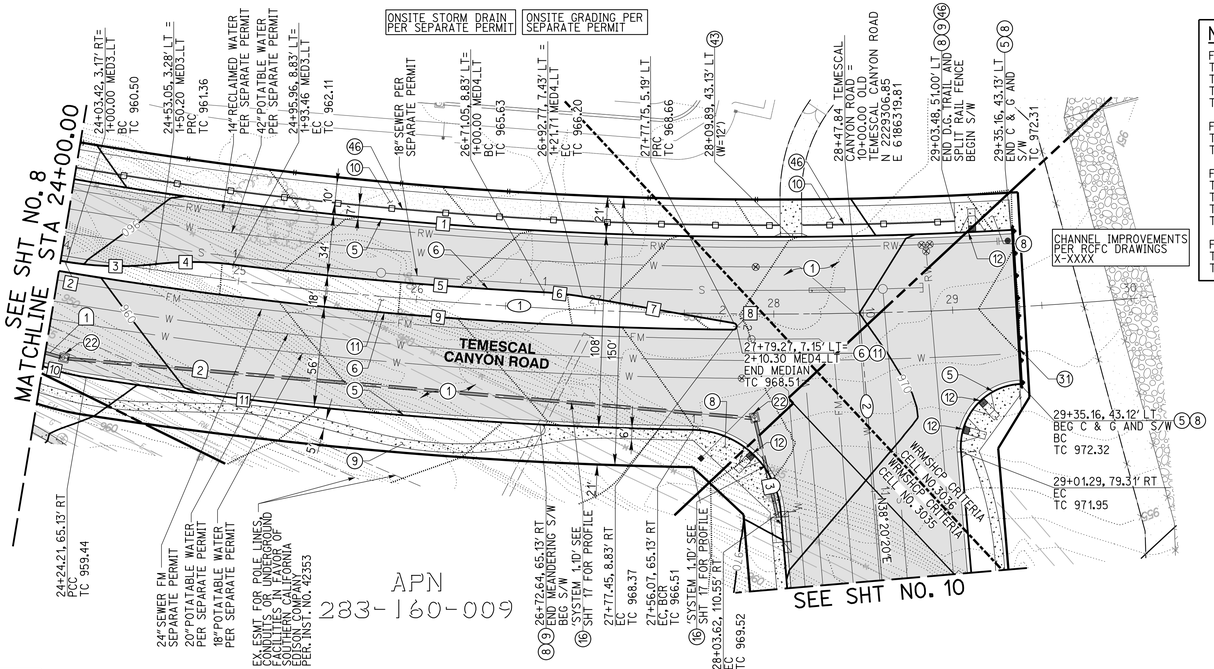
FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=8'



NOTE:

FROM 24+00.00 TO 24+03.42:
TOP OF LEFT MEDIAN CURB IS 0.73' HIGHER THAN THE CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.

FROM 24+03.42 TO 24+95.96:
TOP OF RIGHT MEDIAN CURB IS .49' HIGHER THAN CENTERLINE ELEVATION.

FROM 24+95.96 TO 26+71.05:
TOP OF LEFT MEDIAN CURB IS 0.49' HIGHER THAN THE CENTERLINE ELEVATION.
TOP OF RIGHT MEDIAN CURB IS 0.49 HIGHER THAN CENTERLINE ELEVATION.

FROM 26+71.05 TO 27+77.45:
TOP OF RIGHT MEDIAN CURB IS 0.49' HIGHER THAN CENTERLINE ELEVATION.

CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
5. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201
6. CONSTRUCT TYPE "D" CURB PER RIV. CO. STD. 204
8. CONSTRUCT SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD'S 400 & 401
9. CONSTRUCT MEANDERING SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD. 404
10. CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD 405
11. CONSTRUCT LANDSCAPE MEDIAN PER RIV.CO.STD 113
12. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
16. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
22. CONSTRUCT MANHOLE NO. 1 PER RCFC STD. MH251
31. CONSTRUCT BARRICADE PER RIV.CO.STD. 810 (L=86.0')
43. CONSTRUCT RESIDENTIAL DRIVEWAY PER RIV. CO. STD. 207
46. CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD. H-006

CENTERLINE DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	Δ= 17°03'08"	2400.00'	714.29'	
(2)	N38°20'20"E		106.87'	

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ= 12°46'34"	2356.88'	525.55'	'A-8' C & G
2	Δ= 00°04'54"	2403.17'	3.43'	'D' CURB
3	Δ= 15°58'47"	180.00'	50.20'	'D' CURB
4	Δ= 13°46'15"	180.00'	43.26'	'D' CURB
5	Δ= 04°10'48"	2391.17'	174.45'	'D' CURB
6	Δ= 06°54'58"	179.83'	21.71'	'D' CURB
7	N36°54'02"W		85.87'	'D' CURB
8	Δ= 170°32'37"	1.83'	5.46'	'D' CURB
9	Δ= 09°00'40"	2408.83'	378.84'	'D' CURB
10	Δ= 11°00'23"	130.13'	25.00'	'A-8' C & G
11	Δ= 07°55'21"	2465.12'	340.86'	'A-8' C & G

STORM DRAIN DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	S30°46'20"E		120.27'	18" RCP (2000-D)
2	S41°51'26"E		383.83'	18" RCP (2000-D)
3	S30°03'47"W		55.58'	18" RCP (2000-D)

CAUTION:

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PRELIMINARY
NOT FOR CONSTRUCTION

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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER NICHOLAS A. DORNER NO. 83491 STATE OF CALIFORNIA

RICK
619-291-0707 rickengineering.com
5620 FRIARS ROAD SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1'=40' V: 1'=8'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD
STA 24+00.00 TO 30+00.00

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

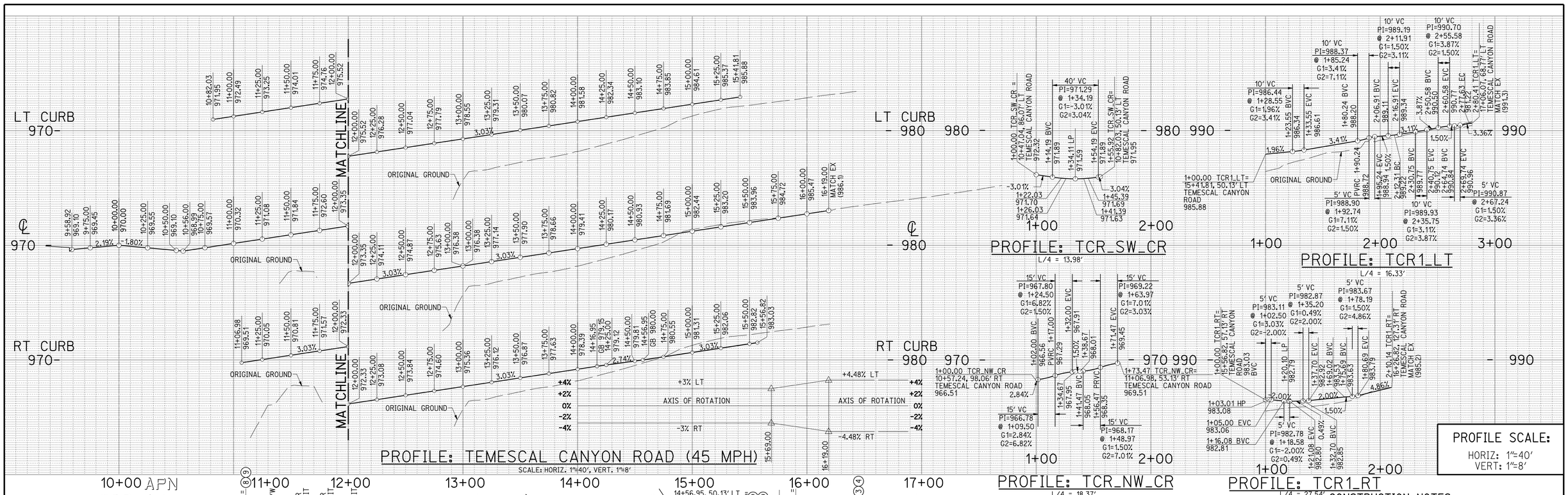
SHEET NO. 9 OF 20 SHEETS

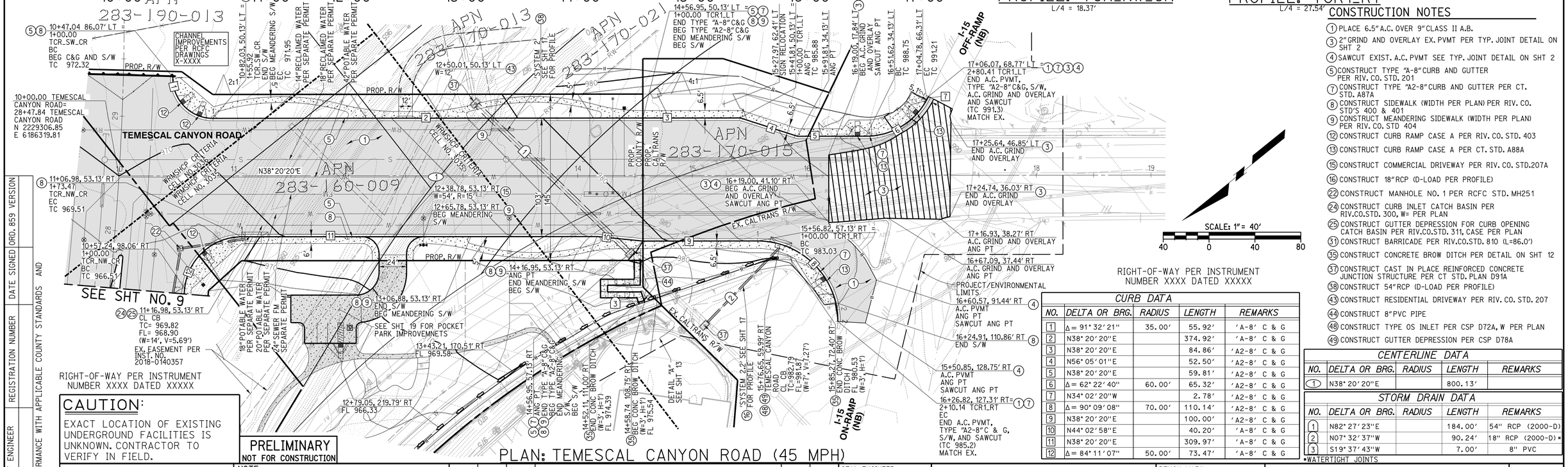
RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

SCALE: 1"= 40'
40 0 40 80

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES			

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CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
3. 2" GRIND AND OVERLAY EX. PVMT PER TYP. JOINT DETAIL ON SHT 2
4. SAWCUT EXIST. A.C. PVMT SEE TYP. JOINT DETAIL ON SHT 2
5. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201
7. CONSTRUCT TYPE "A2-8" CURB AND GUTTER PER CT. STD. A87A
8. CONSTRUCT SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD'S 400 & 401
9. CONSTRUCT MEANDERING SIDEWALK (WIDTH PER PLAN) PER RIV. CO. STD 404
12. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
13. CONSTRUCT CURB RAMP CASE A PER CT. STD. A88A
15. CONSTRUCT COMMERCIAL DRIVEWAY PER RIV. CO. STD.207A
16. CONSTRUCT 18"RCP (D-LOAD PER PROFILE)
22. CONSTRUCT MANHOLE NO. 1 PER RCFC STD. MH251
24. CONSTRUCT CURB INLET CATCH BASIN PER RIV.CO.STD. 300, W= PER PLAN
25. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV.CO.STD. 311, CASE PER PLAN
31. CONSTRUCT BARRICADE PER RIV.CO.STD. 810 (L=86.0')
35. CONSTRUCT CONCRETE BROW DITCH PER DETAIL ON SHT 12
37. CONSTRUCT CAST IN PLACE REINFORCED CONCRETE JUNCTION STRUCTURE PER CT STD. PLAN D91A
38. CONSTRUCT 54"RCP (D-LOAD PER PROFILE)
43. CONSTRUCT RESIDENTIAL DRIVEWAY PER RIV. CO. STD. 207
44. CONSTRUCT 8"PVC PIPE
48. CONSTRUCT TYPE OS INLET PER CSP D72A, W PER PLAN
49. CONSTRUCT GUTTER DEPRESSION PER CSP D78A

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ = 91° 32' 21"	35.00'	55.92'	'A-8' C & G
2	N38° 20' 20"E		374.92'	'A-8' C & G
3	N38° 20' 20"E		84.86'	'A2-8' C & G
4	N56° 05' 01"E		52.50'	'A2-8' C & G
5	N38° 20' 20"E		59.81'	'A2-8' C & G
6	Δ = 62° 22' 40"	60.00'	65.32'	'A2-8' C & G
7	N34° 02' 20"W		2.78'	'A2-8' C & G
8	Δ = 90° 09' 08"	70.00'	110.14'	'A2-8' C & G
9	N38° 20' 20"E		100.00'	'A2-8' C & G
10	N44° 02' 58"E		40.20'	'A-8' C & G
11	N38° 20' 20"E		309.97'	'A-8' C & G
12	Δ = 84° 11' 07"	50.00'	73.47'	'A-8' C & G

CENTERLINE DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N38° 20' 20"E		800.13'	

STORM DRAIN DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N82° 27' 23"E		184.00'	54" RCP (2000-D)
2	N07° 32' 37"W		90.24'	18" RCP (2000-D) *
3	S19° 37' 43"W		7.00'	8" PVC

*WATERTIGHT JOINTS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

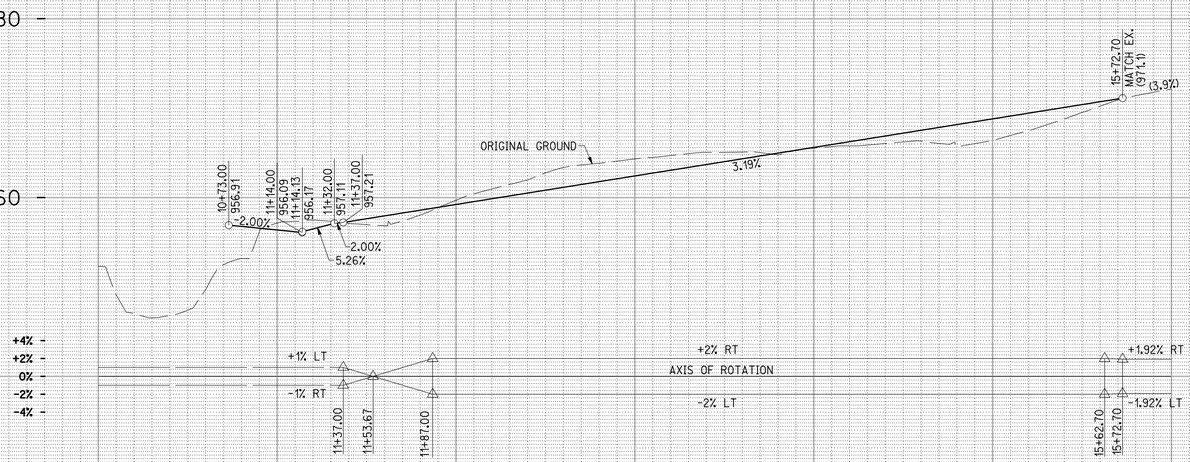
SCALE: H: 1"=40' V: 1"=8'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER- TEMESCAL CANYON ROAD STA 10+00.00 TO 18+00.00

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 10 OF 20 SHEETS

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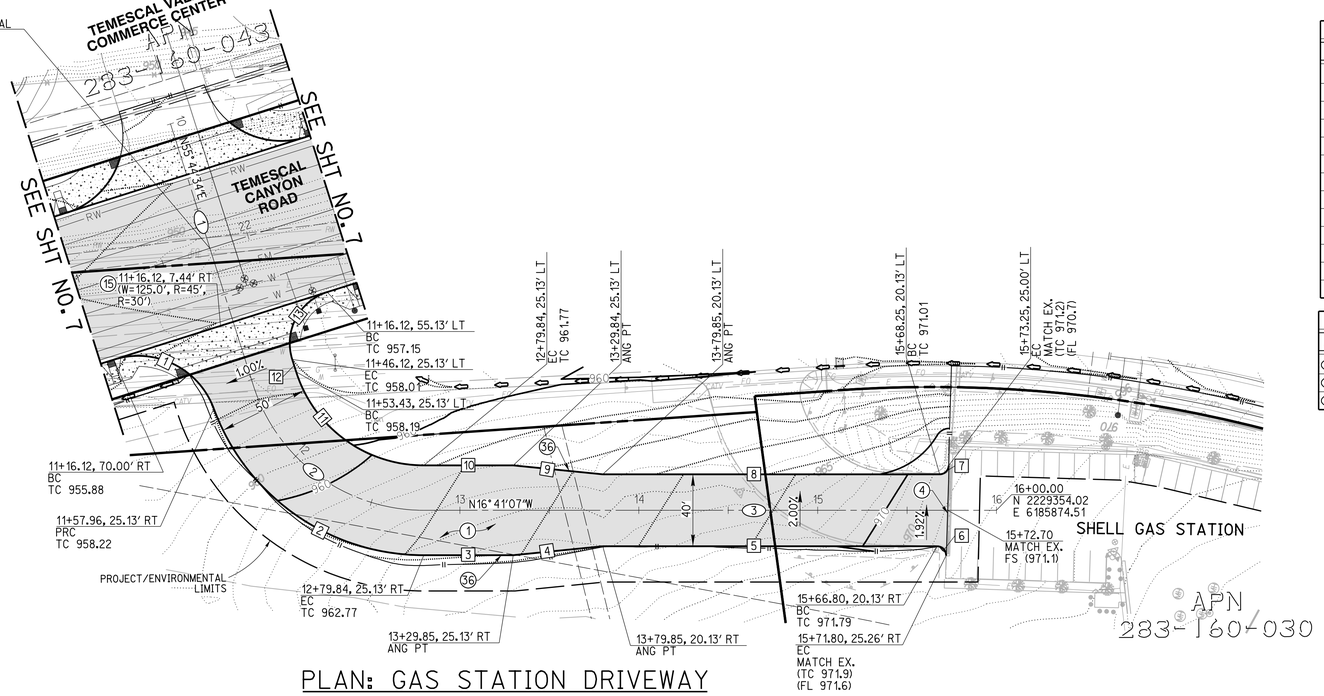


PROFILE: GAS STATION DRIVEWAY

SCALE: HORIZ. 1"=40', VERT. 1"=8'

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=8'

10+00 11+00 12+00 13+00 14+00 15+00 16+00



PLAN: GAS STATION DRIVEWAY

SCALE: 1"= 40'
40 0 40 80

CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
4. SAWCUT EXIST. A.C. PVMT SEE TYPICAL JOINT DETAIL ON SHT 2
15. CONSTRUCT COMMERCIAL DRIVEWAY PER RIV. CO. STD.207A
36. CONSTRUCT TYPE "D" (6" CURB) PER RIV. CO. STD. 204

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ= 87°24'32"	45.00'	68.65'	6" 'D' CURB
2	Δ= 69°50'13"	125.13'	152.51'	6" 'D' CURB
3	N16°41'07"W		50.01'	6" 'D' CURB
4	N22°23'45"W		50.25'	6" 'D' CURB
5	N16°41'07"W		186.95'	6" 'D' CURB
6	Δ= 91°34'44"	5.00'	7.99'	6" 'D' CURB
7	Δ= 88°37'14"	5.00'	7.73'	6" 'D' CURB
8	N16°41'07"W		188.40'	6" 'D' CURB
9	N10°58'29"W		50.25'	6" 'D' CURB
10	N16°41'07"W		50.01'	6" 'D' CURB
11	Δ= 72°25'41"	74.87'	94.65'	6" 'D' CURB
12	N55°44'34"E		7.31'	6" 'D' CURB
13	Δ= 90°00'00"	30.00'	47.12'	6" 'D' CURB

CENTERLINE DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N55°44'34"E		153.43'	
2	Δ= 72°25'41"	100.00'	126.41'	
3	N16°41'07"W		320.16'	

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER — COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

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SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: 1"=8'

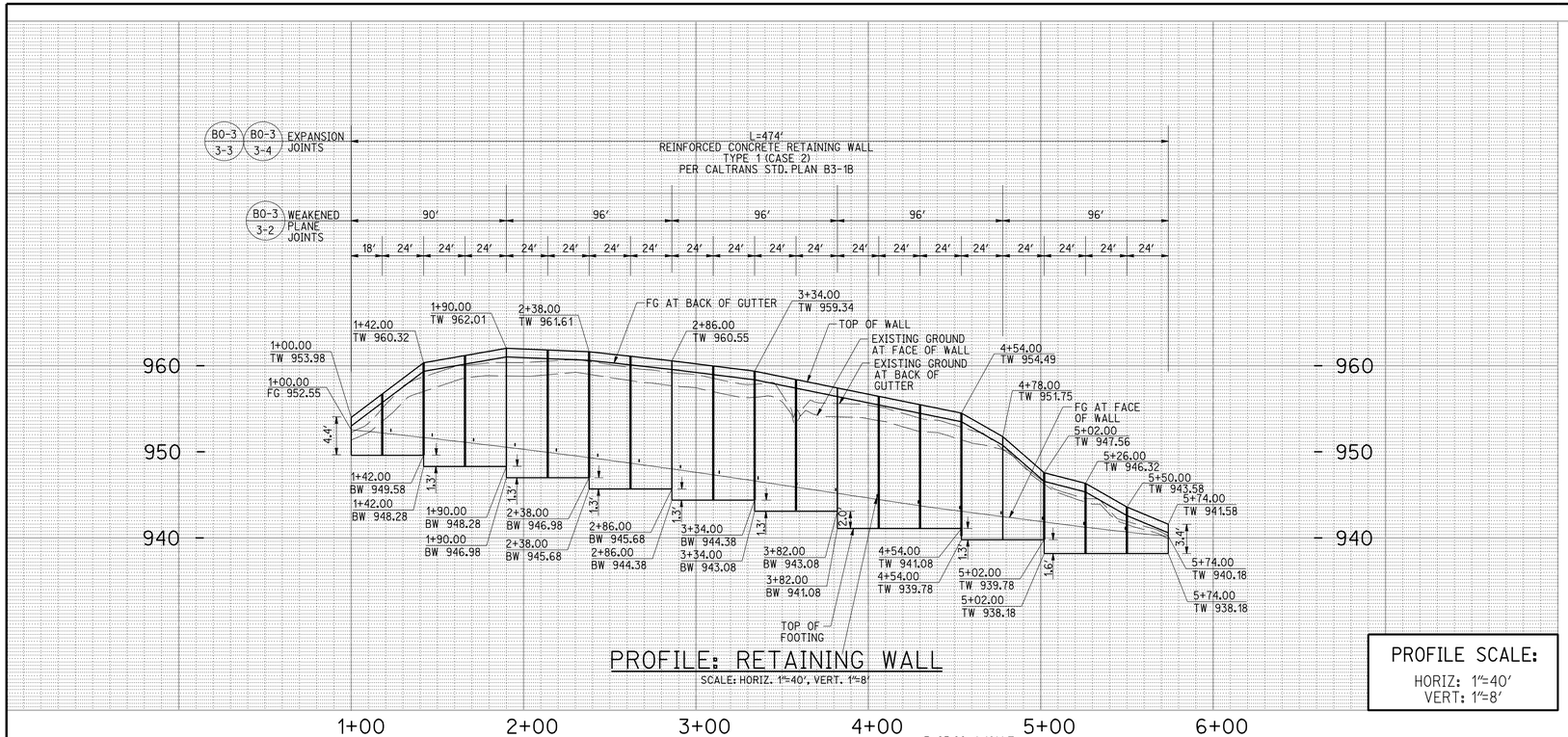
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER -
GAS STATION DRIVEWAY
STA 10+73.00 TO 16+00.00

FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

SHEET NO. 11 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

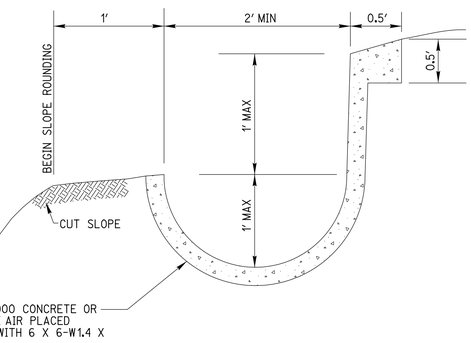
\\cp.rickeng.com\projects\C_RIV_C\18602\18602-B\Civil\PlanSets\Phase 2\18602B_11_IMP05_PH2.dgn



PROFILE: RETAINING WALL

SCALE: HORIZ. 1"=40', VERT. 1"=8'

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=8'



CONCRETE BROW DITCH

NOT TO SCALE

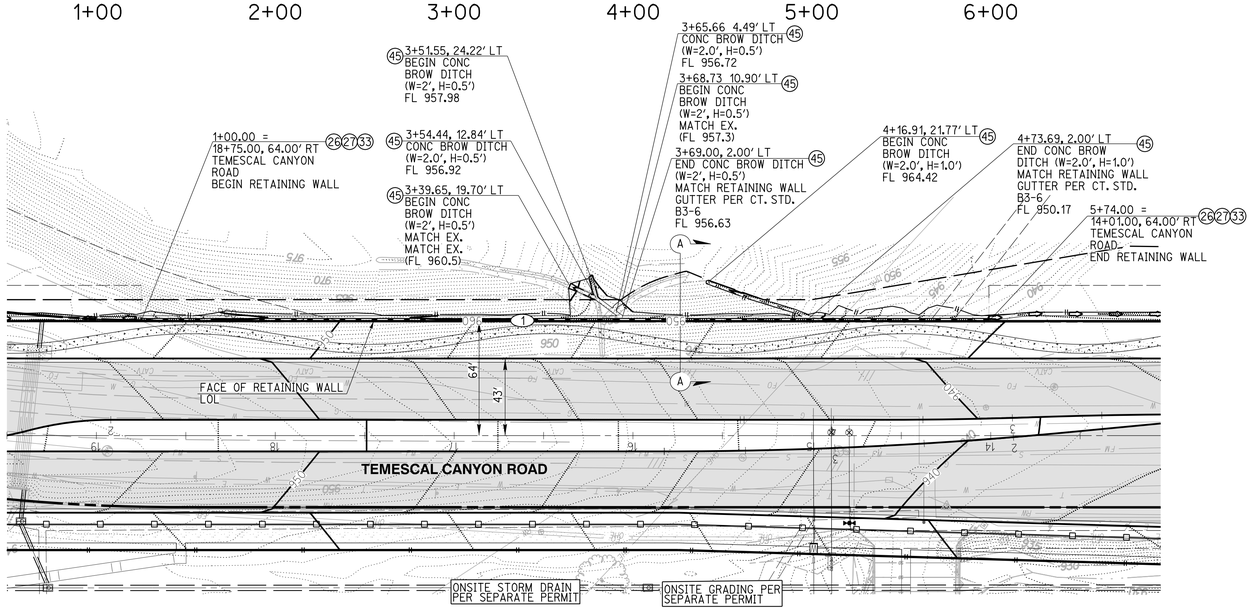
CONSTRUCTION NOTES

(26) CONSTRUCT RETAINING WALL TYPE 1 (CASE 2) (HEIGHT PER PLAN) PER CT. STD. B3-1B

(27) CONSTRUCT TYPICAL RETAINING WALL GUTTER PER CT. STD. B3-6

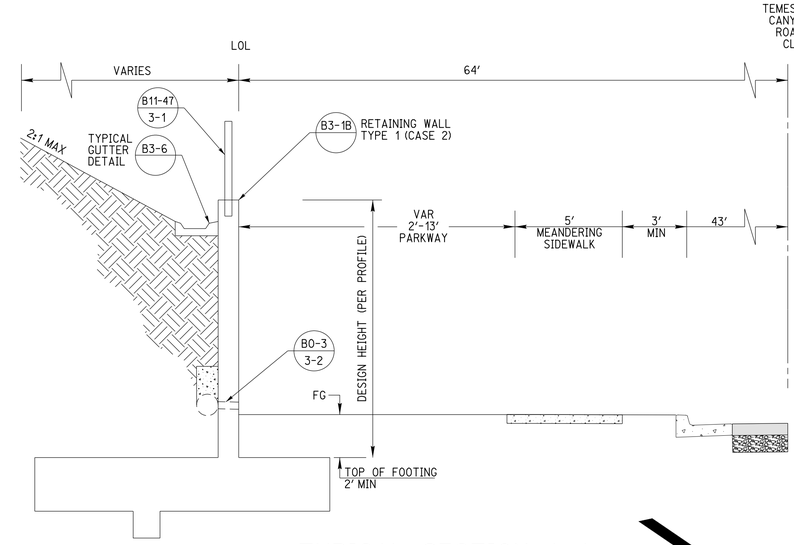
(33) CONSTRUCT CABLE RAILING PER CT. STD. B11-47

(45) CONSTRUCT CONCRETE BROW DITCH PER DETAIL ON SHT 12



PLAN: RETAINING WALL

RETAINING WALL LAYOUT LINE				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	N34° 15' 26"W		474.00'	



TYPICAL SECTION A-A

NOT TO SCALE
STA 1+00.00 TO 5+74.00

SCALE: 1" = 40'
40 0 40 80

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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: 1"=8'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD
TEMESCAL RETAINING WALL

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 12 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

\\cp.rickeng.com\projects\C_RIV_G\18602\18602-B\CIVILPlanSets\Phase 2\18602B_12_IMP07_Retaining WallPH2.dgn

TEMESCAL CANYON ROAD

EX. CALTRANS R/W

3.0%

1+00.00 TCR1 RT=
15+56.82 57.13' RT
TEMESCAL
CANYON ROAD
BC, BEG ALIGNMENT
TC 983.03
FL 982.20
LIP 982.36

1+20.10
CL CB
TC 982.79
FL 982.04
LIP 982.28

1+37.76
TC 982.32
FL 982.09
LIP 982.25

1+37.76
FS 983.01

70.20'

6.5'

1.5%

3.0%

1.5%

STA 14+48.95, 63.63' RT
BEG S/W
FS 979.91

STA 14+48.95, 67.63' RT
FS 979.98

STA 14+49.45 73.00' RT
BEG RETAINING CURB
AND HANDRAIL
PER DETAIL SHT 20
TC 980.61
FS 980.11

STA 14+49.45, 90.50' RT
FS 978.91

STA 14+49.45, 89.00' RT
FS 979.94

STA 14+48.95, 90.50' RT
FS 978.91

PROP R/W

STA 14+54.95, 63.63' RT
BEG S/W
FS 980.05

STA 14+54.95, 67.63' RT
FS 980.07

STA 14+54.45, 73.00' RT
BEG RETAINING CURB
AND HANDRAIL
PER DETAIL SHT 20
TC 980.68
FS 980.18

STA 14+54.45, 74.00' RT
FS 980.20

STA 14+49.45, 90.50' RT
RETAINING CURB ANG PT
TC 979.41
FS 978.91

STA 14+54.45, 89.00' RT
FS 979.01

PROP CALTRANS R/W

STA 14+48.95, 95.50' RT
TC 979.33
FS 978.83

STA 14+54.45, 95.50' RT
RETAINING CURB ANG PT
TC 979.41
FS 978.91

STA 14+55.44, 102.11' RT
RETAINING CURB ANG PT
TC 976.18
FS 975.68

STA 14+55.44 102.11' RT
TC 976.18
FS 975.68

STA 14+56.97, 105.08' RT
FS 975.70
EX. CALTRANS
R/W

STA 14+26.45,
90.50' RT
RETAINING
CURB ANG PT
TC 977.66
FS 977.49

STA 14+19.95,
90.50' RT
RETAINING
CURB ANG PT
TC 978.16
FS 977.66

STA 14+26.45,
90.50' RT
TC 978.16
FS 977.56

STA 14+34.20,
90.50' RT
FS 978.11

STA 14+34.20,
90.50' RT
FS 978.18

STA 14+41.20,
90.50' RT
FS 978.21

STA 14+41.20,
90.50' RT
FS 978.29

STA 14+19.95, 101.00' RT
FS 977.18

STA 14+25.95, 101.50' RT
RETAINING CURB ANG PT
TC 977.58
FS 977.08

STA 14+19.95, 106.50' RT
FS 977.09

STA 14+26.45, 101.50' RT
FS 977.07

STA 14+19.95, 106.50' RT
RETAINING CURB ANG PT
TC 977.59
FS 977.09

STA 14+34.20, 101.50' RT
FS 976.45

STA 14+26.45, 106.50' RT
FS 977.00

STA 14+26.45, 106.50' RT
FS 977.00

STA 14+41.20, 101.50' RT
FS 976.35

STA 14+41.20, 106.50' RT
FS 976.27

STA 14+48.95, 101.50' RT
FS 975.73

STA 14+48.95, 106.50' RT
FS 975.65

STA 14+49.95, 106.50' RT
FS 975.64

STA 14+51.29, 107.00' RT
FS 975.61

STA 14+53.07, 112.26' RT
BEG RETAINING CURB
AND HANDRAIL
PER DETAIL SHT 20
MATCH EX.
TC 975.93
(FS 975.4)

STA 14+58.75, 110.33' RT
END RETAINING CURB
AND HANDRAIL
PER DETAIL SHT 20
MATCH EX.
TC 976.14
(FS 975.6)

2:1 MAX

6.64'

EX. SIGN TO BE
SALVAGED AND
RELOCATED

4:1 MAX

2.2%

1+62.05
TC 983.40
FL 982.73
LIP 982.87

1+65.52
BEG GUTTER TRANSITION
TC 983.09
FL 982.80
LIP 982.96

1+68.11
END GUTTER TRANSITION
TC 982.86
FL 982.86
LIP 982.93

1+72.28
BEG GUTTER TRANSITION
TC 982.92
FL 982.92
LIP 983.99

1+78.71
END GUTTER TRANSITION
TC 983.14
FL 982.96
LIP 983.12

FS 983.53

FS 983.59

FS 983.66

FS 983.69

4.17'

7.5%

1.5%

9%

4.8%

3.3%

3.4%

(3.2%)

4.49'

(0.2%)

3.87'

(3.2%)

(1.5%)

1+89.77
TC 984.24
FL 983.57
LIP 983.73

39.95'

0.5%

10.10'

1+93.54
TC 984.42
FL 983.75
LIP 983.91

1+92.86
FS 984.47

3.7%

PROTECT IN PLACE
EX. PULL BOX

PROTECT IN PLACE
EX. RAMP METER
SIGNAL

PROTECT IN PLACE
EX. RAMP METER
PULL BOX

PROTECT IN PLACE
EX. SIGN

2+10.14 TCR1 RT=16+26.82 127.31' RT
TEMESCAL CANYON ROAD
EC, END ALIGNMENT
TC (985.2)
FL (984.4)
LIP (984.5)
MATCH EXIST

I-15 ON-RAMP (NB)

SCALE: 1"= 5'

5 10 15 20

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	Δ= 90° 09' 08"	70.00'	110.14'	TYPE A2-8

DETAIL "A"
SCALE: HORIZ. 1"=10'

4.17' 9' 2.0'

OG 4:1 MAX 1.5% 7.5% 3.5% 3.4%

SECTION A-A

CURB RAMP DETAIL 1

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER — COUNTY

DESIGNED BY: HR — DRAWN BY: HR — CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

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SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1'=5'
V: _____

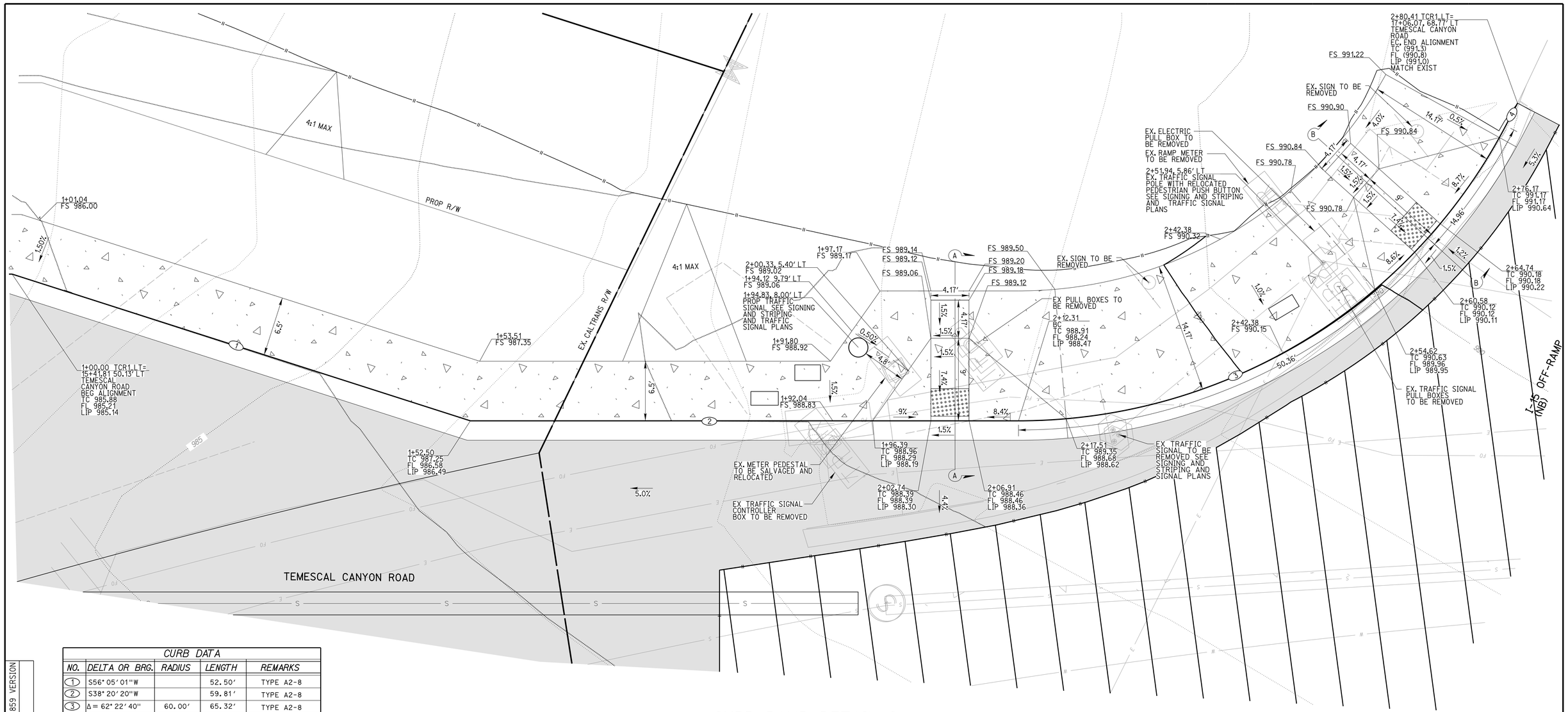
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER-
CONSTRUCTION DETAILS
CURB RAMP DETAIL 1

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 13 OF 20 SHEETS

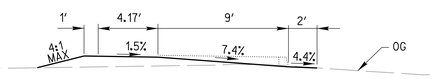
PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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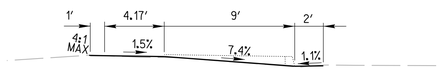


CURB RAMP DETAIL 2

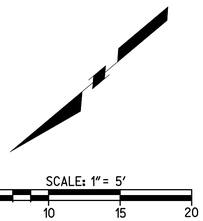
CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	S56° 05' 01"W		52.50'	TYPE A2-8
(2)	S38° 20' 20"W		59.81'	TYPE A2-8
(3)	Δ = 62° 22' 40"	60.00'	65.32'	TYPE A2-8
(4)	S24° 02' 20"E		2.78'	TYPE A2-8



SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE



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ENGINEER — COUNTY

DESIGNED BY: HR — DRAWN BY: HR — CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

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rickengineering.com
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SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=5' V: _____

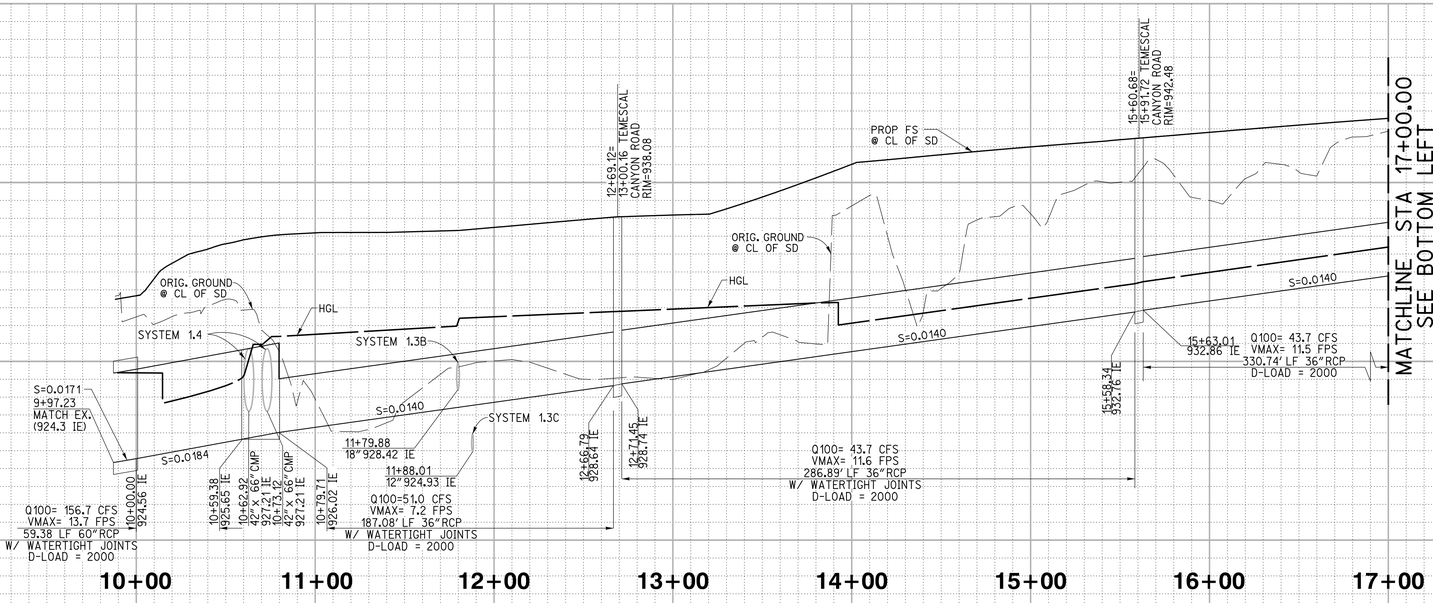
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER-
CONSTRUCTION DETAILS
CURB RAMP DETAIL 2

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

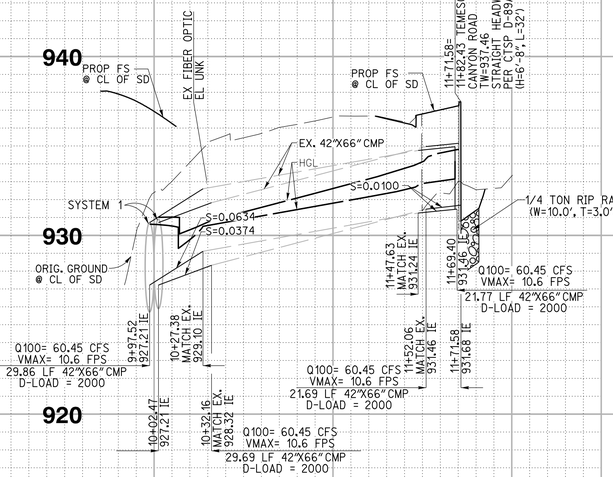
SHEET NO. 14 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

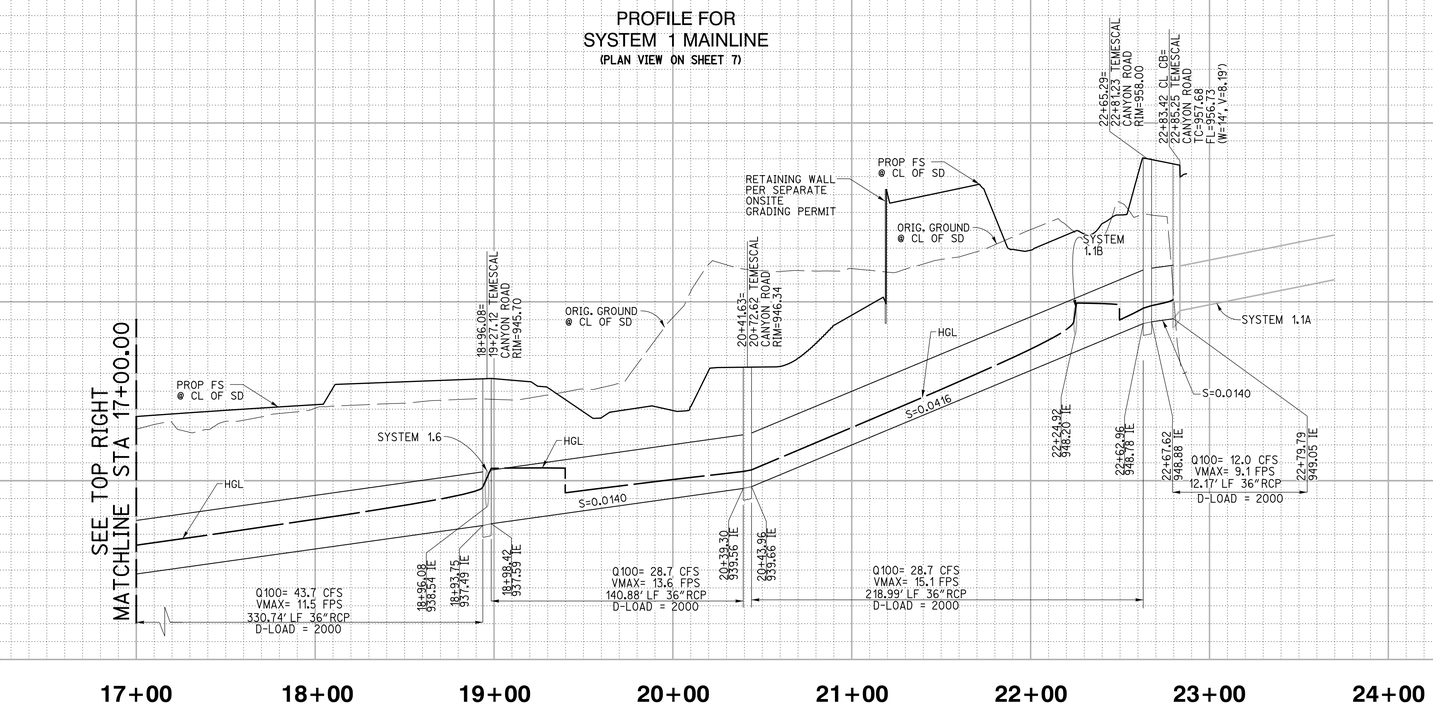
\\cp.rickeng.com\projects\C_RIV_C\18602\18602-B\Civil\PlanSets\Phase 2\18602B_14_IMP09_PH2.dgn



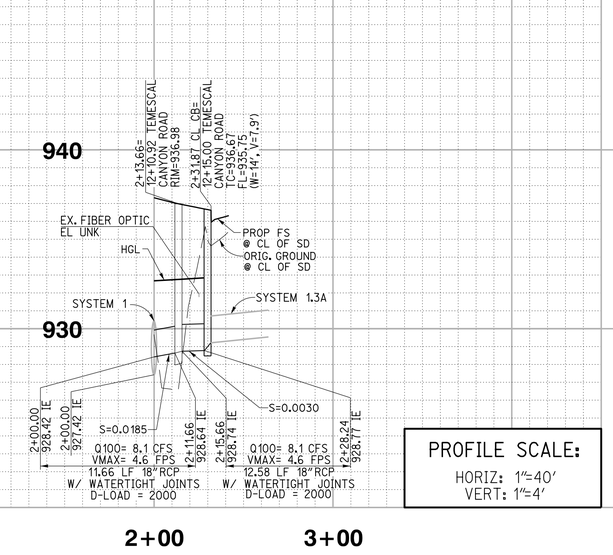
PROFILE FOR
SYSTEM 1 MAINLINE
(PLAN VIEW ON SHEET 7)



PROFILE FOR
SYSTEM 1.4
(PLAN VIEW ON SHEET 7)



PROFILE FOR
SYSTEM 1 MAINLINE
(PLAN VIEW ON SHEET 8)



PROFILE FOR
SYSTEM 1.3B
(PLAN VIEW ON SHEET 7)

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=4'

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

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ENGINEER				COUNTY	

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BENCH MARK:
SEE SHEET 1

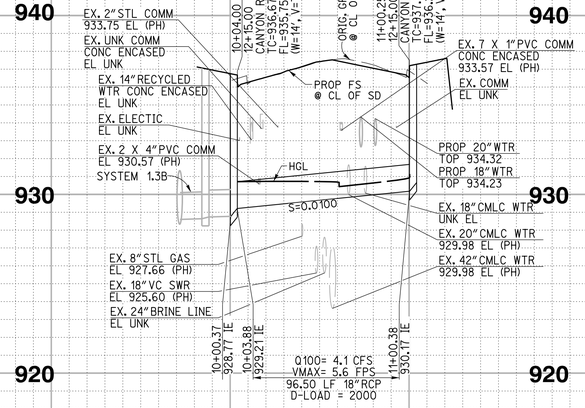
SCALE: H: 1"=40' V: 1"=4'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD
STORM DRAIN PROFILES

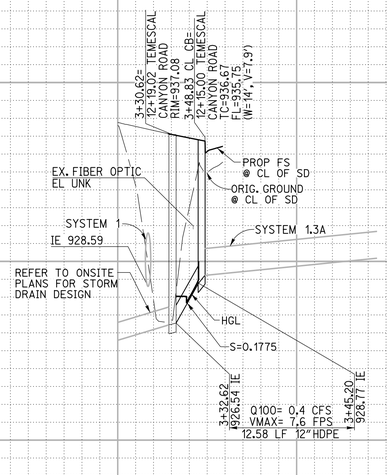
FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 15 OF 20 SHEETS

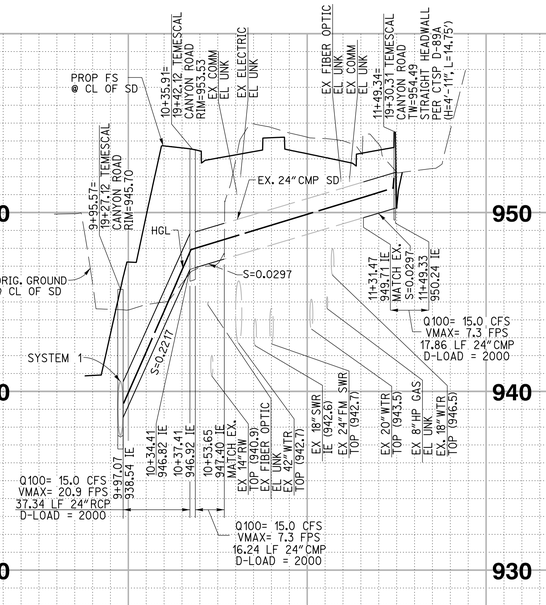
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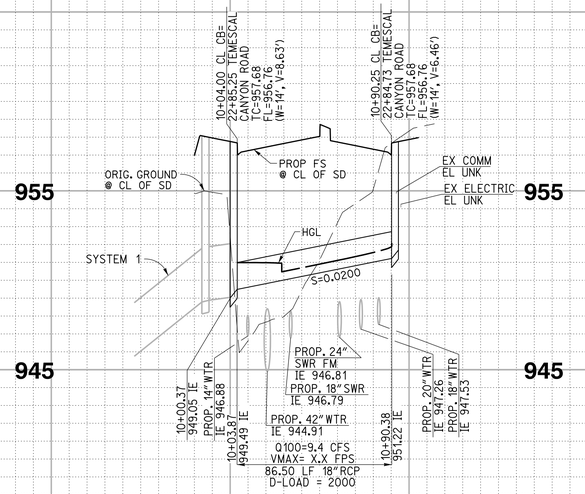
PROFILE FOR
SYSTEM 1.3A
(PLAN VIEW ON SHEET 7)



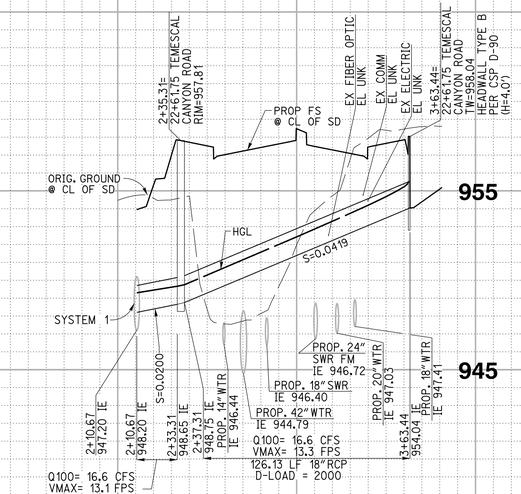
PROFILE FOR
SYSTEM 1.3C
(PLAN VIEW ON SHEET 7)



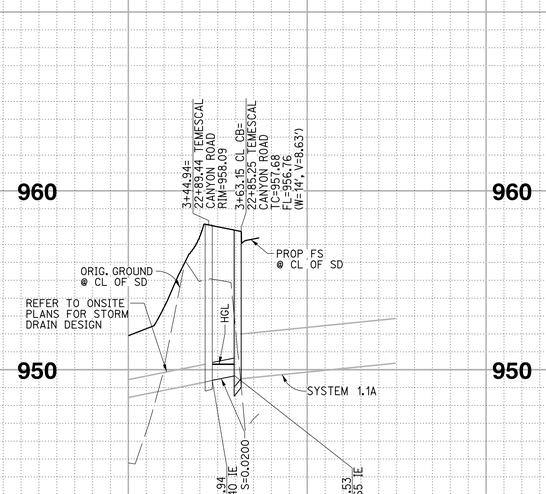
PROFILE FOR
SYSTEM 1.6
(PLAN VIEW ON SHEET 8)



PROFILE FOR
SYSTEM 1.1A
(PLAN VIEW ON SHEET 8)



PROFILE FOR
SYSTEM 1.1B
(PLAN VIEW ON SHEET 8)



PROFILE FOR
SYSTEM 1.1C
(PLAN VIEW ON SHEET 8)

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=4'

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

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DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

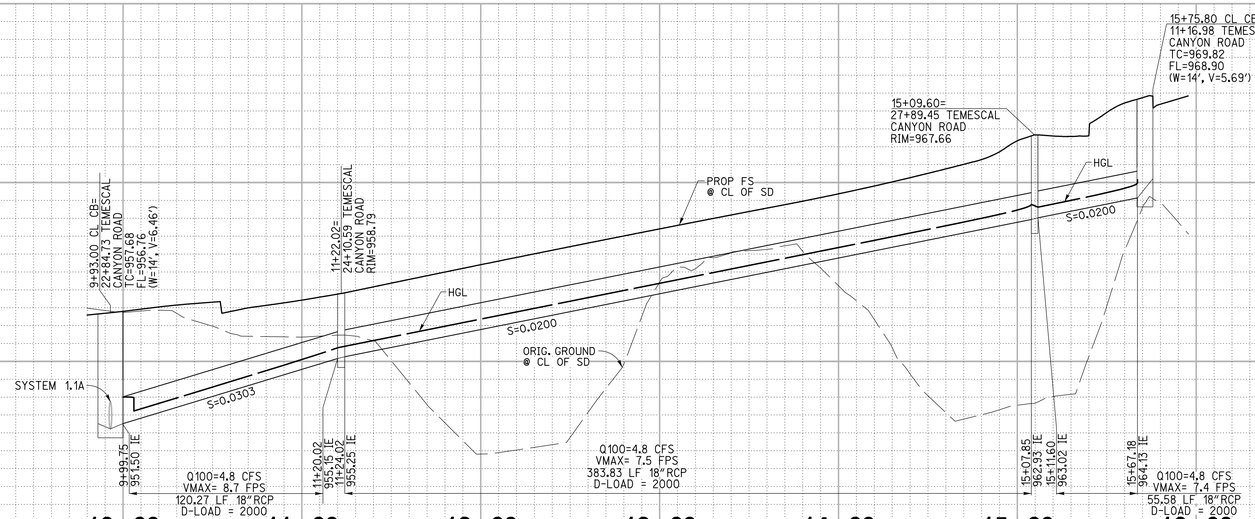
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PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER - TEMESCAL CANYON ROAD STORM DRAIN PROFILES

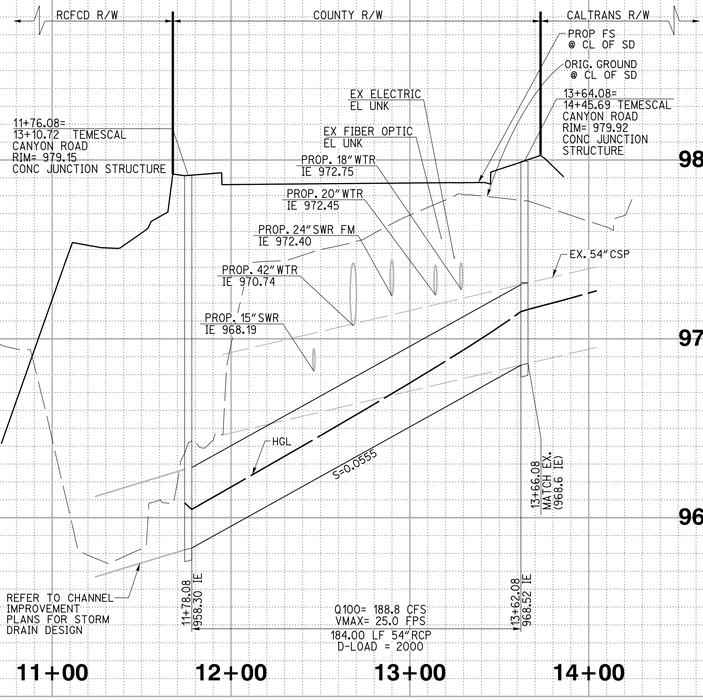
FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 16 OF 20 SHEETS

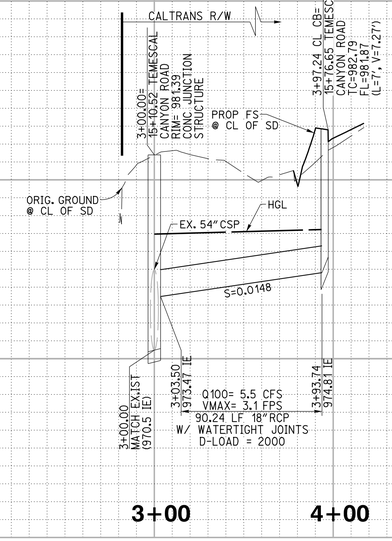
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PROFILE FOR
SYSTEM 1.1D
(PLAN VIEW ON SHEET 9&10)



PROFILE FOR
SYSTEM 2
(PLAN VIEW ON SHEET 10)



PROFILE FOR
SYSTEM 2.2
(PLAN VIEW ON SHEET 10)

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=4'

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

COUNTY

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DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: 1"=4'

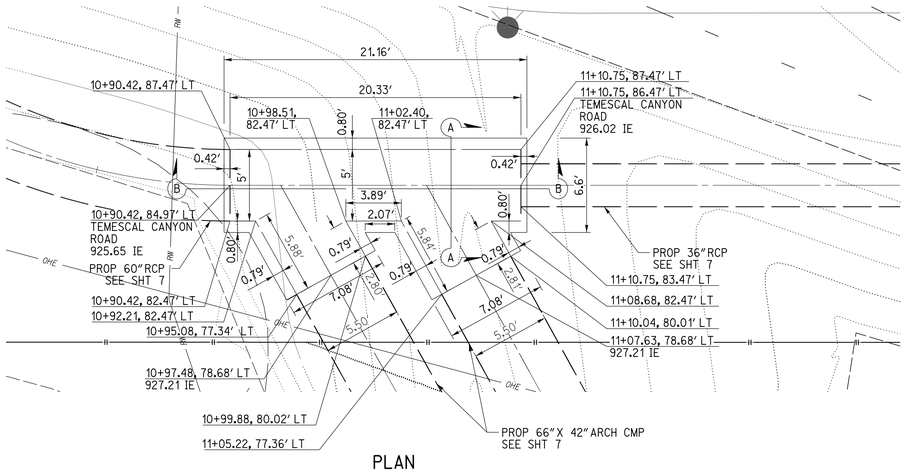
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER -
TEMESCAL CANYON ROAD
STORM DRAIN PROFILES

FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

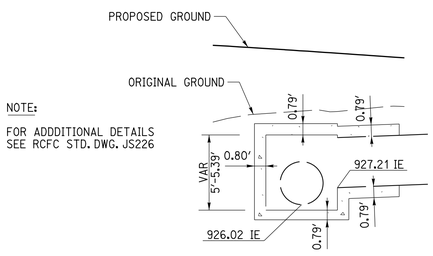
SHEET NO. 17 OF 20 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

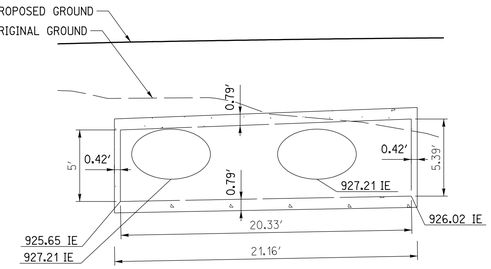
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PLAN



SECTION A-A



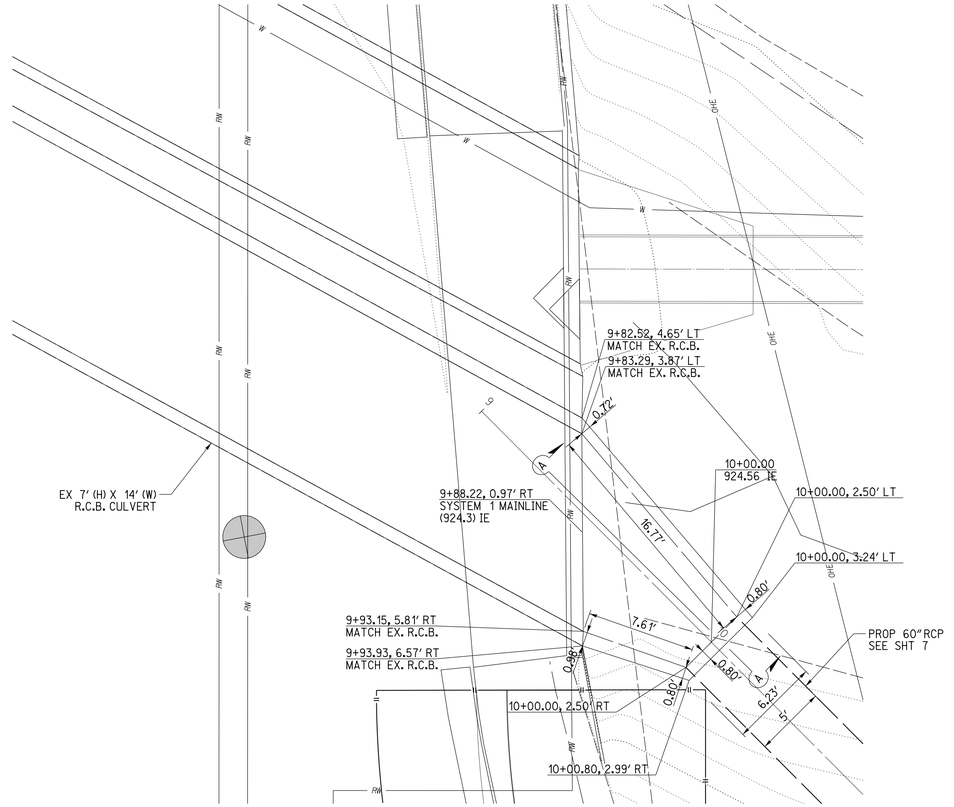
SECTION B-B

NOTE:

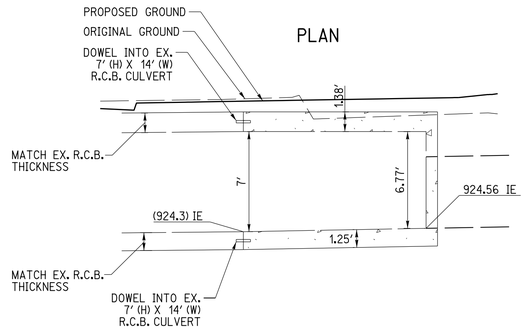
FOR ADDDITIONAL DETAILS SEE RCFC STD. DWG. JS226

MODIFIED JUNCTION STRUCTURE

NOT TO SCALE



PLAN



SECTION A-A

MODIFIED TRANSITION STRUCTURE

NOT TO SCALE

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK

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PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:

SEE SHEET 1

SCALE: H:_____ V:_____

PPT220039/TPM38551 IP NO. 220056

COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER- TEMESCAL CANYON ROAD STORM DRAIN DETAILS

FOR: DAWSON CANYON, LLC

W.O.

COUNTY FILE NO.

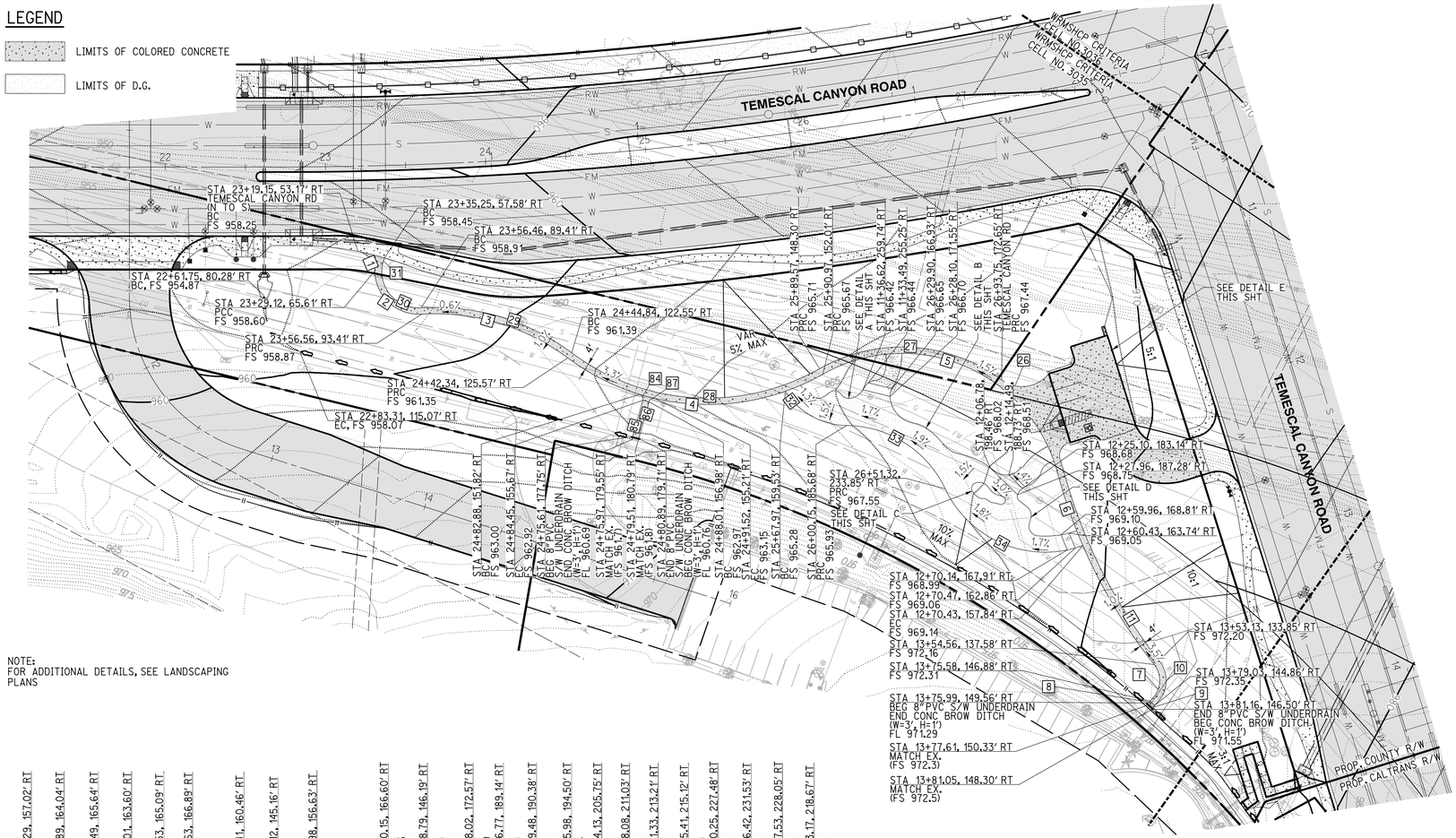
SHEET NO. 18 OF 20 SHEETS

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LEGEND

LIMITS OF COLORED CONCRETE

LIMITS OF D.G.



NOTE:
FOR ADDITIONAL DETAILS, SEE LANDSCAPING PLANS

DETAIL "A"
SCALE: 1"=20'

DETAIL "B"
SCALE: 1"=20'

DETAIL "C"
SCALE: 1"=20'

DETAIL "D"
SCALE: 1"=20'

DETAIL "E"
SCALE: 1"=20'

SCALE: 1"= 40'
40 0 40 80

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

LINE AND CURVE DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ= 79°17'52"	12.62'	17.46'	COLORED S/W
2	Δ= 92°29'54"	27.48'	44.37'	COLORED S/W
3	Δ= 40°22'02"	138.07'	97.28'	COLORED S/W
4	Δ= 66°19'18"	145.71'	168.67'	COLORED S/W
5	Δ= 104°29'48"	100.47'	183.24'	COLORED S/W
6	Δ= 23°30'28"	328.84'	134.92'	COLORED S/W
7	Δ= 80°38'28"	16.00'	22.52'	COLORED S/W
8	N82°07'07"W		6.88'	COLORED S/W
9	N82°07'07"W		6.88'	COLORED S/W
10	Δ=80°38'28"	20.00'	28.15'	COLORED S/W
11	Δ=23°30'28"	324.84'	133.28'	COLORED S/W
12	Δ=04°04'03"	104.47'	7.42'	COLORED S/W
13	Δ=99°26'27"	8.18'	14.20'	COLORED S/W
14	N51°39'40"W		13.26'	6" 'D' CURB
15	Δ= 84°08'36"	5.00'	7.34'	6" 'D' CURB
16	Δ= 84°08'36"	44.00'	64.62'	6" 'D' CURB
17	N51°39'40"W		10.00'	6" 'D' CURB
18	N51°39'40"W		10.00'	6" 'D' CURB
19	Δ= 90°00'00"	20.00'	31.42'	6" 'D' CURB
20	N38°20'20"E		57.00'	6" 'D' CURB
21	N51°39'40"W		24.00'	6" 'D' CURB
22	N38°20'20"E		7.00'	6" 'D' CURB
23	Δ= 90°00'00"	5.00'	7.85'	6" 'D' CURB
24	N51°39'40"W		13.00'	6" 'D' CURB
25	N38°20'20"E		45.00'	6" 'D' CURB
26	Δ= 87°42'08"	21.48'	32.88'	COLORED S/W
27	Δ= 65°58'59"	104.47'	120.31'	COLORED S/W
28	Δ= 66°19'18"	141.71'	164.04'	COLORED S/W
29	Δ= 40°22'02"	142.07'	100.10'	COLORED S/W
30	Δ= 41°39'06"	23.48'	17.07'	COLORED S/W
31	Δ= 74°10'48"	22.44'	29.05'	COLORED S/W
32	Δ= 56°50'46"	46.00'	45.64'	D.G.
33	Δ= 63°58'32"	69.00'	77.04'	D.G.
34	Δ= 84°38'40"	69.00'	101.94'	D.G.
35	Δ= 13°40'00"	36.00'	8.59'	D.G.
36	Δ= 76°56'41"	7.50'	10.07'	D.G.
37	N70°23'22"W		4.27'	D.G.
38	Δ= 84°57'06"	4.50'	6.67'	D.G.
39	N14°33'44"E		2.15'	D.G.
40	Δ= 50°02'37"	5.00'	4.37'	D.G.
41	Δ= 56°04'38"	10.50'	10.28'	D.G.
42	N88°26'29"E		3.58'	D.G.
43	Δ= 54°55'30"	7.00'	6.71'	D.G.
44	Δ= 69°31'47"	7.00'	8.49'	D.G.

LINE AND CURVE DATA (CONT.)				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
45	Δ= 30°48'46"	22.00'	11.83'	D.G.
46	Δ= 30°54'31"	42.00'	22.66'	D.G.
47	Δ= 37°17'25"	10.00'	6.51'	D.G.
48	Δ= 63°56'55"	18.00'	20.09'	D.G.
49	Δ= 11°21'43"	16.00'	3.17'	D.G.
50	Δ= 26°09'58"	18.00'	8.22'	D.G.
51	Δ= 16°26'16"	50.00'	14.34'	D.G.
52	Δ= 18°38'29"	21.00'	6.83'	D.G.
53	Δ= 19°58'11"	12.00'	4.18'	D.G.
54	Δ= 02°46'30"	100.00'	4.84'	D.G.
55	Δ= 25°02'41"	47.00'	20.54'	D.G.
56	Δ= 38°20'01"	12.00'	8.03'	D.G.
57	Δ= 55°54'10"	13.50'	13.17'	D.G.
58	Δ= 29°44'34"	38.00'	19.73'	D.G.
59	Δ= 98°47'38"	3.50'	6.03'	D.G.
60	Δ= 67°49'54"	7.00'	8.29'	D.G.
61	Δ= 07°43'15"	20.00'	2.70'	D.G.
62	Δ= 41°00'46"	8.50'	6.08'	D.G.
63	N19°32'38"W		1.93'	D.G.
64	Δ= 12°08'11"	5.50'	1.17'	D.G.
65	Δ= 25°27'30"	4.00'	1.78'	D.G.
66	Δ= 37°54'10"	1.75'	1.16'	D.G.
67	Δ= 109°26'30"	2.83'	5.41'	D.G.
68	Δ= 12°15'13"	18.00'	3.85'	D.G.
69	Δ= 34°18'00"	6.50'	3.89'	D.G.
70	Δ= 14°54'03"	5.50'	1.43'	D.G.
71	Δ= 32°25'24"	2.50'	1.41'	D.G.
72	Δ= 31°13'28"	5.00'	2.72'	D.G.
73	Δ= 35°46'51"	10.00'	6.24'	D.G.
74	N56°25'10"W		3.71'	D.G.
75	Δ= 52°47'45"	7.50'	6.91'	D.G.
76	Δ= 57°49'40"	13.00'	13.12'	D.G.
77	Δ= 45°06'17"	10.00'	7.87'	D.G.
78	Δ= 78°31'48"	3.50'	4.80'	D.G.
79	N04°58'40"E		6.71'	D.G.
80	Δ= 64°11'52"	6.00'	6.72'	D.G.
81	N69°10'32"E		4.43'	D.G.
82	Δ= 99°00'20"	6.00'	10.37'	D.G.
83	Δ= 23°54'55"	59.00'	24.63'	D.G.
84	Δ= 88°50'39"	3.00'	4.65'	COLORED S/W
85	N71°32'58"E		25.54'	COLORED S/W
86	N71°32'58"E		25.49'	COLORED S/W
87	Δ= 87°18'07"	3.00'	4.57'	COLORED S/W

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

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V:

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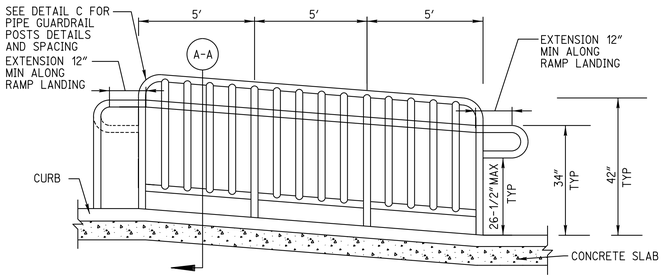
COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER-
TEMESCAL CANYON ROAD
POCKET PARK PLAN

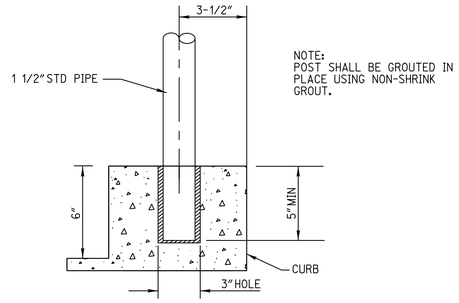
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SHEET NO. 19 OF 20 SHEETS

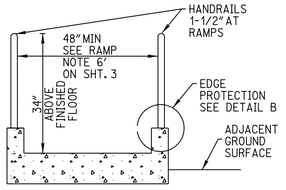
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DETAIL A
NOT TO SCALE

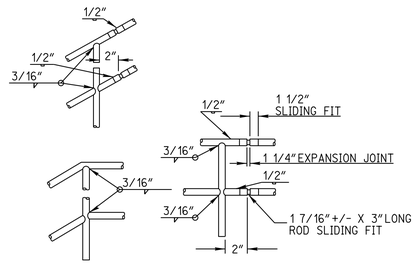


DETAIL B - EDGE PROTECTION AND MOUNTING DETAIL
NOT TO SCALE

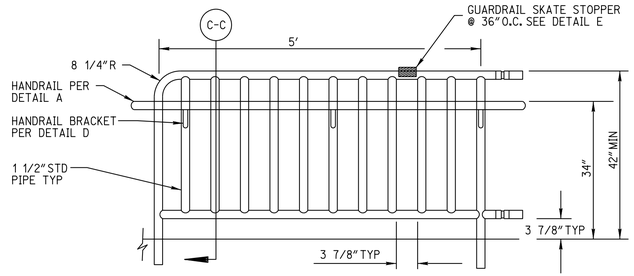


NOTE:
THE HEIGHT OF THE HANDRAIL SHALL BE CONSISTENT AT EACH RAMP RUN.

SECTION A-A
NOT TO SCALE



WELDING DETAIL
NOT TO SCALE

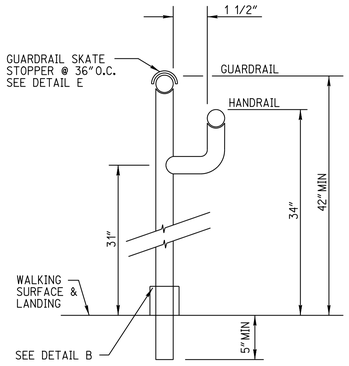


DETAIL C - PIPE GUARDRAIL-POST TYPE
NOT TO SCALE

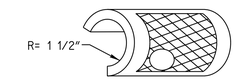
NOTE:

1. THE TOP OF GRIPPING SURFACE OF HANDRAILS SHALL BE THE SAME HEIGHT VERTICALLY ABOVE WALKING SURFACES, STAIR NOSINGS, AND LANDING SURFACES. HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES, STAIR NOSINGS, AND LANDING SURFACES.

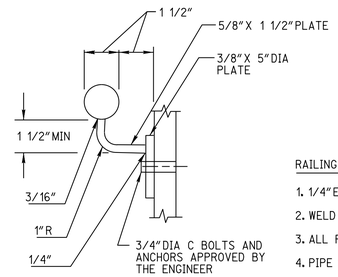
2. BOTTOM AND TOP LANDINGS SHALL BE AS WIDE AS THE WIDTH OF THE RAMP, 60" MINIMUM.



SECTION C-C - PIPE GUARDRAIL
NOT TO SCALE



DETAIL E - ALUMINUM GUARDRAIL SKATE STOPPER
NOT TO SCALE



DETAIL D - HANDRAIL BRACKET
NOT TO SCALE

NOTES:

RAMP:

1. ANY WALKING SURFACE THAT IS PART OF AN ACCESSIBLE ROUTE WITH THE SLOPE GREATER THAN 5% SHALL BE CONSIDERED A PEDESTRIAN RAMP AND MUST COMPLY WITH THE PEDESTRIAN RAMP STANDARDS.
2. THE LEAST POSSIBLE SLOPE SHALL BE USED WITHOUT EXCEEDING 8%.
3. THE RUNNING SLOPE SHALL BE UNIFORM ALONG EACH RAMP SEGMENT.
4. CROSS SLOPE SHALL NOT EXCEED 1.5%.
5. LANDINGS SHALL HAVE A 1.5% SLOPE IN BOTH DIRECTIONS.
6. WALKING SURFACE MUST BE STABLE, FIRM, AND SLIP RESISTANT. CONCRETE SHALL HAVE A MEDIUM BROOM TRANSVERSE FINISH.
7. LANDINGS MUST BE CONSTRUCTED TO PREVENT PONDING.
8. WHERE THE CHANGE OF SLOPE OCCURS, GRADE BREAKS MUST BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUNS TO PREVENT CROSS SLOPE ISSUES.

HANDRAIL:

1. HANDRAILS ARE REQUIRED ON BOTH SIDES OF A PEDESTRIAN RAMP.
2. HANDRAILS SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE RAMP RUN PLUS THE EXTENSION.
3. INSIDE HANDRAILS AT "U" SHAPED AND "L" SHAPED RAMPS SHALL BE CONTINUOUS.
4. HANDRAILS SHALL EXTEND 12 INCHES MINIMUM BEYOND THE TOP, INTERMEDIATE AND BOTTOM OF EACH RAMP SEGMENT IN THE DIRECTION OF THE RAMP RUN, THE HANDRAIL EXTENTION SHALL BE PARALLEL TO THE LANDING SURFACE.
5. HANDRAIL EXTENSION SHALL NOT EXTEND INTO THE REQUIRED WIDTH OF AN ADJACENT ROUTE OF TRAVEL. IN EXISTING FACILITIES WHERE THE ENCROACHMENT OF THE EXTENSION IN THE DIRECTION OF THE RAMP CREATES HAZARD, THE EXTENSION SHALL BE BENT 90 DEGREES TO THE RUN OF THE RAMP.
6. END OF HANDRAIL EXTENSION SHALL BE TURNED TO THE WALL, FLOOR OR POST.
7. END OF HANDRAIL EXTENSION SHALL BE TURNED TO THE FLOOR WHEN EXTENSION IS PROTRUDING PERPENDICULAR INTO PATH OF TRAVEL.
8. TOP GRIPPING SURFACE OF THE HANDRAIL SHALL BE UNIFORM IN HEIGHT. THE GRIPPING SURFACE SHALL BE CONTINUOUS AND SMOOTH (NO SHARP CORNERS).
9. THE GRIPPING PORTION SHALL BE 4 INCHES MIN TO 6-1/4 INCHES MAX PERIMETER DIMENSION, 1-1/4 INCHES TO 2-1/4 INCHES IN CROSS SECTIONAL NOMINAL DIMENSION OR SHAPED WITH EQUIVALENT GRIPPING SURFACE.
10. DESIGN AND SHOP DRAWINGS SHALL BE APPROVED BY THE RESIDENT ENGINEER AND THE COUNTY PRIOR TO FABRICATION.
11. ADJACENT WALL OR OTHER SURFACES SHALL BE FREE OF ANY SHARP OR ABRASIVE ELEMENT (SMOOTH FINISH).
12. A GUARDRAIL 42 INCHES ABOVE FINISHED FLOOR SHALL BE INSTALLED ALONG OPEN EDGES OF THE RAMP AND LANDINGS THAT ARE 30 INCHES OR MORE IN HEIGHT FROM THE ADJACENT GROUND SURFACE AND THE RAMP IS NOT BOUNDED BY A WALL OR FENCE. SEE PIPE GUARDRAIL POST TYPE DETAIL THIS SHT.
13. PROVIDE A CONTINUOUS GUIDE CURB OR GUIDE RAIL IF POSTS ARE INSTALLED ON THE RAMP SURFACE OR IF THE FINISH SURFACE IS GREATER THAN 4 INCHES HIGHER THAN THE ADJACENT GROUND SURFACE.

RAILING NOTES:

1. 1/4" EXPANSION JOINTS @ 16' ON CENTER.
2. WELD AND GRIND SMOOTH ALL CONNECTIONS. SEE WELDING DETAIL THIS SHT.
3. ALL RAILING TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. PIPE SHALL BE SEAMLESS STEEL ASTM A53 GRADE B.
5. INSTALL HANDRAILS ON BOTH SIDES.
6. STAIRS AND LANDINGS THAT ARE OPEN ON ONE OR BOTH SIDES AND MORE THAN 30" ABOVE THE ADJACENT GROUND SHALL BE PROVIDED WITH GUARDRAIL.

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

CAUTION:
EXACT LOCATION OF EXISTING UNDERGROUND FACILITIES IS UNKNOWN. CONTRACTOR TO VERIFY IN FIELD.

PRELIMINARY
NOT FOR CONSTRUCTION

DIG ALERT™
CALL BEFORE YOU DIG!
1-800-227-2600
UNDERGROUND SERVICE ALERT
Call at least 2 working days prior to excavating.

NOTE:
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THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY OF DESIGN AND ACCEPTABILITY OF THE WORK HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

DATE	BY	MARK	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H:_____ V:_____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER- TEMESCAL CANYON ROAD PEDESTRIAN RAMP DETAILS

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 20 OF 20 SHEETS

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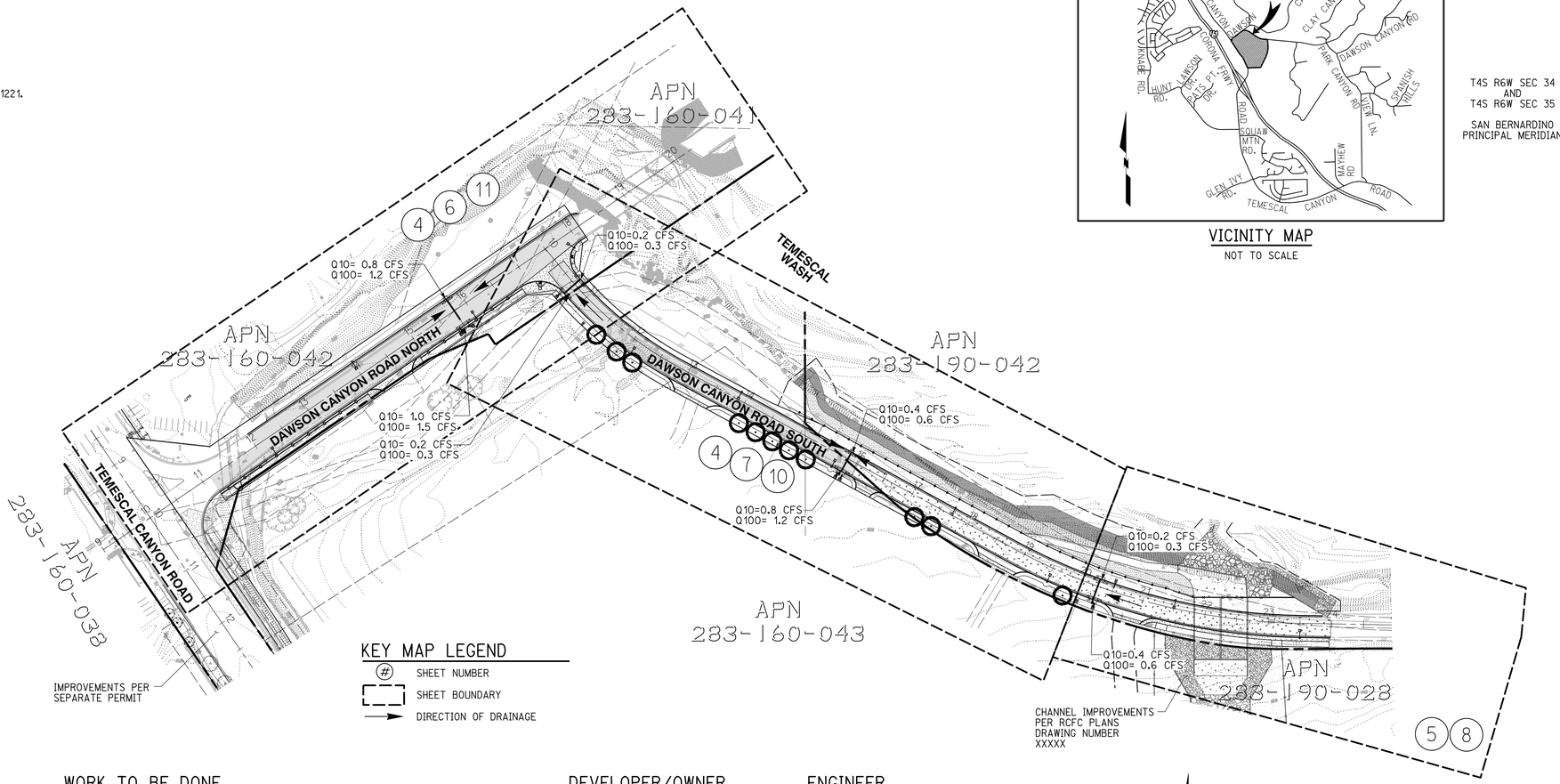
IN THE COUNTY OF RIVERSIDE

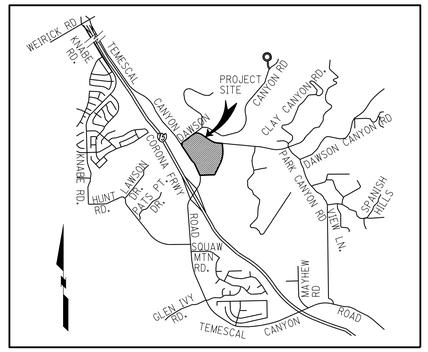
STREET IMPROVEMENT PLANS

TEMESCAL VALLEY COMMERCE CENTER

GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. THIS INCLUDES UNDERGROUNDING OF EXISTING OVERHEAD LINES ALONG THE PROJECT FRONTAGE AS REQUIRED BY THE CONSITIONS OF APPROVAL. PERMITTEE MUST INFORM COUNTY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION.
   PHONE: 951-955-6885 FOR PARCEL AND TRACT MAPS
   PHONE: 951-955-6790 FOR PERMIT CASES (CUP, PUP, PP OR VOLUNTARY MS CASES), CABAZON AND AREA WEST
3. THE DEVELOPER WILL INSTALL STREET NAME SIGNS CONFORMING TO COUNTY STANDARD NO. 1220 AND 1221.
4. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, LATEST EDITION, COUNTY ORDINANCE NO. 461 AND SUBSEQUENT AMENDMENTS.
5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO NOTIFY THE ENGINEER TO INSTALL STREET CENTERLINE MONUMENTS AS REQUIRED BY RIVERSIDE COUNTY ORDINANCE NO. 461. IF CONSTRUCTION CENTERLINE DIFFERS, PROVIDE A TIE TO EXISTING CENTERLINE OF RIGHT-OF-WAY. PRIOR TO ROAD CONSTRUCTION, SURVEY MONUMENTS INCLUDING CENTERLINE MONUMENTS, TIE POINTS, PROPERTY CORNERS AND BENCH MARKS SHALL BE REFERENCED OUT AND CORNER RECORDS FILED WITH THE COUNTY SURVEYOR PURSUANT TO SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE. SURVEY POINTS DESTROYED DURING CONSTRUCTION SHALL BE RESET, AND A SECOND CORNER RECORD FILED FOR THOSE POINTS PRIOR TO COMPLETION AND ACCEPTANCE OF THE IMPROVEMENTS.
6. ALL UNDERGROUND FACILITIES, WITH LATERALS, SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, GAS, AND STORM DRAINS.
7. CURB DEPRESSION AND DRIVEWAY APPROACHES WILL BE INSTALLED AND CONSTRUCTED ACCORDING TO COUNTY STANDARD NO. 206 AND/OR NO. 207, AS DIRECTED IN THE FIELD.
8. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN ALL CONSTRUCTION, REGULATORY, GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.
   A TRAFFIC CONTROL PLAN MUST BE SUBMITTED WITH APPROVED STREET PLAN FOR REVIEW TO THE PERMITS SECTION OR INSPECTION SECTION (FOR MAP CASES) PRIOR TO OBTAINING AN ENCROACHMENT PERMIT.
9. ALL STREET SECTIONS ARE TENTATIVE. ADDITIONAL SOIL TESTS SHALL BE TAKEN FOR PERMIT CASES BY THE COUNTY AFTER ROUGH GRADING TO DETERMINE THE EXACT STREET SECTION REQUIREMENTS. USE STANDARD NO. 401 IF EXPANSIVE SOILS ARE ENCOUNTERED.
10. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING. FOG SEAL AND PAINT BINDER SHALL BE APPLIED AT A RATE OF 0.05 AND 0.03 GALLON PER SQUARE YARD RESPECTIVELY. ASPHALTIC EMULSION SHALL CONFORM TO SECTION 37, 39, AND 94 OF THE STATE STANDARD SPECIFICATIONS.
11. INSTALL STREET TREES IN ACCORDANCE WITH ORDINANCE NO. 461, THE COMPREHENSIVE LANDSCAPING GUIDELINES , AND THE LANDSCAPE PLANS. PROPOSED SPECIES INCLUDE: LONDON PLANE, BLUE PALO VERDE, MEXICAN SAGE.
12. STREET LIGHTS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED STREET LIGHTING PLAN.
13. AS DETERMINED BY THE TRANSPORTATION DIRECTOR, THE DEVELOPER IS RESPONSIBLE AS A MINIMUM FOR ROAD IMPROVEMENTS TO CENTERLINE, AND MAY BE REQUIRED TO RECONSTRUCT EXISTING PAVEMENT, INCLUDING BASE, AND MATCHING OVERLAY REQUIRED TO MEET THE STRUCTURAL STANDARDS FOR THE CURRENT ASSIGNED TRAFFIC INDEX.
14. ONLY LANDSCAPING CONSISTING OF GRASS AND PARKWAY TREES MAY BE INSTALLED WITHIN PARKWAYS ON LOCAL RESIDENTIAL STREETS WITHOUT SEPARATE LANDSCAPE PLANS. ALL OTHER TYPES OF LANDSCAPING IN THESE AREAS, AND ALL LANDSCAPING ON ALL OTHER STREETS, SHALL REQUIRE SEPARATE LANDSCAPING PLANS. ALL LANDSCAPING ENCROACHMENTS SHALL CONFORM TO RIVERSIDE COUNTY COMPREHENSIVE LANDSCAPING GUIDELINES DATED OCTOBER 2009.
15. ANY PRIVATE DRAINAGE FACILITIES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. BY SIGNING THESE IMPROVEMENT PLANS, NO REVIEW OR APPROVAL OF THOSE PRIVATE FACILITIES IS IMPLIED OR INTENDED BY THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT.
16. A. CONSTRUCTION PROJECTS MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNER/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND MONITORING PLAN FOR THE SITE.
    B. PRIOR TO ANY CONSTRUCTION, THE DEVELOPER/OWNER SHALL PROVIDE THE COUNTY A COPY OF THE NOTICE OF INTENT (NOI), WITH A VALID W.D.I.D. NUMBER.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ADDITIONAL SIGNS AND MARKINGS NOT INCLUDED IN THE SIGNING AND STRIPING PLAN WITHIN THE PROJECT AREAS, OR ON ROADWAYS ADJACENT TO THE PROJECT BOUNDARIES, UPON THE REQUEST OF THE DIRECTOR OF TRANSPORTATION OR HIS DESIGNEE TO IMPROVE TRAFFIC SAFETY ON THE ROADS UNDER THE JURISDICTION OF THE DEVELOPER.
18. EXISTING STORM DRAIN PIPES/CULVERTS (WHETHER TO BE CONNECTED TO, EXTENDED, ADJUSTED, DRAINED TO, OR JUST IN THE PROJECT VICINITY) MUST BE REPAIRED, AND / OR CLEANED TO MAKE THEM FUNCTIONAL AND ACCEPTABLE AS DIRECTED BY THE TRANSPORTATION DEPARTMENT.
19. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR TO APPLY TO RIVERSIDE COUNTY FLOOD CONTROL (RCFC) FOR PERMITS WHEN ANY STORM DRAIN PIPE NEEDS TO BE CONNECTED WITH A RCFC FACILITY AND ADD PERMIT # ---------- ON THE PLAN.
20. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO APPLY TO THE CITY AND OR CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN THEIR RIGHT-OF-WAY.
21. FOR ALL DRIVEWAY RECONSTRUCTION BEYOND RIGHT-OF-WAY, PROOF OF DRIVEWAY OWNER NOTIFICATION IS REQUIRED PRIOR TO CONSTRUCTION.
22. ROCK FOR ACCESS ROADS, TURN AROUNDS AND OTHER AREAS WITHIN DISTRICT RIGHT OF WAY AS SHOWN ON THE PROJECT DRAWINGS AND AS DIRECTED BY THE ENGINEER SHALL MEET THE REQUIREMENTS FOR 1"X NO. 4 COARSE AGGREGATE AS PER SECTION 90-1.02C(4)(B) OF THE CALTRANS SPECIFICATIONS. X VALUES FOR ROCK GRADATION SHALL BE 75 AND 15 FOR 3/4" AND 3/8" RESPECTIVELY. ROCK SHALL ADDITIONALLY MEET THE SPREADING AND COMPACTION REQUIREMENTS OF SECTIONS 26-1.03D AND 26-1.03E OF THE CALTRANS SPECIFICATIONS. FURTHERMORE, ROCK DEPTH SHALL NOT EXCEED 3" AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. ROCK SHALL NOT CONTAIN RECYCLED CONCRETE PRODUCTS.





VICINITY MAP

NOT TO SCALE

T4S R6W SEC 34 AND T4S R6W SEC 35

SAN BERNARDINO PRINCIPAL MERIDIAN

KEY MAP LEGEND

- (#) SHEET NUMBER
- SHEET BOUNDARY
- DIRECTION OF DRAINAGE

WORK TO BE DONE

THESE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT COUNTY OF RIVERSIDE STANDARDS AND SPECIFICATIONS, THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION ("GREEN BOOK"), AND THE LATEST CALTRANS STANDARDS AND SPECIFICATIONS.

PRIVATE ENGINEER'S NOTE TO CONTRACTOR

ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING WORK SHOWN ON OR RELATED TO THESE PLANS SHALL CONDUCT THEIR OPERATIONS SO THAT ALL EMPLOYEES ARE PROVIDED A SAFE PLACE TO WORK AND THE PUBLIC IS PROTECTED. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE OCCUPATIONAL SAFETY AND HEALTH REGULATIONS OF THE U.S. DEPARTMENT OF LABOR AND THE STATE OF CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS CONSTRUCTION SAFETY ORDERS. THE CIVIL ENGINEER SHALL NOT BE RESPONSIBLE IN ANY WAY FOR THE CONTRACTOR'S AND SUBCONTRACTOR'S COMPLIANCE WITH SAID REGULATIONS AND ORDERS.

CONTRACTOR FURTHER AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB-SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND CIVIL ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION FOR LIABILITY RISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

THE EXISTENCE AND APPROXIMATE LOCATIONS OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. THE CIVIL ENGINEER ASSUMES NO LIABILITY AS TO THE EXACT LOCATION OF SAID LINES NOR FOR UTILITY OR IRRIGATION LINES WHOSE LOCATIONS ARE NOT SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY AND IRRIGATION COMPANIES PRIOR TO WORK OR EXCAVATION TO DETERMINE THE EXACT LOCATIONS OF ALL LINES AFFECTING THIS WORK, WHETHER OR NOT SHOWN HERE ON, AND FOR ANY DAMAGE OR PROTECTION TO THESE LINES.

DEVELOPER/OWNER

DAWSON CANYON, LLC
11777 SAN VICENTE BLVD, SUITE 780
LOS ANGELES, CA 90049
(310) 979-8000
CONTACT: MATT ENGLHARD

ENGINEER

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA. 92110
PHONE: (619) 291-0707
FAX: (619) 291-4165

BENCHMARK

ELEVATIONS ARE BASED ON RIVERSIDE COUNTY BM LF 124.
DATUM: NAVD88
ELEVATION: 833.51

BASIS OF BEARINGS / COORDINATES:
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, NAD 83 (NSRS 2011) EPOCH 2010.00, COUNTY OF RIVERSIDE, ZONE 6, AS DETERMINED LOCALLY BY A TIE BETWEEN CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) "MJPK" AND "MAT2" AS SHOWN HEREON (I.E. N34°24'51"E)

KEY MAP

SCALE: 1" = 100'

100 0 100 200

SHEET INDEX

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NOTES, DETAILS, AND QUANTITIES	2
TYPICAL SECTIONS	3
DEMOLITION PLAN	4-5
PLAN AND PROFILE SHEETS	6-8
STORM DRAIN PROFILES	9
CURB RAMP DETAILS	10
PROPOSED ROCK SLOPE PROTECTION	11

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:

SEE SHEET 1

SCALE: H: 1"=40' V:

PPT220039/TPM38551 IP NO. 220056

COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER

TITLE SHEET

FOR: DAWSON CANYON, LLC

W.O.

COUNTY FILE NO.

SHEET NO. 1 OF 11 SHEETS

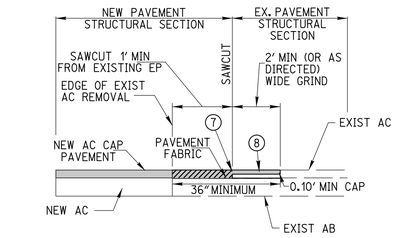
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LEGEND

ITEM	SYMBOL
EXISTING IMPROVEMENTS	
EXISTING PROJECT BOUNDARY	
EXISTING LOT LINE/ROW	
EXISTING CENTERLINE	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
EXISTING ROAD	
EXISTING EDGE OF PAVEMENT	
EXISTING TREE OR BUSH	
EXISTING TREE LINE	
EXISTING WATER COURSE	
EXISTING BUILDING OR MANMADE STRUCTURE	
EXISTING CURB	
EXISTING WATER MAIN	W
EXISTING RECLAIMED WATER	RW
EXISTING WATER VALVE AND HYDRANT	
EXISTING OVERHEAD LINES	OHE OHT
EXISTING STORM DRAIN	
EXISTING STORM DRAIN STRUCTURE	SD
EXISTING DRY UTILITIES	TPB
EXISTING SURVEY MONUMENT, AS NOTED	
EXISTING GUARD RAIL	
EXISTING SIGN	
EXISTING STREET LIGHT	
EXISTING POWER POLE	
EXISTING FENCE	

LEGEND

ITEM	SYMBOL
PROPOSED IMPROVEMENTS	
LOT LINE/ROW	
WRMSHCP CRITERIA	
6" CONCRETE CURB/BERM & GUTTER	
SAWCUT	
SIDEWALK	
ASPHALT PAVING	
CONCRETE PAVING	
DAYLIGHT LINE/GRADING LIMIT	
PROPOSED MAJOR CONTOUR	920
PROPOSED MINOR CONTOUR	
2:1 SLOPE (MAX)	
STORM DRAIN	18" UNLESS OTHERWISE NOTED
MANHOLE	SD
CATCH BASIN	
STORM DRAIN HEADWALL	
STREET LIGHT	
CURB RAMP	
ROCK SLOPE PROTECTION	
DRIVEWAY	
SPLIT RAIL PVC FENCE	



7 8 SAWCUT, GRIND AND OVERLAY DETAIL

NOT TO SCALE

CONSTRUCTION NOTES & QUANTITY ESTIMATE

		TOTAL
1	PLACE 6.5" A.C. OVER 9" CLASS II A.B.	1852 TONS
		1319 CY
2	PLACE 7" PCC OVER 4" CLASS II AB	1006 TON
		296 CY
3	CONSTRUCT TYPE "A-6" CURB AND GUTTER PER RIV. CO. STD. 200	3,230 LF
4	CONSTRUCT SIDEWALK (W PER PLAN) PER RIV. CO. STD'S. 400 & 401	9,415 SQFT
5	CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403	1 EA
6	CONSTRUCT CURB RAMP CASE B PER RIV. CO. STD. 403	1 EA
7	SAWCUT EXIST. A.C. PVMT. SEE TYPICAL JOIN DETAIL THIS SHEET	195 LF
8	GRIND AND OVERLAY EXIST. PAVEMENT PER TYPICAL JOIN DETAIL ON THIS SHEET	
9	CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD. 405	780 SQYD
10	CONSTRUCT UTILITY TRENCH PER RIVERSIDE COUNTY DIRECTION	1,525 LF
11	CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A (W, R PER PLAN)	3,300 SQFT
12	CONSTRUCT TYPE 'C' CURB PER RIV. CO. STD. 202	795 LF
13	CONSTRUCT CURB TRANSITION PER RIV. CO STD. 211	40 LF
14	CONSTRUCT 3" ACCESS ROAD PER NOTE 22 SHT 1	305 SQFT
		4 CY
15	CONSTRUCT SPILT RAIL PVC FENCE PER RIV. CO. STD. H-006	475 LF
16	CONSTRUCT TYPE 60M BARRIER PER CSP A76A	685 LF
17	CONSTRUCT CHAIN LINK RAILING (TYPE 7) PER CSP B11-52	800 LF
18	PLACE 3" CRUSHED ROCK PER NOTE 22 ON SHT 1	14,403 SQFT
		178 CY
19	INSTALL 6' CHAIN LINK FENCE PER RCFC & WCD STD. M801	175 LF
20	INSTALL 12' CHAIN LINK GATE PER RCFC&WCD STD. M801	3 EA
	ASPHALT EMULSION	423 GAL
	STREET TREES - LONDON PLANE	11 EA
	STREET LIGHT	11 EA
	JOINT UTILITY TRENCH	1,525 LF

STORM DRAIN CONSTRUCTION NOTES & QUANTITY ESTIMATE

		TOTAL
21	CONSTRUCT 18" RCP (D-LOAD PER PROFILE)	203 LF
22	CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W=PER PLAN	8 EA
23	CONSTRUCT GUTTER DEPRESSION FOR CURB OPENEING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN	8 EA
24	RECONSTRUCT EXISTING CURB INLET CATCH BASIN	1 EA

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE COUNTY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF ANY OF THESE NOTES AND THE COUNTY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1. NEITHER THE OWNER, NOR THE ENGINEER OF WORK WILL ENFORCE SAFETY MEASURES OR REGULATIONS, THE CONTRACTOR SHALL DESIGN, CONSTRUCT AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS.
2. CONTRACTOR AGREES THAT THEY SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT ALL SLOPES, STREETS, UTILITIES, AND STORM DRAINS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY ENGINEER OF WORK AT 291-0707. THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT THE PROJECT AND ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, SHORING, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY WHATEVER OWNER, AGENCY OR ASSOCIATION IS TO BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE.
4. CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING UNDER-GROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXISTING FACILITIES.
5. LOCATION AND ELEVATION OF IMPROVEMENT SCALE TO BE MET BY WORK TO BE DONE SHALL SHALL BE CONFIRMED BY FIELD MEASUREMENT SCALE PRIOR TO CONSTRUCTION OF NEW WORK.
6. BEFORE EXCAVATING FOR THIS CONTRACT, THE CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND UTILITIES, THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO OTHER EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS.
7. CONTRACTOR SHALL NOTIFY THE ELECTRIC COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. NOTICE: ALL ELECTRICAL AND GAS SERVICES WITHIN THIS SUBDIVISION ARE "UNDERGROUND INSTALLATIONS." FOR LOCATION OF ELECTRICAL CABLES AND GAS PIPING AND APPURTENANCES, CONTACT THE ELECTRIC COMPANY. TELEPHONE: 951-249-8351.
8. CONTRACTOR SHALL NOTIFY THE TELEPHONE COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. NOTICE: ALL TELEPHONE SERVICES WITHIN THIS SUBDIVISION ARE "UNDERGROUND INSTALLATIONS." FOR LOCATION OF CABLES AND APPURTENANCES, CONTACT TELEPHONE COMPANY. TELEPHONE: 714-618-9125.
9. CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. ALL DAMAGES THERETO CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE APPROPRIATE SPECIFICATIONS AND STANDARDS AT THE EXPENSE OF THE CONTRACTOR.

GEOTECHNICAL NOTES

1. AGGREGATE BASE MATERIAL FOR ASPHALT PAVEMENT SHOULD CONSIST OF CRUSHED AGGREGATE BASE COMPLYING WITH THE SPECIFICATIONS IN SECTION 200-2.2 OF THE CURRENT "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" AND SHOULD BE COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D1557. THE SURFACE OF THE BASE SHOULD EXHIBIT A FIRM AND UNYIELDING CONDITION JUST PRIOR TO THE PLACEMENT OF ASPHALT CONCRETE PAVING. THE ASPHALT CONCRETE SHALL BE COMPACTED TO A MINIMUM OF NINETY-FIVE (95) PERCENT RELATIVE COMPACTION.
2. THE PAVEMENT SUBGRADE SHOULD BE COMPACTED TO AT LEAST NINETY (90) PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D1557 TO A DEPTH OF ONE (1) FOOT.
3. APPROXIMATELY 8.5 FEET OF FILL WAS ENCOUNTERED BETWEEN STATIONS 15+50.00 AND 20+00.00. FILL IN THIS AREA SHOULD BE REMOVED AND REPLACED WITH COMPETENT MATERIAL.
4. THE R-VALUE AND THE ASSOCIATED PAVEMENT SECTION SHOULD BE CONFIRMED AT COMPLETION OF SITE GRADING.
5. CORROSION TESTS INDICATE ONSITE SOILS ARE MODERATELY CORROSIVE FOR FERROUS METALS EXPOSED TO SITE SOILS.
6. WITHIN THE PROPOSED DEVELOPMENT AND DEMOLITION AREA, ALL FOUNDATIONS, SLAB-ON-GRADE, VAULTS, UTILITY LINES, SURFACE VEGETATION, TREE ROOTS, TRASH, DEMOLITION DEBRIS, ASPHALTIC CONCRETE, AND PORTLAND CEMENT CONCRETE, SHOULD BE CLEARED AND REMOVED FROM THE PROPOSED SITE.
7. DEPRESSIONS RESULTING FROM REMOVAL OF OBJECTS ENCOUNTERED AS MENTIONED ABOVE SHOULD BE BACKFILLED WITH PROPERLY COMPACTED ENGINEERED FILL UNDER THE TESTING AND OBSERVATION OF THE GEOTECHNICAL ENGINEER OF RECORD.
8. EXISTING SITE SOILS MAY BE RE-USED AS ENGINEERED FILL. A MINIMUM OF ONE (1) FOOT OF ENGINEERED FILL SHALL BE USED UNDER PAVEMENT. EXPOSED BOTTOMS SHOULD BE SCARIFIED A MINIMUM OF 6-INCHES, MOISTURE CONDITIONED AND COMPACTED TO A MINIMUM NINETY (90) PERCENT RELATIVE COMPACTION. SUBSEQUENTLY, SITE FILL SOILS SHOULD BE RE-COMPACTED TO A MINIMUM OF NINETY (90) PERCENT RELATIVE COMPACTION AT A MINIMUM OF OPTIMUM MOISTURE CONTENT. DURING EARTHWORK CONSTRUCTION, ALL SITE PREPARATION AND THE GENERAL PROCEDURES OF THE CONTRACT SHOULD BE OBSERVED, AND THE FILL AND BASE SELECTIVELY TESTED BY THE GEOTECHNICAL ENGINEER OF RECORD. IF UNUSUAL OR UNEXPECTED CONDITIONS ARE EXPOSED IN THE FIELD, THEY SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER OF RECORD AND IF WARRANTED, MODIFIED, AND/OR ADDITIONAL RECOMMENDATION WILL BE OFFERED.
9. THE BEDDING MATERIAL SHOULD CONSIST OF CLEAN, WELL-GRADED SAND WITH A SAND EQUIVALENT OF AT LEAST 30. COARSE, UNIFORMLY GRADED BEDDING MATERIAL SHOULD BE AVOIDED AS INTRUSION OF SUCH BEDDING MATERIAL INTO FINE SUBGRADE SOILS, OR MIGRATION OF THE NATURAL SOILS INTO THE VOIDS OF THE COURSE BEDDING MATERIAL ARE UNDESIRABLE AND POTENTIALLY DETRIMENTAL TO THE QUALITY OF THE COMPLETED CONSTRUCTIONS.
10. IN THE EVENT THAT THE SUBGRADE SOILS BELOW THE PROPOSED BOTTOM OF THE PIPE ARE DISTURBED DURING EXCAVATION OR THAT EXCEPTIONALLY SOFT AND WEAK MATERIAL IS ENCOUNTERED, THE UNSUITABLE SOILS SHOULD BE OVER-EXCAVATED TWELVE (12) INCHES OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER. THE OVER EXCAVATED AREAS SHALL BE BACKFILLED USING APPROVED MATERIAL.
11. PRIOR TO ANY FILL PLACEMENT THE GEOTECHNICAL ENGINEER SHOULD OBSERVE THE EXPOSED SURFACE SOILS. THE SITE SOILS MAY BE RE-USED AS ENGINEERED FILL PROVIDED, THEY ARE FREE OF ORGANIC CONTENT AND PARTICLE SIZE GREATER THAN 4-INCHES. ALL PARTICLES GREATER THAN 4-INCHES SHALL BE REMOVED AND DISPOSED OFFSITE. FILL SHALL BE MOISTURE-CONDITIONED NEAR OPTIMUM AND COMPACTED TO A MINIMUM RELATIVE COMPACTION OF NINETY (90) PERCENT IN ACCORDANCE WITH ASTM D1557. ANY IMPORT SOILS SHALL BE NON-EXPANSIVE AND APPROVED BY THE GEOTECHNICAL ENGINEER.
12. THE SOILS TO BE EXCAVATED FOR THE CULVERT PIPES ARE EXPECTED TO BE GENERALLY ACCEPTABLE FOR USE AS BACKFILL, PROVIDED ANY DEBRIS, ORGANIC MATTER, AND PARTICLES GREATER THAN 4 INCHES ARE REMOVED. IF WET AND PUMPING CONDITIONS OF THE SOIL ARE ENCOUNTERED, DRYING OF THE ON-SITE MATERIALS PRIOR TO PLACEMENT AS BACKFILL SOILS WILL BE ANTICIPATED. SITE SOILS SHALL BE MOISTURE CONDITIONED TO NEAR OPTIMUM MOISTURE CONTENT. THE BACKFILL SOILS SHOULD BE PLACED IN LAYERS, 6 TO 8 INCHES IN THICKNESS, AND BE COMPACTED TO A LEAST NINETY (90) PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM TEST METHOD D1557. COMPACTION OF THE ONSITE SOILS BY FLOODING OR JETTING IS NOT ACCEPTABLE.
13. PRIOR TO FILL PLACEMENT, THE EXPOSED SURFACE SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF SIX (6) INCHES, FILL PLACED IN SIX (6) INCH LOOSE LIFTS, MOISTURE CONDITIONED TO AT LEAST OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A MINIMUM RELATIVE COMPACTION OF NINETY (90) PERCENT IN ACCORDANCE WITH ASTM D1557.
14. ANY IMPORTED SOIL REQUIRED TO COMPLETE GRADING OPERATIONS SHOULD CONSIST OF PREDOMINANTLY GRANULAR MATERIAL WHICH EXHIBITS AN EXPANSION INDEX LESS THAN 20 WHEN TESTED IN ACCORDANCE WITH ASTM D4829, AND SHOULD BE FREE OF DEBRIS, PARTICLES GREATER THAN 4 INCHES IN MAXIMUM DIMENSION, ORGANIC MATTER OR OTHER DELETERIOUS MATERIALS, AND SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER OR A REPRESENTATIVE. FINAL ACCEPTANCE OF ANY IMPORTED SOIL WILL BE BASED UPON REVIEW AND TESTING OF THE SOIL ACTUALLY DELIVERED TO THE SITE.

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707 rickengineering.com
5620 FRIARS ROAD SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H:_____ V:_____

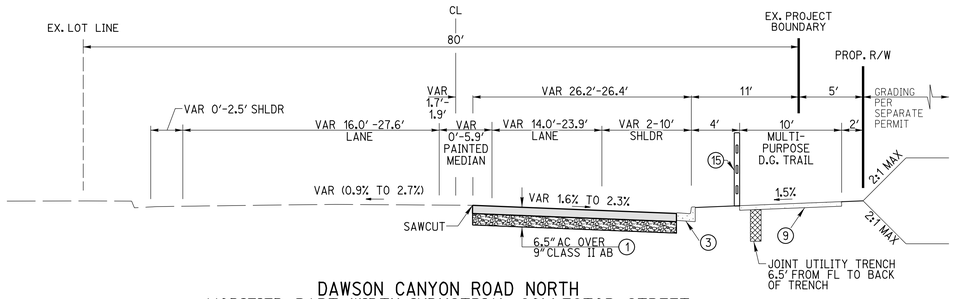
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER NOTES, DETAILS AND QUANTITIES

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 2 OF 11 SHEETS

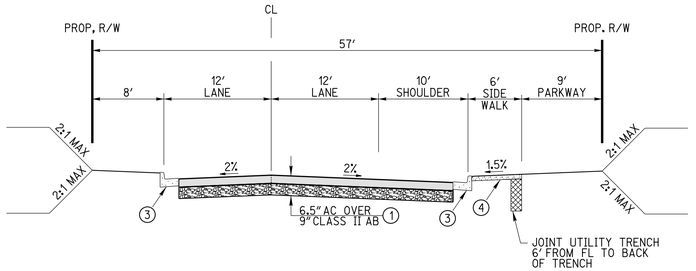
PLAN CHECK | OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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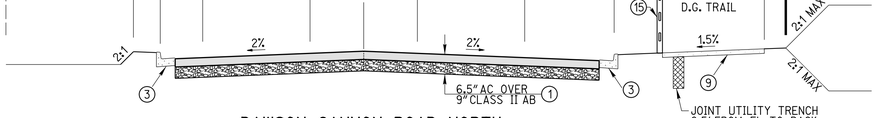
DAWSON CANYON ROAD NORTH
MODIFIED PART WIDTH INDUSTRIAL COLLECTOR STREET

N.T.S.
STA. 11+13.12 TO 12+00.00
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PRELIMINARY R VALUE = 77
COUNTY OF RIVERSIDE STD. 111 (MODIFIED)



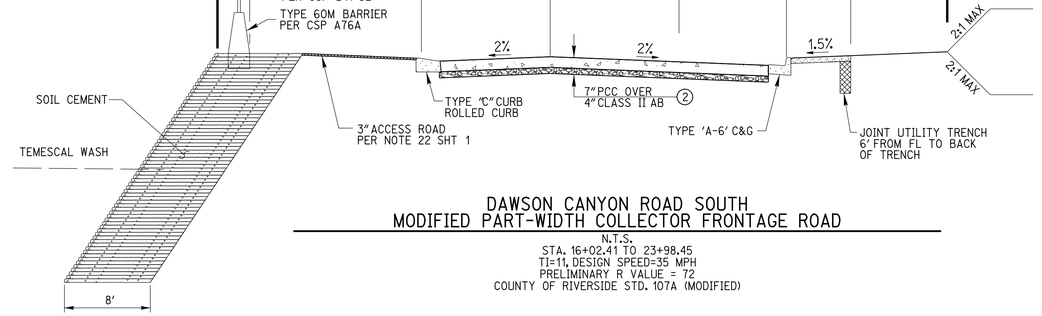
DAWSON CANYON ROAD SOUTH
MODIFIED PART-WIDTH COLLECTOR FRONTAGE ROAD

N.T.S.
STA. 10+00.00 TO 16+02.41
TI=11, DESIGN SPEED=35 MPH
PRELIMINARY R VALUE = 72
COUNTY OF RIVERSIDE STD. 107A (MODIFIED)



DAWSON CANYON ROAD NORTH
MODIFIED PART WIDTH INDUSTRIAL COLLECTOR STREET

N.T.S.
STA. 12+00.00 TO 18+15.03
TI=11, DESIGN SPEED=35 MPH
PRELIMINARY R VALUE = 77
COUNTY OF RIVERSIDE STD. 111 (MODIFIED)



DAWSON CANYON ROAD SOUTH
MODIFIED PART-WIDTH COLLECTOR FRONTAGE ROAD

N.T.S.
STA. 16+02.41 TO 23+98.45
TI=11, DESIGN SPEED=35 MPH
PRELIMINARY R VALUE = 72
COUNTY OF RIVERSIDE STD. 107A (MODIFIED)

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H:_____ V:_____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER
NOTES, DETAILS AND QUANTITIES

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 3 OF 11 SHEETS

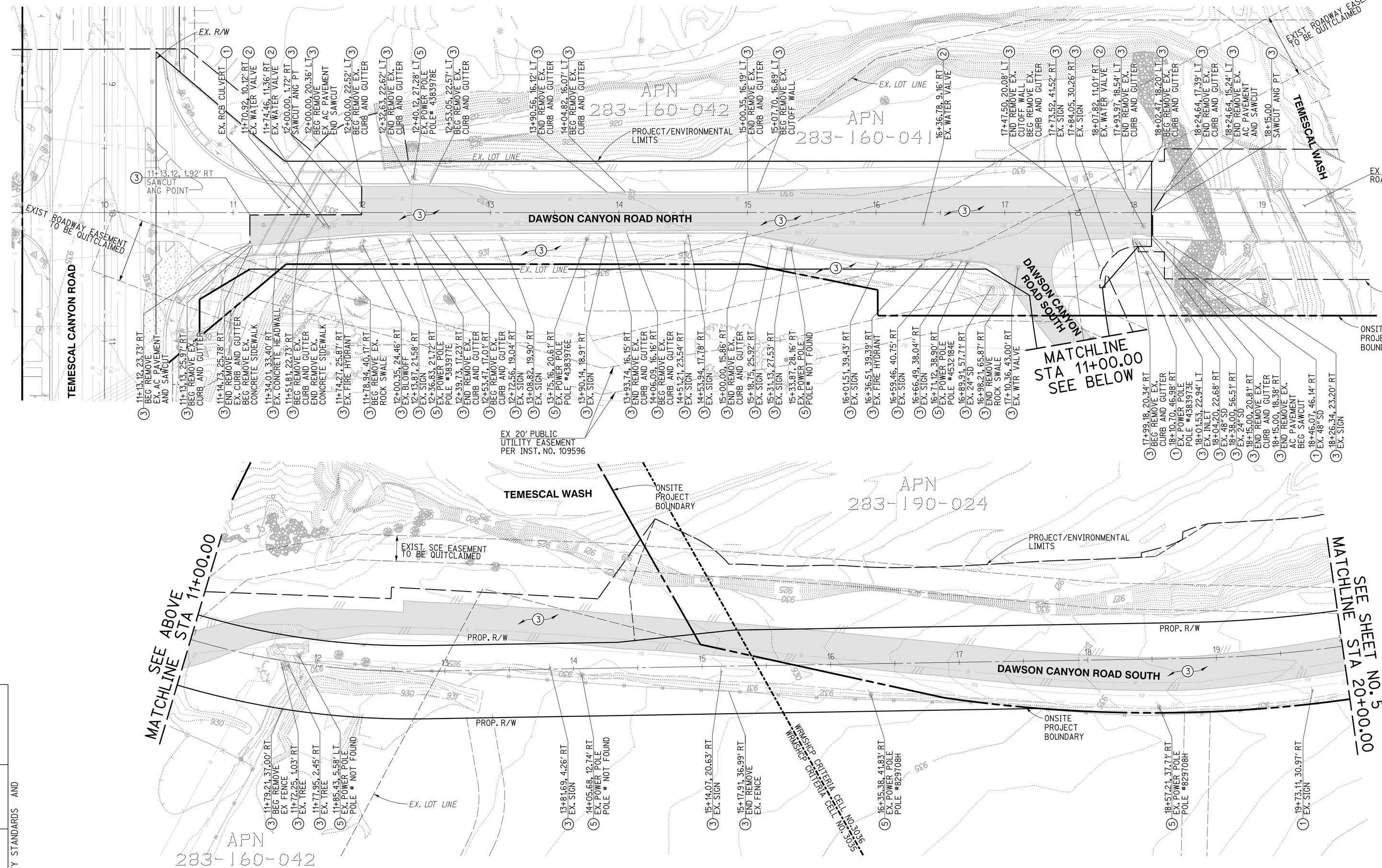
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DEMOLITION NOTES

1. PROTECT IN PLACE
2. ADJUST TO GRADE
3. REMOVE
4. SALVAGE AND RELOCATE
5. TO BE RELOCATED / UNDERGROUNDED BY OTHERS

DEMOLITION LEGEND

AC PAVEMENT REMOVAL



RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

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SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

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PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: _____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER
DEMOLITION PLANS

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 4 OF 11 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND
APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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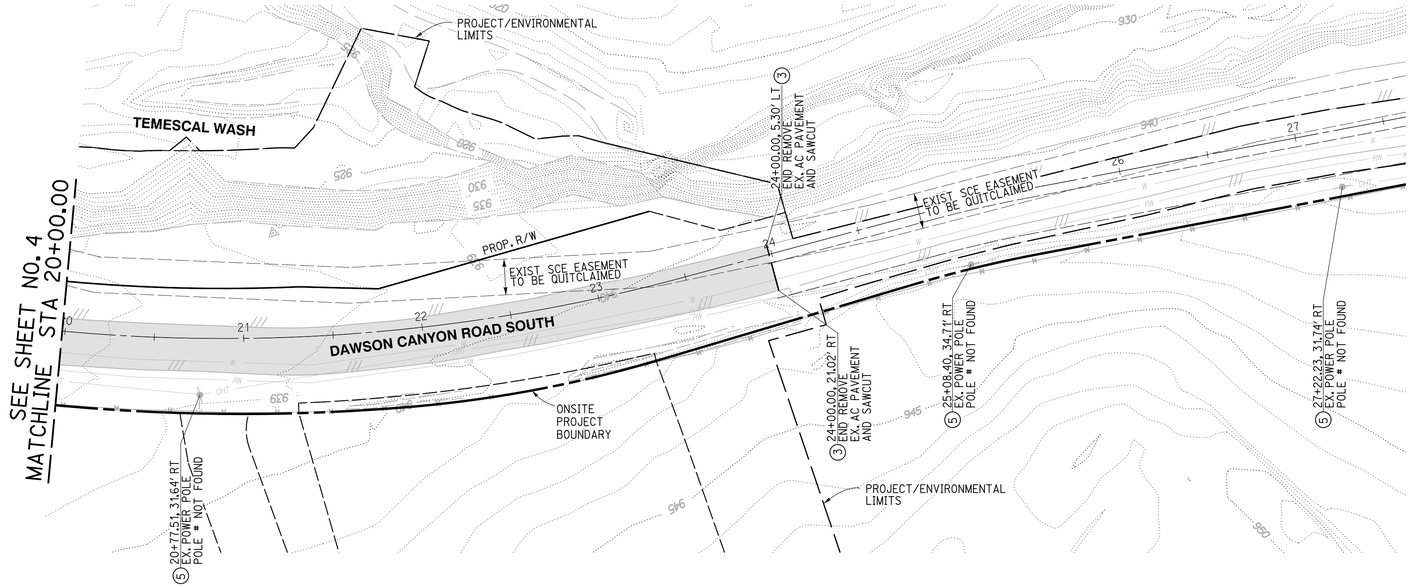
DEMOLITION NOTES

(3) REMOVE

(5) TO BE RELOCATED / UNDERGROUNDED BY OTHERS

DEMOLITION LEGEND

AC PAVEMENT REMOVAL



RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

SCALE: 1" = 40'

40 0 40 80

CAUTION:

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER

COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK

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DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:

SEE SHEET 1

SCALE: H: 1"=40'
V: _____

PPT220039/TPM38551 IP NO. 220056

COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER
DEMOLITION PLANS

FOR: DAWSON CANYON, LLC

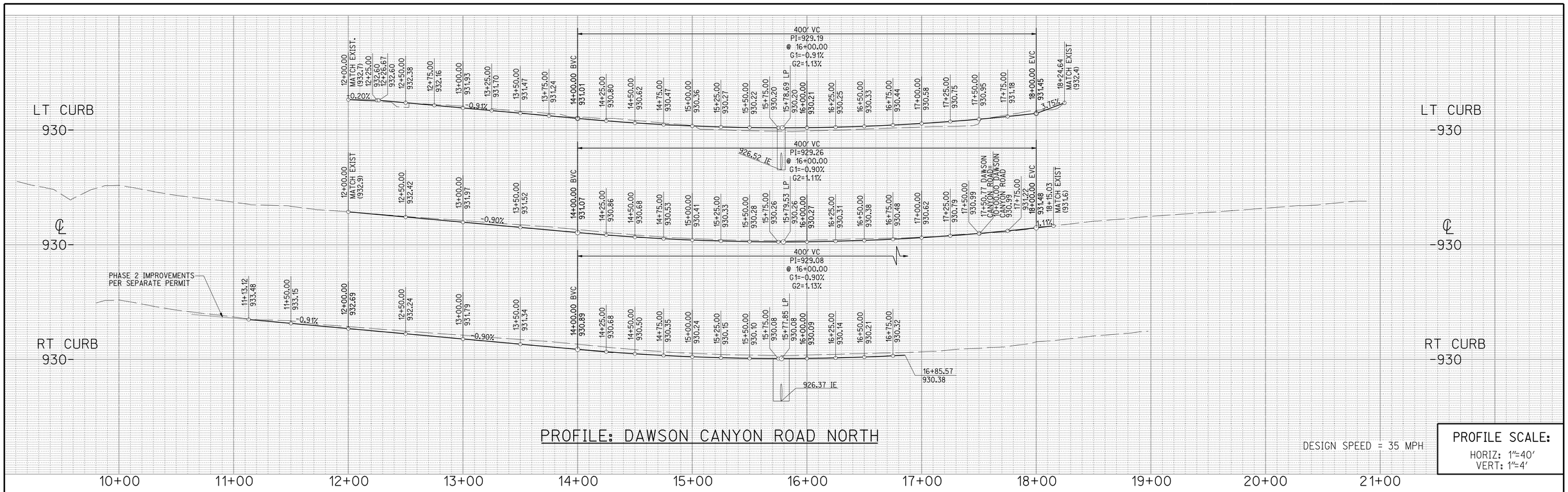
W.O.

COUNTY FILE NO.

SHEET NO. 5 OF 11 SHEETS

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMENDED APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES			

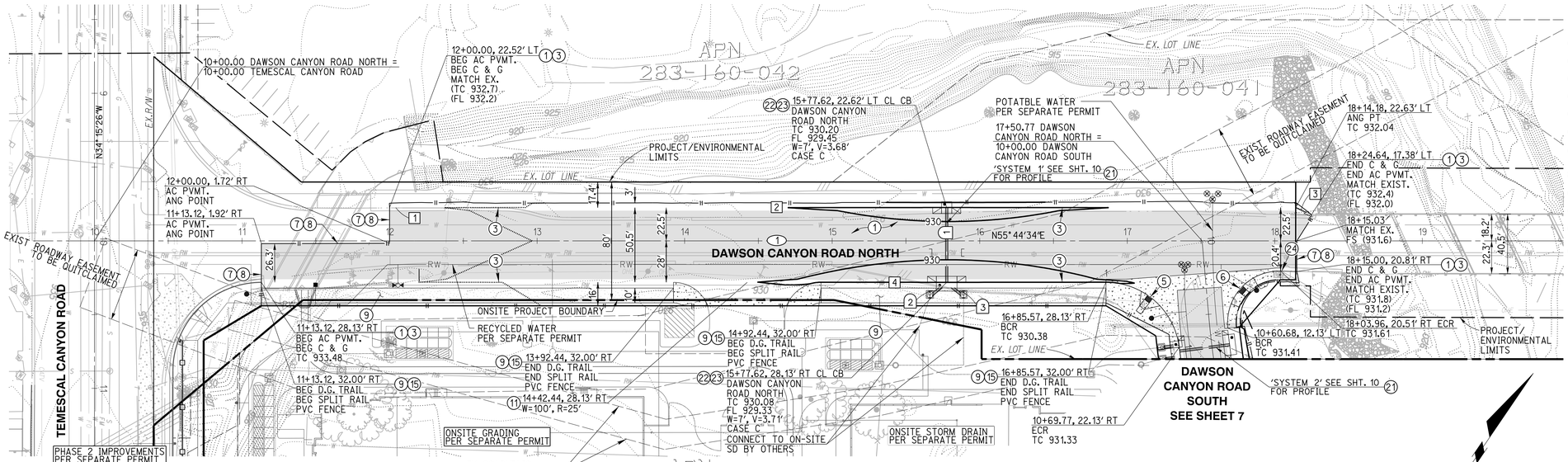
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PROFILE: DAWSON CANYON ROAD NORTH

DESIGN SPEED = 35 MPH

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=4'



PLAN: DAWSON CANYON ROAD NORTH

CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
3. CONSTRUCT TYPE "A-6" CURB AND GUTTER PER RIV. CO. STD. 200
5. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
6. CONSTRUCT CURB RAMP CASE B PER RIV. CO. STD. 403
7. SAWCUT EXIST. A.C. PVMT. SEE TYPICAL JOINT DETAIL ON SHT 2
8. GRIND AND OVERLAY EXIST. PVMT. PER TYPICAL JOINT DETAIL ON SHT 2
9. CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD. 405
11. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A (W, R PER PLAN)
15. CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD. H-006
21. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
22. CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W=PER PLAN
23. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN
24. RECONSTRUCT EXISTING CURB INLET CATCH BASIN

CENTERLINE DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N55°44'34"E		804.10'	

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N55°08'38"E		10.00'	'A-6' C&G
2	N55°44'34"E		604.18'	'A-6' C&G
3	N82°21'06"E		11.71'	'A-6' C&G
4	N55°44'34"E		572.44'	'A-6' C&G

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N34° 15'26"W		51.00'	18" RCP (2000-D)
2	N16° 46'34"E		7.29'	18" RCP (2000-D)
3	N85° 17'25"W		7.29'	18" RCP (2000-D)

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PRELIMINARY
NOT FOR CONSTRUCTION

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UNDERGROUND SERVICE ALERT
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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40' V: _____

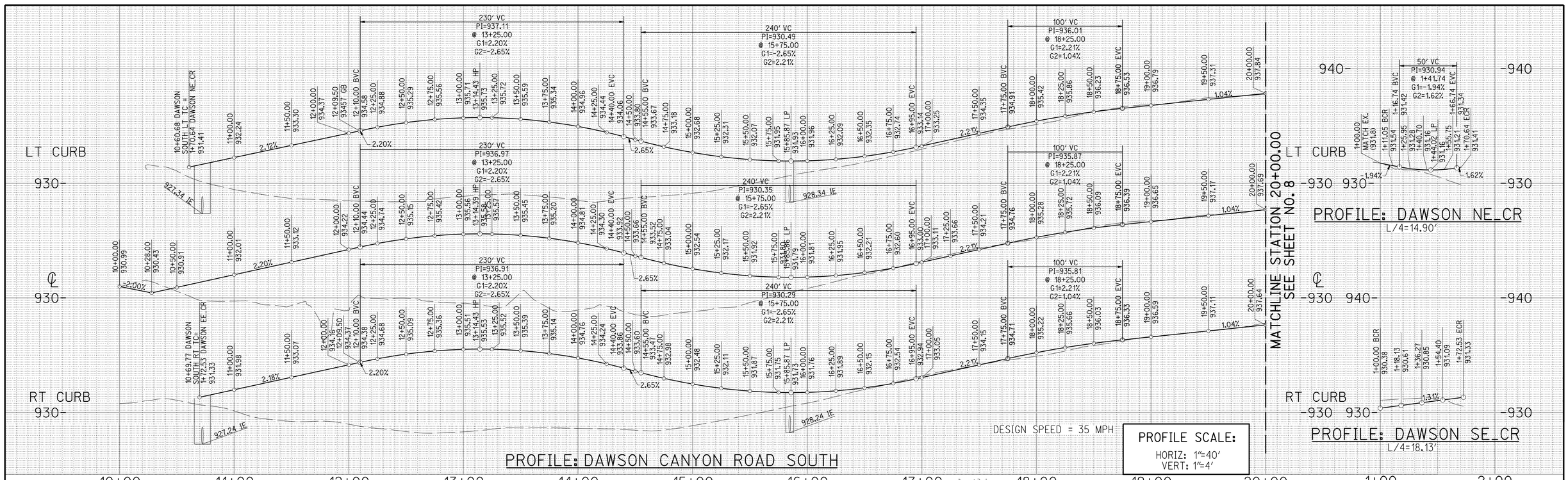
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER
DAWSON CANYON NORTH
STA 10+00.00 TO 18+24.64

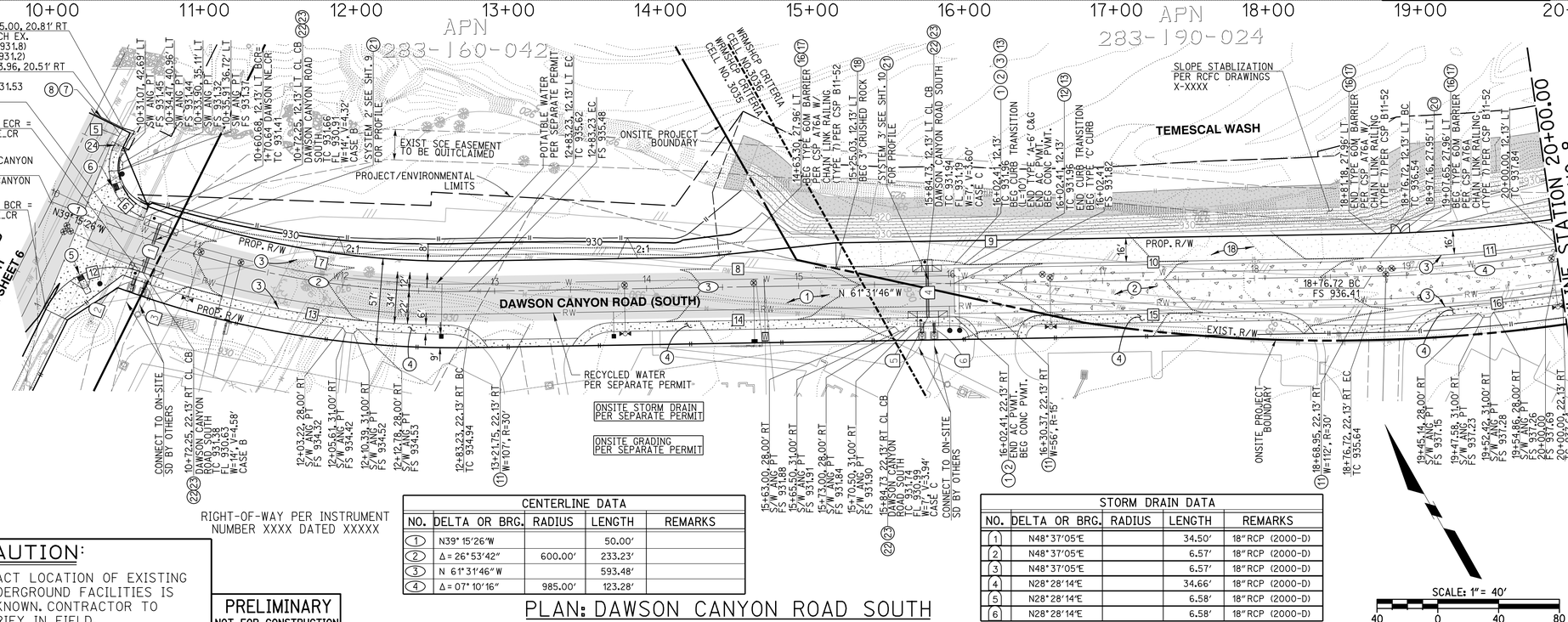
FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

SHEET NO. 6 OF 11 SHEETS

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
2. PLACE 7" P.C.C. OVER 4" CLASS II A.B.
3. CONSTRUCT TYPE "A-6" CURB AND GUTTER PER RIV. CO. STD. 200
4. CONSTRUCT SIDEWALK (W PER PLAN) PER RIV. CO. STD'S. 400 & 401
5. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
6. CONSTRUCT CURB RAMP CASE B PER RIV. CO. STD. 403
7. SAWCUT EXIST. A.C. PVMT. SEE TYPICAL JOINT DETAIL ON SHT 2
8. GRIND AND OVERLAY EXIST. PVMT. PER TYP. JOINT DETAIL ON SHT 2
11. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A (W, R PER PLAN)
12. CONSTRUCT TYPE 'C' CURB PER RIV. CO. STD. 202
13. CONSTRUCT CURB TRANSITION PER RIV. CO STD. 211
16. CONSTRUCT TYPE 60M BARRIER PER CSP A76A
17. CONSTRUCT CHAIN LINK RAILING (TYPE 7) PER CSP B11-52
18. PLACE 3" CRUSHED ROCK PER NOTE 22 ON SHT 1
20. INSTALL 12' CHAIN LINK GATE PER RCFC&WCD STD. M801
21. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
22. CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W=PER PLAN
23. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN
24. RECONSTRUCT EXISTING CURB INLET CATCH BASIN

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

CENTERLINE DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N39° 15'26"W		50.00'	
2	Δ = 26°53'42"	600.00'	233.23'	
3	N 61°31'46" W		593.48'	
4	Δ = 07°10'16"	985.00'	123.28'	

STORM DRAIN DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N48°37'05"E		34.50'	18" RCP (2000-D)
2	N48°37'05"E		6.57'	18" RCP (2000-D)
3	N48°37'05"E		6.57'	18" RCP (2000-D)
4	N28°28'14"E		34.66'	18" RCP (2000-D)
5	N28°28'14"E		6.58'	18" RCP (2000-D)
6	N28°28'14"E		6.58'	18" RCP (2000-D)

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
5	N57°17'20"E		11.06'	'A-6' C&G
6	Δ = 97°33'56"	35.00'	59.60'	'A-6' C&G
7	Δ = 21°15'10"	587.88'	218.06'	'A-6' C&G
8	N61°31'46"W		319.17'	'A-6' C&G
9	N61°31'46"W		10.00'	CURB TRANSITION
10	N61°31'46"W		264.31'	TYPE 'C' CURB
11	Δ = 07°10'16"	972.88'	121.77'	TYPE 'C' CURB
12	Δ = 83°06'43"	50.00'	72.53'	'A-6' C&G
13	Δ = 19°07'58"	622.13'	207.75'	'A-6' C&G
14	N61°31'46"W		225.88'	'A-6' C&G
15	N61°31'46"W		154.78'	'A-6' C&G
16	Δ = 04°25'30"	1007.13'	77.78'	'A-6' C&G

CAUTION:

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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN: DAWSON CANYON ROAD SOUTH

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DATE	BY	MARK	REVISIONS	APPR.	DATE
				ENGINEER	COUNTY

DESIGNED BY: HR DRAWN BY: HR CHECKED BY: ND

SEAL-ENGINEER: REGISTERED PROFESSIONAL ENGINEER — NICHOLAS A. DORNER — NO. 83491 — STATE OF CALIFORNIA

RICK
619-291-0707 rickengineering.com
5620 FRIARS ROAD SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK: SEE SHEET 1

SCALE: H: 1"=40' V: _____

PPT220039/TPM38551 IP NO. 220056

COUNTY OF RIVERSIDE

STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER DAWSON CANYON ROAD SOUTH STA 10+00.00 TO 20+00.00

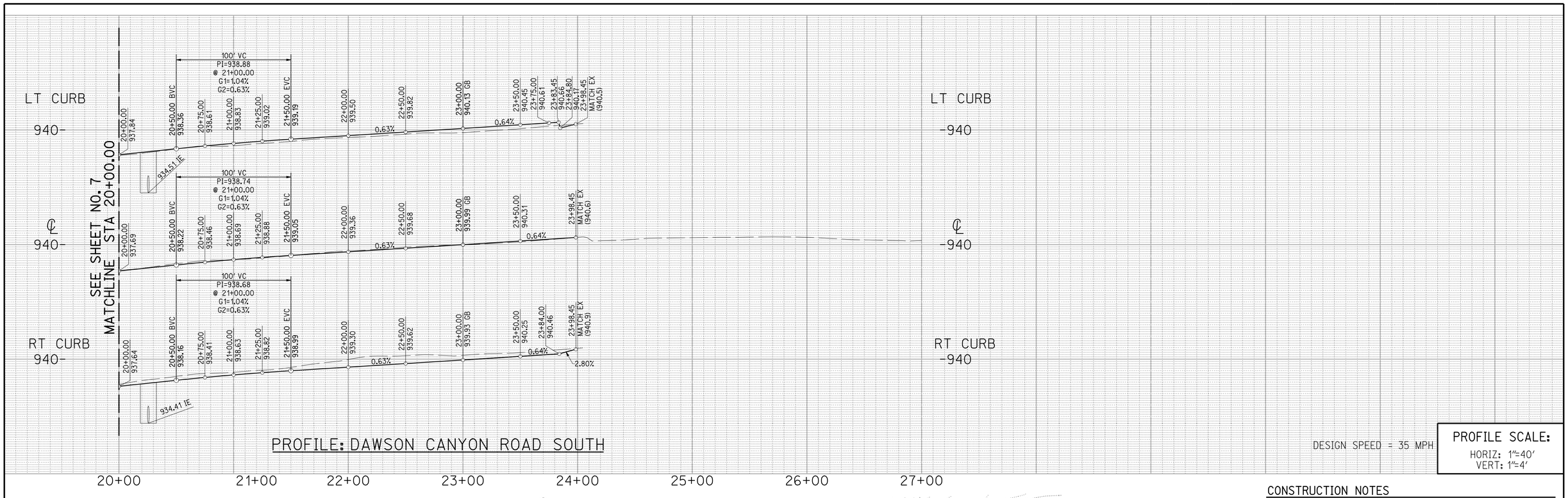
SHEET NO. 7 OF 11 SHEETS

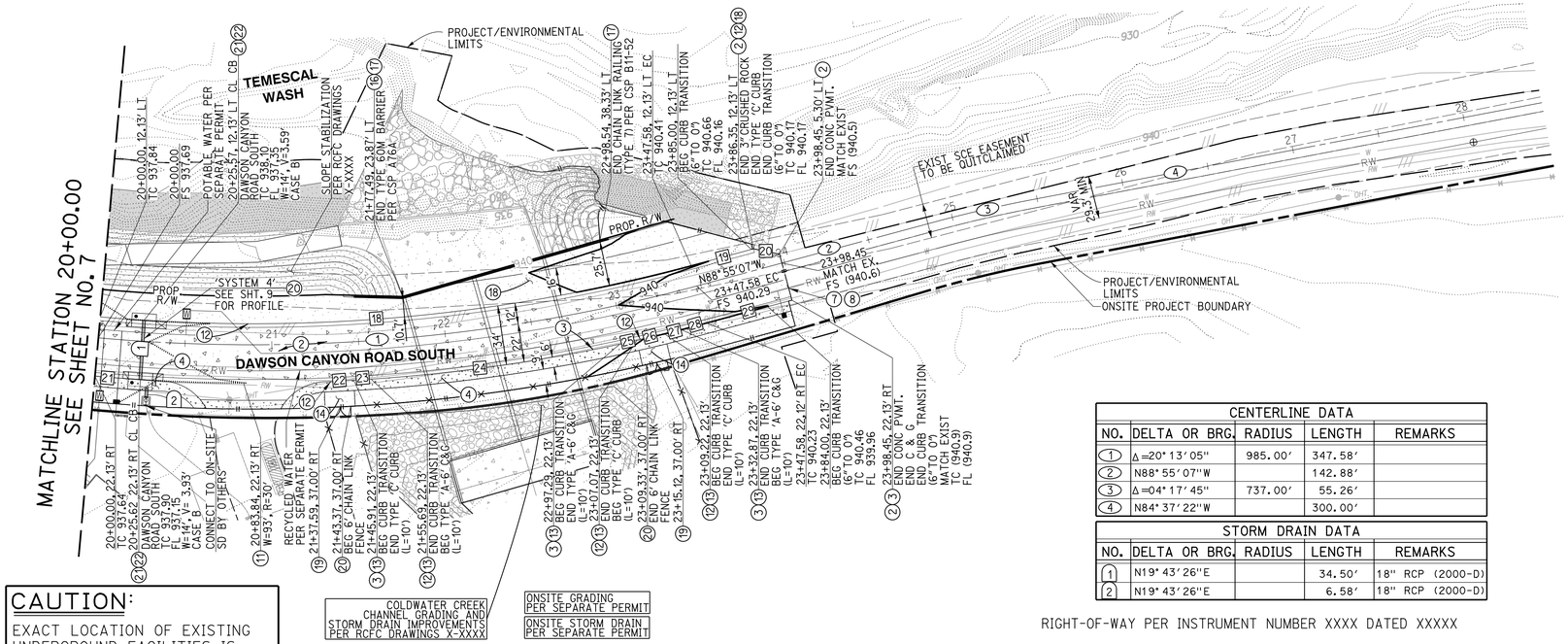
FOR: DAWSON CANYON, LLC W.O. COUNTY FILE NO.

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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PLAN: DAWSON CANYON ROAD SOUTH

CENTERLINE DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	Δ=20°13'05"	985.00'	347.58'	
(2)	N88°55'07"W		142.88'	
(3)	Δ=04°17'45"	737.00'	55.26'	
(4)	N84°37'22"W		300.00'	

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
(1)	N19°43'26"E		34.50'	18" RCP (2000-D)
(2)	N19°43'26"E		6.58'	18" RCP (2000-D)

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX

SCALE: 1"= 40'
40 0 40 80

CONSTRUCTION NOTES

(2) PLACE 7"P.C.C. OVER 4"CLASS II A.B.
(3) CONSTRUCT TYPE "A-6" CURB AND GUTTER PER RIV. CO. STD. 200
(4) CONSTRUCT SIDEWALK (W PER PLAN) PER RIV. CO. STD'S. 400 & 401
(7) SAWCUT EXIST. A.C. PVMT. SEE TYPICAL JOINT DETAIL ON SHT 2
(8) GRIND AND OVERLAY EXIST. PVMT. PER TYP. JOINT DETAIL ON SHT 2
(11) CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A (W, R PER PLAN)
(12) CONSTRUCT TYPE 'C' CURB PER RIV. CO. STD. 202
(13) CONSTRUCT CURB TRANSITION PER RIV. CO STD. 211
(16) CONSTRUCT TYPE 60M BARRIER PER CSP A76A
(17) CONSTRUCT CHAIN LINK RAILING (TYPE 7) PER CSP B11-52
(18) INSTALL 6' CHAIN LINK FENCE PER RCFC & WCD STD. M801
(19) INSTALL 12' CHAIN LINK GATE PER RCFC&WCD STD. M801
(21) PLACE 3"CRUSHED ROCK PER NOTE 22 ON SHT 1
(21) CONSTRUCT 18"RCP (D-LOAD PER PROFILE)
(22) CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W=PER PLAN
(23) CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
18	Δ=20°13'05"	972.88'	343.30'	TYPE 'C' CURB
19	N88°55'07"W		37.22'	TYPE 'C' CURB
20	N62°21'07"W		15.26'	EDGE OF PAVEMENT
21	Δ=07°31'25"	1007.13'	132.25'	'A-6' C&G
22	Δ=00°57'50"	1007.13'	16.94'	TYPE 'C' CURB
23	Δ=00°34'08"	1007.13'	10.00'	CURB TRANSITION
24	Δ=08°14'12"	1007.13'	144.78'	'A-6' C&G
25	Δ=00°34'08"	1007.13'	10.00'	TYPE 'C' CURB
26	Δ=00°55'54"	1007.13'	16.38'	TYPE 'C' CURB
27	Δ=00°34'08"	1007.13'	10.00'	'A-6' C&G
28	Δ=00°51'19"	1007.13'	15.03'	TYPE 'C' CURB
29	N88°55'07"W		50.87'	'A-6' C&G

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PRELIMINARY
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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER
DESIGNED BY: HR
DRAWN BY: HR
CHECKED BY: ND
COUNTY

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

RICK
619-291-0707
rickengineering.com
5620 FRIARS ROAD
SAN DIEGO, CA 92110
SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=40'
V:

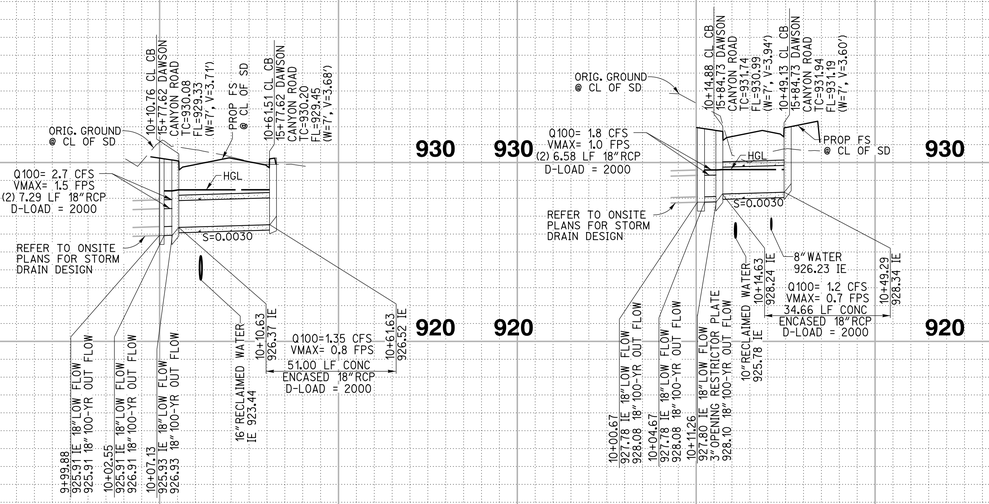
PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER
DAWSON CANYON ROAD SOUTH
STA 20+00.00 TO 24+00.00

FOR: DAWSON CANYON, LLC
W.O.
COUNTY FILE NO.

SHEET NO. 8 OF 11 SHEETS

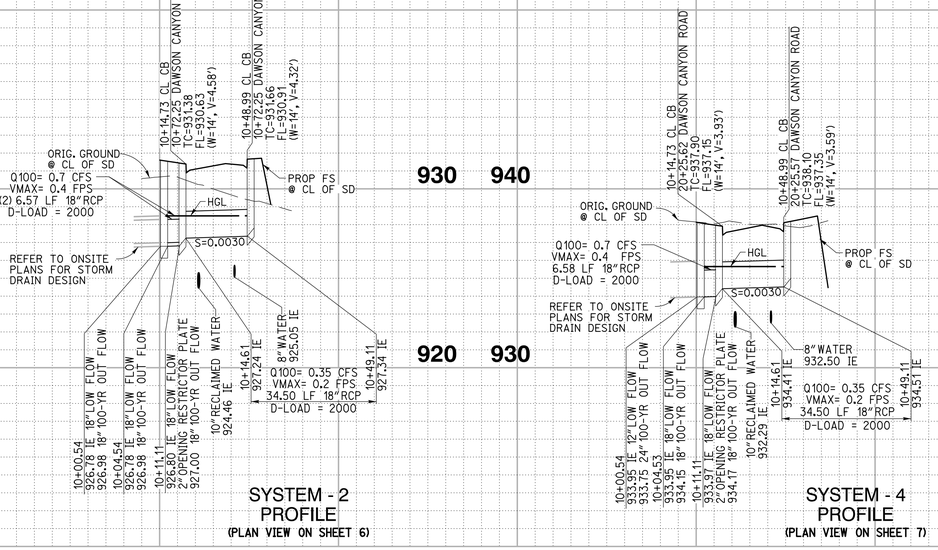
PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED	ORD. 859 VERSION
RECOMMENDED APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES			

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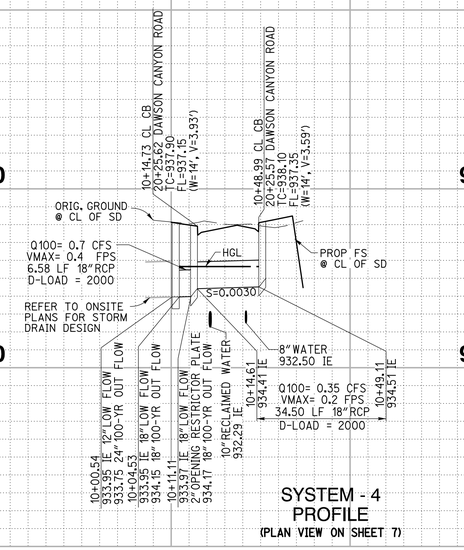


SYSTEM - 1
PROFILE
(PLAN VIEW ON SHEET 5)

SYSTEM - 3
PROFILE
(PLAN VIEW ON SHEET 6)



SYSTEM - 2
PROFILE
(PLAN VIEW ON SHEET 6)



SYSTEM - 4
PROFILE
(PLAN VIEW ON SHEET 7)

PROFILE SCALE:
HORIZ: 1"=40'
VERT: 1"=4'

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

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SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:
NICHOLAS A. DORNER R.C.E. NO. 83491
DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

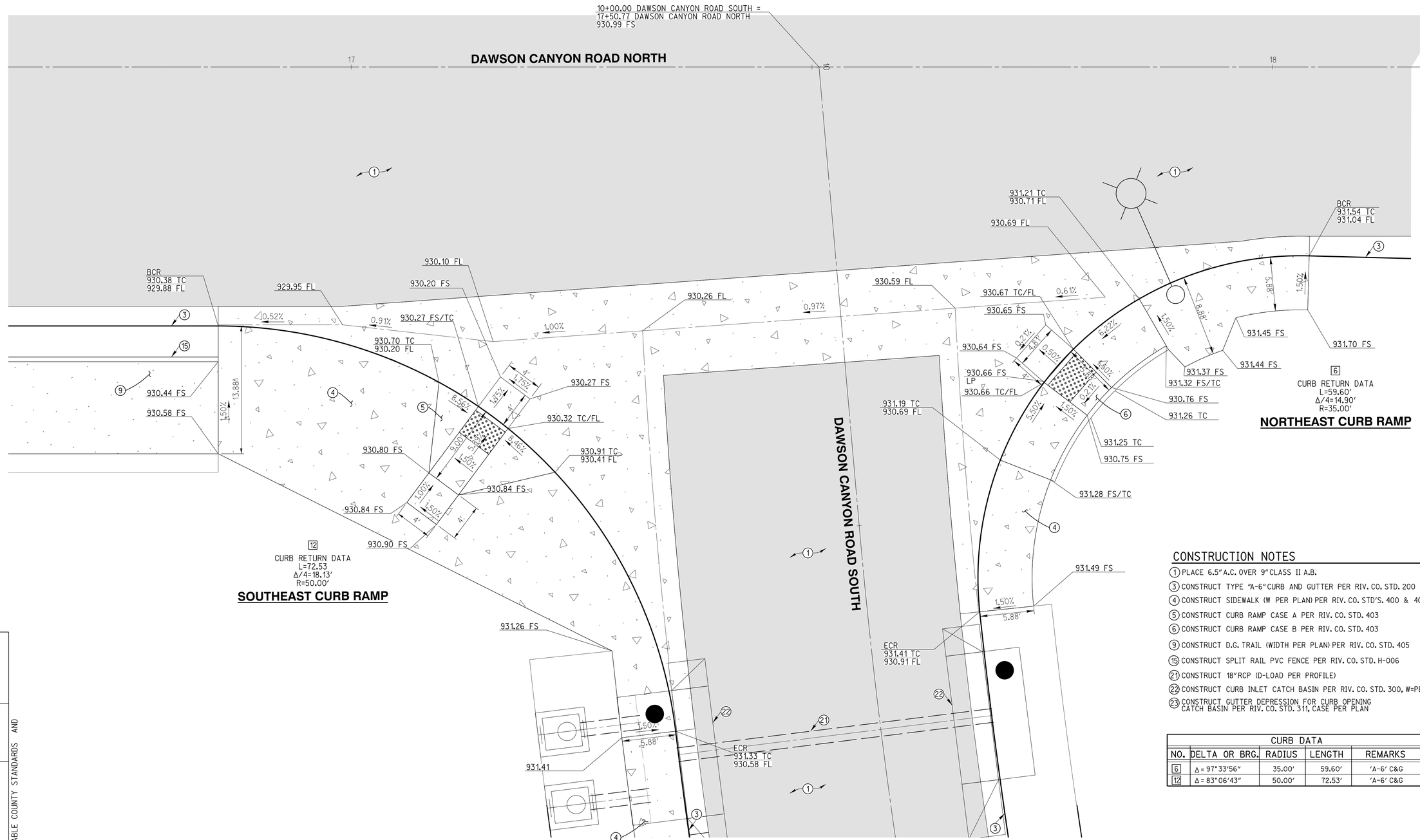
SCALE: H: 1"=40' V: 1"=4'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER STORM DRAIN PROFILE

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 9 OF 11 SHEETS

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CONSTRUCTION NOTES

1. PLACE 6.5" A.C. OVER 9" CLASS II A.B.
3. CONSTRUCT TYPE "A-6" CURB AND GUTTER PER RIV. CO. STD. 200
4. CONSTRUCT SIDEWALK (W PER PLAN) PER RIV. CO. STD'S. 400 & 401
5. CONSTRUCT CURB RAMP CASE A PER RIV. CO. STD. 403
6. CONSTRUCT CURB RAMP CASE B PER RIV. CO. STD. 403
9. CONSTRUCT D.G. TRAIL (WIDTH PER PLAN) PER RIV. CO. STD. 405
15. CONSTRUCT SPLIT RAIL PVC FENCE PER RIV. CO. STD. H-006
21. CONSTRUCT 18" RCP (D-LOAD PER PROFILE)
22. CONSTRUCT CURB INLET CATCH BASIN PER RIV. CO. STD. 300, W=PER PLAN
23. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RIV. CO. STD. 311, CASE PER PLAN

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
6	Δ = 97°33'56"	35.00'	59.60'	'A-6' C&G
12	Δ = 83°06'43"	50.00'	72.53'	'A-6' C&G

SCALE: 1" = 5'
5 0 5 10

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS A. DORNER
NO. 83491
STATE OF CALIFORNIA

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PREPARED UNDER THE DIRECTION OF:
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DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
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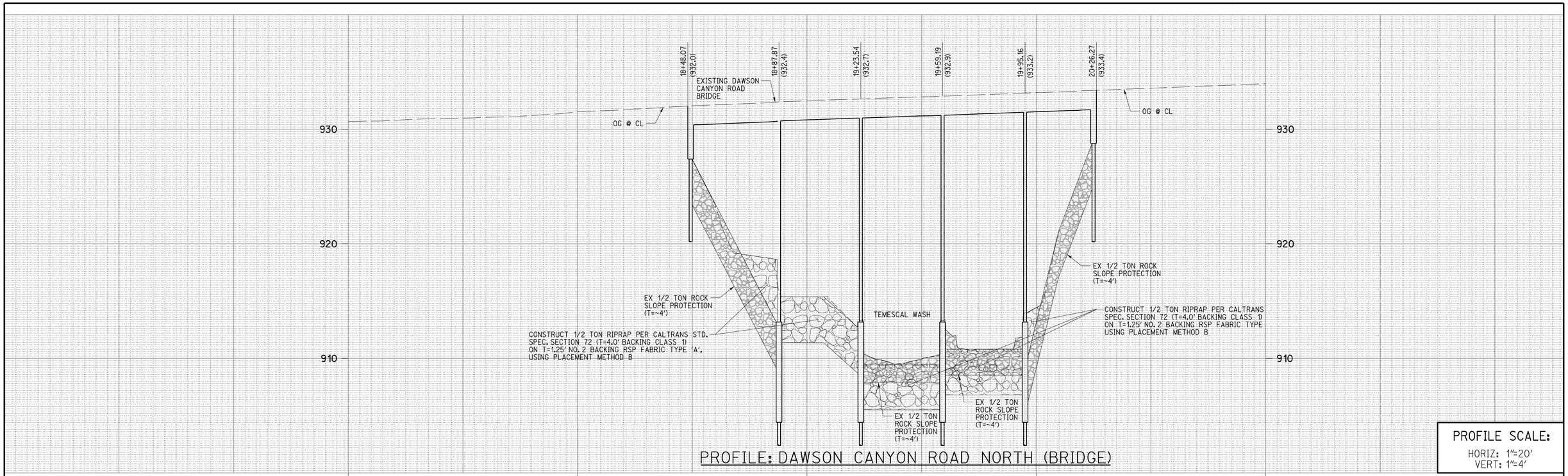
SCALE: H: 1"=5' V: _____

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS TEMESCAL VALLEY COMMERCE CENTER CURB RAMP DETAILS - DAWSON CANYON NORTH & DAWSON CANYON SOUTH

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 10 OF 11 SHEETS

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PROFILE: DAWSON CANYON ROAD NORTH (BRIDGE)

PROFILE SCALE:
HORIZ: 1"=20'
VERT: 1"=4'

RIGHT-OF-WAY PER INSTRUMENT NUMBER XXXX DATED XXXXX



LEGEND

- PROPOSED ROCK SLOPE PROTECTION (EXPOSED)
- PROPOSED ROCK SLOPE PROTECTION (BURIED)
- EXISTING ROCK SLOPE PROTECTION (EXPOSED)

PLAN: DAWSON CANYON ROAD NORTH (BRIDGE)

SCALE: 1"= 20'
20 0 20 40

PLAN CHECK OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED | ORD. 859 VERSION
RECOMMEND APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

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DATE	BY	MARK	REVISIONS	APPR.	DATE

ENGINEER | COUNTY

DESIGNED BY: HR | DRAWN BY: HR | CHECKED BY: ND

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REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

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SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO
SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

PREPARED UNDER THE DIRECTION OF:

NICHOLAS A. DORNER R.C.E. NO. 83491

DATE: _____ REGISTRATION EXPIRES 3-31-25

BENCH MARK:
SEE SHEET 1

SCALE: H: 1"=20' V: 1"=4'

PPT220039/TPM38551 IP NO. 220056
COUNTY OF RIVERSIDE
STREET IMPROVEMENT PLANS
TEMESCAL VALLEY COMMERCE CENTER
DAWSON CANYON ROAD (BRIDGE)
PROPOSED ROCK SLOPE PROTECTION

FOR: DAWSON CANYON, LLC | W.O. | COUNTY FILE NO.

SHEET NO. 11 OF 11 SHEETS

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Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS
10641 HUMBOLT STREET LOS ALAMITOS, CA 90720
(562)799-9469 FAX (562)799-9459

December 10, 2020 Project Number 21206-19

Proficiency Capital, LLC
5020 Campus Drive
Newport Beach, California 92660

Attn: Matt Englhard

RE: **Supplemental Infiltration Testing** - Proposed Warehouse Development - Located at the Corner of Temescal Canyon Road and Park Canyon Road, Corona, in the County of Riverside, California

Dear Mr. Englhard:
As requested, supplemental infiltration testing in addition to tests provided in our previous report titled *Geotechnical Investigation*, dated July 16, 2019 has been performed at the subject site. Test locations and depths as shown on the attached Figure 1 were provided by Thienes Engineering.

INFILTRATION TESTING

Ten test borings were excavated for testing in order to establish infiltration rate for the design of the systems in various areas of the site. Boring logs with descriptions of the subsurface soils encountered are provided in Appendix A. Groundwater in the vicinity is in excess of 50 feet below grade. Some minor seeping of perched water was found in our excavations T-19, T-20 and T-21 near the southwest corner of the site at 9 to 10 feet below grade, as described in our earlier report. (No infiltration is planned in the area of the perched water.)

The borings consisted of 6-inch diameter test holes. A 3-inch diameter perforated PVC casing with solid end cap was installed in the borings and then surrounded with gravel materials to prevent caving. The boreholes were filled with water for pre-soaking purposes. Based upon the rapid initial fall of water in nine of the ten test holes during the pre-soak period, testing was conducted at 10-minute maximum intervals for six additional readings.

Test hole B-5 experienced slower fall during the presoak period; thus, the boring was pre-saturated overnight and testing was completed the next day at 30-minute intervals for twelve additional readings. The measurements were obtained by using an electronic tape measure with 1/16-inch divisions and timed with a stopwatch.

Discussion of Results

Based upon the results of our testing, the underlying soils exhibit generally uniform infiltration rates. The infiltration field data and test calculations are attached in Appendix B. The following table provides our test results:

Test No.	Depth (feet bgs)	Soil Type*	Field Infiltration rate
B-1	7.0	silty SAND	8.70 in/hr
B-2	11.0	sandy SILT	2.06 in/hr
B-3	15.0	slightly silty SAND	7.94 in/hr
B-4	15.0	slightly silty SAND	5.80 in/hr
B-5	16.0	silty SAND	1.65 in/hr
B-6	16.0	silty SAND	4.84 in/hr
B-7	15.0	silty SAND	5.15 in/hr
B-8	15.0	slightly silty SAND	42.86 in/hr
B-9	16.0	slightly silty SAND	42.86 in/hr
B-10	16.0	slightly silty SAND	128.57 in/hr

* All borings encountered varying amount of gravel and cobbles.

The design infiltration rates should utilize a safety factor of 3.0, and as described below.

a) The reduction factor - $R_f = CF_t$ and Rf = 3.50 to 5.83 for the field infiltration test.

b) CF_v = 1.0 based on silt and sand soils encountered in the test borings at 7 to 16 feet.

c) CF_s = 2.0 for long-term siltation, plugging and maintenance. The sand and clay soils are likely to have some plugging and regular maintenance of storm water discharge devices is required.

Existing groundwater is located deeper than 50 feet below existing grade and will not affect the system in the upper 20 feet. The potential of settlement of proposed or existing structures located at least 10 feet from any infiltration system is low. In addition, the potential for hydro-consolidation and the susceptibility for any ground settlements are considered low. All systems shall meet the California Regional Water Quality Control Board (CRWQCB) requirements. The use of an on-site disposal system appears to be geotechnically feasible for future development provided the infiltration rates as given are used in the design.

CLOSURE

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase. It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project.

This firm should have the opportunity to review the final plans (72 hours for review required) to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

The described testing has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

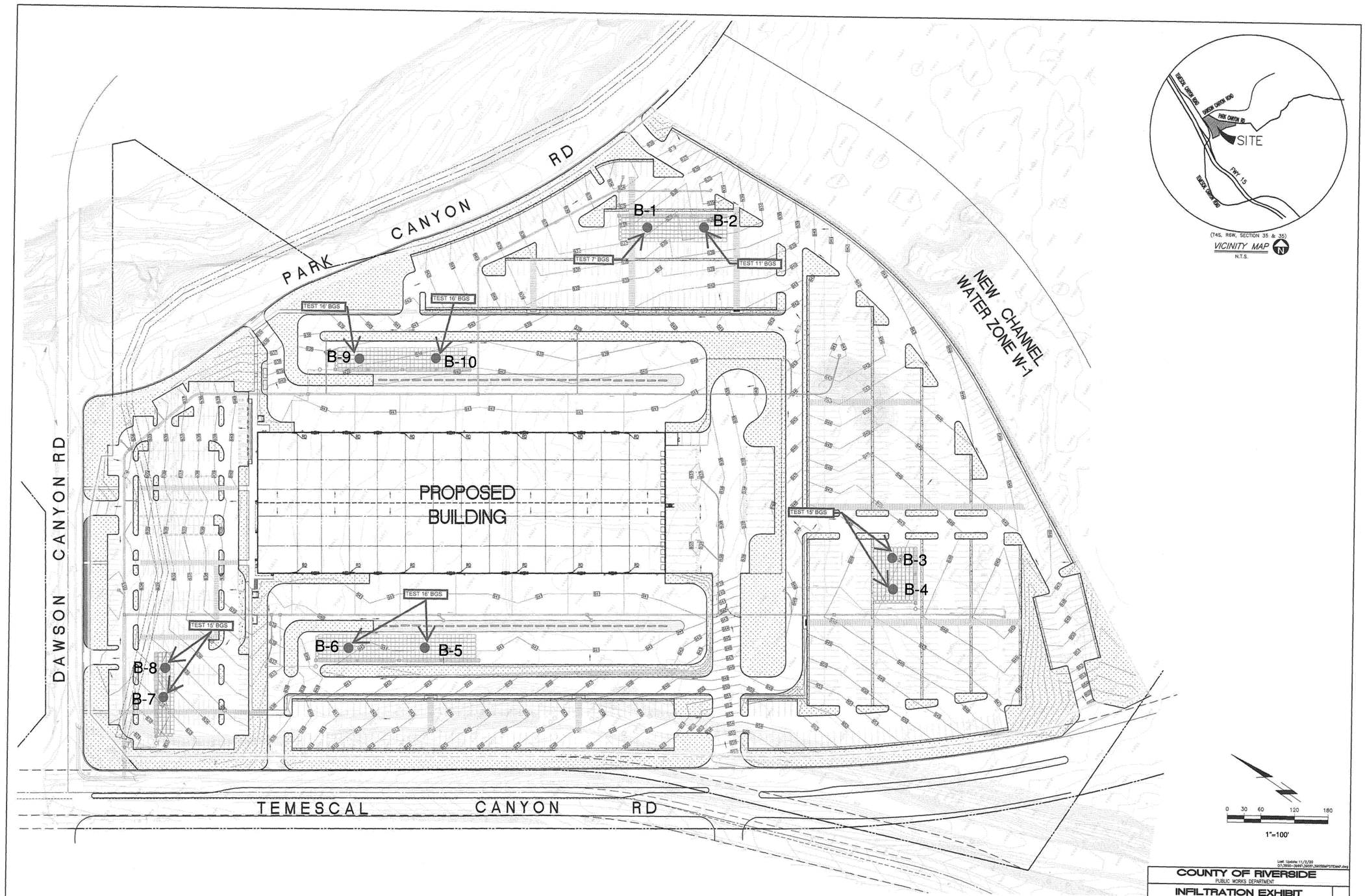
We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING



Keith D. Tucker
Project Engineer
R.G.E. 841

Mark A. Burkholder
Project Manager



NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 21206-20 | DATE 12/2020

LOCATIONS OF INFILTRATION TESTS

FIGURE 1

PREPARED FOR:
PROFICIENCY CAPITAL LLC
11777 SAN VICENTE BLVD, STE 780
LOS ANGELES, CA 90049
PHONE: (949) 296-7006

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX:(714)521-4173

Last Update:11/3/20
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COUNTY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

INFILTRATION EXHIBIT

TEMESCAL VALLEY COMMERCE CENTER

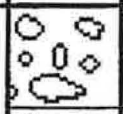
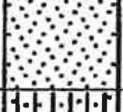
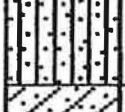
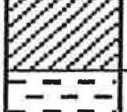
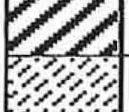
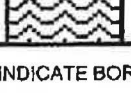
TEMESCAL CANYON ROAD AND DAWNSON CANYON ROAD

Designed by ____ Date ____
Checked by ____ Date ____
Designed by ____ Date ____
Checked by ____ Date ____

Approved by ____ Date ____
Public Works Director ____ R.C.E. ____
Sheet 1 of 1 Sheets

3905/ 1 OF 1 SHEET

APPENDIX A

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- ■ Indicates 2.5-inch Inside Diameter. Ring Sample.
- ⊠ Indicates 2-inch OD Split Spoon Sample (SPT).
- ⧅ Indicates Shelby Tube Sample.
- ◫ Indicates No Recovery.
- ◧ Indicates SPT with 140# Hammer 30 in. Drop.
- ⊠ Indicates Bulk Sample.
- ◩ Indicates Small Bag Sample.
- ◨ Indicates Non-Standard
- ⧓ Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

Proficiency Capital, LLC
21206-19

Log of Boring B-1

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 11/30/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, dry					
		GWT not encountered					
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
		Boring completed at depth of 7'					
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\2120619-2.log Date: 12/10/2020

Proficiency Capital, LLC
21206-19

Log of Boring B-2

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 11/30/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel Brown, medium dense, dry					
		GWT not encountered					
		NATURAL SOILS Sandy SILT with gravel and occasional small cobbles Brown, medium stiff, damp					
5							
10		Boring completed at depth of 11'					
15							
20							
25							
30							
35							

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Proficiency Capital, LLC
21206-19

Log of Boring B-3

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 11/30/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, small cobbles and occasional concrete pieces Brown, medium dense, dry					
		GWT not encountered					
		NATURAL SOILS Sandy SILT with occasional gravel Brown, medium stiff, moist					
5							
10		Slightly silty SAND with gravel and occasional cobbles Brown, very dense, damp					
15		Boring completed at depth of 15'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\2120619-2.log Date: 12/10/2020

Proficiency Capital, LLC
21206-19

Log of Boring B-4

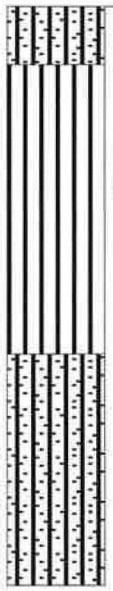
Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 11/30/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured



Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel,cobbles and concrete pieces Brown, medium dense, dry					
		NATURAL SOILS Sandy SILT with gravel and occasional small cobbles Brown, medium stiff, damp to moist					
5							
10		Slightly silty SAND with occasional gravel and cobbles Brown, very dense, damp					
15		Boring completed at depth of 15'					
20							
25							
30							
35							

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Proficiency Capital, LLC 21206-19	Log of Boring B-5

Boring Location: Temescal Cnyn and Park Cnyn, Corona	
Date of Drilling: 11/30/2020	**Groundwater Depth: None Encountered**
Drilling Method: Drill Rig	
Hammer Weight: 140 lbs	**Drop: 30"**
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, dry					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
5		GWT not encountered					
10							
15		Boring completed at depth of 16'					
20							
25							
30							
35							

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Proficiency Capital, LLC
21206-19

Log of Boring B-6

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 11/30/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
5		GWT not encountered					
10							
15		Boring completed at depth of 16'					
20							
25							
30							
35							

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Proficiency Capital, LLC
21206-19

Log of Boring B-7

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 12/1/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, loose, dry					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
5		GWT not encountered					
10							
15		Boring completed at depth of 15'					
20							
25							
30							
35							

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Proficiency Capital, LLC
21206-19

Log of Boring B-8

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 12/1/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, loose, dry					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
5		GWT not encountered					
10		Slightly silty SAND with gravel and small cobbles Brown, medium dense, damp					
15		Boring completed at depth of 15'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\2120619-2.log Date: 12/10/2020

Proficiency Capital, LLC
21206-19

Log of Boring B-9

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 12/1/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, loose, dry					
		NATURAL SOILS Silty SAND with gravel and occasional small cobbles Brown, medium dense, damp					
5		GWT not encountered					
10		Slightly silty SAND with gravel and small cobbles Brown, medium dense, damp					
15		Boring completed at depth of 16'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\2120619-2.log Date: 12/10/2020

Proficiency Capital, LLC
21206-19

Log of Boring B-10

Boring Location: Temescal Cnyn and Park Cnyn, Corona

Date of Drilling: 12/1/2020 | **Groundwater Depth:** None Encountered

Drilling Method: Drill Rig

Hammer Weight: 140 lbs | **Drop:** 30"

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, dense, moist					
5		NATURAL SOILS Silty SAND with gravel and occasional small cobbles Brown, medium dense, moist					
10		Slightly silty SAND with gravel and occasional small cobbles Brown, medium dense, damp					
15		Boring completed at depth of 16'					
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206\19-2.log Date: 12/10/2020

NorCal Engineering

APPENDIX B

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 11/30/2020
Project No.: 21206-19	**Tested By**: J.S.
Test Hole: B-1	**USCS Soil Classification**:
Depth of Test Hole: 7'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	9:04	9:20	16	68.0	84.0	16.0	
2	9:20	9:45	25	69.0	83.0	14.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	9:45	9:55	10	69.0	77.0	8.0	
2	9:55	10:05	10	69.0	77.0	8.0	
3	10:05	10:15	10	69.0	76.5	7.5	
4	10:15	10:25	10	69.0	76.5	7.5	
5	10:25	10:35	10	69.0	76.5	7.5	
6	10:35	10:45	10	69.0	76.0	7.0	
7							
8							
9							
10							
11							
12							
13							
14							
15							
COMMENTS:							

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date:** 11/30/2020
Project No.: 21206-19	**Tested By:** J.S.
Test Hole: B-2	**USCS Soil Classification:**
Depth of Test Hole: 11'	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	9:49	10:14	25	116.5	123.5	7.0	
2	10:14	10:39	25	113.0	121.0	8.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	10:39	10:49	10	114.0	116.5	2.5	
2	10:49	10:59	10	116.5	118.5	2.0	
3	10:59	11:09	10	115.0	117.0	2.0	
4	11:09	11:19	10	117.0	118.5	1.5	
5	11:19	11:29	10	117.0	118.5	1.5	
6	11:29	11:39	10	116.5	118.5	2.0	
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COMMENTS:							

NORCAL ENGINEERING
SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 11/30/2020
Project No.: 21206-19	**Tested By**: D.L.
Test Hole: B-3	**USCS Soil Classification**:
Depth of Test Hole: 15'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	11:39	12:04	25	162.0	173.0	11.0	
2	12:04	12:29	25	165.0	177.0	12.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	12:29	12:39	10	165.0	171.5	6.5	
2	12:39	12:49	10	165.0	171.5	6.5	
3	12:49	12:59	10	165.0	171.5	6.5	
4	12:59	1:09	10	165.0	171.0	6.0	
5	1:09	1:19	10	165.0	171.0	6.0	
6	1:19	1:29	10	165.0	171.5	6.5	
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COMMENTS:							

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SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date:** 11/30/2020
Project No.: 21206-19	**Tested By:** J.S.
Test Hole: B-4	**USCS Soil Classification:**
Depth of Test Hole: 15'	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	11:41	12:06	25	162.0	173.5	11.5	
2	12:06	12:31	25	163.0	174.0	11.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	12:31	12:41	10	165.0	171.0	6.0	
2	12:41	1:41	10	165.0	171.0	6.0	
3	1:41	1:01	10	163.0	169.0	96.0	
4	1:01	1:11	10	163.0	168.5	5.5	
5	1:11	1:21	10	165.0	171.0	6.0	
6	1:21	1:31	10	165.0	170.0	5.0	
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COMMENTS:

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date:** 11/30/2020
Project No.: 21206-19	**Tested By:** D.L..
Test Hole: B-5	**USCS Soil Classification:**
Depth of Test Hole: 16'	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	12:29	12:54	25	177.0	183.5	6.5	
2	12:54	1:19	25	175.0	180.0	5.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	7:15	7:45	30	177.0	182.5	5.5	
2	7:45	8:15	30	176.0	181.0	5.0	
3	8:15	8:45	30	176.0	181.0	5.0	
4	8:45	9:15	30	176.0	181.5	5.5	
5	9:15	9:45	30	176.0	181.0	5.0	
6	9:45	10:15	30	176.0	181.5	5.5	
7	10:15	10:45	30	176.0	181.0	5.0	
8	10:45	11:15	30	176.0	181.0	5.0	
9	11:15	11:45	30	176.0	181.0	5.0	
10	11:45	12:15	30	176.0	181.5	5.5	
11	12:15	12:45	30	175.0	180.0	5.0	
12	12:45	1:15	30	176.0	181.0	5.0	
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15							
COMMENTS:							

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 11/30/2020
Project No.: 21206-19	**Tested By**: J.S.
Test Hole: B-6	**USCS Soil Classification**:
Depth of Test Hole: 16'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	12:40	1:05	25	177.0	189.0	12.0	
2	1:05	1:30	25	177.0	187.0	10.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	1:30	1:40	10	176.0	182.0	6.0	
2	1:40	1:50	10	176.0	182.0	6.0	
3	1:50	2:00	10	176.0	181.5	5.5	
4	2:00	2:10	10	176.0	181.0	5.0	
5	2:10	2:20	10	176.0	181.0	5.0	
6	2:20	2:30	10	176.0	180.5	4.5	
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COMMENTS:

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 12/1/2020
Project No.: 21206-19	**Tested By**: D.R.
Test Hole: B-7	**USCS Soil Classification**:
Depth of Test Hole: 15'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	7:07	7:23	16	165.0	180.0	15.0	
2	7:23	7:48	25	163.0	174.0	11.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	7:48	7:58	10	163.0	169.0	6.0	
2	7:58	8:08	10	165.0	175.5	5.5	
3	8:08	8:18	10	165.0	175.5	5.5	
4	8:18	8:28	10	164.5	169.5	5.0	
5	8:28	8:38	10	165.0	170.0	5.0	
6	8:38	8:48	10	163.0	108.0	5.0	
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COMMENTS:

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 12/1/2020
Project No.: 21206-19	**Tested By**: J.S.
Test Hole: B-8	**USCS Soil Classification**:
Depth of Test Hole: 15'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	7:31	8:35	4	165.0	180.0	15.0	
2	8:35	8:40	5	165.0	180.0	15.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	8:40	8:44	4	165.0	180.0	15.0	
2	8:44	8:48	4	165.0	180.0	15.0	
3	8:48	8:52	4	165.0	180.0	15.0	
4	8:52	8:57	5	165.0	180.0	15.0	
5	8:57	9:02	5	165.0	180.0	15.0	
6	9:02	9:07	5	165.0	180.0	15.0	
7	9:07	9:12	5	165.0	180.0	15.0	
8	9:12	9:22	5	165.0	180.0	15.0	
9	9:22	9:27	5	165.0	180.0	15.0	
10	9:27	9:33	6	165.0	180.0	15.0	
11	9:33	9:39	6	165.0	180.0	15.0	
12	9:39	9:45	6	165.0	180.0	15.0	
13							
14							
15							
COMMENTS:							

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date:** 12/1/2020
Project No.: 21206-19	**Tested By:** J.S.
Test Hole: B-9	**USCS Soil Classification:**
Depth of Test Hole: 16'	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	10:05	10:10	5	176.0	192.0	16.0	
2	10:10	10:15	5	176.5	192.0	15.5	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	10:15	10:20	5	177.0	192.0	15.0	
2	10:20	10:25	5	177.0	192.0	15.0	
3	10:25	10:30	5	177.0	192.0	15.0	
4	10:30	10:35	5	177.0	192.0	15.0	
5	10:35	10:40	5	177.0	192.0	15.0	
6	10:40	10:45	5	177.0	192.0	15.0	
7	10:45	10:50	5	177.0	192.0	15.0	
8	10:50	10:56	6	177.0	192.0	15.0	
9	10:56	11:02	6	177.0	192.0	15.0	
10	11:02	11:08	6	177.0	192.0	15.0	
11	11:08	11:14	6	177.0	192.0	15.0	
12	11:14	11:20	6	177.0	192.0	15.0	
13							
14							
15							
COMMENTS:							

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date:** 12/1/2020
Project No.: 21206-19	**Tested By:** J.S.
Test Hole: B-10	**USCS Soil Classification:**
Depth of Test Hole: 16'	**Sides (if rectangular):**
Diameter of Test Hole: 6"	**Length:**
Sandy Soil Criteria Test*:	**Width:**

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1	1:22	1:24	2	176.5	192.0	15.5	
2	1:24	1:26	2	176.0	192.0	16.0	

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	1:26	1:28	2	176.0	192.0	16.0	
2	1:28	1:30	2	176.0	192.0	16.0	
3	1:30	1:32	2	177.0	192.0	15.0	
4	1:32	1:34	2	177.0	192.0	15.0	
5	1:34	1:36	2	177.0	192.0	15.0	
6	1:36	1:38	2	177.0	192.0	15.0	
7	1:38	1:40	2	176.5	192.0	15.5	
8	1:40	1:42	2	177.0	192.0	15.0	
9	1:42	1:44	2	177.0	192.0	15.0	
10	1:44	1:46	2	176.5	192.0	15.5	
11	1:46	1:48	2	177.0	192.0	15.0	
12	1:48	1:50	2	177.0	192.0	15.0	
13	1:50	1:52	2	177.0	192.0	15.0	
14	1:52	1:54	2	177.0	192.0	15.0	
15	1:54	1:56	2	177.0	192.0	15.0	

COMMENTS:

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PERCOLATION TEST DATA

Client: Dawson Canyon, LLC	**Date**: 12/1/2020
Project No.: 21206-19	**Tested By**: D.L.
Test Hole: B-10	**USCS Soil Classification**:
Depth of Test Hole: 16'	**Sides (if rectangular)**:
Diameter of Test Hole: 6"	**Length**:
Sandy Soil Criteria Test*:	**Width**:

TRIAL NO.	START TIME	STOP TIME	TIME INTERVAL (MIN)	INITIAL DEPTH TO WATER (IN)	FINAL DEPTH TO WATER (IN)	CHANGE IN WATER LEVEL (IN)	GREATER THAN OR EQUAL TO 6"
1							
2							

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30-minute intervals) with a precision of at least 0.25".

TRIAL NO	START TIME	STOP TIME	ΔT TIME INTERVAL (MIN)	Do INITIAL DEPTH TO WATER (IN)	Df FINAL DEPTH TO WATER (IN)	ΔD CHANGE IN WATER LEVEL (IN)	PERCOLATION RATE (MIN/IN)
1	1:56	1:58	2	177.0	192.0	15.0	
2	1:58	2:00	2	177.0	192.0	15.0	
3	2:00	2:02	2	177.0	192.0	15.0	
4	2:02	2:04	2	177.0	192.0	15.0	
5	2:04	2:06	2	177.0	192.0	15.0	
6	2:06	2:08	2	176.5	192.0	15.5	
7	2:08	2:10	2	177.0	192.0	15.0	
8	2:10	2:12	2	177.0	192.0	15.0	
9	2:12	2:14	2	177.0	192.0	15.0	
10	2:14	2:16	2	177.0	192.0	15.0	
11	2:16	2:18	2	177.0	192.0	15.0	
12	2:18	2:20	2	177.0	192.0	15.0	
13	2:20	2:22	2	177.0	192.0	15.0	
14	2:22	2:24	2	177.0	192.0	15.0	
15	2:24	2:26	2	177.0	192.0	15.0	
COMMENTS:							

SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-1	B-2	B-3
• Depth =	7 ft.	11 ft.	15'
• Hole Dia. =	6 in.	6 in.	6 in.
• Drop = Δd	7.0 in.	2.0 in.	6.5 in.
• Time = Δt Interval	10 min.	10 min.	10 min.
• Preadjusted Perc. Rate	42 in/hr.	12 in/hr.	39 in/hr.
• Initial Water Depth = d_i	15.0 in.	15.5 in.	15.0 in.
• Reduction Factor = R_f	4.83	5.83	4.91
• INFILTRATION RATE	8.70 in/hr	2.06 in/hr	7.94 in/hr

$$\text{Infiltration Rate} = \frac{\text{Pre adjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_i - \Delta d}{\text{Dia.}}\right] + 1$$

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SOIL INFILTRATION RATE CALCULATIONS

DATE

SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-4	B-5	B-6
• Depth =	15 ft.	16 ft.	16 ft.
• Hole Dia. =	6 in.	6 in.	6 in.
• Drop = Δd	5.0 in.	4.5 in.	4.5 in.
• Time = Δt Interval	10 min.	30 min.	10 min.
• Preadjusted Perc. Rate	30 in/hr.	9 in/hr	27 in/hr.
• Initial Water Depth = d_i	15.0 in.	16.0 in	16.0 in.
• Reduction Factor = R_f	5.17	5.50	5.58
• INFILTRATION RATE	5.80 in/hr	1.65 in/hr	4.84 in/hr.

$$\text{Infiltration Rate} = \frac{\text{Pre-adjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_i - \Delta d}{\text{Dia.}}\right] + 1$$

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SOIL INFILTRATION RATE CALCULATIONS

SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-7	B-8	B-9
• Depth =	15 ft.	15 ft.	16 ft.
• Hole Dia. =	6 in.	6 in.	6 in.
• Drop = Δd	5.0 in.	15.0 in.	15.0 in.
• Time = Δt Interval	10 min.	6 min.	6 min
• Preadjusted Perc. Rate	30 in/hr	150 in/hr	150 in/hr
• Initial Water Depth = d_i	17.0 in.	15.0 in.	15.0 in
• Reduction Factor = R_f	5.83	3.50	3.50
• INFILTRATION RATE	5.15 in/hr	42.86 in/hr	42.86 in/hr.

$$\text{Infiltration Rate} = \frac{\text{Pre-adjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_i - \Delta d}{\text{Dia.}}\right] + 1$$

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SOIL INFILTRATION RATE CALCULATIONS

SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-10
• Depth =	16 ft.
• Hole Dia. =	6 in.
• Drop = Δd	15.0 in.
• Time = Δt Interval	2 min.
• Preadjusted Perc. Rate	450 in/hr.
• Initial Water Depth = d_i	15 in.
• Reduction Factor = R_f	3.50
• INFILTRATION RATE	128.57 in/hr.

$$\text{Infiltration Rate} = \frac{\text{Preadjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_i - \Delta d}{\text{Dia.}}\right] + 1$$

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DATE

SOIL INFILTRATION RATE CALCULATIONS

GEOTECHNICAL INVESTIGATION

Proposed Warehouse Development
Temescal Canyon Road and Park Canyon Road, Corona
County of Riverside, California

Proficiency Capital, LLC
5020 Campus Drive
Newport Beach, California 92660

Project Number 21206-19
July 16, 2019

NorCal Engineering

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS
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July 16, 2019 Project Number 21206-19

Proficiency Capital, LLC
5020 Campus Drive
Newport Beach, California 92660

Attn: Matt Englhard

RE: **GEOTECHNICAL INVESTIGATION** - Proposed Warehouse Development - Located at the Corner of Temescal Canyon Road and Park Canyon Road, Corona, in the County of Riverside, California

Dear Mr. Englhard:
Pursuant to your request, this firm has performed this Geotechnical Investigation for the above referenced project. The purpose of this investigation is to evaluate the geotechnical conditions of subject property and to provide recommendations for the proposed development. This geotechnical engineering report presents the findings of our study along with conclusions and recommendations for development.

1.0 STRUCTURAL CONSIDERATIONS

1.1 Proposed Development

It is currently proposed to develop the 71-acre site with concrete tilt-up warehouse buildings along with associated pavement and landscape areas. Grading for the development will include minor cut and fill procedures. Final building plans shall be reviewed by this firm prior to submittal for city approval to determine the need for any additional study and revised recommendations pertinent to the proposed development, if necessary.

2.0 SITE DESCRIPTION

The subject site is located at the corner of Temescal Canyon Road and Park Canyon Road in the Corona area of the County of Riverside. The parcel is relatively level with variable drainage patterns across the property. Some stockpiles of gravel base material are located in the central area of the site.

3.0 GEOLOGIC SETTING

The property is located in the Peninsular Ranges geomorphic province of California. The Peninsular Ranges province extends from the Los Angeles Basin southeast to Baja California and from the Pacific Ocean eastward to the Coachella Valley and Colorado Desert. The province consists of numerous northwest to southeast-trending mountain ranges and valleys that are geologically controlled by several major active faults. The subject site is located within and near the southwestern edge part of the Perris block, a generally stable area situated roughly midway between two of these major faults; the Chino /Elsinore and San Jacinto fault zones. More specifically, the property is situated on the ancient flood plain of the Temescal Wash drainage.

The USGS Open File Reports for the Lake Mathews 7.5' Quadrangle assigns the soil materials underlying the site as early Pleistocene to Holocene alluvial deposits. These sediments are, in turn, underlain by Cretaceous volcanic rocks and older metamorphic rocks. Relatively minor amounts of Paleocene sediments are mapped south of the site. The alluvium is described in general as unconsolidated to mostly well-dissected and well-indurated silt, sand and gravel deposits. Figure 1, Regional Geologic Map, shows the distribution of the alluvial sediments and bedrock in the vicinity of the property.

3.1 Faulting

The property is not located in an Alquist-Priolo (AP) earthquake fault zone. Several stereo pair aerial photographs, from the years 1948 to 2014, available online at HistoricAerials.com, were reviewed to evaluate for any lineaments or fault-related geomorphic features within, adjacent or trending towards the property. No indications of natural lineaments or other fault-related features indicative of Holocene or older faulting were noted. No indications of faulting were noted during our reconnaissance at and in the vicinity of the site. No faults are shown trending towards or through the site on the referenced geologic maps. Based on our evaluation, we conclude that there are no active or potentially active faults trending towards or through the property, and additional fault investigations are not necessary. The potential for surface fault rupture to occur at the site is considered low. The site is situated roughly 3,500 feet northeast of the active Elsinore fault zone. As is the case with most of southern California, the property is expected to experience strong ground shaking during the lifetime of the project.

3.2 Subsidence

According to the Riverside County Hazards report (Earth Consultants International, 2001), subsidence in Riverside County has been linked to significant fluctuations in groundwater levels within deep alluvial basins, and generally, the subsidence occurs throughout the valley region. Three areas have been identified with documented subsidence; the Elsinore Trough, the San Jacinto Valley, and the southern Coachella Valley. The property is not situated within any of the three areas of Riverside County associated with documented subsidence. The potential for subsidence to impact the site is considered low.

4.0 SEISMICITY DESIGN

The proposed development lies outside of any Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered unlikely.

The following seismic design parameters (printout attached Appendix A) are provided and are in accordance with the 2016 California Building Code (CBC) as determined using the ASCE 7 Hazard Tool (https://asce7hazardtool.online/) for the referenced project.

Seismic Design Parameters

Site Location – Region 1	Latitude	33.781°
	Longitude	-117.484°
Seismic Use Group		II
Site Class		D
Risk Category		I/II/III
Maximum Spectral Response Acceleration	S_S	2.291g
	S_1	0.901g
Adjusted Maximum Acceleration	S_{MS}	2.291g
	S_{M1}	1.352g
Design Spectral Response Acceleration Parameters	S_{DS}	1.527g
	S_{D1}	0.901g

The Elsinore Fault (Glen Ivy) is capable of producing a Magnitude 6.8 earthquake. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults.

5.0 LIQUEFACTION EVALUATION

The site is expected to experience ground shaking and earthquake activity that is typical of the Southern California area. It is during severe ground shaking that loose, granular soils below groundwater can liquify. Based upon information in the Riverside County *Generalized Liquefaction Map*, dated December 13, 2013, the subject site is situated in an area of generalized low/very low liquefaction potential.

The design of the proposed development in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards typical to this region.

6.0 FIELD INVESTIGATION

6.1 Site Exploration

The investigation consisted of the placement of thirty-five (35) subsurface excavations by backhoe. Explorations extended to a maximum depth of 20.5 feet below current ground elevations. The explorations were placed at accessible locations throughout the site.

The explorations were visually classified and logged by a field engineer with locations of the subsurface excavations are shown on the attached Figure 2. Detailed descriptions of the subsurface conditions are listed on the logs in Appendix B. It should be noted that the transition from one soil type to another as shown on the excavation logs is approximate and may in fact be a gradual transition. The soils encountered are described as follows:

Fill Soils– Fill soils generally classifying as silty SAND to sandy SILT with some gravel, cobbles, concrete pieces and other minor debris were encountered in the explorations to depths ranging from 1.5 to 12 feet. These soils were noted to be variable in density and damp to moist.

Native Soils – Native soils classifying as slightly silty to silty SAND and sandy SILT with gravel and occasional cobbles were encountered beneath the upper fill soils. Cobble content increased with depth in some of the excavations and some boulders were also encountered with depth in T-19, T-21 and T-22. These soils were noted to be medium dense/stiff to dense/stiff and damp. Some lenses of silts and clays were noted in some of the excavations as well. It also appears bedrock may be located at approximately 10 feet below grade in the southern portion of the site. Backhoe pits met refusal at this depth in the area and this is the area where some perched water was found at the contact (see Section 6.2 below).

6.2 Groundwater

Groundwater in the vicinity is in excess of 50 feet below grade. Some minor seeping of perched water was found in our excavations T-19, T-20 and T-21 at 9 to 10 feet below grade.

7.0 LABORATORY TESTS

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These relatively undisturbed ring samples were obtained by driving a thin-walled steel sampler lined with one-inch long brass rings with an inside diameter of 2.42 inches into the undisturbed soils.

Bulk bag samples were obtained in the upper soils for expansion index tests, Atterberg limits tests, corrosion tests, resistance value and maximum density tests. Wall loadings on the order of 4,000 lbs./lin.ft. and maximum compression loads on the order of 100 kips were utilized for testing and design purposes. All test results are included in Appendix C, unless otherwise noted.

7.1 **Field moisture content** (ASTM:D 2216-10) and the dry density of the ring samples were determined in the laboratory. This data is listed on the logs of explorations.

7.2 **Maximum density tests** (ASTM: D-1557-12) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

7.3 **Expansion index tests** (ASTM: D-4829-11) were performed on remolded samples of the upper soils to determine the expansive characteristics and to provide any necessary recommendations for reinforcement of the slabs-on-grade and the foundations. Results of these tests are provided on Table II and are discussed later in this report.

7.4 **Atterberg Limits** (ASTM: D 4318-10) consisting of liquid limit, plastic limit and plasticity index were performed on representative soil samples. Results are shown on Table III.

7.5 **Direct shear tests** (ASTM: D-3080-11) were performed on undisturbed and/or remolded samples of the subsurface soils. These tests were performed to determine parameters for the calculation of the allowable soil bearing capacity. The test is performed under saturated conditions at loads of 1,000 lbs./sq.ft., 2,000 lbs./sq.ft., and 3,000 lbs./sq.ft. with results shown on Plates A-D.

7.6 **Consolidation tests** (ASTM: D-2435-11) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates E-H.

7.7 **Soluble sulfate, pH, Resistivity and Chloride tests** to determine potential corrosive effects of soils on concrete and metal structures were performed in the laboratory. Test results are given in Tables III – VI and are discussed later in this report.

7.8 **Resistance 'R' Value tests** (CA 301) were conducted on a representative soil sample to determine preliminary pavement section design for the proposed pavement areas. Test results are provided in Table VIII and recommended pavement sections are provided later within the text of this report.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures and grading will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed grading and development shall meet all requirements of the County Building Ordinance and will not impose any adverse effect on existing adjacent land or structures.

The following recommendations are based upon soil conditions encountered in our field investigation; these near-surface soil conditions could vary across the site. Variations in the soil conditions may not become evident until the commencement of grading operations for the proposed development and revised recommendations from the soils engineer may be necessary based upon the conditions encountered.

8.1 Site Grading Recommendations

It is recommended that site inspections be performed by a representative of this firm during all grading and construction of the development to verify the findings and recommendations documented in this report. Any unusual conditions which may be encountered in the course of the project development may require the need for additional study and revised recommendations.

Any vegetation and organic laden soils shall be removed and hauled from proposed grading areas prior to and during the grading operations if encountered. Existing vegetation shall not be mixed or disced into the soils. Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Grading operations shall be performed in accordance with the attached *Specifications for Placement of Compacted Fill.*

8.1.1 **Removal and Recompaction Recommendations**

The upper existing fill soils (2 to 12 feet) shall be removed to competent native materials, the exposed surface scarified to a depth of 8 inches, brought to within 2% of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557-12) prior to placement of any additional compacted fill soils and pavement. *The upper 12 inches of soils beneath building pad and concrete paving shall be compacted to a minimum of 95%.* Grading shall extend a minimum of 5 horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater. Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase.

Adequate drainage away from the structures, pavement and slopes should be provided at all times per the current building code.

It is likely that isolated areas of undiscovered fill not described in this report or materials disturbed during demolition operations will be encountered on site; if found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction. Abandonment procedures will be provided once underground structures are encountered.

If placement of slabs-on-grade and pavement is not performed immediately upon completion of grading operations, additional testing and grading of the areas may be necessary prior to continuation of construction operations. Likewise, if adverse weather conditions occur which may damage the subgrade soils, additional assessment by the soils engineer as to the suitability of the supporting soils may be needed.

8.1.2 **Fill Blanket Recommendations**

Due to the potential for differential settlement of structures supported on both compacted fill and native soils, it is recommended that all building foundations be underlain by a uniform compacted fill blanket at least 2 feet in thickness. The fill blanket shall extend a minimum of 5 horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

Building floor slabs should also be underlain by a minimum of 2 feet of compacted fill soils.

8.1.3 **Shrinkage and Subsidence**

Results of our in-place density tests reveal that the soil shrinkage will be on the order of 10 to 15% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of the maximum dry density per ASTM standards. Subsidence should be 0.15 feet due to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements or topographic approximations.

Although these values are only approximate, they represent our best estimate of shrinkage values which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing using the actual equipment and grading techniques should be conducted.

8.2 **Temporary Excavations and Shoring Design**

Temporary unsurcharged excavations less than 4 feet in height may be excavated at vertical inclinations. Unsurcharged excavations over 4 feet and not in excess of 10 feet in height in the existing site materials may be trimmed at a 1 to 1 (horizontal to vertical) gradient for the entire height of the cut. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring, slot-cutting, or flatter excavations may be required.

The temporary cut slope gradients given above do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of the soils engineer, CAL-OSHA and other public agencies having jurisdiction.

Temporary shoring design may utilize an active earth pressure of 25 pcf without any surcharge due to adjacent traffic, equipment or structures. The passive fluid pressures of 250 pcf may be doubled to 500 pcf for temporary design.

8.3 Foundation Design

All foundations may be designed utilizing the following allowable soil bearing capacities for an embedded depth of 18 inches into approved compacted fill materials with the corresponding widths. Footings shall not traverse from compacted fill to native soils due to the potential for differential settlement of structures.

Allowable Soil Bearing Capacity (psf)

Width (ft)	Continuous Foundation	Isolated Foundation
1.5	2000	2500
2.0	2100	2600
4.0	2500	2900
6.0	2900	3400

The bearing value may be increased by 500 psf for each additional foot of depth in excess of the 18-inch minimum depth, up to a maximum of 4500 psf. Property line screen wall foundations where proper overexcavation and recompaction is not possible due to property line restrictions may be designed using a reduced allowable soil bearing capacity of 1,500 psf for foundations a minimum of 18 inches in depth *and* at least 8 inches into the underlying medium dense native soils. A one-third increase may be used when considering short term loading from wind and seismic forces.

Continuous foundations shall be reinforced with a minimum of 2-#4 steel bars top and 2 bottom. Spread foundations may be reinforced at the discretion of the structural engineer. Additional reinforcement may be necessary due to soil expansion or proposed loadings and shall be further evaluated by the project engineers and/or architect. A representative of this firm shall observe foundation excavations prior placement of steel reinforcement and concrete.

8.4 Settlement Analysis

Resultant pressure curves for the consolidation tests are shown on Plates E-H. Computations utilizing these curves and the recommended allowable soil bearing capacities reveal that the foundations will experience normal settlements on the order of ¾ inch and differential settlements of less than ¼ inch.

8.5 Lateral Resistance

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the California Building Code should be adhered to when the coefficient of friction and passive pressures are combined.

Coefficient of Friction - 0.40
Equivalent Passive Fluid Pressure = 250 lbs./cu.ft.
Maximum Passive Pressure = 2,500 lbs./cu.ft.

The passive pressure recommendations are valid only for approved compacted fill soils or competent native ground.

8.6 **Retaining Wall Design Parameters**

Active earth pressures against retaining walls will be equal to the pressures developed by the following fluid densities. These values are for **granular backfill material** placed behind the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical)	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. All walls shall be waterproofed as needed and protected from hydrostatic pressure by a reliable permanent subdrain system.

During a local Magnitude 6.8 earthquake along the Elsinore fault zone, additional lateral pressures will occur along the back of walls retaining 6 feet or more of soil. The seismic-induced lateral soil pressure may be computed using a triangular pressure distribution with the maximum value at the top of the wall. The maximum lateral pressure of (20 pcf) H where H is the height of the retained soils above the wall footing should be used in final design of retaining walls.

Sliding resistance values and passive fluid pressure values given in our previous report may be increased by 1/3 during short-term wind and seismic loading conditions.

8.7 **Floor Slab Design**

Concrete floor slabs-on-grade shall be a minimum of 4 and 6 inches in thickness in office and warehouse areas, respectively, and may be placed upon fill soils compacted to a minimum of *95%* relative compaction. Soils should be brought to near-optimum moisture levels prior to placement of concrete, as verified by the soil engineer. Slabs-on-grade shall be reinforced with a minimum of #3 steel bars placed at 18 inches on-center, both directions, positioned mid-height in the slab. Slabs 7 inches in thickness may delete the reinforcement requirement. Additional reinforcement requirements and an increase in thickness of the slabs-on-grade may be necessary based upon soils expansion potential at the conclusion of grading and proposed loading conditions in the structures and should be evaluated further by the project engineers and/or architect.

A vapor retarder should be utilized in areas which would be sensitive to the infiltration of moisture. This retarder shall meet requirements of ASTM E 96, *Water Vapor Transmission of Materials* and ASTM E 1745, *Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.* The vapor retarder shall be installed in accordance with procedures stated in ASTM E 1643, *Standard practice for Installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs*.

The moisture retarder may be placed upon 4 inches of sand or gravel. The surface upon which the retarder is placed shall be smooth and free of rocks, gravel or other protrusions which may damage the retarder. Use of sand above the retarder is under the purview of the structural engineer; if sand is used over the retarder, it should be placed in a dry condition.

All concrete slab areas to receive floor coverings should be moisture tested to meet all manufacturer requirements prior to placement.

8.8 **Expansive Soil**

The upper soils at the site are very low (Expansion Index = 0-20) to low (21-50) in expansion potential. Sites with expansive soils (Expansion Index >20) require special attention during project design and maintenance. The attached *Expansive Soil Guidelines* should be reviewed by the engineers, architects, owner, maintenance personnel and other interested parties and considered during the design of the project and future property maintenance.

8.9 **Utility Trench and Excavation Backfill**

Trenches from installation of utility lines and other excavations may be backfilled with on-site soils or approved imported soils compacted to a minimum of 90% relative compaction. All utility lines shall be properly bedded and shaded with clean sand having a sand equivalency rating of 30 or more. This material shall be thoroughly water jetted around the pipe structure prior to placement of compacted backfill soils.

8.10 **Corrosion Design Criteria**

Representative samples of the surficial soils revealed negligible sulfate concentrations and no special concrete design recommendations are deemed necessary at this time. It is recommended that additional sulfate tests be performed at the completion of rough grading to assure that the as graded conditions are consistent with the recommendations stated in this design. Sulfate test results may be found on the attached Table IV.

Tests were also conducted on a random representative sample of soils to determine the potential corrosive effects on buried metallic structures. Tests for pH, resistivity and chloride are included on Tables V – VII. Soil pH indicates a slightly acidic condition. Resistivity is representative of corrosive soils and metallic structures should be protected as necessary. Chloride content measured 351 ppm.

A corrosion engineer may be consulted regarding protection of buried metallic piping.

8.11 **Preliminary Pavement Design**

The table below provides a preliminary pavement design based upon a tested R-Value of 16 for the proposed pavement areas. Final pavement design should be based on R-Value testing of the subgrade soils near the conclusion of rough grading to assure that the as-graded conditions are consistent with those used in this preliminary design.

On-Site Flexible (Asphaltic) Pavement Section Design

Type of Traffic	Traffic Index	Inches Asphalt	Inches Base
Auto Parking/Circulation	5.0	3.5	7.0
Truck	7.0	5.0	12.5

Subgrade soils to receive base material shall be compacted to a minimum of 90% relative compaction; base material shall be compacted to at least 95%. Any concrete slab-on-grade in pavement areas may be placed on subgrade soils compacted to at least 95% relative compaction and shall be a minimum of 6 inches in thickness and reinforced with a minimum of #3 steel bars placed at 18 inches on-center, both directions, positioned mid-height in the slab. Slabs 7 inches in thickness may delete the reinforcement requirement.

An increase in slab thickness and placement of steel reinforcement due to loading conditions and soil expansion may be necessary and should be reviewed by the structural engineer.

The above recommendations are based upon estimated traffic loadings. Client should submit anticipated traffic loadings for the pavement areas to the soils engineer, when available, so that pavement sections may be reviewed to determine adequacy to support the proposed loadings.

9.0 INFILTRATION TESTING

Five test locations were excavated to determine the infiltration rate of the proposed infiltration/bio-retention systems. The test locations were excavated by backhoe to depths ranging from 5 to 10 feet below existing ground surface (bgs). Excavations were trimmed at 1:1 (horizontal to vertical) inclinations in order to provide safe entry into the excavations.

The infiltration test consisted of the double ring infiltration test per ASTM Method D 3385. The double ring infiltrometer method consists of driving two open cylinders, one inside the other, into the ground, partially filling the ring with water, and then maintaining the liquid at a constant level. The volume of liquid added to the inner ring, to maintain the liquid level constant is the measure of the volume of liquid that infiltrates into the soil.

The volume infiltrated during timed intervals is converted to an incremental infiltration velocity, usually expressed in centimeters per hour or inches per hour and plotted verses elapsed time. The maximum-steady state or average incremental infiltration velocity, depending on the purpose/application of the test is equivalent to the infiltration rate.

Water levels were maintained at a constant level in both the inner ring and annular space between rings throughout the test, to prevent flow of water from one ring to the other.

The volume of liquid used during each measured time interval was converted into an incremental infiltration velocity of both the inner ring in the annular space using the following equations:

For the inner ring calculated as follows:

$Vir=\Delta Vir/(Air\Delta t)$

where:

Vir = inner ring incremental infiltration velocity, cm/hr

ΔVir = volume of water used during time interval to maintain constant head in the inner ring, cm^3

Air = internal area of the inner ting, cm^2

Δt = time interval, hr

An average of the final readings obtained was used for design purposes in each of the basins. The testing data sheets are attached in Appendix D and summarized in the *Discussion of Results* section below.

The use of on-site disposal system by means of retention/infiltration basins or chambers appears to be geotechnically feasible for future development in all areas except test T-3 where very low infiltration rates were encountered. The field infiltration rates given below may be utilized in the final basin design with a safety factor of 2.0 or greater.

Test No.	Depth (feet bgs)	Soil Type	Infiltration Rate (cm/hr)	(in/hr)
T-3	5.0	sandy Silt	0.5	0.2
T-12	7.0	silty Sand	181.5	72.6
T-15	5.0	silty Sand	44.2	17.7
T-29	6.0	sandy Silt	8.1	3.2
T-33	10.0	sandy Silt	5.9	2.4

It is our opinion that the site is generally suitable for stormwater infiltration without increasing the potential of settlement of proposed and existing structures or adversely affecting retaining/basement walls located either on or adjacent to the subject site. In addition, the potential for hydro-consolidation and the susceptibility for any ground settlements are considered low. All systems shall meet the California Regional Water Quality Control Board (CRWQCB) requirements.

10.0 CLOSURE

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase. It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project.

This firm should have the opportunity to review the final plans (72 hours for review required) to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

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SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Excavation
Any existing low-density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-12).

In any area where a transition between fill and native soil or between bedrock and soil are encountered, additional excavation beneath foundations and slabs will be necessary in order to provide uniform support and avoid differential settlement of the structure. Verification of elevations during grading operations will be the responsibility of the owner or his designated representative.

Material For Fill
The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 72 hours prior to importation of site.

Placement of Compacted Fill Soils
The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 2% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-12) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24-hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

EXPANSIVE SOIL GUIDELINES

The following expansive soil guidelines are provided for your project. The intent of these guidelines is to inform you, the client, of the importance of proper design and maintenance of projects supported on expansive soils. ***You, as the owner or other interested party, should be warned that you have a duty to provide the information contained in the soil report including these guidelines to your design engineers, architects, landscapers and other design parties in order to enable them to provide a design that takes into consideration expansive soils.***

In addition, you should provide the soil report with these guidelines to any property manager, lessee, property purchaser or other interested party that will have or assume the responsibility of maintaining the development in the future.

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. Expansive soils are divided into five categories ranging from "very low" to "very high". Expansion indices are assigned to each classification and are included in the laboratory testing section of this report. *If the expansion index of the soils on your site, as stated in this report, is 21 or higher, you have expansive soils.* The classifications of expansive soils are as follows:

Classification of Expansive Soil*

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

*From Table 18A-I-B of California Building Code (1988)

When expansive soils are compacted during site grading operations, care is taken to place the materials at or slightly above optimum moisture levels and perform proper compaction operations. Any subsequent excessive wetting and/or drying of expansive soils will cause the soil materials to expand and/or contract. These actions are likely to cause distress of foundations, structures, slabs-on-grade, sidewalks and pavement over the life of the structure. ***It is therefore imperative that even after construction of improvements, the moisture contents are maintained at relatively constant levels, allowing neither excessive wetting or drying of soils.***

Evidence of excessive wetting of expansive soils may be seen in concrete slabs, both interior and exterior. Slabs may lift at construction joints producing a trip hazard or may crack from the pressure of soil expansion. Wet clays in foundation areas may result in lifting of the structure causing difficulty in the opening and closing of doors and windows, as well as cracking in exterior and interior wall surfaces. In extreme wetting of soils to depth, settlement of the structure may eventually result. Excessive wetting of soils in landscape areas adjacent to concrete or asphaltic pavement areas may also result in expansion of soils beneath pavement and resultant distress to the pavement surface.

Excessive drying of expansive soils is initially evidenced by cracking in the surface of the soils due to contraction. Settlement of structures and on-grade slabs may also eventually result along with problems in the operation of doors and windows.

Projects located in areas of expansive clay soils will be subject to more movement and "hairline" cracking of walls and slabs than similar projects situated on non-expansive sandy soils. There are, however, measures that developers and property owners may take to reduce the amount of movement over the life the development. The following guidelines are provided to assist you in both design and maintenance of projects on expansive soils:

- Drainage away from structures and pavement is essential to prevent excessive wetting of expansive soils. Grades of at least 3% should be designed and maintained to allow flow of irrigation and rain water to approved drainage devices or to the street. Any "ponding" of water adjacent to buildings, slabs and pavement after rains is evidence of poor drainage; the installation of drainage devices or regrading of the area may be required to assure proper drainage. Installation of rain gutters is also recommended to control the introduction of moisture next to buildings. Gutters should discharge into a drainage device or onto pavement which drains to roadways.

- Irrigation should be strictly controlled around building foundations, slabs and pavement and may need to be adjusted depending upon season. This control is essential to maintain a relatively uniform moisture content in the expansive soils and to prevent swelling and contracting. Over-watering adjacent to improvements may result in damage to those improvements. NorCal Engineering makes no specific recommendations regarding landscape irrigation schedules.

- Planting schemes for landscaping around structures and pavement should be analyzed carefully. Plants (including sod) requiring high amounts of water may result in excessive wetting of soils. Trees and large shrubs may actually extract moisture from the expansive soils, thus causing contraction of the fine-grained soils.

- Thickened edges on exterior slabs will assist in keeping excessive moisture from entering directly beneath the concrete. A six-inch thick or greater deepened edge on slabs may be considered. Underlying interior and exterior slabs with 6 to 12 inches or more of non-expansive soils and providing presaturation of the underlying clayey soils as recommended in the soil report will improve the overall performance of on-grade slabs.

- Increase the amount of steel reinforcing in concrete slabs, foundations and other structures to resist the forces of expansive soils. The precise amount of reinforcing should be determined by the appropriate design engineers and/or architects.

- Recommendations of the soil report should always be followed in the development of the project. Any recommendations regarding presaturation of the upper subgrade soils in slab areas should be performed in the field and verified by the Soil Engineer.

REFERENCES

1. California Building Code, 2016.

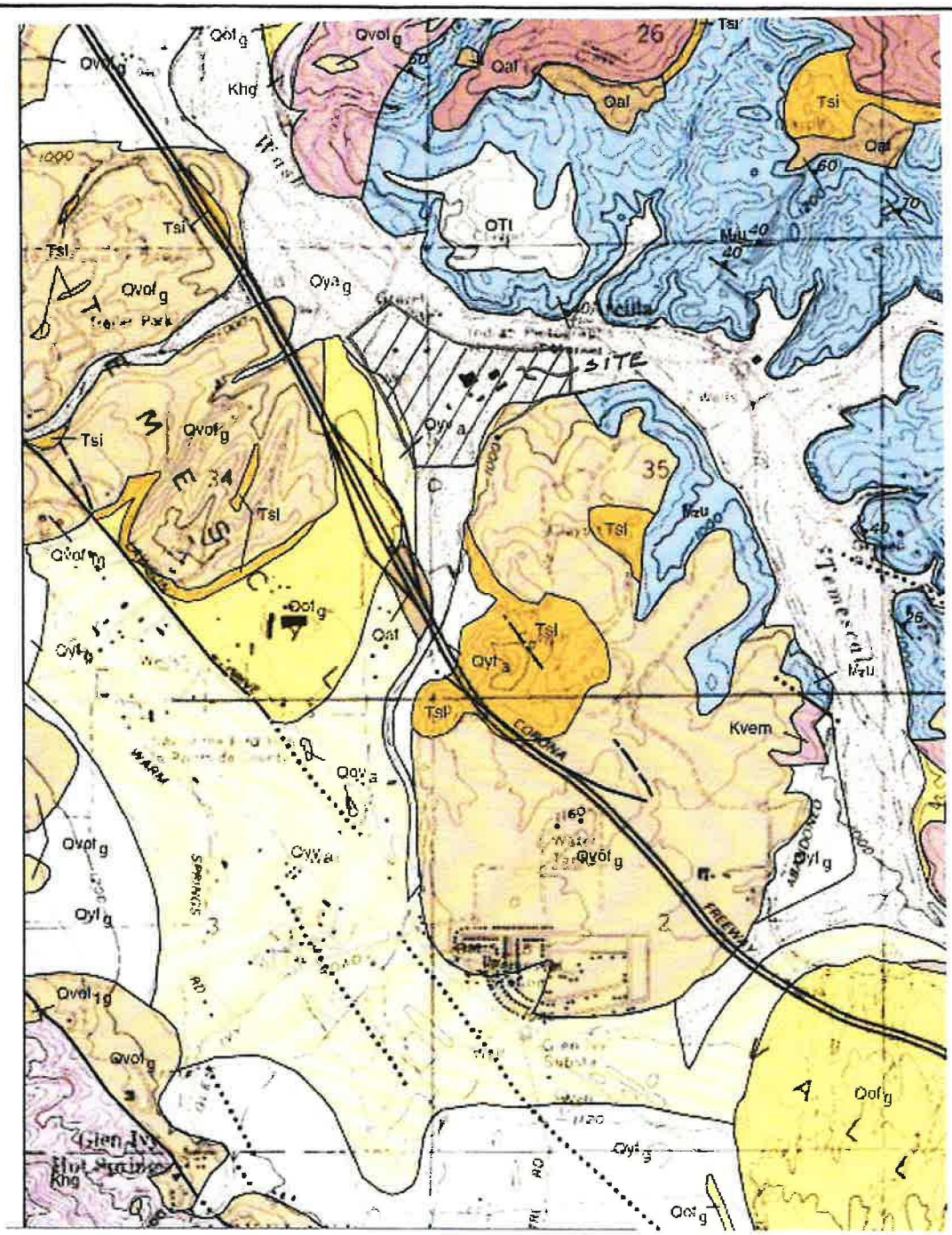
2. California Division of Mines and Geology, 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California: Special Publication 117.

3. International Conference of Building Officials, Uniform Building Code UBC, 2009.

4. ACI Building Code Requirements for Structural Concrete (ACI 318-05) and Commentary (ACI 318R-05), 2005.

5. Geologic Map of the Lake Mathews 7.5' Quadrangle, Riverside County, California, Morton, D.M. and Weber, F.H., 2001, published by the United States Geological Survey as Open File Report 01-479

6. *State of California, Special Studies Zones, Lake Mathews Quadrangle,* January 1, 1980, available through the California Geological Survey



LEGEND

Qya, Qyv, Qvof	ALLUVIUM
Tsi	Silverado Formation
Kvem	Volcanic Rock
MzU	Metamorphic Rock

N

0 2000'

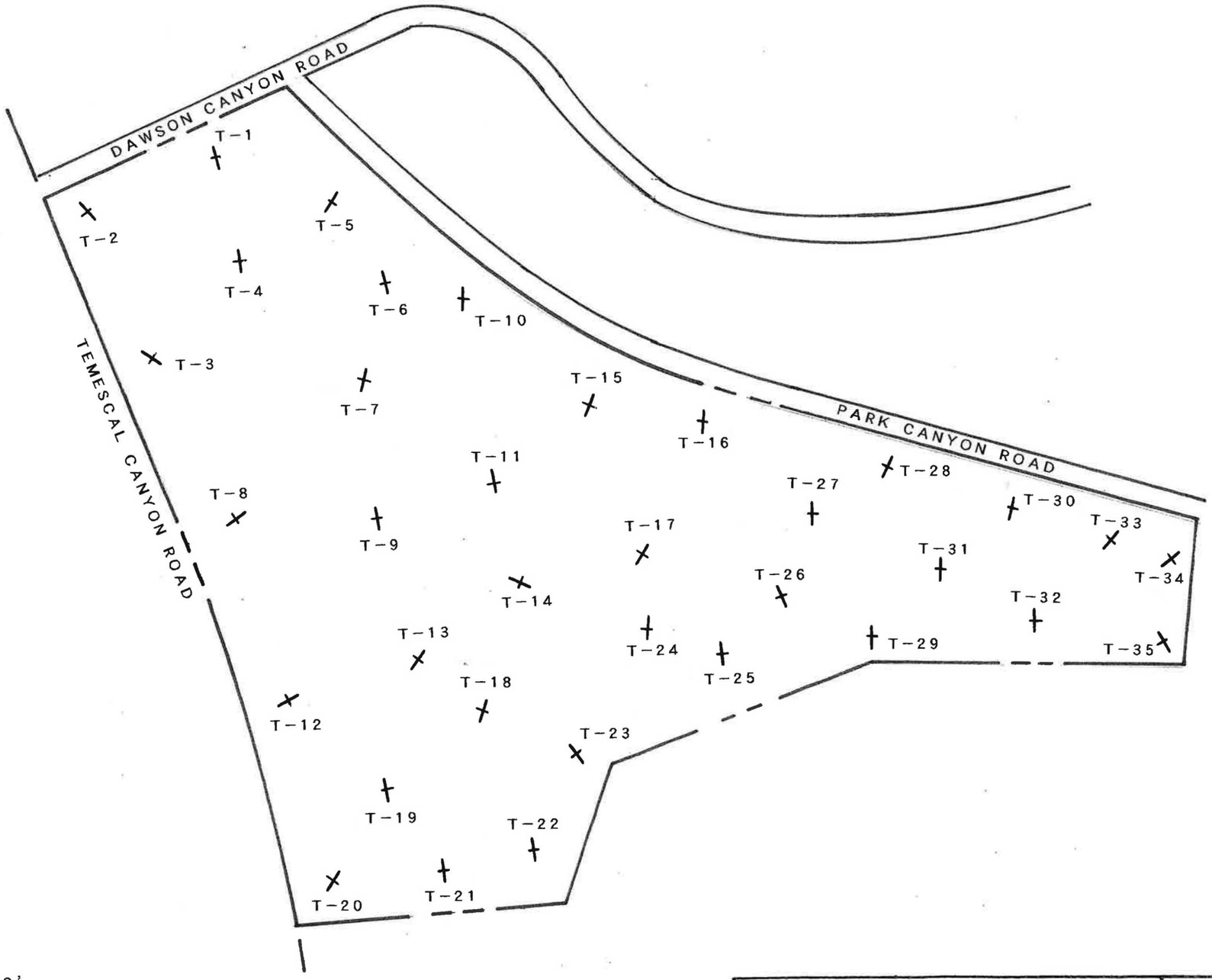
Portion of: *Geologic Map of the Lake Mathews 7.5' Quadrangle, Riverside County, California,* Morton, D.M. and Weber, F.H., 2001

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SOILS AND GEOTECHNICAL CONSULTANTS

GEOLOGIC MAP

PROJECT 21206-19 | DATE 7/2019

FIG. 1



N

0 300'

SCALE

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 21206-19 DATE 7/2019

APPROXIMATE LOCATIONS OF SOIL BORINGS

FIG. 2

APPENDICES

(In order of appearance)

Appendix A – Seismic Design

Appendix B –Logs of Test Explorations
***Logs of Test Excavations T-1 to T-35**

Appendix C - Laboratory Analysis
***Table I - Maximum Dry Density Tests**
***Table II - Expansion Index Tests**
***Table III - Atterberg Limits Tests**
***Table IV - Sulfate Tests**
***Table V - pH Tests**
***Table VI - Resistivity Tests**
***Table VII - Chloride Tests**
***Table VIII - Resistance 'R' Value Tests**

***Plates A-D - Direct Shear Tests**
***Plates E-H - Consolidation Tests**

Appendix D – Infiltration Test Data

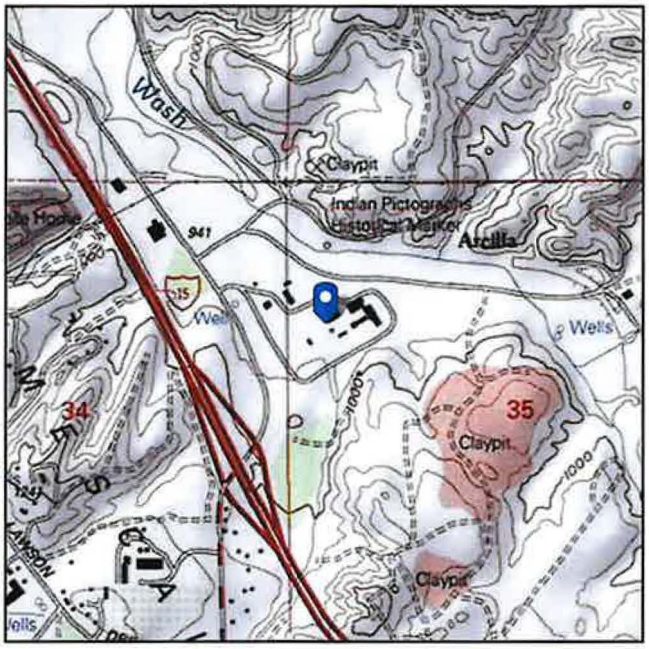
APPENDIX A

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 954.27 ft (NAVD 88)
Latitude: 33.781
Longitude: -117.484





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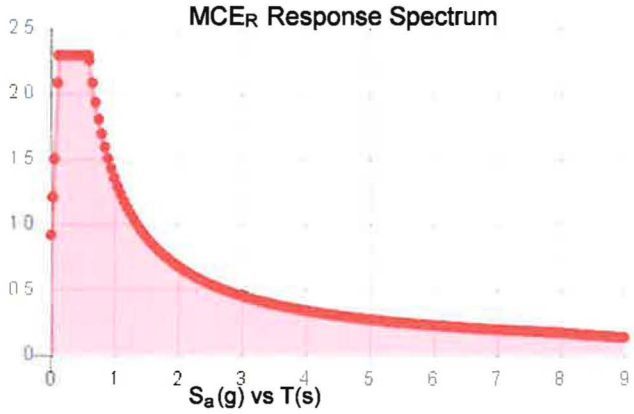
Seismic

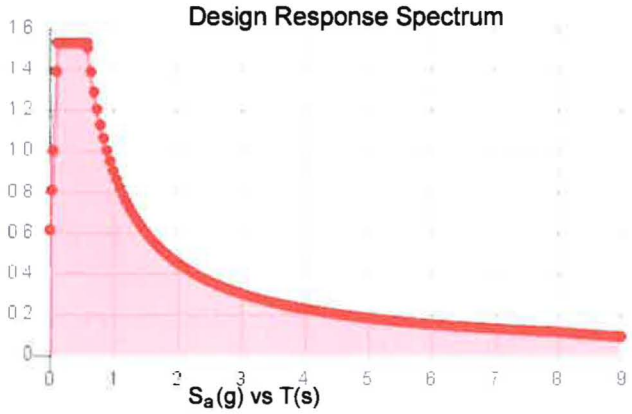
Site Soil Class: D - Stiff Soil

Results:

S_S :	2.291	S_{DS} :	1.527
S_1 :	0.901	S_{D1} :	0.901
F_a :	1	T_L :	8
F_v :	1.5	PGA :	0.88
S_{MS} :	2.291	PGA_M :	0.88
S_{M1} :	1.352	F_{PGA} :	1
		I_e :	1.25

Seismic Design Category E





Data Accessed: Sun Jul 14 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

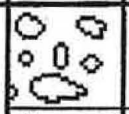
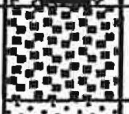
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APPENDIX B

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- ■ Indicates 2.5-inch Inside Diameter. Ring Sample.
- ⊠ Indicates 2-inch OD Split Spoon Sample (SPT).
- ⧅ Indicates Shelby Tube Sample.
- ◫ Indicates No Recovery.
- ◧ Indicates SPT with 140# Hammer 30 in. Drop.
- ☒ Indicates Bulk Sample.
- ◩ Indicates Small Bag Sample.
- ◨ Indicates Non-Standard
- ⊠ Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

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21206-19

Log of Trench T-1

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty (fine grained) SAND with gravel, some cobbles and some concrete pieces Brown, loose to medium dense, dry to moist	■		10.2	113.2	
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, moist	☑		4.5		
		Slightly silty (medium to coarse grained) SAND with gravel and occasional cobbles Brown, medium dense, damp					
10		Trench completed at depth of 6'					
15							
20							
25							
30							
35							

GWT not encountered

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Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Slightly silty SAND with gravel and some small cobbles Light brown to brown, loose to medium dense, dry to damp	▽				
5		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with gravel, small cobbles Brown, dense, damp	■		3.2	124.0	
		Fine to coarse grained, Silty SAND with gravel Brown, dense, moist					
10		Clayey SAND with gravel Dark brown, dense, moist	■		10.0	124.0	
15		Slightly silty (medium to coarse grained) SAND with gravel, small cobbles Light brown to brown, dense, damp Some lenses of clayey SAND noted	■		3.0	118.0	
20		Trench completed at depth of 20.5'	■		4.5	108.4	
25							
30							
35							

GWT not encountered

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21206-19

Log of Trench T-3

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, small cobbles and some concrete pieces Brown, medium dense, damp					
		GWT not encountered					
		NATURAL SOILS Sandy SILT with gravel, small cobbles Brown, medium stiff, damp	☑		4.4		
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

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Log of Trench T-4

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Gravelly Silty SAND Brown, medium dense, dry	■		3.3	113.9	
5		NATURAL SOILS Sandy SILT with occasional gravel Brown, medium stiff, damp	■		5.3	96.3	
10		Slightly silty (fine to coarse grained) SAND with gravel and some small cobbles Brown, medium dense, damp Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

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Log of Trench T-5

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and some cobbles Brown, medium dense, damp					
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp	■		7.7	110.4	
			■		8.1	116.6	
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

Date: 7/16/2019 File: C:\Superlog4\PROJECT\21206-19.log

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21206-19

Log of Trench T-6

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, loose to medium dense, dry to damp					
		GWT not encountered					
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, dense, damp Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

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Log of Trench T-7

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, loose to medium dense, damp	☑				
5		GWT not encountered NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
10		Slightly silty (fine to coarse grained) SAND with gravel and occasional small cobbles Brown, medium dense, damp Trench completed at depth of 8'					
15							
20							
25							
30							
35							

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Log of Trench T-8

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and occasional small cobbles Brown, dense, dry to damp					
5		GWT not encountered NATURAL SOILS Slightly silty SAND with occasional small cobbles Brown, medium dense, moist	■		2.9	106.8	
		Silty SAND with occasional gravel and some cobbles Brown, medium dense, damp	■		5.4	107.2	
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Proficiency Capital, LLC 21206-19	Log of Trench T-9

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/11/19	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles and occasional wood pieces Brown, dense, dry to moist	■		11.2	100.4	
		NATURAL SOILS Silty (fine grained) SAND to Sandy SILT with gravel and small cobbles Brown, medium dense/stiff, moist	■		10.7	96.1	
5		Trench completed at depth of 6'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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21206-19

Log of Trench T-10

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, medium dense, dry to damp					
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, moist	■		8.7	111.2	
		Slightly silty (medium to coarse grained) SAND with cobbles Brown, medium dense, damp	▽		3.9		
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

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Log of Trench T-11

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, medium dense, dry to damp					
5		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with small cobbles Light brown to brown, medium dense, damp	☑		3.9		
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

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Proficiency Capital, LLC 21206-19	Log of Trench T-12

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/11/19	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
5		GWT not encountered NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
		Trench completed at depth of 7'	☑		7.3		
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC
21206-19

Log of Trench T-13

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, concrete pieces and wire Brown, loose to medium dense, dry to damp					
5		GWT not encountered NATURAL SOILS Slightly silty (medium to coarse grained) SAND with small cobbles Brown, medium dense, dry to damp	☑		2.3		
10		Trench completed at depth of 10'	☑		1.9		
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-14

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/11/19	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty (medium to coarse grained) SAND with gravel, some cobbles and some concrete pieces Brown, loose to medium dense, dry to moist					
5		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, moist	■		2.8	110.1	
		Slightly silty (medium to coarse grained) SAND with gravel and occasional cobbles Brown, medium dense, damp Increase in cobbles with depth	☑		2.4		
10			☑		2.4		
15			☑		4.3		
20		Trench completed at depth of 20.5'	☑		5.1		
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC
21206-19

Log of Trench T-15

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, medium dense, dry to damp					
5	GWT not encountered	NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, dry Trench completed at depth of 5'	☑		1.6		
10							
15							
20							
25							
30							
35							

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NorCal Engineering

Proficiency Capital, LLC 21206-19	Log of Trench T-16

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, rock, small cobbles and wood pieces Brown, medium dense, dry to moist with depth Very dense below 24"					
5		GWT not encountered					
10			▽		13.4		
			■		11.7	116.2	
		NATURAL SOILS Clayey SAND with occasional gravel and some small cobbles Brown, dense, moist					
15		Trench completed at depth of 14'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

NorCal Engineering

Proficiency Capital, LLC 21206-19	Log of Trench T-17

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	**Groundwater Depth:** None Encountered
Drilling Method: Backhoe	
Hammer Weight:	**Drop:**
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Sandy CLAY with gravel and rock Brown, medium dense, moist	☑				
5		GWT not encountered FILL SOILS Silty SAND with gravel and small cobbles Dark brown, medium dense, damp Some organic odor noted	☑		5.2		
10		NATURAL SOILS Slightly (medium to coarse grained) SAND with gravel, small cobbles Light brown, medium dense, damp	☑		2.6		
15		Trench completed at depth of 12'					
20							
25							
30							
35							

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NorCal Engineering

Proficiency Capital, LLC
21206-19

Log of Trench T-18

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Slightly silty SAND with gravel, small cobbles Brown, loose, dry					
		GWT not encountered					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp					
10		Trench completed at depth of 10'	☑		7.7		
15							
20							
25							
30							
35							

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NorCal Engineering

Proficiency Capital, LLC 21206-19	Log of Trench T-19
Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	Groundwater Depth: 9' (seeping)
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty (fine grained) SAND with gravel, some cobbles and some concrete pieces Brown, medium dense, dry to damp	■		13.8	119.1	
5		NATURAL SOILS Fine grained Sandy SILT with occasional gravel Brown, stiff, moist Slightly silty (medium to coarse grained) SAND with cobbles Brown, dense, damp					
10		Refusal at depth of 10' (possible bedrock)	▽		6.0		
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-20

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	Groundwater Depth: 10' (seeping)
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND to Clayey sandy SILT with gravel and small concrete pieces Brown, medium stiff, damp					
		FILL SOILS Clayey SILT with occasional gravel Brown, stiff, moist	■		23.2	100.0	
5		Sandy SILT with Silty SAND Brown, medium stiff/dense, damp	■		15.7	110.3	
		Fine grained Silty SAND Brown, medium dense, moist Wet @ 6'					
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Proficiency Capital, LLC 21206-19	Log of Trench T-21
Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/11/19	Groundwater Depth: 10' (seeping)
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and rock Brown, medium dense, dry					
		NATURAL SOILS Silty SAND with gravel and cobbles Brown, very dense, damp					
5							
10		Refusal at depth of 10' due to boulders (possible bedrock)					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC
21206-19

Log of Trench T-22

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, some cobbles Brown, medium dense, dry to damp					
5		GWT not encountered NATURAL SOILS Slightly silty (medium to coarse grained) SAND with small cobbles Brown, medium dense, damp					
10		Refusal at depth of 10' due to boulders (possible bedrock)					
15							
20							
25							
30							
35							

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21206-19

Log of Trench T-23

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel, occasional some cobbles and roots Brown, medium dense, dry to damp					
5		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with occasional small cobbles Brown, medium dense, damp					
10		Silty SAND with gravel and occasional small cobbles Brown, dense, moist	■		7.6	122.7	
		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

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Proficiency Capital, LLC
21206-19

Log of Trench T-24

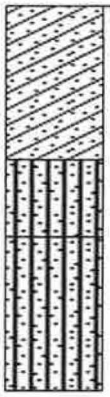
Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured



Depth (feet)	Lithology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty clayey SAND with gravel and occasional cobbles Brown, medium dense to dense, damp					
5		FILL SOILS Silty SAND with gravel, metal pieces and wood chips Dark brown, medium dense, moist	☑		10.3		
		NATURAL SOILS Silty SAND with occasional gravel and small cobbles Brown, medium dense, moist	■		10.2	99.0	
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

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Proficiency Capital, LLC 21206-19	Log of Trench T-25

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	**Groundwater Depth: None Encountered**
Drilling Method: Backhoe	
Hammer Weight:	**Drop:**
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SANd with gravel and small cobbles Brown, dense, dry to damp Wood pieces @ 24"					
5		GWT not encountered NATURAL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, damp Trench completed at depth of 7'					
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-26

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel, small cobbles and wood pieces Brown, medium dense, dry to damp					
5			☑		3.8		
		NATURAL SOILS Silty SAND with gravel and occasional cobbles Brown, medium dense, damp	■		4.0	94.9	
10							
		Slightly silty (medium to coarse grained SAND with gravel Light brown, medium dense, damp Occasional small cobbles below 15'					
15			☑		2.0		
20			☑		2.1		
		Trench completed at depth of 20.5'					
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-27

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel and occasional small cobbles Brown, medium dense, dry to damp					
5		GWT not encountered NATURAL SOILS Silty SAND with occasional gravel Brown, medium dense, damp Trench completed at depth of 6'	■		5.8	105.1	
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-28

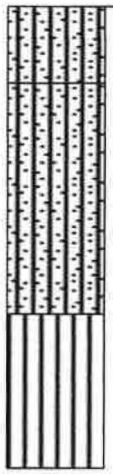
Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured



Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and rock Brown, medium dense, dry to damp	☑		1.5		
5		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with occasional cobbles Brown, medium dense, dry					
10		Sandy SILT with gravel, occasional cobbles Brown, medium stiff, damp	■		6.6	108.0	
		Trench completed at depth of 12'					
15							
20							
25							
30							
35							

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NorCal Engineering

Proficiency Capital, LLC 21206-19	Log of Trench T-29

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, dry to damp					
5		GWT not encountered NATURAL SOILS Sandy SILT with gravel and small cobbles Brown, medium stiff, damp	☑		4.8		
		Trench completed at depth of 6'					
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

NorCal Engineering

Proficiency Capital, LLC 21206-19	Log of Trench T-30

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	**Groundwater Depth: None Encountered**
Drilling Method: Backhoe	
Hammer Weight:	**Drop:**
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel and small cobbles Brown, medium dense, dry					
		GWT not encountered					
		NATURAL SOILS Slightly silty SAND with gravel and cobbles Light brown to brown, medium dense, damp					
5		Trench completed at depth of 5'					
10							
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC
21206-19

Log of Trench T-31

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and rock Brown, medium dense, dry					
5		NATURAL SOILS Silty SAND with gravel ans some small cobbles Brown, medium dense, damp Slightly silty (medium to coarse grained) SAND with gravel and occasional small cobbles Light brown to brown, medium dense, damp					
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-32

Boring Location: Temescal Cnyn & Park Cnyn, Corona	
Date of Drilling: 6/12/19	**Groundwater Depth: None Encountered**
Drilling Method: Backhoe	
Hammer Weight:	**Drop:**
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	Fines Content %
0		FILL SOILS Silty SAND with gravel Brown, medium dense, dry					
		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with gravel and small cobbles Light brown to brown, medium dense, damp					
5		GWT not encountered					
		Silty SAND with occasional gravel and small cobbles Brown, medium dense, damp					
10		Trench completed at depth of 10'					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC
21206-19

Log of Trench T-33

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/11/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Slightly silty SAND with gravel, small cobbles Brown, medium dense, dry to damp					
5		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with gravel and occasional small cobbles Light brown, medium dense, damp Sandy SILT with occasional gravel Brown, medium stiff, damp to moist					
10		Trench completed at depth of 10'	☑		15.2		
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

NorCal Engineering

Proficiency Capital, LLC
21206-19

Log of Trench T-34

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Silty SAND with gravel and rock Brown, medium dense, damp	■		1.4	109.3	
		NATURAL SOILS Slightly silty (medium to coarse grained) SAND with gravel and occasional cobbles					
5		Light brown to brown, medium dense, dry	■		1.5	106.7	
		Silty SAND with occasional gravel Brown, dense, moist					
10		Trench completed at depth of 10.5'	■		12.2	114.8	
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

Proficiency Capital, LLC 21206-19	Log of Trench T-35

Boring Location: Temescal Cnyn & Park Cnyn, Corona

Date of Drilling: 6/12/19 | **Groundwater Depth:** None Encountered

Drilling Method: Backhoe

Hammer Weight: | **Drop:**

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Fines Content %
0		FILL SOILS Slightly silty SAND with gravel and small cobbles Brown, dense, moist					
		NATURAL SOILS Silty SAND with gravel and small cobbles Brown, dense, moist	▽		2.6		
5		Slightly silty (medium to coarse grained) SAND with gravel and occasional small cobbles Light brown to brown, medium dense, damp					
		Sandy SILT (fine grained) with occasional gravel Brown, medium stiff, moist	■		9.2	85.9	
10							
		Slightly silty (fine to coarse grained) SAND with gravel, occasional cobbles Brown, medium dense, damp	■		3.1	107.0	
15		Trench completed at depth of 15'					
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\21206-19.log Date: 7/16/2019

NorCal Engineering

APPENDIX C

TABLE I
MAXIMUM DENSITY TESTS
(ASTM: D-1557-12)

Sample	Classification	Optimum Moisture	Maximum Dry Density (lbs./cu.ft.)
T-2 @ 1-2'	slightly silty SAND	12.0	129.0
T-9 @ 2-4'	sandy SILT	12.0	121.0
T-17 @ 1-2'	sandy CLAY	11.0	129.0

TABLE II
EXPANSION INDEX TESTS
(ASTM: D-4829-11)

Sample	Classification	Expansion Index
T-9 @ 2-4'	sandy SILT	14
T-17 @ 1-2'	sandy CLAY	22

TABLE III
ATTERBERG LIMITS
(ASTM: D-4318-10)

Sample	Liquid Limit	Plastic Limit	Plasticity Index
T-17 @ 1-2'	14	8	6

TABLE IV
SOLUBLE SULFATE TESTS
(CT 417)

Sample	Sulfate Concentration (%)
T-7 @ 2-3'	.0087

TABLE V
pH TESTS

Sample	pH
T-7 @ 2-3'	6.1

TABLE VI
RESISTIVITY TESTS
(CT 643)

Sample	Resistivity (ohm-cm)
T-7 @ 2-3'	1485

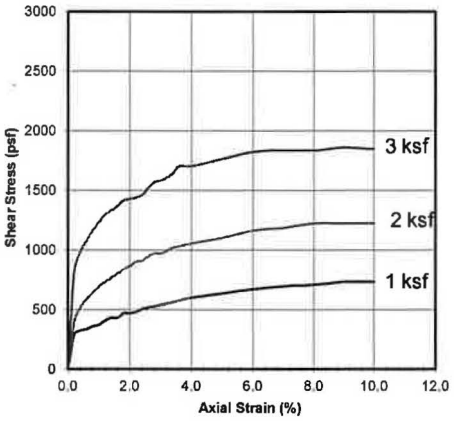
TABLE VII
CHLORIDE TESTS
(CT 422))

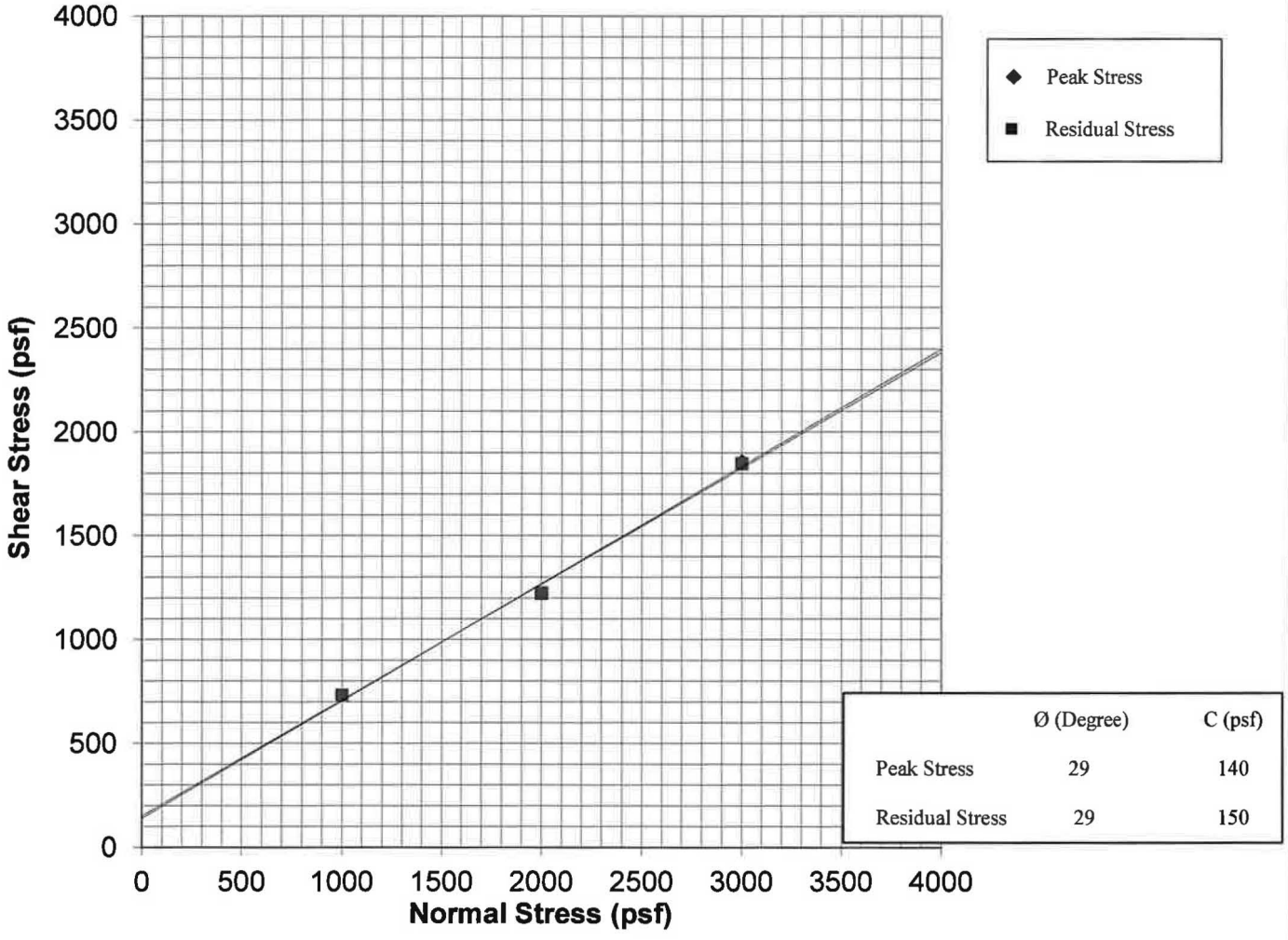
Sample	Concentration (ppm)
T-7 @ 2-3'	351

TABLE VIII
RESISTANCE 'R' VALUE TESTS
(CA 301))

Sample	'R' Value
T-19 @ 1-2'	16

Sample No.		T4@5'		
Sample Type:		Undisturbed/Saturated		
Soil Description:		Silty Sand w/ Some Small Gravel		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	732	1224	1860
Displacement	(in.)	0.225	0.200	0.225
Residual Stress	(psf)	732	1224	1848
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	96.3	96.3	96.3
In Situ Water Content	(%)	5.3	5.3	5.3
Saturated Water Content	(%)	27.7	27.7	27.7
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Degree)	C (psf)
Peak Stress	29	140
Residual Stress	29	150

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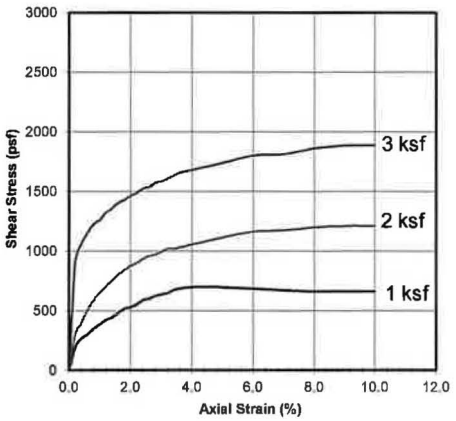
PROJECT NUMBER: 21206-19 DATE: 6/25/2019

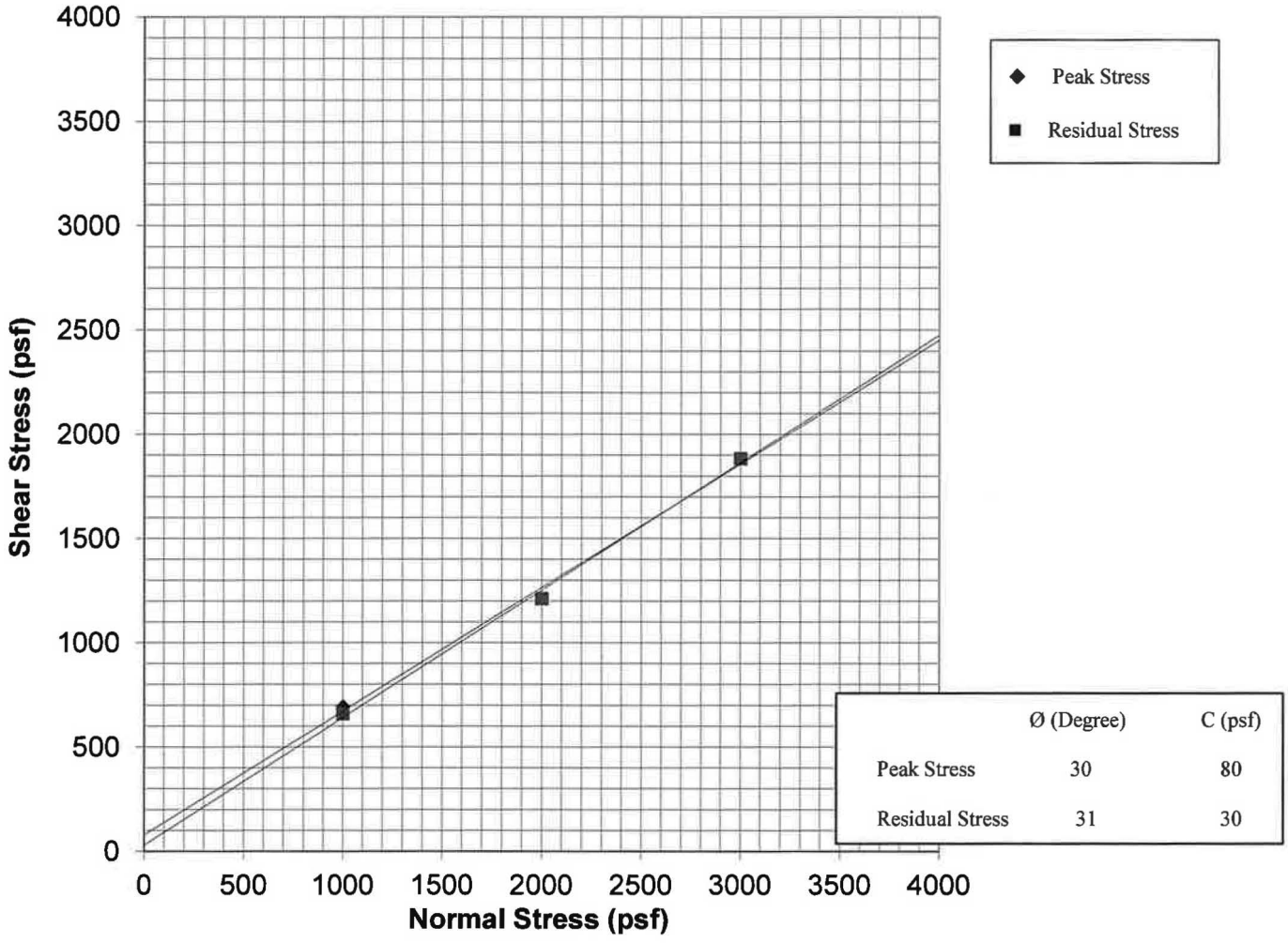
DIRECT SHEAR TEST

ASTM D3080

Plate A

Sample No.		T9@2'		
Sample Type:		Remolded/Saturated		
Soil Description:		Silty Clay w/ Some Sand		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	696	1212	1884
Displacement	(in)	0.100	0.225	0.225
Residual Stress	(psf)	660	1212	1884
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	108.9	108.9	108.9
In Situ Water Content	(%)	12.0	12.0	12.0
Saturated Water Content	(%)	20.1	20.1	20.1
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Degree)	C (psf)
Peak Stress	30	80
Residual Stress	31	30

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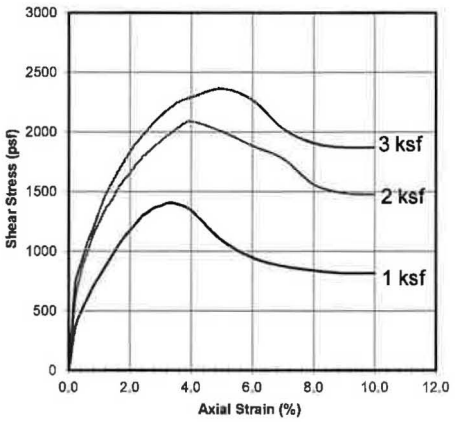
PROJECT NUMBER: 21206-19 DATE: 6/25/2019

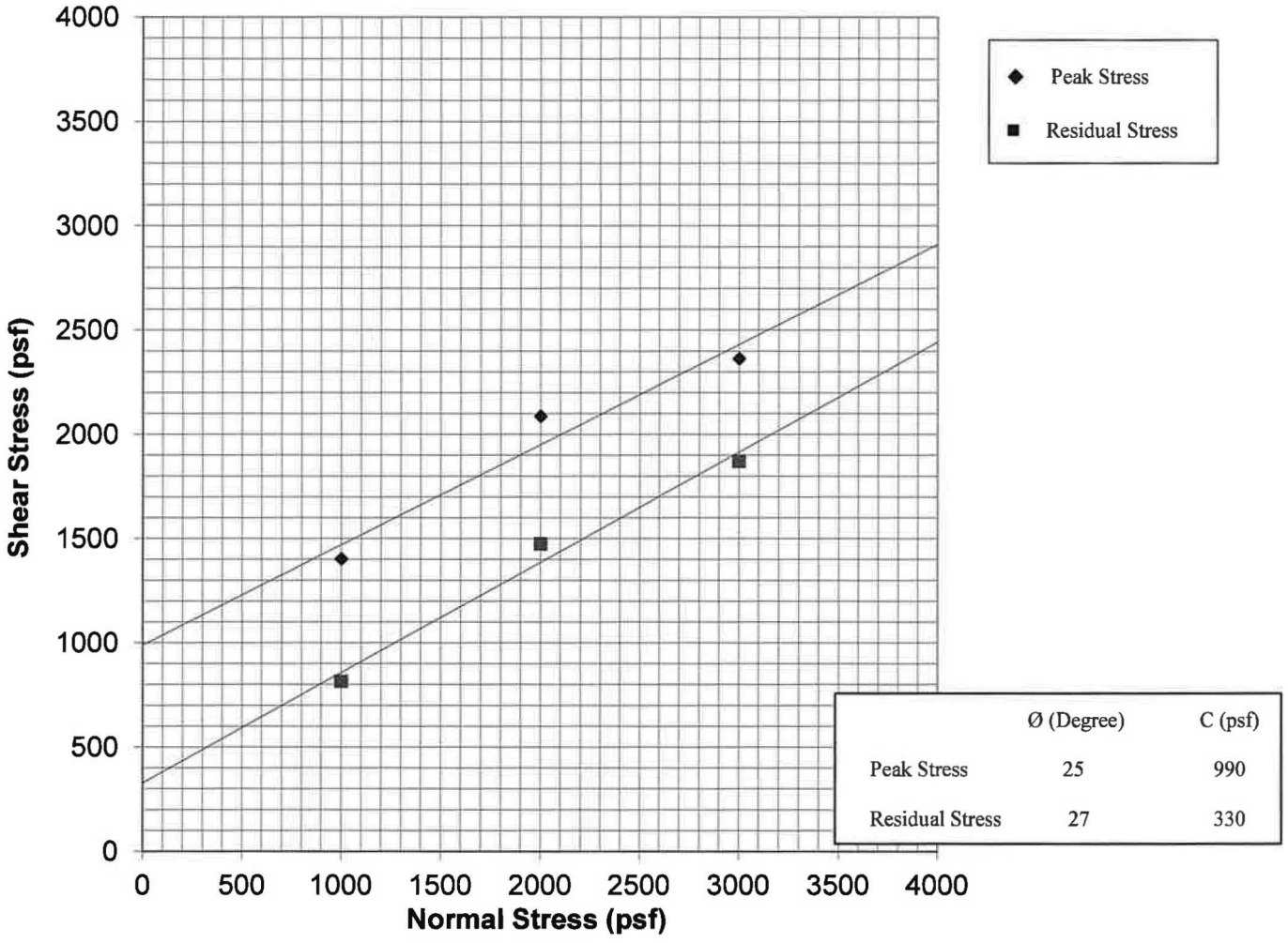
DIRECT SHEAR TEST

ASTM D3080

Plate B

Sample No.		T19@2'		
Sample Type:		Undisturbed/Saturated		
Soil Description:		Silty Clay w/ Some Fine Grained Sand		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	1404	2088	2364
Displacement	(in)	0.080	0.100	0.125
Residual Stress	(psf)	816	1476	1872
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	119.1	119.1	119.1
In Situ Water Content	(%)	13.8	13.8	13.8
Saturated Water Content	(%)	15.2	15.2	15.2
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Degree)	C (psf)
Peak Stress	25	990
Residual Stress	27	330

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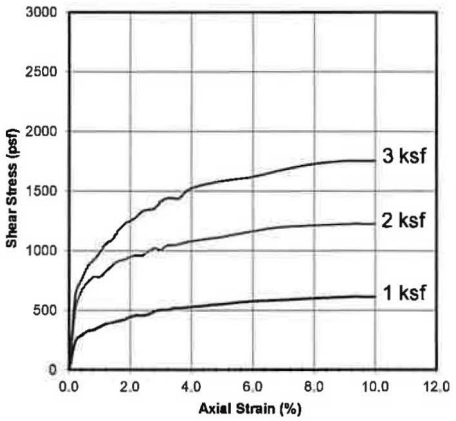
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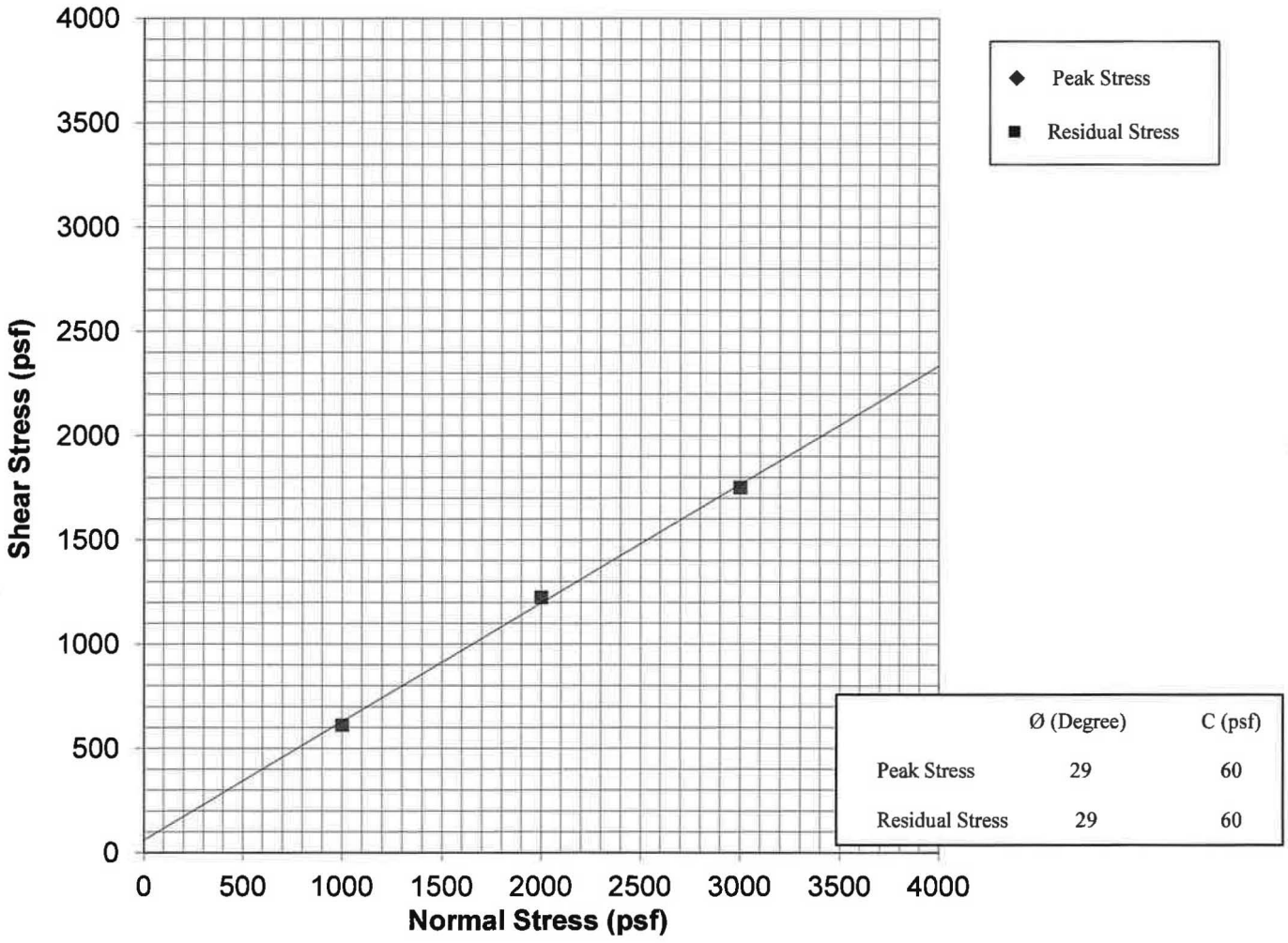
DIRECT SHEAR TEST

ASTM D3080

Plate C

Sample No.		T35@8'		
Sample Type:		Undisturbed/Saturated		
Soil Description:		Fine Grained Sand w/ Some Silt		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	612	1224	1752
Displacement	(in)	0.225	0.225	0.225
Residual Stress	(psf)	612	1224	1752
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	85.9	85.9	85.9
In Situ Water Content	(%)	9.2	9.2	9.2
Saturated Water Content	(%)	35.5	35.5	35.5
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Degree)	C (psf)
Peak Stress	29	60
Residual Stress	29	60

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Proficiency Capital, LLC

PROJECT NUMBER: 21206-19 DATE: 6/25/2019

DIRECT SHEAR TEST

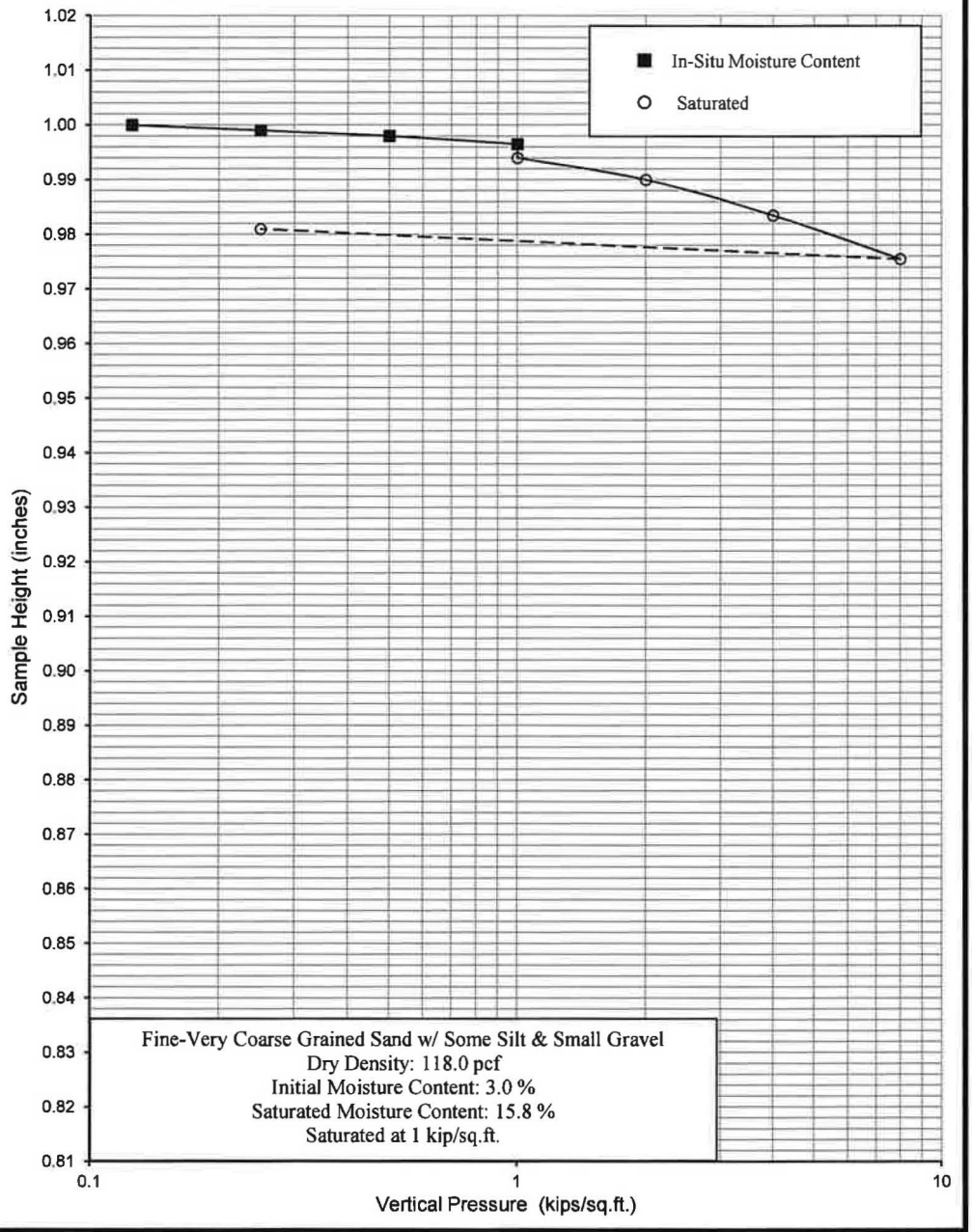
ASTM D3080

Plate D

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9990	0.1	
0.5	0.9980	0.2	
1	0.9965	0.4	
1	0.9940	0.6	Saturated
2	0.9900	1.0	
4	0.9835	1.7	
8	0.9755	2.5	
0.25	0.9810	1.9	

Sample No.	T2
Depth	15'
Date	6/25/2019

Date Tested: 6/20/2019
Sample: T2
Depth: 15'



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PROJECT NUMBER: 21206-19 DATE: 6/25/2019

CONSOLIDATION TEST

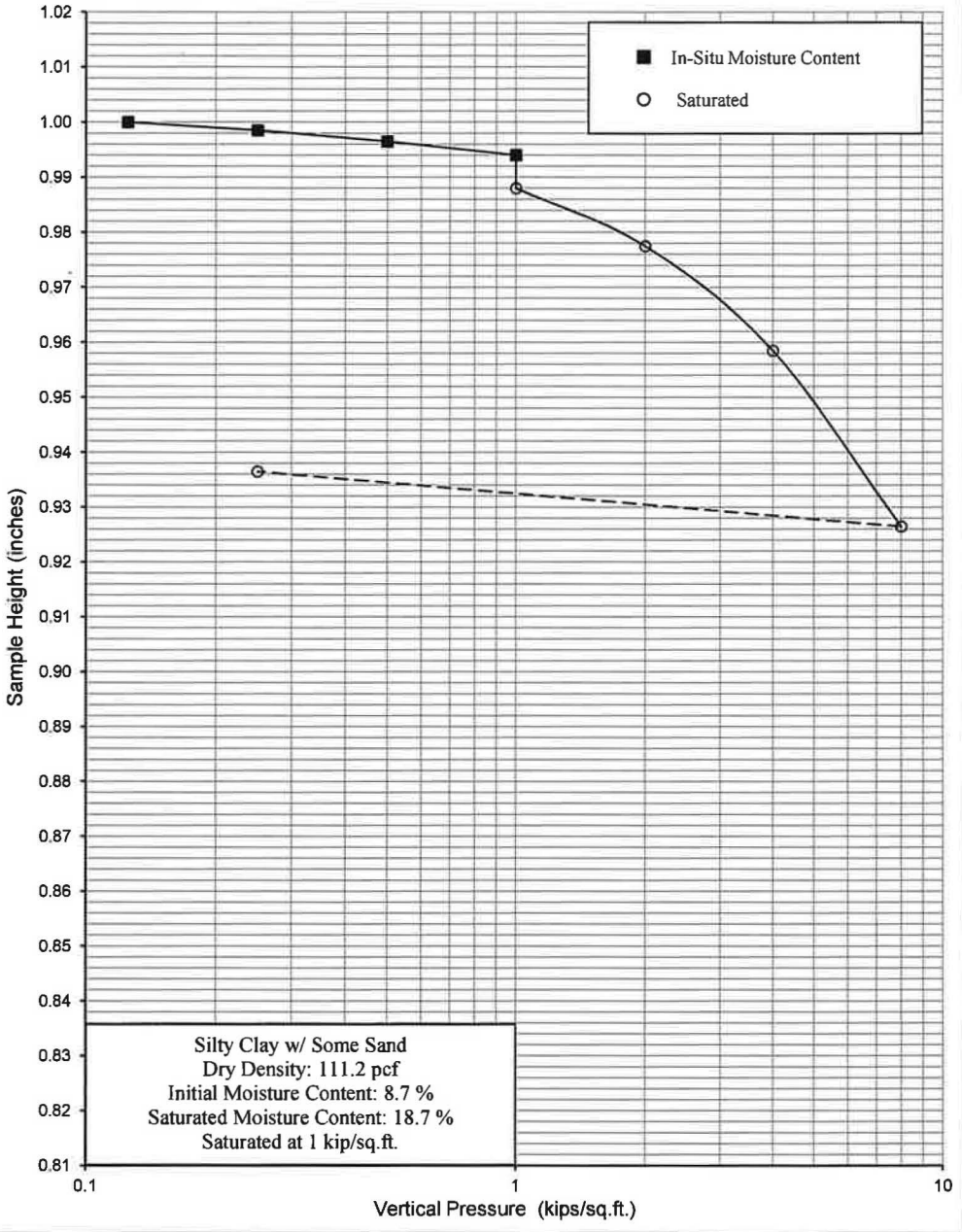
ASTM D2435

Plate E

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9985	0.2	
0.5	0.9965	0.4	
1	0.9940	0.6	
1	0.9880	1.2	Saturated
2	0.9775	2.3	
4	0.9585	4.2	
8	0.9265	7.4	
0.25	0.9365	6.4	

Sample No.	T10	Depth	4'	Date	6/25/2019

Date Tested: 6/20/2019
Sample: T10
Depth: 4'



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SOILS AND GEOTECHNICAL CONSULTANTS

Proficiency Capital, LLC

PROJECT NUMBER: 21206-19 DATE: 6/25/2019

CONSOLIDATION TEST

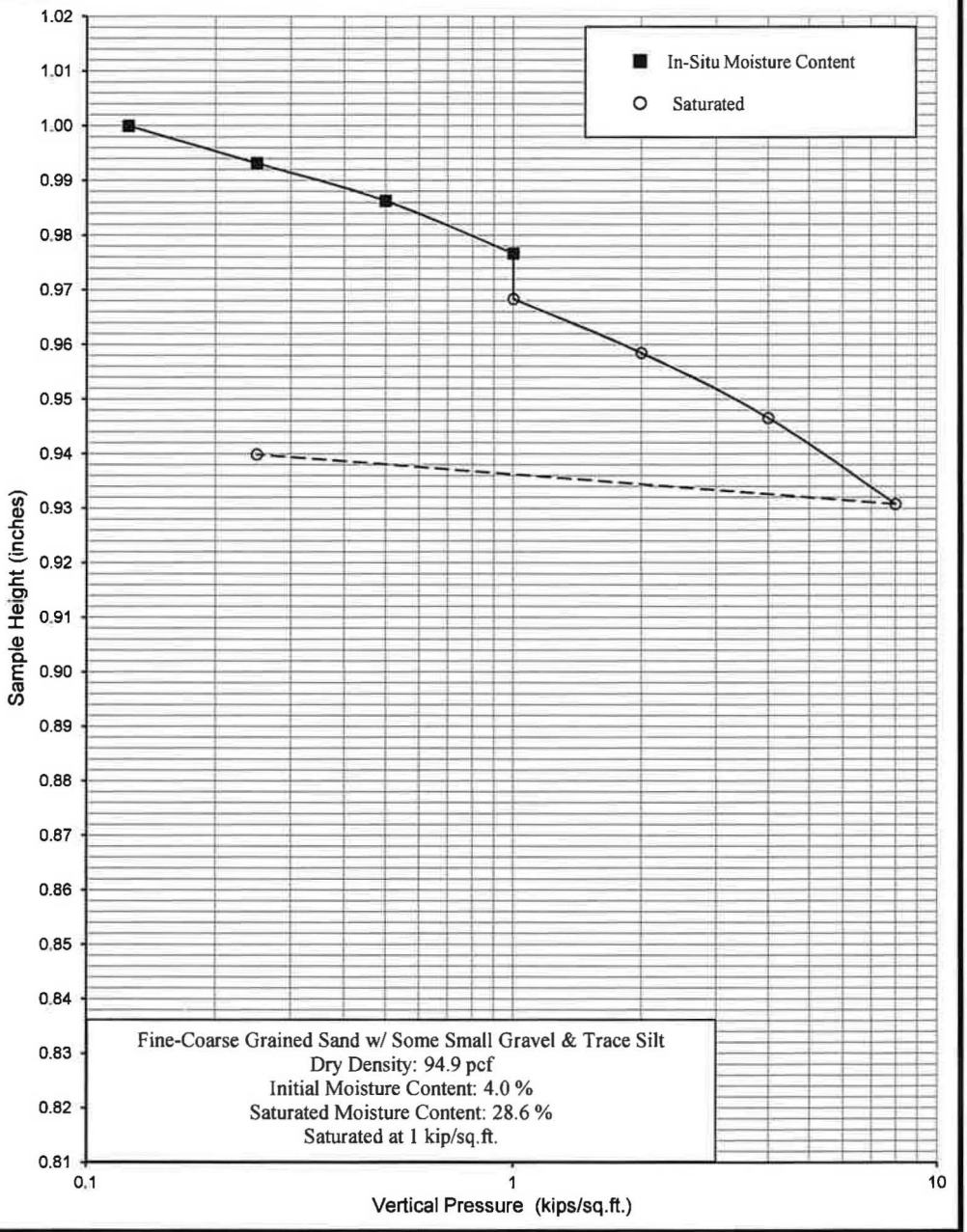
ASTM D2435

Plate F

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9932	0.7	
0.5	0.9863	1.4	
1	0.9767	2.3	
1	0.9684	3.2	Saturated
2	0.9585	4.2	
4	0.9466	5.3	
8	0.9308	6.9	
0.25	0.9399	6.0	

Sample No.	T26	Depth	10'	Date	6/25/2019

Date Tested: 6/20/2019
Sample: T26
Depth: 10'



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Proficiency Capital, LLC

PROJECT NUMBER: 21206-19 DATE: 6/25/2019

CONSOLIDATION TEST

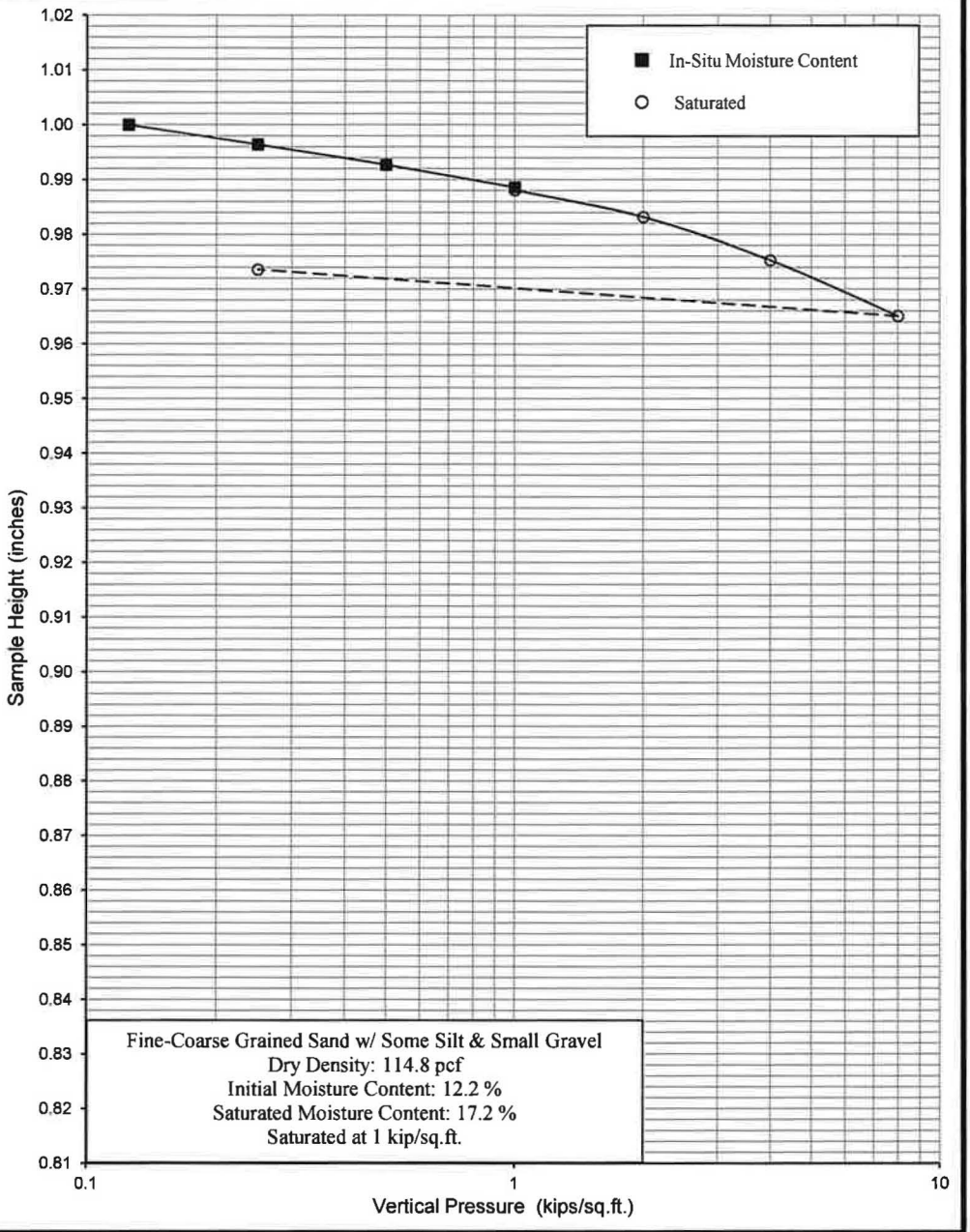
ASTM D2435

Plate G

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9964	0.4	
0.5	0.9927	0.7	
1	0.9886	1.1	
1	0.9881	1.2	Saturated
2	0.9832	1.7	
4	0.9753	2.5	
8	0.9651	3.5	
0.25	0.9736	2.6	

Sample No.	T34	Depth	10'	Date	6/25/2019

Date Tested: 6/24/2019
Sample: T34
Depth: 10'



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Proficiency Capital, LLC

PROJECT NUMBER: 21206-19 DATE: 6/25/2019

CONSOLIDATION TEST

ASTM D2435

Plate H

APPENDIX D

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Proficiency Capital, LLC
Project No.: 21206-19
Date: 6/11/19
Test No. T-3
Depth: 5'
Tested By: J.S. Jr.

TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
7:14			74.7			41.0					
7:29	15	15	75.0	0.3		41.3	0.3				
7:29			75.0			41.3					
7:44	15	30	75.0	0.0		41.3	0.0				
7:44			75.0			41.3					
7:59	15	45	75.2	0.2		41.4	0.1				
7:59			75.2			41.4					
8:14	15	60	75.2	0.0		41.5	0.1				
8:14			75.5			41.5					
8:29	15	75	75.5	0.3		41.8	0.3				
8:29			75.5			41.8					
8:44	15	90	75.5	0.0		41.8	0.0				
8:44			75.5			41.8					
8:59	15	105	75.7	0.2		42.0	0.2		0.8	0.8	
8:59			75.7			42.0					
9:14	15	120	75.7	0.0		42.0	0.0		0.0	0.0	
9:14			75.7			42.0					
9:29	15	135	75.9	0.2		42.1	0.1		0.8	0.4	
9:29			75.9			42.1					
9:44	15	150	76.0	0.1		42.1	0.0		0.4	0.0	
9:44			76.0			42.1					
9:59	15	165	76.0	0.0		42.1	0.0		0.0	0.0	
9:59			76.0			42.1					
10:14	15	180	76.2	0.2		42.2	0.1		0.8	0.4	

Average = 0.47 / 0.27 cm/hr

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Proficiency Capital, LLC
Project No.: 21206-19
Date: 6/11/19
Test No. T-12
Depth: 7'
Tested By: J.S. Jr.

TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
7:30			102.8			42.7					
7:31	1	1	106.5	3.7		45.8	3.1				
7:31			106.5			45.8					
7:32	1	2	109.3	2.8		48.6	2.8				
7:32			102.7			42.4					
7:33	1	3	106.2	3.5		46.0	3.6				
7:33			104.0			43.5					
7:35	2	5	110.1	6.1		49.3	5.8				
7:35			101.8			41.3					
7:37	2	7	107.9	6.1		47.5	6.0				
7:37			102.1			42.2					
7:39	2	9	108.2	6.1		48.1	5.9				
7:39			105.0			45.5					
7:41	2	11	111.0	6.0		51.2	5.7		180	171	
7:41			103.2			43.6					
7:43	2	13	107.4	6.2		49.8	6.2		186	186	
7:43			100.5			40.4					
7:45	2	15	106.4	5.9		46.0	5.6		177	168	
7:45			99.8			40.2					
7:47	2	17	105.9	6.1		46.0	5.8		183	174	
7:47			100.2			40.1					
7:49	2	19	106.4	6.2		45.9	5.8		186	174	
7:49			101.9			41.3					
7:51	2	21	107.8	5.9		46.8	5.5		177	165	

Average = 181.5 / 173 cm/hr

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Proficiency Capital, LLC
Project No.: 21206-19
Date: 6/11/19
Test No. T-15
Depth: 5'
Tested By: J.S. Jr.

TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
12:00			97.9			38.2					
12:05	5	5	103.0	5.1		43.4	5.2				
12:05			103.0			43.4					
12:10	5	10	106.7	3.7		47.9	4.5				
12:10			99.6			38.3					
12:15	5	15	102.6	3.0		42.5	4.2				
12:15			102.6			42.5					
12:20	5	20	106.1	3.5		47.2	4.7				
12:20			98.4			31.8					
12:25	5	25	101.6	3.2		41.9	4.1				
12:25			101.6			41.9					
12:30	5	30	105.0	3.4		46.1	4.2				
12:30			99.7			40.6					
12:35	5	35	103.3	3.6		45.1	4.5		43.2	54.0	
12:35			103.3			45.1					
12:40	5	40	107.0	3.7		49.3	4.2		44.4	50.4	
12:40			98.4			39.6					
12:45	5	45	101.9	3.5		43.6	4.0		42.0	48.0	
12:45			101.9			43.6					
12:50	5	50	105.7	3.8		47.7	4.1		45.6	49.2	
12:50			98.4			41.2					
12:55	5	55	102.2	3.8		45.4	4.2		45.6	50.4	
12:55			102.2			45.4					
1:00	5	60	105.9	3.7		49.6	4.2		44.4	50.4	

Average = 44.2 / 50.4 cm/hr

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Proficiency Capital, LLC
Project No.: 21206-19
Date: 6/11/19
Test No. T-29
Depth: 6'
Tested By: J.S. Jr.

TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
8:50			98.0			42.3					
9:05	15	15	104.4	6.4		47.1	4.8				
9:05			98.6			41.3					
9:20	15	30	101.8	3.2		44.3	3.0				
9:20			101.8			44.3					
9:35	15	45	104.2	2.4		46.7	2.4				
9:35			104.2			46.7					
9:50	15	60	106.1	1.9		48.8	2.1				
9:50			100.1			42.8					
10:05	15	75	102.3	2.2		45.1	2.3				
10:05			102.3			45.1					
10:20	15	90	104.6	2.3		47.3	2.2				
10:20			104.6			47.3					
10:35	15	105	106.7	2.1		49.3	2.0		8.4	8.0	
10:35			106.7			49.3					
10:50	15	120	106.7	2.0		51.3	2.0		8.0	8.0	
10:50			100.1			43.1					
11:05	15	135	102.4	2.3		45.5	2.4		9.2	9.6	
11:05			102.4			45.5					
11:20	15	150	104.3	1.9		47.6	2.1		7.6	8.4	
11:20			104.3			47.6					
11:35	15	165	106.3	2.0		49.7	2.1		8.0	8.4	
11:35			99.8			42.2					
11:50	15	180	101.6	1.8		44.2	2.0		7.2	8.0	

Average = 8.1 / 8.4 cm/hr

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

Project: Proficiency Capital, LLC
Project No.: 21206-19
Date: 6/11/19
Test No. T-33
Depth: 10'
Tested By: J.S. Jr.

TIME (hr/min)	CHANGE TIME (min)	CUMULATIVE TIME (min)	INNER RING READING (cm)	INNER RING CHANGE	INNER RING FLOW (cc)	OUTER RING READING (cm)	OUTER RING CHANGE	OUTER RING FLOW (cc)	INNER RING INF RATE (cm/hr)	OUTER RING INF RATE (cm/hr)	INNER RING INF RATE (ft/hr)
10:39			69.0			37.0					
10:54	15	15	72.3	3.3		40.9	3.9				
10:54			72.3			40.9					
11:09	15	30	74.8	2.5		43.0	2.1				
11:09			74.8			43.0					
11:24	15	45	76.7	1.9		45.0	2.0				
11:24			76.7			45.0					
11:39	15	60	78.3	1.6		47.1	2.1				
11:39			78.3			47.1					
11:54	15	75	79.8	1.5		48.9	1.8				
11:54			67.5			37.6					
12:09	15	90	69.3	1.8		39.7	2.1				
12:09			69.3			39.7					
12:24	15	105	70.9	1.6		41.8	2.1		6.4	8.4	
12:24			70.9			41.8					
12:39	15	120	72.5	1.6		43.8	2.0		6.4	8.0	
12:39			72.5			43.8					
12:54	15	135	74.0	1.5		45.6	1.8		6.0	7.2	
12:54			74.0			45.7					
1:09	15	150	75.5	1.5		47.4	1.8		6.0	7.2	
1:09			75.5			47.4					
1:24	15	165	76.9	1.4		49.1	1.7		5.6	6.8	
1:24			76.9			49.1					
1:39	15	180	78.2	1.3		50.9	1.8		5.2	7.2	

Average = 5.9 / 7.5 cm/hr

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use (NOT APPLICABLE)

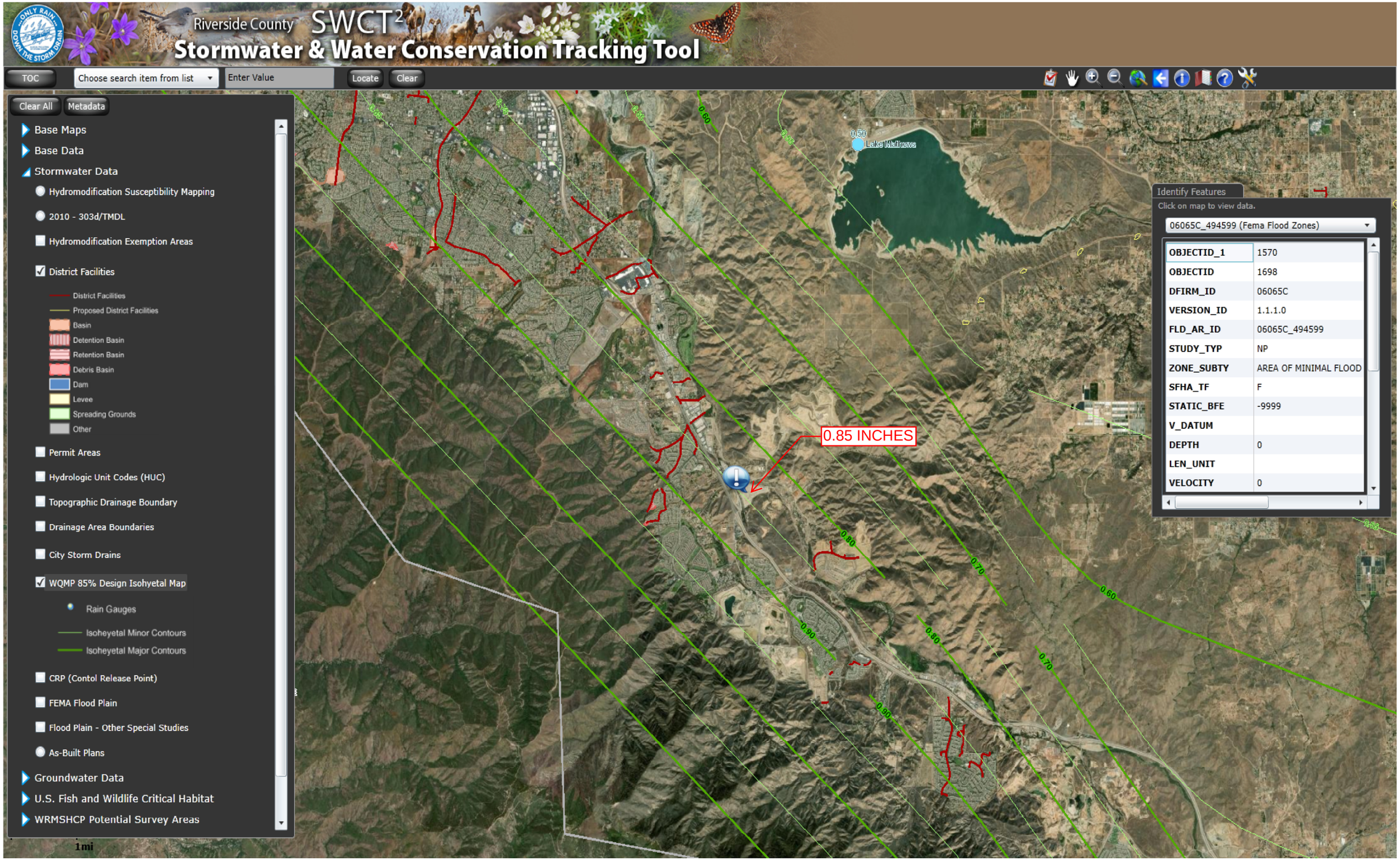
Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis (NOT APPLICABLE)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

ONSITE DCV CALCULATIONS


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
District Facilities
Proposed District Facilities
Basin
Detention Basin
Retention Basin
Debris Basin
Dam
Levee
Spreading Grounds
Other
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
Rain Gauges
Isoheyetal Minor Contours
Isoheyetal Major Contours
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
WRMSHCP Potential Survey Areas
1mi
Lake Matthews
0.85 INCHES
Identify Features
Click on map to view data.
06065C_494599 (Fema Flood Zones)
OBJECTID_1 1570
OBJECTID 1698
DFIRM_ID 06065C
VERSION_ID 1.1.1.0
FLD_AR_ID 06065C_494599
STUDY_TYP NP
ZONE_SUBTY AREA OF MINIMAL FLOOD
SFHA_TF F
STATIC_BFE -9999
V_DATUM
DEPTH 0
LEN_UNIT
VELOCITY 0

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc. | Date: 11/10/2023

Designed by: Luis Prado | Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: STC "A" / DMA A

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
A-1	*169448.4*	*Concrete or Asphalt*	*1*	*0.89*	*151148*			
A-2	*9147.6*	*Ornamental Landscaping*	*0.1*	*0.11*	*1010.4*			
	178596		***Total***		**152158.4**	**0.85**	***10777.9***	***11047***

Notes:

Tributary area = 4.10 acres

HCOC volume needed = 21,530 CF (Per Appendix 7)

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc. | Date: 11/10/2023

Designed by: Luis Prado | Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: CDS "A" (DMA A) - CDS2015-5-C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMAs	*A-1*	*169448.4*	*Concrete or Asphalt*	*1*	*0.89*	*151148*			
	A-2	*9147.6*	*Ornamental Landscaping*	*0.1*	*0.11046*	*1010.4*			
		178596		***Total***		**152158.4**	**0.20**	***0.7***	***0.7***

Notes:

Design Flow Rate = 0.70 cfs

Provided Flow Rate = 0.70 cfs

Project: **Temescal Canyon Road / DMA A**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	85	
Number of End Caps -	20	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	5113	sf Min. Area - 4703 sf min. area

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☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)	
93	**0.00**	**0.00**	**0.00**	**0.00**	**170.43**	**170.43**	**21637.08**	**7.75**	HCOC MET
92	0.00	0.00	0.00	0.00	170.43	170.43	21466.65	7.67	
91	0.00	0.00	0.00	0.00	170.43	170.43	21296.21	7.58	
90	0.00	0.00	0.00	0.00	170.43	170.43	21125.78	7.50	
89	0.00	0.00	0.00	0.00	170.43	170.43	20955.35	7.42	
88	0.00	0.00	0.00	0.00	170.43	170.43	20784.91	7.33	
87	0.00	0.00	0.00	0.00	170.43	170.43	20614.48	7.25	
86	0.00	0.00	0.00	0.00	170.43	170.43	20444.05	7.17	
85	0.00	0.00	0.00	0.00	170.43	170.43	20273.61	7.08	
84	0.00	0.00	0.00	0.00	170.43	170.43	20103.18	7.00	
83	0.00	0.00	0.00	0.00	170.43	170.43	19932.75	6.92	
82	0.00	0.00	0.00	0.00	170.43	170.43	19762.31	6.83	
81	0.06	0.00	4.94	0.00	168.46	173.40	19591.88	6.75	
80	0.19	0.02	16.50	0.48	163.64	180.62	19418.48	6.67	
79	0.29	0.04	24.99	0.75	160.14	185.88	19237.86	6.58	
78	0.40	0.05	34.31	1.03	156.30	191.64	19051.99	6.50	
77	0.69	0.07	58.41	1.35	146.53	206.29	18860.35	6.42	
76	1.03	0.09	87.41	1.76	134.77	223.94	18654.06	6.33	
75	1.25	0.11	106.21	2.14	127.09	235.45	18430.12	6.25	
74	1.42	0.13	120.89	2.53	121.07	244.48	18194.68	6.17	
73	1.57	0.14	133.72	2.89	115.79	252.40	17950.20	6.08	
72	1.71	0.16	145.11	3.26	111.09	259.45	17697.80	6.00	
71	1.83	0.18	155.42	3.63	106.81	265.87	17438.35	5.92	
70	1.94	0.20	164.71	4.01	102.95	271.67	17172.48	5.83	
69	2.04	0.22	173.47	4.37	99.30	277.13	16900.81	5.75	
68	2.13	0.23	181.45	4.70	95.97	282.12	16623.68	5.67	
67	2.22	0.25	189.06	5.01	92.81	286.87	16341.56	5.58	
66	2.31	0.27	196.08	5.31	89.88	291.27	16054.68	5.50	
65	2.38	0.28	202.71	5.60	87.11	295.42	15763.42	5.42	
64	2.46	0.29	209.02	5.88	84.47	299.37	15468.00	5.33	
63	2.53	0.31	214.89	6.16	82.01	303.06	15168.63	5.25	
62	2.59	0.32	220.47	6.42	79.68	306.57	14865.56	5.17	
61	2.66	0.33	225.76	6.69	77.45	309.91	14558.99	5.08	
60	2.72	0.35	230.78	6.94	75.34	313.07	14249.09	5.00	
59	2.77	0.36	235.56	7.20	73.33	316.09	13936.02	4.92	
58	2.82	0.37	240.10	7.45	71.42	318.96	13619.93	4.83	
57	2.88	0.38	244.41	7.69	69.59	321.69	13300.97	4.75	
56	2.92	0.40	248.55	7.92	67.84	324.32	12979.28	4.67	
55	2.97	0.41	252.44	8.15	66.20	326.79	12654.96	4.58	
54	3.01	0.42	256.06	8.37	64.66	329.09	12328.173	4.50	
53	3.05	0.43	259.53	8.59	63.19	331.31	11999.08	4.42	
52	3.09	0.44	263.01	8.81	61.70	333.53	11667.78	4.33	
51	3.13	0.45	266.10	9.02	60.39	335.50	11334.25	4.25	
50	**3.17**	**0.46**	**269.08**	**9.22**	**59.11**	**337.41**	**10998.75**	**4.17**	DCV MET
49	3.20	0.47	271.95	9.41	57.89	339.25	10661.34	4.08	
48	3.23	0.48	274.64	9.60	56.73	340.98	10322.08	4.00	
47	3.26	0.49	277.22	9.78	55.63	342.64	9981.10	3.92	
46	3.29	0.50	279.67	9.96	54.58	344.21	9638.47	3.83	
45	3.32	0.51	282.03	10.13	53.57	345.73	9294.25	3.75	
44	3.34	0.51	284.25	10.29	52.62	347.16	8948.53	3.67	
43	3.37	0.52	286.33	10.44	51.72	348.50	8601.37	3.58	
42	3.39	0.53	288.36	10.59	50.85	349.81	8252.87	3.50	
41	3.41	0.54	290.24	10.73	50.05	351.01	7903.06	3.42	

40	3.44	0.54	292.15	10.86	49.23	352.24	7552.05	3.33
39	3.46	0.55	293.91	10.99	48.48	353.37	7199.81	3.25
38	3.48	0.56	295.69	11.10	47.72	354.51	6846.44	3.17
37	3.51	0.59	297.93	11.90	46.50	356.33	6491.93	3.08
36	0.00	0.00	0.00	0.00	170.43	170.43	6135.60	3.00
35	0.00	0.00	0.00	0.00	170.43	170.43	5965.17	2.92
34	0.00	0.00	0.00	0.00	170.43	170.43	5794.73	2.83
33	0.00	0.00	0.00	0.00	170.43	170.43	5624.30	2.75
32	0.00	0.00	0.00	0.00	170.43	170.43	5453.87	2.67
31	0.00	0.00	0.00	0.00	170.43	170.43	5283.43	2.58
30	0.00	0.00	0.00	0.00	170.43	170.43	5113.00	2.50
29	0.00	0.00	0.00	0.00	170.43	170.43	4942.57	2.42
28	0.00	0.00	0.00	0.00	170.43	170.43	4772.13	2.33
27	0.00	0.00	0.00	0.00	170.43	170.43	4601.70	2.25
26	0.00	0.00	0.00	0.00	170.43	170.43	4431.27	2.17
25	0.00	0.00	0.00	0.00	170.43	170.43	4260.83	2.08
24	0.00	0.00	0.00	0.00	170.43	170.43	4090.40	2.00
23	0.00	0.00	0.00	0.00	170.43	170.43	3919.97	1.92
22	0.00	0.00	0.00	0.00	170.43	170.43	3749.53	1.83
21	0.00	0.00	0.00	0.00	170.43	170.43	3579.10	1.75
20	0.00	0.00	0.00	0.00	170.43	170.43	3408.67	1.67
19	0.00	0.00	0.00	0.00	170.43	170.43	3238.23	1.58
18	0.00	0.00	0.00	0.00	170.43	170.43	3067.80	1.50
17	0.00	0.00	0.00	0.00	170.43	170.43	2897.37	1.42
16	0.00	0.00	0.00	0.00	170.43	170.43	2726.93	1.33
15	0.00	0.00	0.00	0.00	170.43	170.43	2556.50	1.25
14	0.00	0.00	0.00	0.00	170.43	170.43	2386.07	1.17
13	0.00	0.00	0.00	0.00	170.43	170.43	2215.63	1.08
12	0.00	0.00	0.00	0.00	170.43	170.43	2045.20	1.00
11	0.00	0.00	0.00	0.00	170.43	170.43	1874.77	0.92
10	0.00	0.00	0.00	0.00	170.43	170.43	1704.33	0.83
9	0.00	0.00	0.00	0.00	170.43	170.43	1533.90	0.75
8	0.00	0.00	0.00	0.00	170.43	170.43	1363.47	0.67
7	0.00	0.00	0.00	0.00	170.43	170.43	1193.03	0.58
6	0.00	0.00	0.00	0.00	170.43	170.43	1022.60	0.50
5	0.00	0.00	0.00	0.00	170.43	170.43	852.17	0.42
4	0.00	0.00	0.00	0.00	170.43	170.43	681.73	0.33
3	0.00	0.00	0.00	0.00	170.43	170.43	511.30	0.25
2	0.00	0.00	0.00	0.00	170.43	170.43	340.87	0.17
1	0.00	0.00	0.00	0.00	170.43	170.43	170.43	0.08

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID DMA A	Legend:	Required Entries / Calculated Cells
Company Name: Thienes Engineering			Date: 11/10/2023
Designed by: Luis Prado			County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	4.1	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	10,778	ft^3

Maximum Depth

a) Infiltration rate	I =	5.15	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	10.3	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		50	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		50	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	39.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	10.3	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	n/a	:1
b) Proposed basin depth (excluding freeboard)	d_B =	2.37	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	4548	ft^2
d) Proposed Design Surface Area	A_D =	5113.0	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	54	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	n/a	ft
c) Forebay surface area (minimum)	Area =	#######	ft^2
d) Full height notch-type weir	Width (W) =	n/a	in

Notes: Effective ponding depth to achieve Vbmp = 28.4 inches = (36" x 0.4) + 14" chamber ponding

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc. — Date: 11/10/2023

Designed by: Luis Prado — Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: STC "B" / DMA B

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
B-1	*696960*	*Concrete or Asphalt*	*1*	*0.89*	*621688.3*			
B-2	*36590.4*	*Ornamental Landscaping*	*0.1*	*0.11*	*4041.7*			
	733550.4	***Total***			625730	0.85	*44322.5*	*45669*

Notes:

Tributary area = 16.84 cres

HCOC volume need = 88,431 CF (Per Appendix 7)

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc. — Date: 11/10/2023

Designed by: Luis Prado — Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: CDS "B" (DMA B) - CDS3030-6-C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMAs	*B-1*	*696960*	*Concrete or Asphalt*	*1*	*0.89*	*621688.3*			
	B-2	*36590.4*	*Ornamental Landscaping*	*0.1*	*0.110458*	*4041.7*			
		733550.4		***Total***		**625730**	**0.20**	***2.9***	***3***

Notes:

Design Flow Rate = 2.9 cfs

Provided Flow Rate = 3.0 cfs

Project: **Temescal Canyon Road / DMA B**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	342	
Number of End Caps -	14	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	21230	sf Min. Area - 17801 sf min. area

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☑ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch, EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)	
93	**0.00**	**0.00**	**0.00**	**0.00**	**707.67**	**707.67**	**88499.79**	**7.75**	HCOC MET
92	0.00	0.00	0.00	0.00	707.67	707.67	87792.12	7.67	
91	0.00	0.00	0.00	0.00	707.67	707.67	87084.46	7.58	
90	0.00	0.00	0.00	0.00	707.67	707.67	86376.79	7.50	
89	0.00	0.00	0.00	0.00	707.67	707.67	85669.12	7.42	
88	0.00	0.00	0.00	0.00	707.67	707.67	84961.46	7.33	
87	0.00	0.00	0.00	0.00	707.67	707.67	84253.79	7.25	
86	0.00	0.00	0.00	0.00	707.67	707.67	83546.12	7.17	
85	0.00	0.00	0.00	0.00	707.67	707.67	82838.46	7.08	
84	0.00	0.00	0.00	0.00	707.67	707.67	82130.79	7.00	
83	0.00	0.00	0.00	0.00	707.67	707.67	81423.12	6.92	
82	0.00	0.00	0.00	0.00	707.67	707.67	80715.46	6.83	
81	0.06	0.00	19.87	0.00	699.72	719.59	80007.79	6.75	
80	0.19	0.02	66.38	0.33	680.98	747.70	79288.21	6.67	
79	0.29	0.04	100.53	0.53	667.24	768.30	78540.51	6.58	
78	0.40	0.05	138.05	0.72	652.16	790.93	77772.20	6.50	
77	0.69	0.07	235.02	0.95	613.28	849.24	76981.28	6.42	
76	1.03	0.09	351.68	1.24	566.50	919.41	76132.03	6.33	
75	1.25	0.11	427.34	1.50	536.13	964.97	75212.62	6.25	
74	1.42	0.13	486.40	1.77	512.40	1000.57	74247.65	6.17	
73	1.57	0.14	538.01	2.02	491.65	1031.69	73247.08	6.08	
72	1.71	0.16	583.85	2.28	473.22	1059.34	72215.39	6.00	
71	1.83	0.18	625.35	2.54	456.51	1084.40	71156.05	5.92	
70	1.94	0.20	662.72	2.81	441.46	1106.98	70071.65	5.83	
69	2.04	0.22	697.96	3.06	427.26	1128.28	68964.67	5.75	
68	2.13	0.23	730.06	3.29	414.33	1147.68	67836.39	5.67	
67	2.22	0.25	760.68	3.51	401.99	1166.18	66688.71	5.58	
66	2.31	0.27	788.92	3.72	390.61	1183.25	65522.53	5.50	
65	2.38	0.28	815.59	3.92	379.86	1199.37	64339.28	5.42	
64	2.46	0.29	841.01	4.12	369.62	1214.74	63139.91	5.33	
63	2.53	0.31	864.63	4.31	360.09	1229.03	61925.17	5.25	
62	2.59	0.32	887.06	4.50	351.04	1242.60	60696.13	5.17	
61	2.66	0.33	908.37	4.68	342.45	1255.50	59453.53	5.08	
60	2.72	0.35	928.57	4.86	334.30	1267.72	58198.03	5.00	
59	2.77	0.36	947.78	5.04	326.54	1279.36	56930.31	4.92	
58	2.82	0.37	966.03	5.21	319.17	1290.41	55650.95	4.83	
57	2.88	0.38	983.41	5.38	312.15	1300.94	54360.54	4.75	
56	2.92	0.40	1000.05	5.54	305.43	1311.03	53059.60	4.67	
55	2.97	0.41	1015.70	5.71	299.10	1320.51	51748.57	4.58	
54	3.01	0.42	1030.26	5.86	293.22	1329.34	50428.064	4.50	
53	3.05	0.43	1044.21	6.02	287.57	1337.80	49098.73	4.42	
52	3.09	0.44	1058.24	6.17	281.90	1346.31	47760.92	4.33	
51	3.13	0.45	1070.65	6.31	276.88	1353.84	46414.61	4.25	
50	**3.17**	**0.46**	**1082.66**	**6.45**	**272.02**	**1361.13**	**45060.77**	**4.17**	DCV MET
49	3.20	0.47	1094.21	6.59	267.35	1368.15	43699.63	4.08	
48	3.23	0.48	1105.04	6.72	262.96	1374.72	42331.49	4.00	
47	3.26	0.49	1115.40	6.85	258.77	1381.02	40956.76	3.92	
46	3.29	0.50	1125.27	6.97	254.77	1387.01	39575.74	3.83	
45	3.32	0.51	1134.74	7.09	250.93	1392.77	38188.73	3.75	
44	3.34	0.51	1143.69	7.20	247.31	1398.20	36795.97	3.67	
43	3.37	0.52	1152.07	7.31	243.92	1403.29	35397.76	3.58	
42	3.39	0.53	1160.24	7.41	240.61	1408.26	33994.47	3.50	
41	3.41	0.54	1167.77	7.51	237.55	1412.84	32586.21	3.42	

40	3.44	0.54	1175.46	7.60	234.44	1417.51	31173.38	3.33
39	3.46	0.55	1182.54	7.69	231.57	1421.80	29755.87	3.25
38	3.48	0.56	1189.71	7.77	228.67	1426.16	28334.07	3.17
37	3.51	0.59	1198.74	8.33	224.84	1431.91	26907.91	3.08
36	0.00	0.00	0.00	0.00	707.67	707.67	25476.00	3.00
35	0.00	0.00	0.00	0.00	707.67	707.67	24768.33	2.92
34	0.00	0.00	0.00	0.00	707.67	707.67	24060.67	2.83
33	0.00	0.00	0.00	0.00	707.67	707.67	23353.00	2.75
32	0.00	0.00	0.00	0.00	707.67	707.67	22645.33	2.67
31	0.00	0.00	0.00	0.00	707.67	707.67	21937.67	2.58
30	0.00	0.00	0.00	0.00	707.67	707.67	21230.00	2.50
29	0.00	0.00	0.00	0.00	707.67	707.67	20522.33	2.42
28	0.00	0.00	0.00	0.00	707.67	707.67	19814.67	2.33
27	0.00	0.00	0.00	0.00	707.67	707.67	19107.00	2.25
26	0.00	0.00	0.00	0.00	707.67	707.67	18399.33	2.17
25	0.00	0.00	0.00	0.00	707.67	707.67	17691.67	2.08
24	0.00	0.00	0.00	0.00	707.67	707.67	16984.00	2.00
23	0.00	0.00	0.00	0.00	707.67	707.67	16276.33	1.92
22	0.00	0.00	0.00	0.00	707.67	707.67	15568.67	1.83
21	0.00	0.00	0.00	0.00	707.67	707.67	14861.00	1.75
20	0.00	0.00	0.00	0.00	707.67	707.67	14153.33	1.67
19	0.00	0.00	0.00	0.00	707.67	707.67	13445.67	1.58
18	0.00	0.00	0.00	0.00	707.67	707.67	12738.00	1.50
17	0.00	0.00	0.00	0.00	707.67	707.67	12030.33	1.42
16	0.00	0.00	0.00	0.00	707.67	707.67	11322.67	1.33
15	0.00	0.00	0.00	0.00	707.67	707.67	10615.00	1.25
14	0.00	0.00	0.00	0.00	707.67	707.67	9907.33	1.17
13	0.00	0.00	0.00	0.00	707.67	707.67	9199.67	1.08
12	0.00	0.00	0.00	0.00	707.67	707.67	8492.00	1.00
11	0.00	0.00	0.00	0.00	707.67	707.67	7784.33	0.92
10	0.00	0.00	0.00	0.00	707.67	707.67	7076.67	0.83
9	0.00	0.00	0.00	0.00	707.67	707.67	6369.00	0.75
8	0.00	0.00	0.00	0.00	707.67	707.67	5661.33	0.67
7	0.00	0.00	0.00	0.00	707.67	707.67	4953.67	0.58
6	0.00	0.00	0.00	0.00	707.67	707.67	4246.00	0.50
5	0.00	0.00	0.00	0.00	707.67	707.67	3538.33	0.42
4	0.00	0.00	0.00	0.00	707.67	707.67	2830.67	0.33
3	0.00	0.00	0.00	0.00	707.67	707.67	2123.00	0.25
2	0.00	0.00	0.00	0.00	707.67	707.67	1415.33	0.17
1	0.00	0.00	0.00	0.00	707.67	707.67	707.67	0.08

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID DMA B	Legend:	Required Entries / Calculated Cells

Company Name: Thienes Engineering — Date: 11/10/2023

Designed by: — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	16.84	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	44,323	ft^3

Maximum Depth

a) Infiltration rate	I =	1.65	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	3.3	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		50	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		50	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	39.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	3.3	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	n/a	:1
b) Proposed basin depth (excluding freeboard)	d_B =	2.53	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	17519	ft^2
d) Proposed Design Surface Area	A_D =	21230.0	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	222	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	n/a	ft
c) Forebay surface area (minimum)	Area =	#######	ft^2
d) Full height notch-type weir	Width (W) =	n/a	in

Notes: Effective ponding depth to achieve Vbmp = 28.4 inches = (36" x 0.4) + 14" chamber ponding.

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc. — Date: 11/10/2023

Designed by: Luis Prado — Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: STC "C" / DMA C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
C-1	*121532.4*	*Roofs*	*1*	*0.89*	*108406.9*			
C-2	*6534*	*Ornamental Landscaping*	*0.1*	*0.11*	*721.7*			
	128066.4	***Total***			109128.6	0.85	*7729.9*	*8928*

Notes:

Tributary area = 2.94 acres

HCOC volume needed = 15,439 CF (Per Appendix 7)

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc.
Date: 11/10/2023
Designed by: Luis Prado
Case No:
Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: CDS "C" (DMA C) - CDS1515-3-C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMAs	*C-1*	*121532.4*	*Roofs*	*1*	*0.89*	*108406.9*			
	C-2	*6534*	*Ornamental Landscaping*	*0.1*	*0.110458*	*721.7*			
		128066.4	***Total***			**109128.6**	**0.20**	***0.5***	***0.5***

Notes:
Design Flow Rate = 0.5 cfs
Provided Flow Rate = 0.5 cfs

Project: **Temescal Canyon Road / DMA C**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	61	
Number of End Caps -	14	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	3703	sf Min. Area - 3369 sf min. area

StormTech Detention • Retention • Water Quality
A division of ADS

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)	
93	**0.00**	**0.00**	**0.00**	**0.00**	**123.43**	**123.43**	**15629.00**	**7.75**	HCOC MET
92	0.00	0.00	0.00	0.00	123.43	123.43	15505.56	7.67	
91	0.00	0.00	0.00	0.00	123.43	123.43	15382.13	7.58	
90	0.00	0.00	0.00	0.00	123.43	123.43	15258.70	7.50	
89	0.00	0.00	0.00	0.00	123.43	123.43	15135.26	7.42	
88	0.00	0.00	0.00	0.00	123.43	123.43	15011.83	7.33	
87	0.00	0.00	0.00	0.00	123.43	123.43	14888.40	7.25	
86	0.00	0.00	0.00	0.00	123.43	123.43	14764.96	7.17	
85	0.00	0.00	0.00	0.00	123.43	123.43	14641.53	7.08	
84	0.00	0.00	0.00	0.00	123.43	123.43	14518.10	7.00	
83	0.00	0.00	0.00	0.00	123.43	123.43	14394.66	6.92	
82	0.00	0.00	0.00	0.00	123.43	123.43	14271.23	6.83	
81	0.06	0.00	3.54	0.00	122.02	125.56	14147.80	6.75	
80	0.19	0.02	11.84	0.33	118.56	130.74	14022.24	6.67	
79	0.29	0.04	17.93	0.53	116.05	134.51	13891.50	6.58	
78	0.40	0.05	24.62	0.72	113.30	138.64	13756.99	6.50	
77	0.69	0.07	41.92	0.95	106.29	149.15	13618.35	6.42	
76	1.03	0.09	62.73	1.24	97.85	161.81	13469.20	6.33	
75	1.25	0.11	76.22	1.50	92.34	170.07	13307.39	6.25	
74	1.42	0.13	86.76	1.77	88.02	176.55	13137.32	6.17	
73	1.57	0.14	95.96	2.02	84.24	182.22	12960.78	6.08	
72	1.71	0.16	104.14	2.28	80.87	187.28	12778.55	6.00	
71	1.83	0.18	111.54	2.54	77.80	191.88	12591.27	5.92	
70	1.94	0.20	118.20	2.81	75.03	196.04	12399.39	5.83	
69	2.04	0.22	124.49	3.06	72.41	199.96	12203.35	5.75	
68	2.13	0.23	130.22	3.29	70.03	203.54	12003.39	5.67	
67	2.22	0.25	135.68	3.51	67.76	206.94	11799.85	5.58	
66	2.31	0.27	140.71	3.72	65.66	210.09	11592.91	5.50	
65	2.38	0.28	145.47	3.92	63.68	213.07	11382.81	5.42	
64	2.46	0.29	150.00	4.12	61.79	215.91	11169.74	5.33	
63	2.53	0.31	154.22	4.31	60.02	218.55	10953.84	5.25	
62	2.59	0.32	158.22	4.50	58.35	221.06	10735.29	5.17	
61	2.66	0.33	162.02	4.68	56.75	223.45	10514.23	5.08	
60	2.72	0.35	165.62	4.86	55.24	225.72	10290.77	5.00	
59	2.77	0.36	169.05	5.04	53.80	227.89	10065.05	4.92	
58	2.82	0.37	172.30	5.21	52.43	229.94	9837.17	4.83	
57	2.88	0.38	175.40	5.38	51.12	231.90	9607.22	4.75	
56	2.92	0.40	178.37	5.54	49.87	233.78	9375.32	4.67	
55	2.97	0.41	181.16	5.71	48.69	235.55	9141.54	4.58	
54	3.01	0.42	183.76	5.86	47.58	237.21	8905.9806	4.50	
53	3.05	0.43	186.25	6.02	46.53	238.79	8668.77	4.42	
52	3.09	0.44	188.75	6.17	45.47	240.38	8429.98	4.33	
51	3.13	0.45	190.96	6.31	44.52	241.80	8189.60	4.25	
50	**3.17**	**0.46**	**193.11**	**6.45**	**43.61**	**243.17**	**7947.80**	**4.17**	DCV MET
49	3.20	0.47	195.17	6.59	42.73	244.49	7704.63	4.08	
48	3.23	0.48	197.10	6.72	41.91	245.72	7460.15	4.00	
47	3.26	0.49	198.95	6.85	41.12	246.91	7214.42	3.92	
46	3.29	0.50	200.71	6.97	40.36	248.04	6967.51	3.83	
45	3.32	0.51	202.40	7.09	39.64	249.12	6719.47	3.75	
44	3.34	0.51	203.99	7.20	38.96	250.15	6470.35	3.67	
43	3.37	0.52	205.49	7.31	38.31	251.11	6220.20	3.58	
42	3.39	0.53	206.94	7.41	37.69	252.05	5969.09	3.50	
41	3.41	0.54	208.29	7.51	37.11	252.91	5717.04	3.42	

40	3.44	0.54	209.66	7.60	36.53	253.79	5464.13	3.33
39	3.46	0.55	210.92	7.69	35.99	254.60	5210.33	3.25
38	3.48	0.56	212.20	7.77	35.44	255.42	4955.73	3.17
37	3.51	0.59	213.81	8.33	34.58	256.72	4700.32	3.08
36	0.00	0.00	0.00	0.00	123.43	123.43	4443.60	3.00
35	0.00	0.00	0.00	0.00	123.43	123.43	4320.17	2.92
34	0.00	0.00	0.00	0.00	123.43	123.43	4196.73	2.83
33	0.00	0.00	0.00	0.00	123.43	123.43	4073.30	2.75
32	0.00	0.00	0.00	0.00	123.43	123.43	3949.87	2.67
31	0.00	0.00	0.00	0.00	123.43	123.43	3826.43	2.58
30	0.00	0.00	0.00	0.00	123.43	123.43	3703.00	2.50
29	0.00	0.00	0.00	0.00	123.43	123.43	3579.57	2.42
28	0.00	0.00	0.00	0.00	123.43	123.43	3456.13	2.33
27	0.00	0.00	0.00	0.00	123.43	123.43	3332.70	2.25
26	0.00	0.00	0.00	0.00	123.43	123.43	3209.27	2.17
25	0.00	0.00	0.00	0.00	123.43	123.43	3085.83	2.08
24	0.00	0.00	0.00	0.00	123.43	123.43	2962.40	2.00
23	0.00	0.00	0.00	0.00	123.43	123.43	2838.97	1.92
22	0.00	0.00	0.00	0.00	123.43	123.43	2715.53	1.83
21	0.00	0.00	0.00	0.00	123.43	123.43	2592.10	1.75
20	0.00	0.00	0.00	0.00	123.43	123.43	2468.67	1.67
19	0.00	0.00	0.00	0.00	123.43	123.43	2345.23	1.58
18	0.00	0.00	0.00	0.00	123.43	123.43	2221.80	1.50
17	0.00	0.00	0.00	0.00	123.43	123.43	2098.37	1.42
16	0.00	0.00	0.00	0.00	123.43	123.43	1974.93	1.33
15	0.00	0.00	0.00	0.00	123.43	123.43	1851.50	1.25
14	0.00	0.00	0.00	0.00	123.43	123.43	1728.07	1.17
13	0.00	0.00	0.00	0.00	123.43	123.43	1604.63	1.08
12	0.00	0.00	0.00	0.00	123.43	123.43	1481.20	1.00
11	0.00	0.00	0.00	0.00	123.43	123.43	1357.77	0.92
10	0.00	0.00	0.00	0.00	123.43	123.43	1234.33	0.83
9	0.00	0.00	0.00	0.00	123.43	123.43	1110.90	0.75
8	0.00	0.00	0.00	0.00	123.43	123.43	987.47	0.67
7	0.00	0.00	0.00	0.00	123.43	123.43	864.03	0.58
6	0.00	0.00	0.00	0.00	123.43	123.43	740.60	0.50
5	0.00	0.00	0.00	0.00	123.43	123.43	617.17	0.42
4	0.00	0.00	0.00	0.00	123.43	123.43	493.73	0.33
3	0.00	0.00	0.00	0.00	123.43	123.43	370.30	0.25
2	0.00	0.00	0.00	0.00	123.43	123.43	246.87	0.17
1	0.00	0.00	0.00	0.00	123.43	123.43	123.43	0.08

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID DMA C	Legend:	Required Entries / Calculated Cells

Company Name: Thienes Engineering — Date: 11/10/2023

Designed by: — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	2.94	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	7,730	ft^3

Maximum Depth

a) Infiltration rate	I =	2.06	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	4.1	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		50	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		50	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	39.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	4.1	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	n/a	:1
b) Proposed basin depth (excluding freeboard)	d_B =	2.53	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	3055	ft^2
d) Proposed Design Surface Area	A_D =	3703.0	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	39	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	n/a	ft
c) Forebay surface area (minimum)	Area =	#######	ft^2
d) Full height notch-type weir	Width (W) =	n/a	in

Notes: Effective ponding depth to achieve Vbmp = 28.4 inches = (36" x 0.4) + 14" chamber ponding

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

(Note this worksheet shall ***only*** *be used in conjunction with BMP designs from the* ***LID BMP Design Handbook****)*

Company Name: Thienes Engineering, Inc. — Date: 11/10/2023

Designed by: Luis Prado — Case No:

Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: STC "D" / DMA D

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D-1	*378972*	*Roofs*	*1*	*0.89*	*338043*			
D-2	*20037.6*	*Ornamental Landscaping*	*0.1*	*0.11*	*2213.3*			
	399009.6	***Total***			**340256.3**	**0.85**	***24101.5***	***26713***

Notes:

Tributary area = 9.16 acres

HCOC volume needed = 48,101 CF (Per Appendix 7)

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries | Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Thienes Engineering, Inc.
Date: 11/10/2023
Designed by: Luis Prado
Case No:
Company Project Number/Name: Temescal Canyon Road (3905)

BMP Identification

BMP NAME / ID: CDS "D" (DMA D) - CDS2025-5-C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
D-1	*378972*	*Roofs*	*1*	*0.89*	*338043*			
D-2	*20037.6*	*Ornamental Landscaping*	*0.1*	*0.110458*	*2213.3*			
	399009.6	*Total*			340256.3	0.20	*1.6*	*1.6*

Notes:
Design Flow Rate = 1.6 cfs
Provided Flow Rate = 1.6 cfs

Project: **Temescal Canyon Road / DMA D**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	203	
Number of End Caps -	16	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	11175	sf Min. Area - 10696 sf min. area

StormTech Detention • Retention • Water Quality
A division of ADS

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)	
93	**0.00**	**0.00**	**0.00**	**0.00**	**372.50**	**372.50**	**48177.64**	**7.75**	HCOC MET
92	0.00	0.00	0.00	0.00	372.50	372.50	47805.14	7.67	
91	0.00	0.00	0.00	0.00	372.50	372.50	47432.64	7.58	
90	0.00	0.00	0.00	0.00	372.50	372.50	47060.14	7.50	
89	0.00	0.00	0.00	0.00	372.50	372.50	46687.64	7.42	
88	0.00	0.00	0.00	0.00	372.50	372.50	46315.14	7.33	
87	0.00	0.00	0.00	0.00	372.50	372.50	45942.64	7.25	
86	0.00	0.00	0.00	0.00	372.50	372.50	45570.14	7.17	
85	0.00	0.00	0.00	0.00	372.50	372.50	45197.64	7.08	
84	0.00	0.00	0.00	0.00	372.50	372.50	44825.14	7.00	
83	0.00	0.00	0.00	0.00	372.50	372.50	44452.64	6.92	
82	0.00	0.00	0.00	0.00	372.50	372.50	44080.14	6.83	
81	0.06	0.00	11.79	0.00	367.78	379.57	43707.64	6.75	
80	0.19	0.02	39.40	0.38	356.59	396.37	43328.07	6.67	
79	0.29	0.04	59.67	0.60	348.39	408.67	42931.70	6.58	
78	0.40	0.05	81.94	0.82	339.39	422.16	42523.03	6.50	
77	0.69	0.07	139.50	1.08	316.27	456.85	42100.87	6.42	
76	1.03	0.09	208.74	1.41	288.44	498.59	41644.03	6.33	
75	1.25	0.11	253.65	1.71	270.35	525.72	41145.43	6.25	
74	1.42	0.13	288.71	2.02	256.21	546.94	40619.71	6.17	
73	1.57	0.14	319.35	2.31	243.84	565.49	40072.77	6.08	
72	1.71	0.16	346.55	2.61	232.84	581.99	39507.28	6.00	
71	1.83	0.18	371.19	2.91	222.86	596.96	38925.28	5.92	
70	1.94	0.20	393.37	3.21	213.87	610.45	38328.33	5.83	
69	2.04	0.22	414.29	3.49	205.39	623.17	37717.88	5.75	
68	2.13	0.23	433.34	3.76	197.66	634.76	37094.71	5.67	
67	2.22	0.25	451.52	4.01	190.29	645.82	36459.95	5.58	
66	2.31	0.27	468.28	4.25	183.49	656.02	35814.14	5.50	
65	2.38	0.28	484.11	4.48	177.06	665.65	35158.12	5.42	
64	2.46	0.29	499.20	4.70	170.94	674.84	34492.47	5.33	
63	2.53	0.31	513.22	4.93	165.24	683.39	33817.63	5.25	
62	2.59	0.32	526.53	5.14	159.83	691.50	33134.24	5.17	
61	2.66	0.33	539.18	5.35	154.69	699.22	32442.74	5.08	
60	2.72	0.35	551.17	5.55	149.81	706.53	31743.52	5.00	
59	2.77	0.36	562.57	5.76	145.17	713.50	31036.99	4.92	
58	2.82	0.37	573.40	5.96	140.76	720.12	30323.49	4.83	
57	2.88	0.38	583.72	6.15	136.55	726.42	29603.38	4.75	
56	2.92	0.40	593.60	6.34	132.53	732.46	28876.96	4.67	
55	2.97	0.41	602.89	6.52	128.74	738.15	28144.49	4.58	
54	3.01	0.42	611.53	6.70	125.21	743.44	27406.35	4.50	
53	3.05	0.43	619.81	6.87	121.83	748.51	26662.91	4.42	
52	3.09	0.44	628.14	7.05	118.43	753.61	25914.40	4.33	
51	3.13	0.45	635.50	7.21	115.41	758.13	25160.79	4.25	
50	**3.17**	**0.46**	**642.63**	**7.37**	**112.50**	**762.50**	**24402.66**	**4.17**	DCV MET
49	3.20	0.47	649.49	7.53	109.69	766.71	23640.16	4.08	
48	3.23	0.48	655.92	7.68	107.06	770.66	22873.45	4.00	
47	3.26	0.49	662.07	7.83	104.54	774.44	22102.79	3.92	
46	3.29	0.50	667.92	7.97	102.14	778.03	21328.35	3.83	
45	3.32	0.51	673.55	8.10	99.84	781.49	20550.32	3.75	
44	3.34	0.51	678.86	8.23	97.66	784.75	19768.83	3.67	
43	3.37	0.52	683.83	8.36	95.63	787.81	18984.08	3.58	
42	3.39	0.53	688.68	8.47	93.64	790.79	18196.27	3.50	
41	3.41	0.54	693.15	8.58	91.81	793.54	17405.48	3.42	

40	3.44	0.54	697.71	8.69	89.94	796.34	16611.93	3.33
39	3.46	0.55	701.92	8.79	88.22	798.92	15815.59	3.25
38	3.48	0.56	706.17	8.88	86.48	801.54	15016.67	3.17
37	3.51	0.59	711.53	9.52	84.08	805.13	14215.13	3.08
36	0.00	0.00	0.00	0.00	372.50	372.50	13410.00	3.00
35	0.00	0.00	0.00	0.00	372.50	372.50	13037.50	2.92
34	0.00	0.00	0.00	0.00	372.50	372.50	12665.00	2.83
33	0.00	0.00	0.00	0.00	372.50	372.50	12292.50	2.75
32	0.00	0.00	0.00	0.00	372.50	372.50	11920.00	2.67
31	0.00	0.00	0.00	0.00	372.50	372.50	11547.50	2.58
30	0.00	0.00	0.00	0.00	372.50	372.50	11175.00	2.50
29	0.00	0.00	0.00	0.00	372.50	372.50	10802.50	2.42
28	0.00	0.00	0.00	0.00	372.50	372.50	10430.00	2.33
27	0.00	0.00	0.00	0.00	372.50	372.50	10057.50	2.25
26	0.00	0.00	0.00	0.00	372.50	372.50	9685.00	2.17
25	0.00	0.00	0.00	0.00	372.50	372.50	9312.50	2.08
24	0.00	0.00	0.00	0.00	372.50	372.50	8940.00	2.00
23	0.00	0.00	0.00	0.00	372.50	372.50	8567.50	1.92
22	0.00	0.00	0.00	0.00	372.50	372.50	8195.00	1.83
21	0.00	0.00	0.00	0.00	372.50	372.50	7822.50	1.75
20	0.00	0.00	0.00	0.00	372.50	372.50	7450.00	1.67
19	0.00	0.00	0.00	0.00	372.50	372.50	7077.50	1.58
18	0.00	0.00	0.00	0.00	372.50	372.50	6705.00	1.50
17	0.00	0.00	0.00	0.00	372.50	372.50	6332.50	1.42
16	0.00	0.00	0.00	0.00	372.50	372.50	5960.00	1.33
15	0.00	0.00	0.00	0.00	372.50	372.50	5587.50	1.25
14	0.00	0.00	0.00	0.00	372.50	372.50	5215.00	1.17
13	0.00	0.00	0.00	0.00	372.50	372.50	4842.50	1.08
12	0.00	0.00	0.00	0.00	372.50	372.50	4470.00	1.00
11	0.00	0.00	0.00	0.00	372.50	372.50	4097.50	0.92
10	0.00	0.00	0.00	0.00	372.50	372.50	3725.00	0.83
9	0.00	0.00	0.00	0.00	372.50	372.50	3352.50	0.75
8	0.00	0.00	0.00	0.00	372.50	372.50	2980.00	0.67
7	0.00	0.00	0.00	0.00	372.50	372.50	2607.50	0.58
6	0.00	0.00	0.00	0.00	372.50	372.50	2235.00	0.50
5	0.00	0.00	0.00	0.00	372.50	372.50	1862.50	0.42
4	0.00	0.00	0.00	0.00	372.50	372.50	1490.00	0.33
3	0.00	0.00	0.00	0.00	372.50	372.50	1117.50	0.25
2	0.00	0.00	0.00	0.00	372.50	372.50	745.00	0.17
1	0.00	0.00	0.00	0.00	372.50	372.50	372.50	0.08

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID DMA D	Legend:	Required Entries / Calculated Cells

Company Name: Thienes Engineering — Date: 11/10/2023

Designed by: — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	9.16	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	24,102	ft^3

Maximum Depth

a) Infiltration rate	I =	5.8	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	11.6	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		50	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		50	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	39.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	11.6	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	n/a	:1
b) Proposed basin depth (excluding freeboard)	d_B =	2.53	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	9526	ft^2
d) Proposed Design Surface Area	A_D =	11175.0	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	121	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	n/a	ft
c) Forebay surface area (minimum)	Area =	#######	ft^2
d) Full height notch-type weir	Width (W) =	n/a	in

Notes: Effective ponding depth to achieve Vbmp = 28.4 inches = (36" x 0.4) + 14" chamber ponding

OFFSITE DCV CALCULATIONS (PER RICK ENGINEERING)

Temescal Valley Commerce Center
Offsite Frontage Roads
RIck Engineering JN-18602
9/18/2023

DCV and HCOC Calculation Summary
HCOC Rainfall Data: 2yr 24 hr Depth = 2.09 in; Intensity = 0.087 in/hr (per NOAA Atlas 14)
Water Quality Rainfall Data: Depth = 85th Percentile = 0.85 in; Intensity = 0.2 in/hr (Per RCFC LID Manual)

DMA TYPE/ID	DMA AREA (sf)	*DMA AREA (ac)*	ASSUMED % IMP	EFFECTIVE IMPERIVOUS FRACTION, If	DMA RUNOFF FACTOR	DMA AREAS X RUNOFF FACTOR	STORM DESIGN DEPTH (in)	**VBMP DESIGN CAPTURE VOLUME (cf) (Unchanged from 9/21/2021)**	PRE-PROJECT IMPERVIOUS AREA (sf)	POST-PROJECT IMPERVIOUS AREA (sf)	Increase of Impervious Area (sf)	HCOC Pre Volume (cf)	HCOC Post Volume (cf)	**Approximate HCOC Detention Volume (cf)**	WQ Flowrate (for catch basin offset structure) (cfs)	HCOC Flowrate (for catch basin offset structure) (cfs)	**Total Flowrate (Greater flowrate of WQ/HCOC for catch basin offset structure) (cfs)**
DMA 1.1	*139,609*	*3.2*	*95*	*0.98*	*0.86*	*119,638*	0.85	**8,474**	72,003	130,838	58,835	10,533	20,424	**9,890**	0.55	0.24	**0.55**
DMA 1.3	*110,953*	*2.5*	*95*	*0.97*	*0.84*	*93,195*	0.85	**6,601**	33,738	37,539	3,801	4,936	16,231	**11,296**	0.43	0.19	**0.43**
DMA 2.1	*39,197*	*0.9*	*95*	*0.97*	*0.84*	*32,924*	0.85	**2,332**	33,631	39,197	5,566	4,920	5,734	**814**	0.15	0.07	**0.15**
DMA 3.1	*10,234*	*0.2*	*95*	*0.97*	*0.84*	*8,596*	0.85	**609**	7,387	*10,234*	2,847	1,081	1,497	**416**	0.04	0.02	**0.04**
DMA 3.2	*26,633*	*0.6*	*95*	*0.97*	*0.84*	*22,370*	0.85	**1,585**	23,866	*26,633*	2,767	3,491	3,896	**405**	0.10	0.04	**0.10**
DMA 3.3	*12,558*	*0.3*	*95*	*0.97*	*0.84*	*10,548*	0.85	**747**	8,023	*12,558*	4,535	1,174	1,837	**663**	0.05	0.02	**0.05**

Notes: 1. Above Vbmp Calculations performed in accordance with RCFC LID Manual
2. HCOC Detention Volumes calculated using Q=CIA where DMA runoff factor (C value) = 0.84 and 2yr 24hr Rainfall depth (I) = 2.09 in
3. WQ/HCOC Flowrates calculated using Q=CIA where DMA runoff factor (C value) = 0.84 and Rainfall Intensities (I) = 0.2 in/hr and 0.087 in/hr respectively
4. Pre-project HCOC is calculated from the pre-project impervious area

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Rick Engineering	Date	11/14/2023
Designed by	TR	Case No	
Company Project Number/Name	18602B		

BMP Identification

BMP NAME / ID: DMA 1.1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 1.1	*139609*	*Mixed Surface Types*	*0.98*	*0.86*	*119638*			
	139609		*Total*		119638	0.85	*8474.4*	*10181*

Notes:

Project: **Temescal Canyon Road / DMA 1.1**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	52	
Number of End Caps -	4	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	3052	sf Min. Area - 2738 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	101.73	101.73	10180.65	5.50
65	0.00	0.00	0.00	0.00	101.73	101.73	10078.91	5.42
64	0.00	0.00	0.00	0.00	101.73	101.73	9977.18	5.33
63	0.00	0.00	0.00	0.00	101.73	101.73	9875.45	5.25
62	0.00	0.00	0.00	0.00	101.73	101.73	9773.71	5.17
61	0.00	0.00	0.00	0.00	101.73	101.73	9671.98	5.08
60	0.00	0.00	0.00	0.00	101.73	101.73	9570.25	5.00
59	0.00	0.00	0.00	0.00	101.73	101.73	9468.51	4.92
58	0.00	0.00	0.00	0.00	101.73	101.73	9366.78	4.83
57	0.00	0.00	0.00	0.00	101.73	101.73	9265.05	4.75
56	0.00	0.00	0.00	0.00	101.73	101.73	9163.31	4.67
55	0.00	0.00	0.00	0.00	101.73	101.73	9061.58	4.58
54	0.06	0.00	3.02	0.00	100.53	103.55	8959.85	4.50
53	0.19	0.02	10.09	0.10	97.66	107.85	8856.30	4.42
52	0.29	0.04	15.29	0.15	95.56	111.00	8748.45	4.33
51	0.40	0.05	20.99	0.21	93.26	114.45	8637.46	4.25
50	0.69	0.07	35.73	0.27	87.33	123.34	8523.01	4.17
49	1.03	0.09	53.47	0.35	80.20	134.03	8399.67	4.08
48	1.25	0.11	64.98	0.43	75.57	140.98	8265.64	4.00
47	1.42	0.13	73.96	0.51	71.95	146.41	8124.67	3.92
46	1.57	0.14	81.80	0.58	68.78	151.16	7978.26	3.83
45	1.71	0.16	88.77	0.65	65.96	155.39	7827.10	3.75
44	1.83	0.18	95.08	0.73	63.41	159.22	7671.71	3.67
43	1.94	0.20	100.76	0.80	61.11	162.67	7512.49	3.58
42	2.04	0.22	106.12	0.87	58.93	165.93	7349.82	3.50
41	2.13	0.23	111.00	0.94	56.96	168.90	7183.89	3.42
40	2.22	0.25	115.66	1.00	55.07	171.73	7014.99	3.33
39	2.31	0.27	119.95	1.06	53.33	174.34	6843.26	3.25
38	2.38	0.28	124.01	1.12	51.68	176.81	6668.91	3.17
37	2.46	0.29	127.87	1.18	50.11	179.16	6492.10	3.08
36	2.53	0.31	131.46	1.23	48.65	181.35	6312.94	3.00
35	2.59	0.32	134.87	1.28	47.27	183.43	6131.59	2.92
34	2.66	0.33	138.11	1.34	45.95	185.40	5948.16	2.83
33	2.72	0.35	141.19	1.39	44.70	187.28	5762.76	2.75
32	2.77	0.36	144.11	1.44	43.51	189.06	5575.48	2.67
31	2.82	0.37	146.88	1.49	42.38	190.76	5386.42	2.58
30	2.88	0.38	149.52	1.54	41.31	192.37	5195.66	2.50
29	2.92	0.40	152.06	1.58	40.28	193.92	5003.29	2.42
28	2.97	0.41	154.43	1.63	39.31	195.37	4809.38	2.33
27	3.01	0.42	156.65	1.67	38.40	196.73	4614.0034	2.25
26	3.05	0.43	158.77	1.72	37.54	198.03	4417.28	2.17
25	3.09	0.44	160.90	1.76	36.67	199.33	4219.25	2.08
24	3.13	0.45	162.79	1.80	35.90	200.49	4019.92	2.00
23	3.17	0.46	164.61	1.84	35.15	201.61	3819.43	1.92
22	3.20	0.47	166.37	1.88	34.43	202.69	3617.82	1.83
21	3.23	0.48	168.02	1.92	33.76	203.70	3415.14	1.75

20	3.26	0.49	169.59	1.96	33.11	204.66	3211.44	1.67
19	3.29	0.50	171.09	1.99	32.50	205.58	3006.78	1.58
18	3.32	0.51	172.53	2.03	31.91	206.47	2801.19	1.50
17	3.34	0.51	173.89	2.06	31.35	207.30	2594.72	1.42
16	3.37	0.52	175.17	2.09	30.83	208.09	2387.42	1.33
15	3.39	0.53	176.41	2.12	30.32	208.85	2179.33	1.25
14	3.41	0.54	177.56	2.15	29.85	209.55	1970.48	1.17
13	3.44	0.54	178.72	2.17	29.37	210.27	1760.93	1.08
12	3.46	0.55	179.80	2.20	28.93	210.93	1550.65	1.00
11	3.48	0.56	180.89	2.22	28.49	211.60	1339.72	0.92
10	3.51	0.59	182.26	2.38	27.88	212.52	1128.12	0.83
9	0.00	0.00	0.00	0.00	101.73	101.73	915.60	0.75
8	0.00	0.00	0.00	0.00	101.73	101.73	813.87	0.67
7	0.00	0.00	0.00	0.00	101.73	101.73	712.13	0.58
6	0.00	0.00	0.00	0.00	101.73	101.73	610.40	0.50
5	0.00	0.00	0.00	0.00	101.73	101.73	508.67	0.42
4	0.00	0.00	0.00	0.00	101.73	101.73	406.93	0.33
3	0.00	0.00	0.00	0.00	101.73	101.73	305.20	0.25
2	0.00	0.00	0.00	0.00	101.73	101.73	203.47	0.17
1	0.00	0.00	0.00	0.00	101.73	101.73	101.73	0.08

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Rick Engineering — Date: 11/14/2023
Designed by: TR — Case No:
Company Project Number/Name: 18602B

BMP Identification

BMP NAME / ID: DMA 1.3

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 1.3	*110953*	*Mixed Surface Types*	*0.97*	*0.84*	*93195.1*			
	110953	***Total***			93195.1	0.85	*6601.3*	*11627*

Notes:

Project: **Temescal Canyon Road / DMA 1.3**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	43	
Number of End Caps -	12	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	2801	sf Min. Area - 2411 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
93	0.00	0.00	0.00	0.00	93.37	93.37	11627.42	7.75
92	0.00	0.00	0.00	0.00	93.37	93.37	11534.05	7.67
91	0.00	0.00	0.00	0.00	93.37	93.37	11440.69	7.58
90	0.00	0.00	0.00	0.00	93.37	93.37	11347.32	7.50
89	0.00	0.00	0.00	0.00	93.37	93.37	11253.95	7.42
88	0.00	0.00	0.00	0.00	93.37	93.37	11160.59	7.33
87	0.00	0.00	0.00	0.00	93.37	93.37	11067.22	7.25
86	0.00	0.00	0.00	0.00	93.37	93.37	10973.85	7.17
85	0.00	0.00	0.00	0.00	93.37	93.37	10880.49	7.08
84	0.00	0.00	0.00	0.00	93.37	93.37	10787.12	7.00
83	0.00	0.00	0.00	0.00	93.37	93.37	10693.75	6.92
82	0.00	0.00	0.00	0.00	93.37	93.37	10600.39	6.83
81	0.06	0.00	2.50	0.00	92.37	94.87	10507.02	6.75
80	0.19	0.02	8.35	0.29	89.91	98.55	10412.16	6.67
79	0.29	0.04	12.64	0.45	88.13	101.22	10313.61	6.58
78	0.40	0.05	17.36	0.62	86.18	104.15	10212.39	6.50
77	0.69	0.07	29.55	0.81	81.22	111.58	10108.24	6.42
76	1.03	0.09	44.22	1.06	75.26	120.53	9996.65	6.33
75	1.25	0.11	53.73	1.29	71.36	126.38	9876.12	6.25
74	1.42	0.13	61.16	1.52	68.30	130.97	9749.75	6.17
73	1.57	0.14	67.64	1.73	65.62	134.99	9618.78	6.08
72	1.71	0.16	73.41	1.95	63.22	138.58	9483.78	6.00
71	1.83	0.18	78.63	2.18	61.04	141.85	9345.20	5.92
70	1.94	0.20	83.32	2.41	59.07	144.80	9203.35	5.83
69	2.04	0.22	87.76	2.62	57.22	147.59	9058.54	5.75
68	2.13	0.23	91.79	2.82	55.52	150.13	8910.95	5.67
67	2.22	0.25	95.64	3.01	53.91	152.56	8760.82	5.58
66	2.31	0.27	99.19	3.19	52.42	154.79	8608.26	5.50
65	2.38	0.28	102.55	3.36	51.00	156.91	8453.47	5.42
64	2.46	0.29	105.74	3.53	49.66	158.93	8296.56	5.33
63	2.53	0.31	108.71	3.69	48.40	160.81	8137.63	5.25
62	2.59	0.32	111.53	3.85	47.21	162.60	7976.82	5.17
61	2.66	0.33	114.21	4.01	46.08	164.30	7814.22	5.08
60	2.72	0.35	116.75	4.16	45.00	165.91	7649.92	5.00
59	2.77	0.36	119.17	4.32	43.97	167.46	7484.01	4.92
58	2.82	0.37	121.46	4.47	43.00	168.92	7316.55	4.83
57	2.88	0.38	123.64	4.61	42.06	170.32	7147.63	4.75
56	2.92	0.40	125.74	4.75	41.17	171.66	6977.31	4.67
55	2.97	0.41	127.71	4.89	40.33	172.92	6805.65	4.58
54	3.01	0.42	129.54	5.02	39.54	174.10	6632.7214	4.50
53	3.05	0.43	131.29	5.16	38.79	175.23	6458.62	4.42
52	3.09	0.44	133.05	5.28	38.03	176.37	6283.38	4.33
51	3.13	0.45	134.61	5.41	37.36	177.38	6107.01	4.25
50	3.17	0.46	136.12	5.53	36.71	178.36	5929.63	4.17
49	3.20	0.47	137.58	5.65	36.08	179.30	5751.27	4.08
48	3.23	0.48	138.94	5.76	35.49	180.19	5571.97	4.00

47	3.26	0.49	140.24	5.87	34.92	181.03	5391.79	3.92
46	3.29	0.50	141.48	5.98	34.38	181.84	5210.75	3.83
45	3.32	0.51	142.67	6.08	33.87	182.62	5028.91	3.75
44	3.34	0.51	143.80	6.17	33.38	183.35	4846.30	3.67
43	3.37	0.52	144.85	6.27	32.92	184.04	4662.95	3.58
42	3.39	0.53	145.88	6.35	32.47	184.71	4478.91	3.50
41	3.41	0.54	146.83	6.44	32.06	185.33	4294.20	3.42
40	3.44	0.54	147.79	6.52	31.64	185.95	4108.88	3.33
39	3.46	0.55	148.68	6.59	31.26	186.53	3922.93	3.25
38	3.48	0.56	149.58	6.66	30.87	187.11	3736.40	3.17
37	3.51	0.59	150.72	7.14	30.22	188.08	3549.28	3.08
36	0.00	0.00	0.00	0.00	93.37	93.37	3361.20	3.00
35	0.00	0.00	0.00	0.00	93.37	93.37	3267.83	2.92
34	0.00	0.00	0.00	0.00	93.37	93.37	3174.47	2.83
33	0.00	0.00	0.00	0.00	93.37	93.37	3081.10	2.75
32	0.00	0.00	0.00	0.00	93.37	93.37	2987.73	2.67
31	0.00	0.00	0.00	0.00	93.37	93.37	2894.37	2.58
30	0.00	0.00	0.00	0.00	93.37	93.37	2801.00	2.50
29	0.00	0.00	0.00	0.00	93.37	93.37	2707.63	2.42
28	0.00	0.00	0.00	0.00	93.37	93.37	2614.27	2.33

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Rick Engineering — Date: 11/14/2023

Designed by: TR — Case No:

Company Project Number/Name: 18602B

BMP Identification

BMP NAME / ID: DMA 2.1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 2.1	*39197*	*Mixed Surface Types*	*0.97*	*0.84*	*32923.6*			
	39197	***Total***			**32923.6**	**0.85**	**2332.1**	**2757**

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Thienes Engineering, Inc.	Date	11/13/2023
Designed by	Luis Prado	Case No	
Company Project Number/Name	Temescal Canyon Road (3905)		

BMP Identification

BMP NAME / ID: STC "2.1" / DMA E

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
E-1	*1306.8*	*Concrete or Asphalt*	*1*	*0.89*	*1165.7*			
E-2	*11761.2*	*Ornamental Landscaping*	*0.1*	*0.11*	*1299.1*			
	13068		***Total***		**2464.8**	**0.85**	***174.6***	***2757***

Notes:

Tributary area = 0.30 acres (onsite runoff from DMA F along Dawson Canyon Road North sheet flowing into Offsite DMA 2.1)

Total DCV for STC "2.1" = 175 CF (onsite) + 2,332 CF (offsite) = 2,507 CF

Project: **Dawson Canyon Rd / DMA 2.1**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	12	
Number of End Caps -	6	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	869	sf Min. Area - 717 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	28.97	28.97	2757.26	5.50
65	0.00	0.00	0.00	0.00	28.97	28.97	2728.29	5.42
64	0.00	0.00	0.00	0.00	28.97	28.97	2699.33	5.33
63	0.00	0.00	0.00	0.00	28.97	28.97	2670.36	5.25
62	0.00	0.00	0.00	0.00	28.97	28.97	2641.39	5.17
61	0.00	0.00	0.00	0.00	28.97	28.97	2612.43	5.08
60	0.00	0.00	0.00	0.00	28.97	28.97	2583.46	5.00
59	0.00	0.00	0.00	0.00	28.97	28.97	2554.49	4.92
58	0.00	0.00	0.00	0.00	28.97	28.97	2525.53	4.83
57	0.00	0.00	0.00	0.00	28.97	28.97	2496.56	4.75
56	0.00	0.00	0.00	0.00	28.97	28.97	2467.59	4.67
55	0.00	0.00	0.00	0.00	28.97	28.97	2438.63	4.58
54	0.06	0.00	0.70	0.00	28.69	29.38	2409.66	4.50
53	0.19	0.02	2.33	0.14	27.98	30.45	2380.28	4.42
52	0.29	0.04	3.53	0.23	27.47	31.22	2349.83	4.33
51	0.40	0.05	4.84	0.31	26.91	32.06	2318.61	4.25
50	0.69	0.07	8.25	0.41	25.51	34.16	2286.55	4.17
49	1.03	0.09	12.34	0.53	23.82	36.69	2252.39	4.08
48	1.25	0.11	14.99	0.64	22.71	38.35	2215.70	4.00
47	1.42	0.13	17.07	0.76	21.84	39.66	2177.35	3.92
46	1.57	0.14	18.88	0.87	21.07	40.81	2137.69	3.83
45	1.71	0.16	20.49	0.98	20.38	41.84	2096.88	3.75
44	1.83	0.18	21.94	1.09	19.75	42.79	2055.04	3.67
43	1.94	0.20	23.25	1.20	19.18	43.64	2012.25	3.58
42	2.04	0.22	24.49	1.31	18.65	44.45	1968.61	3.50
41	2.13	0.23	25.62	1.41	18.16	45.18	1924.16	3.42
40	2.22	0.25	26.69	1.50	17.69	45.88	1878.98	3.33
39	2.31	0.27	27.68	1.59	17.26	46.53	1833.10	3.25
38	2.38	0.28	28.62	1.68	16.85	47.14	1786.57	3.17
37	2.46	0.29	29.51	1.76	16.46	47.73	1739.42	3.08
36	2.53	0.31	30.34	1.85	16.09	48.28	1691.69	3.00
35	2.59	0.32	31.12	1.93	15.75	48.80	1643.41	2.92
34	2.66	0.33	31.87	2.01	15.41	49.29	1594.62	2.83
33	2.72	0.35	32.58	2.08	15.10	49.76	1545.32	2.75
32	2.77	0.36	33.26	2.16	14.80	50.22	1495.56	2.67
31	2.82	0.37	33.90	2.23	14.51	50.64	1445.34	2.58
30	2.88	0.38	34.51	2.31	14.24	51.05	1394.70	2.50
29	2.92	0.40	35.09	2.38	13.98	51.45	1343.64	2.42
28	2.97	0.41	35.64	2.45	13.73	51.82	1292.20	2.33
27	3.01	0.42	36.15	2.51	13.50	52.16	1240.3789	2.25
26	3.05	0.43	36.64	2.58	13.28	52.50	1188.22	2.17
25	3.09	0.44	37.13	2.64	13.06	52.83	1135.72	2.08
24	3.13	0.45	37.57	2.70	12.86	53.13	1082.89	2.00
23	3.17	0.46	37.99	2.77	12.67	53.42	1029.76	1.92
22	3.20	0.47	38.39	2.82	12.48	53.70	976.34	1.83
21	3.23	0.48	38.77	2.88	12.31	53.96	922.64	1.75

20	3.26	0.49	39.14	2.94	12.14	54.21	868.68	1.67
19	3.29	0.50	39.48	2.99	11.98	54.45	814.47	1.58
18	3.32	0.51	39.82	3.04	11.83	54.68	760.02	1.50
17	3.34	0.51	40.13	3.09	11.68	54.90	705.35	1.42
16	3.37	0.52	40.42	3.13	11.54	55.10	650.45	1.33
15	3.39	0.53	40.71	3.18	11.41	55.30	595.35	1.25
14	3.41	0.54	40.97	3.22	11.29	55.48	540.05	1.17
13	3.44	0.54	41.24	3.26	11.17	55.67	484.57	1.08
12	3.46	0.55	41.49	3.30	11.05	55.84	428.90	1.00
11	3.48	0.56	41.74	3.33	10.94	56.01	373.06	0.92
10	3.51	0.59	42.06	3.57	10.71	56.35	317.05	0.83
9	0.00	0.00	0.00	0.00	28.97	28.97	260.70	0.75
8	0.00	0.00	0.00	0.00	28.97	28.97	231.73	0.67
7	0.00	0.00	0.00	0.00	28.97	28.97	202.77	0.58
6	0.00	0.00	0.00	0.00	28.97	28.97	173.80	0.50
5	0.00	0.00	0.00	0.00	28.97	28.97	144.83	0.42
4	0.00	0.00	0.00	0.00	28.97	28.97	115.87	0.33
3	0.00	0.00	0.00	0.00	28.97	28.97	86.90	0.25
2	0.00	0.00	0.00	0.00	28.97	28.97	57.93	0.17
1	0.00	0.00	0.00	0.00	28.97	28.97	28.97	0.08

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Rick Engineering — Date: 11/14/2023

Designed by: TR — Case No:

Company Project Number/Name: 18602B

BMP Identification

BMP NAME / ID: DMA 3.1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 3.1	*10234*	*Mixed Surface Types*	*0.97*	*0.84*	*8596.1*			
	10234		***Total***		**8596.1**	**0.85**	***608.9***	***790***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Thienes Engineering, Inc.	Date	11/13/2023
Designed by	Luis Prado	Case No	
Company Project Number/Name	Temescal Canyon Road (3905)		

BMP Identification

BMP NAME / ID: STC "3.1" / DMA F

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
F-1	*871.2*	*Concrete or Asphalt*	*1*	*0.89*	*777.1*			
F-2	*6969.6*	*Ornamental Landscaping*	*0.1*	*0.11*	*769.8*			
	7840.8	***Total***			**1546.9**	**0.85**	***109.6***	***790***

Notes:

Tributary area = 0.18 acres (onsite runoff from DMA F along Dawson Canyon Road South sheet flowing into Offsite DMA 3.1)

Total DCV for STC "3.1" = 110 CF (onsite) + 609 CF (offsite) = 719 CF

Project: **Dawson Canyon Rd / DMA 3.1**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	3	
Number of End Caps -	2	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	261	sf Min. Area - 188 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	8.70	8.70	790.05	5.50
65	0.00	0.00	0.00	0.00	8.70	8.70	781.35	5.42
64	0.00	0.00	0.00	0.00	8.70	8.70	772.65	5.33
63	0.00	0.00	0.00	0.00	8.70	8.70	763.95	5.25
62	0.00	0.00	0.00	0.00	8.70	8.70	755.25	5.17
61	0.00	0.00	0.00	0.00	8.70	8.70	746.55	5.08
60	0.00	0.00	0.00	0.00	8.70	8.70	737.85	5.00
59	0.00	0.00	0.00	0.00	8.70	8.70	729.15	4.92
58	0.00	0.00	0.00	0.00	8.70	8.70	720.45	4.83
57	0.00	0.00	0.00	0.00	8.70	8.70	711.75	4.75
56	0.00	0.00	0.00	0.00	8.70	8.70	703.05	4.67
55	0.00	0.00	0.00	0.00	8.70	8.70	694.35	4.58
54	0.06	0.00	0.17	0.00	8.63	8.80	685.65	4.50
53	0.19	0.02	0.58	0.05	8.45	9.08	676.85	4.42
52	0.29	0.04	0.88	0.08	8.32	9.27	667.77	4.33
51	0.40	0.05	1.21	0.10	8.17	9.49	658.50	4.25
50	0.69	0.07	2.06	0.14	7.82	10.02	649.01	4.17
49	1.03	0.09	3.08	0.18	7.40	10.66	638.99	4.08
48	1.25	0.11	3.75	0.21	7.11	11.08	628.33	4.00
47	1.42	0.13	4.27	0.25	6.89	11.41	617.25	3.92
46	1.57	0.14	4.72	0.29	6.70	11.70	605.84	3.83
45	1.71	0.16	5.12	0.33	6.52	11.97	594.14	3.75
44	1.83	0.18	5.49	0.36	6.36	12.21	582.17	3.67
43	1.94	0.20	5.81	0.40	6.21	12.43	569.96	3.58
42	2.04	0.22	6.12	0.44	6.08	12.64	557.53	3.50
41	2.13	0.23	6.40	0.47	5.95	12.82	544.90	3.42
40	2.22	0.25	6.67	0.50	5.83	13.00	532.07	3.33
39	2.31	0.27	6.92	0.53	5.72	13.17	519.07	3.25
38	2.38	0.28	7.15	0.56	5.61	13.33	505.90	3.17
37	2.46	0.29	7.38	0.59	5.51	13.48	492.57	3.08
36	2.53	0.31	7.58	0.62	5.42	13.62	479.09	3.00
35	2.59	0.32	7.78	0.64	5.33	13.75	465.47	2.92
34	2.66	0.33	7.97	0.67	5.25	13.88	451.71	2.83
33	2.72	0.35	8.15	0.69	5.16	14.00	437.83	2.75
32	2.77	0.36	8.31	0.72	5.09	14.12	423.83	2.67
31	2.82	0.37	8.47	0.74	5.01	14.23	409.71	2.58
30	2.88	0.38	8.63	0.77	4.94	14.34	395.48	2.50
29	2.92	0.40	8.77	0.79	4.87	14.44	381.14	2.42
28	2.97	0.41	8.91	0.82	4.81	14.53	366.70	2.33
27	3.01	0.42	9.04	0.84	4.75	14.62	352.16681	2.25
26	3.05	0.43	9.16	0.86	4.69	14.71	337.54	2.17
25	3.09	0.44	9.28	0.88	4.63	14.80	322.83	2.08
24	3.13	0.45	9.39	0.90	4.58	14.88	308.03	2.00
23	3.17	0.46	9.50	0.92	4.53	14.95	293.16	1.92
22	3.20	0.47	9.60	0.94	4.48	15.02	278.21	1.83
21	3.23	0.48	9.69	0.96	4.44	15.09	263.18	1.75

20	3.26	0.49	9.78	0.98	4.39	15.16	248.09	1.67
19	3.29	0.50	9.87	1.00	4.35	15.22	232.93	1.58
18	3.32	0.51	9.95	1.01	4.31	15.28	217.71	1.50
17	3.34	0.51	10.03	1.03	4.28	15.34	202.43	1.42
16	3.37	0.52	10.11	1.04	4.24	15.39	187.09	1.33
15	3.39	0.53	10.18	1.06	4.21	15.44	171.70	1.25
14	3.41	0.54	10.24	1.07	4.17	15.49	156.26	1.17
13	3.44	0.54	10.31	1.09	4.14	15.54	140.77	1.08
12	3.46	0.55	10.37	1.10	4.11	15.58	125.23	1.00
11	3.48	0.56	10.44	1.11	4.08	15.63	109.65	0.92
10	3.51	0.59	10.52	1.19	4.02	15.72	94.02	0.83
9	0.00	0.00	0.00	0.00	8.70	8.70	78.30	0.75
8	0.00	0.00	0.00	0.00	8.70	8.70	69.60	0.67
7	0.00	0.00	0.00	0.00	8.70	8.70	60.90	0.58
6	0.00	0.00	0.00	0.00	8.70	8.70	52.20	0.50
5	0.00	0.00	0.00	0.00	8.70	8.70	43.50	0.42
4	0.00	0.00	0.00	0.00	8.70	8.70	34.80	0.33
3	0.00	0.00	0.00	0.00	8.70	8.70	26.10	0.25
2	0.00	0.00	0.00	0.00	8.70	8.70	17.40	0.17
1	0.00	0.00	0.00	0.00	8.70	8.70	8.70	0.08

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Rick Engineering	Date	11/14/2023
Designed by	TR	Case No	
Company Project Number/Name	18602B		

BMP Identification

BMP NAME / ID: DMA 3.2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 3.2	*26633*	*Mixed Surface Types*	*0.97*	*0.84*	*22370.4*			
	26633		*Total*		*22370.4*	*0.85*	*1584.6*	*1790*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Thienes Engineering, Inc.	Date	11/13/2023
Designed by	Luis Prado	Case No	
Company Project Number/Name	Temescal Canyon Road (3905)		

BMP Identification

BMP NAME / ID: STC "3.2" / DMA G

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
G-1	*1742.4*	*Concrete or Asphalt*	*1*	*0.89*	*1554.2*			
G-2	*6969.6*	*Ornamental Landscaping*	*0.1*	*0.11*	*769.8*			
	8712	***Total***			**2324**	**0.85**	***164.6***	***1790***

Notes:

Tributary area = 0.20 acres (onsite runoff from DMA G along Dawson Canyon Road South sheet flowing into Offsite DMA 3.2)

Total DCV for STC "3.2" = 165 CF (onsite) + 1,585 CF (offsite) = 1,750 CF

Project: **Dawson Canyon Road / DMA 3.2**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	6	
Number of End Caps -	2	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	36	in
Area of system -	444	sf Min. Area - 342 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
93	0.00	0.00	0.00	0.00	14.80	14.80	1790.16	7.75
92	0.00	0.00	0.00	0.00	14.80	14.80	1775.36	7.67
91	0.00	0.00	0.00	0.00	14.80	14.80	1760.56	7.58
90	0.00	0.00	0.00	0.00	14.80	14.80	1745.76	7.50
89	0.00	0.00	0.00	0.00	14.80	14.80	1730.96	7.42
88	0.00	0.00	0.00	0.00	14.80	14.80	1716.16	7.33
87	0.00	0.00	0.00	0.00	14.80	14.80	1701.36	7.25
86	0.00	0.00	0.00	0.00	14.80	14.80	1686.56	7.17
85	0.00	0.00	0.00	0.00	14.80	14.80	1671.76	7.08
84	0.00	0.00	0.00	0.00	14.80	14.80	1656.96	7.00
83	0.00	0.00	0.00	0.00	14.80	14.80	1642.16	6.92
82	0.00	0.00	0.00	0.00	14.80	14.80	1627.36	6.83
81	0.06	0.00	0.35	0.00	14.66	15.01	1612.56	6.75
80	0.19	0.02	1.16	0.05	14.32	15.53	1597.55	6.67
79	0.29	0.04	1.76	0.08	14.06	15.90	1582.02	6.58
78	0.40	0.05	2.42	0.10	13.79	16.31	1566.12	6.50
77	0.69	0.07	4.12	0.14	13.10	17.35	1549.80	6.42
76	1.03	0.09	6.17	0.18	12.26	18.61	1532.45	6.33
75	1.25	0.11	7.50	0.21	11.72	19.43	1513.84	6.25
74	1.42	0.13	8.53	0.25	11.29	20.07	1494.41	6.17
73	1.57	0.14	9.44	0.29	10.91	20.64	1474.34	6.08
72	1.71	0.16	10.24	0.33	10.57	21.14	1453.70	6.00
71	1.83	0.18	10.97	0.36	10.27	21.60	1432.56	5.92
70	1.94	0.20	11.63	0.40	9.99	22.02	1410.96	5.83
69	2.04	0.22	12.24	0.44	9.73	22.41	1388.95	5.75
68	2.13	0.23	12.81	0.47	9.49	22.77	1366.54	5.67
67	2.22	0.25	13.35	0.50	9.26	23.11	1343.77	5.58
66	2.31	0.27	13.84	0.53	9.05	23.42	1320.66	5.50
65	2.38	0.28	14.31	0.56	8.85	23.72	1297.24	5.42
64	2.46	0.29	14.75	0.59	8.66	24.01	1273.52	5.33
63	2.53	0.31	15.17	0.62	8.49	24.27	1249.51	5.25
62	2.59	0.32	15.56	0.64	8.32	24.52	1225.24	5.17
61	2.66	0.33	15.94	0.67	8.16	24.76	1200.72	5.08
60	2.72	0.35	16.29	0.69	8.01	24.99	1175.96	5.00
59	2.77	0.36	16.63	0.72	7.86	25.21	1150.97	4.92
58	2.82	0.37	16.95	0.74	7.72	25.42	1125.76	4.83
57	2.88	0.38	17.25	0.77	7.59	25.61	1100.34	4.75
56	2.92	0.40	17.54	0.79	7.47	25.80	1074.73	4.67
55	2.97	0.41	17.82	0.82	7.35	25.98	1048.93	4.58
54	3.01	0.42	18.07	0.84	7.24	26.15	1022.9453	4.50
53	3.05	0.43	18.32	0.86	7.13	26.31	996.80	4.42
52	3.09	0.44	18.57	0.88	7.02	26.47	970.49	4.33
51	3.13	0.45	18.78	0.90	6.93	26.61	944.02	4.25
50	3.17	0.46	18.99	0.92	6.83	26.75	917.41	4.17
49	3.20	0.47	19.20	0.94	6.74	26.88	890.66	4.08
48	3.23	0.48	19.39	0.96	6.66	27.01	863.78	4.00

47	3.26	0.49	19.57	0.98	6.58	27.13	836.77	3.92
46	3.29	0.50	19.74	1.00	6.51	27.24	809.64	3.83
45	3.32	0.51	19.91	1.01	6.43	27.35	782.40	3.75
44	3.34	0.51	20.06	1.03	6.36	27.46	755.05	3.67
43	3.37	0.52	20.21	1.04	6.30	27.55	727.59	3.58
42	3.39	0.53	20.36	1.06	6.23	27.65	700.04	3.50
41	3.41	0.54	20.49	1.07	6.18	27.74	672.39	3.42
40	3.44	0.54	20.62	1.09	6.12	27.83	644.65	3.33
39	3.46	0.55	20.75	1.10	6.06	27.91	616.83	3.25
38	3.48	0.56	20.87	1.11	6.01	27.99	588.92	3.17
37	3.51	0.59	21.03	1.19	5.91	28.13	560.93	3.08
36	0.00	0.00	0.00	0.00	14.80	14.80	532.80	3.00
35	0.00	0.00	0.00	0.00	14.80	14.80	518.00	2.92
34	0.00	0.00	0.00	0.00	14.80	14.80	503.20	2.83
33	0.00	0.00	0.00	0.00	14.80	14.80	488.40	2.75
32	0.00	0.00	0.00	0.00	14.80	14.80	473.60	2.67
31	0.00	0.00	0.00	0.00	14.80	14.80	458.80	2.58
30	0.00	0.00	0.00	0.00	14.80	14.80	444.00	2.50
29	0.00	0.00	0.00	0.00	14.80	14.80	429.20	2.42
28	0.00	0.00	0.00	0.00	14.80	14.80	414.40	2.33

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries | Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Rick Engineering
Date: 11/14/2023
Designed by: TR
Case No:
Company Project Number/Name: 18602B

BMP Identification

BMP NAME / ID: DMA 3.3

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 3.3	*12558*	*Mixed Surface Types*	*0.97*	*0.84*	*10548.1*			
	12558	*Total*			**10548.1**	**0.85**	**747.2**	**790**

Notes:

Project: **Dawson Canyon Road / DMA 3.3**

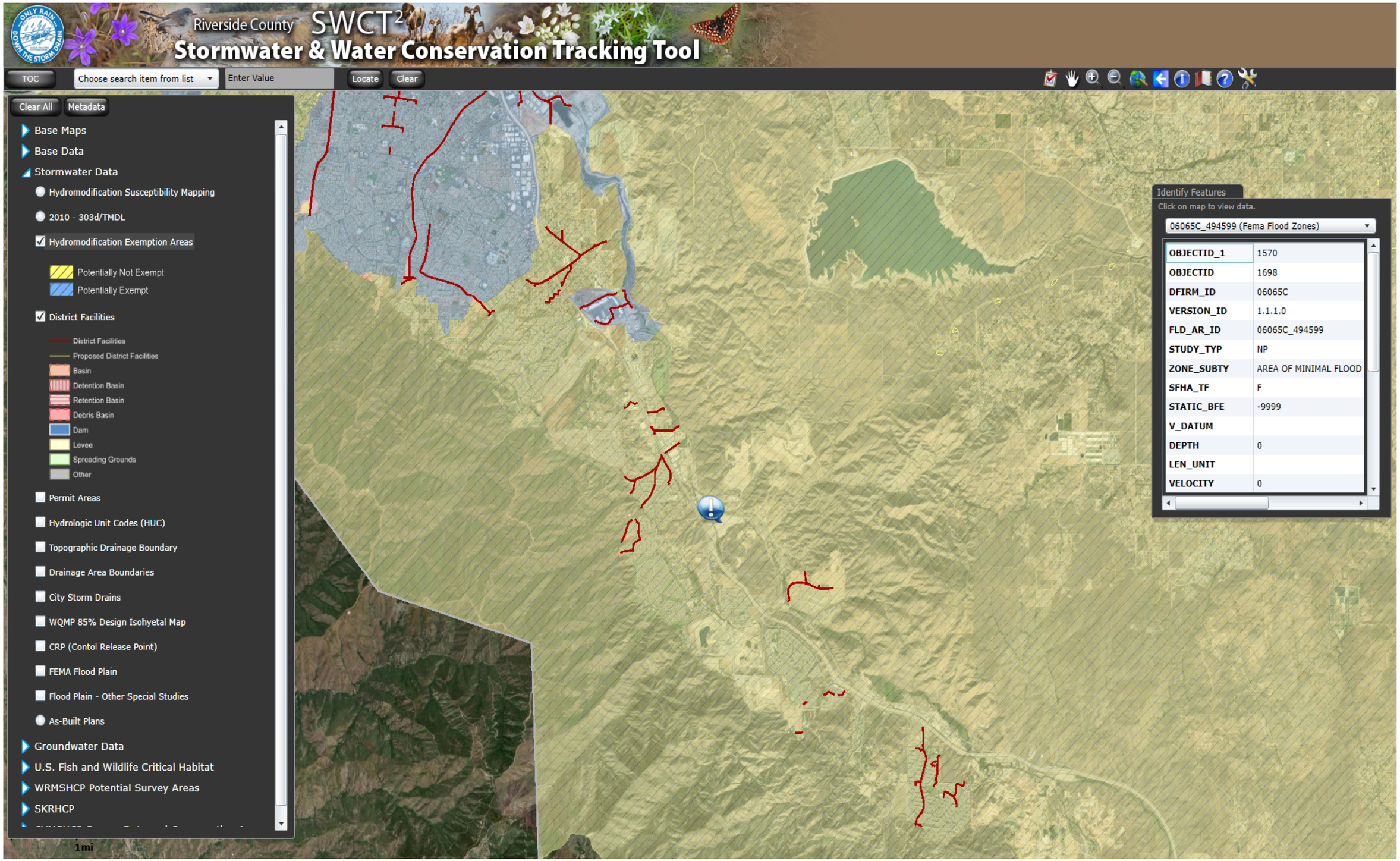
Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	3	
Number of End Caps -	2	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	261	sf Min. Area - 188 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	8.70	8.70	790.05	5.50
65	0.00	0.00	0.00	0.00	8.70	8.70	781.35	5.42
64	0.00	0.00	0.00	0.00	8.70	8.70	772.65	5.33
63	0.00	0.00	0.00	0.00	8.70	8.70	763.95	5.25
62	0.00	0.00	0.00	0.00	8.70	8.70	755.25	5.17
61	0.00	0.00	0.00	0.00	8.70	8.70	746.55	5.08
60	0.00	0.00	0.00	0.00	8.70	8.70	737.85	5.00
59	0.00	0.00	0.00	0.00	8.70	8.70	729.15	4.92
58	0.00	0.00	0.00	0.00	8.70	8.70	720.45	4.83
57	0.00	0.00	0.00	0.00	8.70	8.70	711.75	4.75
56	0.00	0.00	0.00	0.00	8.70	8.70	703.05	4.67
55	0.00	0.00	0.00	0.00	8.70	8.70	694.35	4.58
54	0.06	0.00	0.17	0.00	8.63	8.80	685.65	4.50
53	0.19	0.02	0.58	0.05	8.45	9.08	676.85	4.42
52	0.29	0.04	0.88	0.08	8.32	9.27	667.77	4.33
51	0.40	0.05	1.21	0.10	8.17	9.49	658.50	4.25
50	0.69	0.07	2.06	0.14	7.82	10.02	649.01	4.17
49	1.03	0.09	3.08	0.18	7.40	10.66	638.99	4.08
48	1.25	0.11	3.75	0.21	7.11	11.08	628.33	4.00
47	1.42	0.13	4.27	0.25	6.89	11.41	617.25	3.92
46	1.57	0.14	4.72	0.29	6.70	11.70	605.84	3.83
45	1.71	0.16	5.12	0.33	6.52	11.97	594.14	3.75
44	1.83	0.18	5.49	0.36	6.36	12.21	582.17	3.67
43	1.94	0.20	5.81	0.40	6.21	12.43	569.96	3.58
42	2.04	0.22	6.12	0.44	6.08	12.64	557.53	3.50
41	2.13	0.23	6.40	0.47	5.95	12.82	544.90	3.42
40	2.22	0.25	6.67	0.50	5.83	13.00	532.07	3.33
39	2.31	0.27	6.92	0.53	5.72	13.17	519.07	3.25
38	2.38	0.28	7.15	0.56	5.61	13.33	505.90	3.17
37	2.46	0.29	7.38	0.59	5.51	13.48	492.57	3.08
36	2.53	0.31	7.58	0.62	5.42	13.62	479.09	3.00
35	2.59	0.32	7.78	0.64	5.33	13.75	465.47	2.92
34	2.66	0.33	7.97	0.67	5.25	13.88	451.71	2.83
33	2.72	0.35	8.15	0.69	5.16	14.00	437.83	2.75
32	2.77	0.36	8.31	0.72	5.09	14.12	423.83	2.67
31	2.82	0.37	8.47	0.74	5.01	14.23	409.71	2.58
30	2.88	0.38	8.63	0.77	4.94	14.34	395.48	2.50
29	2.92	0.40	8.77	0.79	4.87	14.44	381.14	2.42
28	2.97	0.41	8.91	0.82	4.81	14.53	366.70	2.33
27	3.01	0.42	9.04	0.84	4.75	14.62	352.16681	2.25
26	3.05	0.43	9.16	0.86	4.69	14.71	337.54	2.17
25	3.09	0.44	9.28	0.88	4.63	14.80	322.83	2.08
24	3.13	0.45	9.39	0.90	4.58	14.88	308.03	2.00
23	3.17	0.46	9.50	0.92	4.53	14.95	293.16	1.92
22	3.20	0.47	9.60	0.94	4.48	15.02	278.21	1.83
21	3.23	0.48	9.69	0.96	4.44	15.09	263.18	1.75
20	3.26	0.49	9.78	0.98	4.39	15.16	248.09	1.67
19	3.29	0.50	9.87	1.00	4.35	15.22	232.93	1.58
18	3.32	0.51	9.95	1.01	4.31	15.28	217.71	1.50
17	3.34	0.51	10.03	1.03	4.28	15.34	202.43	1.42
16	3.37	0.52	10.11	1.04	4.24	15.39	187.09	1.33
15	3.39	0.53	10.18	1.06	4.21	15.44	171.70	1.25
14	3.41	0.54	10.24	1.07	4.17	15.49	156.26	1.17
13	3.44	0.54	10.31	1.09	4.14	15.54	140.77	1.08
12	3.46	0.55	10.37	1.10	4.11	15.58	125.23	1.00
11	3.48	0.56	10.44	1.11	4.08	15.63	109.65	0.92
10	3.51	0.59	10.52	1.19	4.02	15.72	94.02	0.83
9	0.00	0.00	0.00	0.00	8.70	8.70	78.30	0.75
8	0.00	0.00	0.00	0.00	8.70	8.70	69.60	0.67
7	0.00	0.00	0.00	0.00	8.70	8.70	60.90	0.58
6	0.00	0.00	0.00	0.00	8.70	8.70	52.20	0.50
5	0.00	0.00	0.00	0.00	8.70	8.70	43.50	0.42
4	0.00	0.00	0.00	0.00	8.70	8.70	34.80	0.33
3	0.00	0.00	0.00	0.00	8.70	8.70	26.10	0.25
2	0.00	0.00	0.00	0.00	8.70	8.70	17.40	0.17
1	0.00	0.00	0.00	0.00	8.70	8.70	8.70	0.08

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern


Riverside County SWCT²
Stormwater & Water Conservation Tracking Tool
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
2010 - 303d/TMDL
Hydromodification Exemption Areas
Potentially Not Exempt
Potentially Exempt
District Facilities
District Facilities
Proposed District Facilities
Basin
Detention Basin
Retention Basin
Debris Basin
Dam
Levee
Spreading Grounds
Other
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
WRMSHCP Potential Survey Areas
SKRHCP
1mi
Identify Features
Click on map to view data.
06065C_494599 (Fema Flood Zones)
OBJECTID_1 1570
OBJECTID 1698
DFIRM_ID 06065C
VERSION_ID 1.1.1.0
FLD_AR_ID 06065C_494599
STUDY_TYP NP
ZONE_SUBTY AREA OF MINIMAL FLOOD
SFHA_TF F
STATIC_BFE -9999
V_DATUM
DEPTH 0
LEN_UNIT
VELOCITY 0

HCOC VOLUME SUMMARY

EXISTING 2 YR, 24 HR VOL =	42,485	CF	
PROPOSED 2 YR, 24 HR VOL =	218,110	CF	
HCOC MITIGATION VOL =	**173,501**	CF	Prop. 2-yr, 24-hr Vol. - (Ex. 2-yr, 24-hr Vol. x 1.05[1])

[1]Per TGD, a difference of 5 percent or less is not considered significant.

DMA ID	DMA AREA (AC)	DCV (CF)	AREA-WEIGHTED RATIO	HCOC MITIGATION VOL. (CF)	TOTAL VOL. PROVIDED IN UNDEGROUND CHAMBERS (CF)	# OF CHAMBERS PROVIDED	DEPTH WHERE DCV IS ACHIEVED (IN)
DMA A	4.10	10,778	0.12	21,530	21,637	85	50
DMA B	16.84	44,323	0.51	88,431	88,499	342	50
DMA C	2.94	7,730	0.09	15,439	15,629	61	50
DMA D	9.16	24,102	0.28	48,101	48,177	203	50
TOTAL	**33.04**	**86,933**	**1.00**	**173,501**	**173,942**	**691**	**---**

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/10/23 File: 3905EX2242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TEI JOB NUMBER 3905
EXISTING CONDITION HCOC
2-YEAR 24-HOUR STORM EVENT

Drainage Area = 33.72(Ac.) = 0.053 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 33.72(Ac.) = 0.053 Sq. Mi.
Length along longest watercourse = 2031.00(Ft.)
Length along longest watercourse measured to centroid = 1048.00(Ft.)
Length along longest watercourse = 0.385 Mi.
Length along longest watercourse measured to centroid = 0.198 Mi.
Difference in elevation = 20.50(Ft.)
Slope along watercourse = 53.2939 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.127 Hr.
Lag time = 7.64 Min.
25% of lag time = 1.91 Min.
40% of lag time = 3.05 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
33.72	1.98	66.77

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
33.72	6.50	219.18

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.980(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 1.980(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
33.720	86.00	0.000

Total Area Entered = 33.72(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
86.0	86.0	0.176	0.000	0.176	1.000	0.176
					Sum (F) =	0.176

Area averaged mean soil loss (F) (In/Hr) = 0.176
Minimum soil loss rate ((In/Hr)) = 0.088
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	65.477	9.500	3.228

2	0.167	130.954	37.564	12.765
3	0.250	196.431	24.706	8.396
4	0.333	261.909	9.507	3.231
5	0.417	327.386	5.748	1.953
6	0.500	392.863	3.858	1.311
7	0.583	458.340	2.631	0.894
8	0.667	523.817	1.984	0.674
9	0.750	589.294	1.499	0.510
10	0.833	654.772	1.107	0.376
11	0.917	720.249	0.771	0.262
12	1.000	785.726	0.655	0.223
13	1.083	851.203	0.470	0.160
		Sum = 100.000	Sum=	33.983

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.016	(0.311)	0.014	0.002
2	0.17	0.07	0.016	(0.310)	0.014	0.002
3	0.25	0.07	0.016	(0.309)	0.014	0.002
4	0.33	0.10	0.024	(0.308)	0.021	0.002
5	0.42	0.10	0.024	(0.306)	0.021	0.002
6	0.50	0.10	0.024	(0.305)	0.021	0.002
7	0.58	0.10	0.024	(0.304)	0.021	0.002
8	0.67	0.10	0.024	(0.303)	0.021	0.002
9	0.75	0.10	0.024	(0.302)	0.021	0.002
10	0.83	0.13	0.032	(0.301)	0.029	0.003
11	0.92	0.13	0.032	(0.299)	0.029	0.003
12	1.00	0.13	0.032	(0.298)	0.029	0.003
13	1.08	0.10	0.024	(0.297)	0.021	0.002
14	1.17	0.10	0.024	(0.296)	0.021	0.002
15	1.25	0.10	0.024	(0.295)	0.021	0.002
16	1.33	0.10	0.024	(0.293)	0.021	0.002
17	1.42	0.10	0.024	(0.292)	0.021	0.002
18	1.50	0.10	0.024	(0.291)	0.021	0.002
19	1.58	0.10	0.024	(0.290)	0.021	0.002
20	1.67	0.10	0.024	(0.289)	0.021	0.002
21	1.75	0.10	0.024	(0.288)	0.021	0.002
22	1.83	0.13	0.032	(0.287)	0.029	0.003
23	1.92	0.13	0.032	(0.285)	0.029	0.003
24	2.00	0.13	0.032	(0.284)	0.029	0.003
25	2.08	0.13	0.032	(0.283)	0.029	0.003
26	2.17	0.13	0.032	(0.282)	0.029	0.003
27	2.25	0.13	0.032	(0.281)	0.029	0.003
28	2.33	0.13	0.032	(0.280)	0.029	0.003
29	2.42	0.13	0.032	(0.278)	0.029	0.003
30	2.50	0.13	0.032	(0.277)	0.029	0.003
31	2.58	0.17	0.040	(0.276)	0.036	0.004
32	2.67	0.17	0.040	(0.275)	0.036	0.004
33	2.75	0.17	0.040	(0.274)	0.036	0.004
34	2.83	0.17	0.040	(0.273)	0.036	0.004
35	2.92	0.17	0.040	(0.272)	0.036	0.004
36	3.00	0.17	0.040	(0.271)	0.036	0.004
37	3.08	0.17	0.040	(0.269)	0.036	0.004
38	3.17	0.17	0.040	(0.268)	0.036	0.004
39	3.25	0.17	0.040	(0.267)	0.036	0.004
40	3.33	0.17	0.040	(0.266)	0.036	0.004
41	3.42	0.17	0.040	(0.265)	0.036	0.004
42	3.50	0.17	0.040	(0.264)	0.036	0.004
43	3.58	0.17	0.040	(0.263)	0.036	0.004
44	3.67	0.17	0.040	(0.262)	0.036	0.004
45	3.75	0.17	0.040	(0.261)	0.036	0.004
46	3.83	0.20	0.048	(0.259)	0.043	0.005
47	3.92	0.20	0.048	(0.258)	0.043	0.005
48	4.00	0.20	0.048	(0.257)	0.043	0.005
49	4.08	0.20	0.048	(0.256)	0.043	0.005
50	4.17	0.20	0.048	(0.255)	0.043	0.005
51	4.25	0.20	0.048	(0.254)	0.043	0.005
52	4.33	0.23	0.055	(0.253)	0.050	0.006
53	4.42	0.23	0.055	(0.252)	0.050	0.006
54	4.50	0.23	0.055	(0.251)	0.050	0.006
55	4.58	0.23	0.055	(0.250)	0.050	0.006
56	4.67	0.23	0.055	(0.249)	0.050	0.006
57	4.75	0.23	0.055	(0.248)	0.050	0.006
58	4.83	0.27	0.063	(0.246)	0.057	0.006
59	4.92	0.27	0.063	(0.245)	0.057	0.006
60	5.00	0.27	0.063	(0.244)	0.057	0.006
61	5.08	0.20	0.048	(0.243)	0.043	0.005
62	5.17	0.20	0.048	(0.242)	0.043	0.005
63	5.25	0.20	0.048	(0.241)	0.043	0.005
64	5.33	0.23	0.055	(0.240)	0.050	0.006
65	5.42	0.23	0.055	(0.239)	0.050	0.006
66	5.50	0.23	0.055	(0.238)	0.050	0.006
67	5.58	0.27	0.063	(0.237)	0.057	0.006
68	5.67	0.27	0.063	(0.236)	0.057	0.006
69	5.75	0.27	0.063	(0.235)	0.057	0.006
70	5.83	0.27	0.063	(0.234)	0.057	0.006
71	5.92	0.27	0.063	(0.233)	0.057	0.006

72	6.00	0.27	0.063	(	0.232)	0.057	0.006
73	6.08	0.30	0.071	(	0.231)	0.064	0.007
74	6.17	0.30	0.071	(	0.230)	0.064	0.007
75	6.25	0.30	0.071	(	0.229)	0.064	0.007
76	6.33	0.30	0.071	(	0.228)	0.064	0.007
77	6.42	0.30	0.071	(	0.227)	0.064	0.007
78	6.50	0.30	0.071	(	0.226)	0.064	0.007
79	6.58	0.33	0.079	(	0.225)	0.071	0.008
80	6.67	0.33	0.079	(	0.224)	0.071	0.008
81	6.75	0.33	0.079	(	0.223)	0.071	0.008
82	6.83	0.33	0.079	(	0.222)	0.071	0.008
83	6.92	0.33	0.079	(	0.221)	0.071	0.008
84	7.00	0.33	0.079	(	0.220)	0.071	0.008
85	7.08	0.33	0.079	(	0.219)	0.071	0.008
86	7.17	0.33	0.079	(	0.218)	0.071	0.008
87	7.25	0.33	0.079	(	0.217)	0.071	0.008
88	7.33	0.37	0.087	(	0.216)	0.078	0.009
89	7.42	0.37	0.087	(	0.215)	0.078	0.009
90	7.50	0.37	0.087	(	0.214)	0.078	0.009
91	7.58	0.40	0.095	(	0.213)	0.086	0.010
92	7.67	0.40	0.095	(	0.212)	0.086	0.010
93	7.75	0.40	0.095	(	0.211)	0.086	0.010
94	7.83	0.43	0.103	(	0.210)	0.093	0.010
95	7.92	0.43	0.103	(	0.209)	0.093	0.010
96	8.00	0.43	0.103	(	0.208)	0.093	0.010
97	8.08	0.50	0.119	(	0.207)	0.107	0.012
98	8.17	0.50	0.119	(	0.206)	0.107	0.012
99	8.25	0.50	0.119	(	0.205)	0.107	0.012
100	8.33	0.50	0.119	(	0.204)	0.107	0.012
101	8.42	0.50	0.119	(	0.203)	0.107	0.012
102	8.50	0.50	0.119	(	0.202)	0.107	0.012
103	8.58	0.53	0.127	(	0.201)	0.114	0.013
104	8.67	0.53	0.127	(	0.200)	0.114	0.013
105	8.75	0.53	0.127	(	0.199)	0.114	0.013
106	8.83	0.57	0.135	(	0.198)	0.121	0.013
107	8.92	0.57	0.135	(	0.197)	0.121	0.013
108	9.00	0.57	0.135	(	0.196)	0.121	0.013
109	9.08	0.63	0.150	(	0.195)	0.135	0.015
110	9.17	0.63	0.150	(	0.195)	0.135	0.015
111	9.25	0.63	0.150	(	0.194)	0.135	0.015
112	9.33	0.67	0.158	(	0.193)	0.143	0.016
113	9.42	0.67	0.158	(	0.192)	0.143	0.016
114	9.50	0.67	0.158	(	0.191)	0.143	0.016
115	9.58	0.70	0.166	(	0.190)	0.150	0.017
116	9.67	0.70	0.166	(	0.189)	0.150	0.017
117	9.75	0.70	0.166	(	0.188)	0.150	0.017
118	9.83	0.73	0.174	(	0.187)	0.157	0.017
119	9.92	0.73	0.174	(	0.186)	0.157	0.017
120	10.00	0.73	0.174	(	0.185)	0.157	0.017
121	10.08	0.50	0.119	(	0.185)	0.107	0.012
122	10.17	0.50	0.119	(	0.184)	0.107	0.012
123	10.25	0.50	0.119	(	0.183)	0.107	0.012
124	10.33	0.50	0.119	(	0.182)	0.107	0.012
125	10.42	0.50	0.119	(	0.181)	0.107	0.012
126	10.50	0.50	0.119	(	0.180)	0.107	0.012
127	10.58	0.67	0.158	(	0.179)	0.143	0.016
128	10.67	0.67	0.158	(	0.178)	0.143	0.016
129	10.75	0.67	0.158	(	0.177)	0.143	0.016
130	10.83	0.67	0.158	(	0.177)	0.143	0.016
131	10.92	0.67	0.158	(	0.176)	0.143	0.016
132	11.00	0.67	0.158	(	0.175)	0.143	0.016
133	11.08	0.63	0.150	(	0.174)	0.135	0.015
134	11.17	0.63	0.150	(	0.173)	0.135	0.015
135	11.25	0.63	0.150	(	0.172)	0.135	0.015
136	11.33	0.63	0.150	(	0.171)	0.135	0.015
137	11.42	0.63	0.150	(	0.171)	0.135	0.015
138	11.50	0.63	0.150	(	0.170)	0.135	0.015
139	11.58	0.57	0.135	(	0.169)	0.121	0.013
140	11.67	0.57	0.135	(	0.168)	0.121	0.013
141	11.75	0.57	0.135	(	0.167)	0.121	0.013
142	11.83	0.60	0.143	(	0.166)	0.128	0.014
143	11.92	0.60	0.143	(	0.166)	0.128	0.014
144	12.00	0.60	0.143	(	0.165)	0.128	0.014
145	12.08	0.83	0.198		0.164	(0.178)	0.034
146	12.17	0.83	0.198		0.163	(0.178)	0.035
147	12.25	0.83	0.198		0.162	(0.178)	0.036
148	12.33	0.87	0.206		0.161	(0.185)	0.044
149	12.42	0.87	0.206		0.161	(0.185)	0.045
150	12.50	0.87	0.206		0.160	(0.185)	0.046
151	12.58	0.93	0.222		0.159	(0.200)	0.063
152	12.67	0.93	0.222		0.158	(0.200)	0.064
153	12.75	0.93	0.222		0.157	(0.200)	0.064
154	12.83	0.97	0.230		0.157	(0.207)	0.073
155	12.92	0.97	0.230		0.156	(0.207)	0.074
156	13.00	0.97	0.230		0.155	(0.207)	0.075
157	13.08	1.13	0.269		0.154	(0.242)	0.115
158	13.17	1.13	0.269		0.154	(0.242)	0.116
159	13.25	1.13	0.269		0.153	(0.242)	0.117
160	13.33	1.13	0.269		0.152	(0.242)	0.117
161	13.42	1.13	0.269		0.151	(0.242)	0.118
162	13.50	1.13	0.269		0.150	(0.242)	0.119
163	13.58	0.77	0.182		0.150	(0.164)	0.033

164	13.67	0.77	0.182		0.149	(	0.164)	0.033
165	13.75	0.77	0.182		0.148	(	0.164)	0.034
166	13.83	0.77	0.182		0.147	(	0.164)	0.035
167	13.92	0.77	0.182		0.147	(	0.164)	0.036
168	14.00	0.77	0.182		0.146	(	0.164)	0.036
169	14.08	0.90	0.214		0.145	(	0.192)	0.069
170	14.17	0.90	0.214		0.144	(	0.192)	0.069
171	14.25	0.90	0.214		0.144	(	0.192)	0.070
172	14.33	0.87	0.206		0.143	(	0.185)	0.063
173	14.42	0.87	0.206		0.142	(	0.185)	0.064
174	14.50	0.87	0.206		0.141	(	0.185)	0.064
175	14.58	0.87	0.206		0.141	(	0.185)	0.065
176	14.67	0.87	0.206		0.140	(	0.185)	0.066
177	14.75	0.87	0.206		0.139	(	0.185)	0.067
178	14.83	0.83	0.198		0.139	(	0.178)	0.059
179	14.92	0.83	0.198		0.138	(	0.178)	0.060
180	15.00	0.83	0.198		0.137	(	0.178)	0.061
181	15.08	0.80	0.190		0.136	(	0.171)	0.054
182	15.17	0.80	0.190		0.136	(	0.171)	0.054
183	15.25	0.80	0.190		0.135	(	0.171)	0.055
184	15.33	0.77	0.182		0.134	(	0.164)	0.048
185	15.42	0.77	0.182		0.134	(	0.164)	0.048
186	15.50	0.77	0.182		0.133	(	0.164)	0.049
187	15.58	0.63	0.150		0.132	(	0.135)	0.018
188	15.67	0.63	0.150		0.132	(	0.135)	0.019
189	15.75	0.63	0.150		0.131	(	0.135)	0.020
190	15.83	0.63	0.150		0.130	(	0.135)	0.020
191	15.92	0.63	0.150		0.130	(	0.135)	0.021
192	16.00	0.63	0.150		0.129	(	0.135)	0.022
193	16.08	0.13	0.032	(	0.128)		0.029	0.003
194	16.17	0.13	0.032	(	0.128)		0.029	0.003
195	16.25	0.13	0.032	(	0.127)		0.029	0.003
196	16.33	0.13	0.032	(	0.126)		0.029	0.003
197	16.42	0.13	0.032	(	0.126)		0.029	0.003
198	16.50	0.13	0.032	(	0.125)		0.029	0.003
199	16.58	0.10	0.024	(	0.124)		0.021	0.002
200	16.67	0.10	0.024	(	0.124)		0.021	0.002
201	16.75	0.10	0.024	(	0.123)		0.021	0.002
202	16.83	0.10	0.024	(	0.123)		0.021	0.002
203	16.92	0.10	0.024	(	0.122)		0.021	0.002
204	17.00	0.10	0.024	(	0.121)		0.021	0.002
205	17.08	0.17	0.040	(	0.121)		0.036	0.004
206	17.17	0.17	0.040	(	0.120)		0.036	0.004
207	17.25	0.17	0.040	(	0.119)		0.036	0.004
208	17.33	0.17	0.040	(	0.119)		0.036	0.004
209	17.42	0.17	0.040	(	0.118)		0.036	0.004
210	17.50	0.17	0.040	(	0.118)		0.036	0.004
211	17.58	0.17	0.040	(	0.117)		0.036	0.004
212	17.67	0.17	0.040	(	0.117)		0.036	0.004
213	17.75	0.17	0.040	(	0.116)		0.036	0.004
214	17.83	0.13	0.032	(	0.115)		0.029	0.003
215	17.92	0.13	0.032	(	0.115)		0.029	0.003
216	18.00	0.13	0.032	(	0.114)		0.029	0.003
217	18.08	0.13	0.032	(	0.114)		0.029	0.003
218	18.17	0.13	0.032	(	0.113)		0.029	0.003
219	18.25	0.13	0.032	(	0.113)		0.029	0.003
220	18.33	0.13	0.032	(	0.112)		0.029	0.003
221	18.42	0.13	0.032	(	0.111)		0.029	0.003
222	18.50	0.13	0.032	(	0.111)		0.029	0.003
223	18.58	0.10	0.024	(	0.110)		0.021	0.002
224	18.67	0.10	0.024	(	0.110)		0.021	0.002
225	18.75	0.10	0.024	(	0.109)		0.021	0.002
226	18.83	0.07	0.016	(	0.109)		0.014	0.002
227	18.92	0.07	0.016	(	0.108)		0.014	0.002
228	19.00	0.07	0.016	(	0.108)		0.014	0.002
229	19.08	0.10	0.024	(	0.107)		0.021	0.002
230	19.17	0.10	0.024	(	0.107)		0.021	0.002
231	19.25	0.10	0.024	(	0.106)		0.021	0.002
232	19.33	0.13	0.032	(	0.106)		0.029	0.003
233	19.42	0.13	0.032	(	0.105)		0.029	0.003
234	19.50	0.13	0.032	(	0.105)		0.029	0.003
235	19.58	0.10	0.024	(	0.104)		0.021	0.002
236	19.67	0.10	0.024	(	0.104)		0.021	0.002
237	19.75	0.10	0.024	(	0.103)		0.021	0.002
238	19.83	0.07	0.016	(	0.103)		0.014	0.002
239	19.92	0.07	0.016	(	0.102)		0.014	0.002
240	20.00	0.07	0.016	(	0.102)		0.014	0.002
241	20.08	0.10	0.024	(	0.102)		0.021	0.002
242	20.17	0.10	0.024	(	0.101)		0.021	0.002
243	20.25	0.10	0.024	(	0.101)		0.021	0.002
244	20.33	0.10	0.024	(	0.100)		0.021	0.002
245	20.42	0.10	0.024	(	0.100)		0.021	0.002
246	20.50	0.10	0.024	(	0.099)		0.021	0.002
247	20.58	0.10	0.024	(	0.099)		0.021	0.002
248	20.67	0.10	0.024	(	0.099)		0.021	0.002
249	20.75	0.10	0.024	(	0.098)		0.021	0.002
250	20.83	0.07	0.016	(	0.098)		0.014	0.002
251	20.92	0.07	0.016	(	0.097)		0.014	0.002
252	21.00	0.07	0.016	(	0.097)		0.014	0.002
253	21.08	0.10	0.024	(	0.097)		0.021	0.002
254	21.17	0.10	0.024	(	0.096)		0.021	0.002
255	21.25	0.10	0.024	(	0.096)		0.021	0.002

256	21.33	0.07	0.016	(0.095)	0.014	0.002
257	21.42	0.07	0.016	(0.095)	0.014	0.002
258	21.50	0.07	0.016	(0.095)	0.014	0.002
259	21.58	0.10	0.024	(0.094)	0.021	0.002
260	21.67	0.10	0.024	(0.094)	0.021	0.002
261	21.75	0.10	0.024	(0.094)	0.021	0.002
262	21.83	0.07	0.016	(0.093)	0.014	0.002
263	21.92	0.07	0.016	(0.093)	0.014	0.002
264	22.00	0.07	0.016	(0.093)	0.014	0.002
265	22.08	0.10	0.024	(0.092)	0.021	0.002
266	22.17	0.10	0.024	(0.092)	0.021	0.002
267	22.25	0.10	0.024	(0.092)	0.021	0.002
268	22.33	0.07	0.016	(0.092)	0.014	0.002
269	22.42	0.07	0.016	(0.091)	0.014	0.002
270	22.50	0.07	0.016	(0.091)	0.014	0.002
271	22.58	0.07	0.016	(0.091)	0.014	0.002
272	22.67	0.07	0.016	(0.090)	0.014	0.002
273	22.75	0.07	0.016	(0.090)	0.014	0.002
274	22.83	0.07	0.016	(0.090)	0.014	0.002
275	22.92	0.07	0.016	(0.090)	0.014	0.002
276	23.00	0.07	0.016	(0.090)	0.014	0.002
277	23.08	0.07	0.016	(0.089)	0.014	0.002
278	23.17	0.07	0.016	(0.089)	0.014	0.002
279	23.25	0.07	0.016	(0.089)	0.014	0.002
280	23.33	0.07	0.016	(0.089)	0.014	0.002
281	23.42	0.07	0.016	(0.089)	0.014	0.002
282	23.50	0.07	0.016	(0.088)	0.014	0.002
283	23.58	0.07	0.016	(0.088)	0.014	0.002
284	23.67	0.07	0.016	(0.088)	0.014	0.002
285	23.75	0.07	0.016	(0.088)	0.014	0.002
286	23.83	0.07	0.016	(0.088)	0.014	0.002
287	23.92	0.07	0.016	(0.088)	0.014	0.002
288	24.00	0.07	0.016	(0.088)	0.014	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.2

Flood volume = Effective rainfall 0.35(In)
times area 33.7(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 1.63(In)
Total soil loss = 4.588(Ac.Ft)
Total rainfall = 1.98(In)
Flood volume = 42482.4 Cubic Feet
Total soil loss = 199860.8 Cubic Feet

Peak flow rate of this hydrograph = 3.847(CFS)

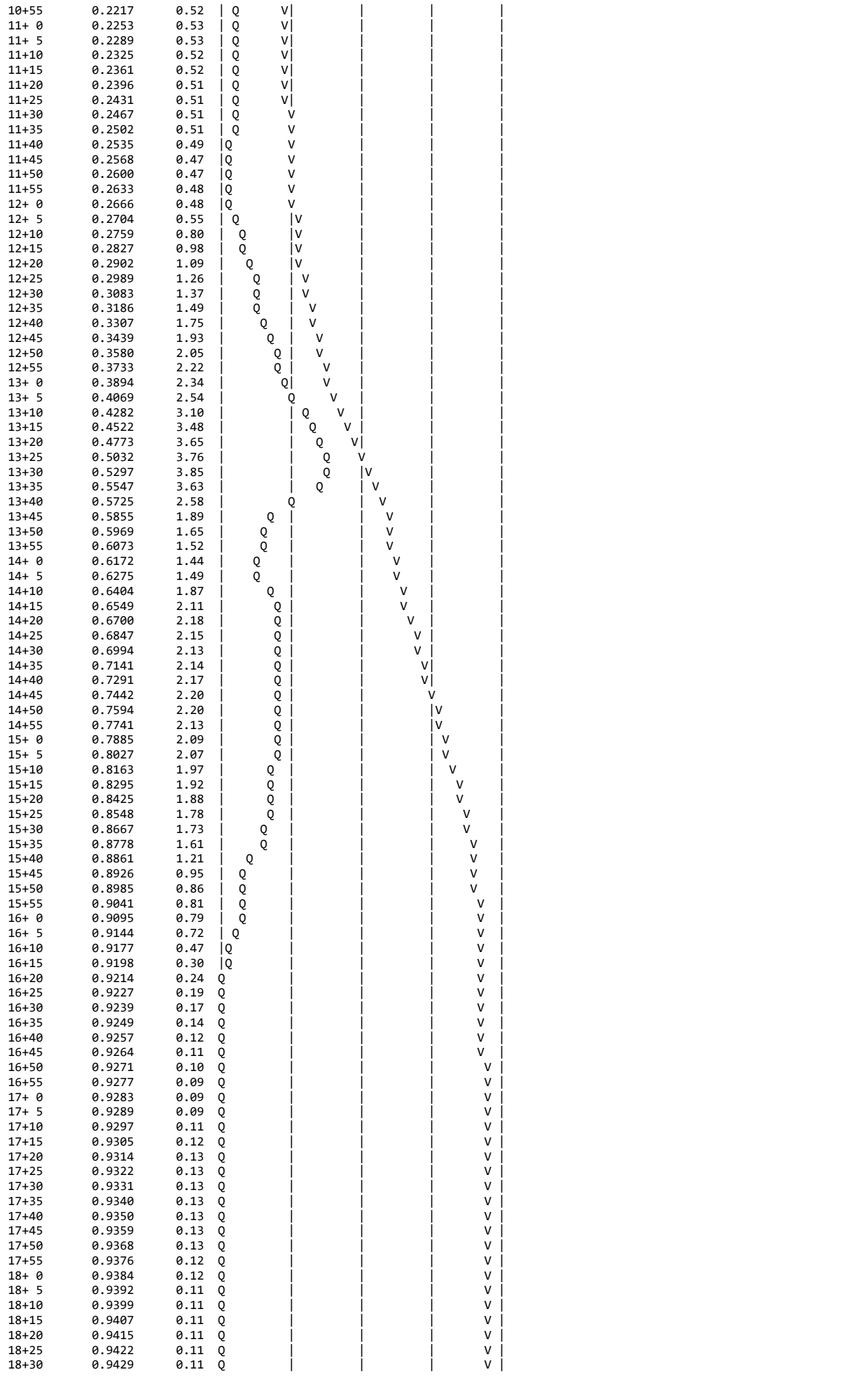
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				
0+10	0.0002	0.03	Q				
0+15	0.0005	0.04	Q				
0+20	0.0008	0.05	Q				
0+25	0.0012	0.06	Q				
0+30	0.0017	0.07	Q				
0+35	0.0022	0.07	Q				
0+40	0.0027	0.07	Q				
0+45	0.0032	0.08	Q				
0+50	0.0038	0.08	Q				
0+55	0.0044	0.09	Q				
1+ 0	0.0051	0.10	Q				
1+ 5	0.0058	0.10	Q				
1+10	0.0064	0.09	Q				
1+15	0.0070	0.09	Q				
1+20	0.0076	0.08	Q				
1+25	0.0081	0.08	Q				
1+30	0.0087	0.08	Q				
1+35	0.0093	0.08	Q				
1+40	0.0098	0.08	Q				
1+45	0.0104	0.08	Q				
1+50	0.0110	0.08	Q				
1+55	0.0116	0.09	Q				
2+ 0	0.0123	0.10	Q				
2+ 5	0.0130	0.10	Q				
2+10	0.0137	0.10	Q				
2+15	0.0145	0.11	Q				
2+20	0.0152	0.11	Q				
2+25	0.0159	0.11	Q				
2+30	0.0167	0.11	Q				
2+35	0.0174	0.11	Q				
2+40	0.0182	0.12	Q				
2+45	0.0191	0.13	Q				
2+50	0.0200	0.13	Q				
2+55	0.0209	0.13	Q				
3+ 0	0.0218	0.13	Q				
3+ 5	0.0227	0.13	Q				
3+10	0.0237	0.13	Q				

3+15	0.0246	0.13	QV	|	|	|	|
3+20	0.0255	0.13	QV	|	|	|	|
3+25	0.0264	0.13	QV	|	|	|	|
3+30	0.0274	0.13	QV	|	|	|	|
3+35	0.0283	0.13	QV	|	|	|	|
3+40	0.0292	0.13	QV	|	|	|	|
3+45	0.0301	0.13	QV	|	|	|	|
3+50	0.0311	0.14	QV	|	|	|	|
3+55	0.0321	0.15	QV	|	|	|	|
4+ 0	0.0332	0.15	QV	|	|	|	|
4+ 5	0.0342	0.16	QV	|	|	|	|
4+10	0.0353	0.16	QV	|	|	|	|
4+15	0.0364	0.16	QV	|	|	|	|
4+20	0.0375	0.16	QV	|	|	|	|
4+25	0.0387	0.17	QV	|	|	|	|
4+30	0.0400	0.18	QV	|	|	|	|
4+35	0.0412	0.18	QV	|	|	|	|
4+40	0.0425	0.18	QV	|	|	|	|
4+45	0.0438	0.19	QV	|	|	|	|
4+50	0.0451	0.19	QV	|	|	|	|
4+55	0.0465	0.20	QV	|	|	|	|
5+ 0	0.0479	0.21	QV	|	|	|	|
5+ 5	0.0493	0.20	Q V	|	|	|	|
5+10	0.0506	0.19	Q V	|	|	|	|
5+15	0.0518	0.17	Q V	|	|	|	|
5+20	0.0530	0.17	Q V	|	|	|	|
5+25	0.0542	0.18	Q V	|	|	|	|
5+30	0.0555	0.18	Q V	|	|	|	|
5+35	0.0568	0.19	Q V	|	|	|	|
5+40	0.0582	0.20	Q V	|	|	|	|
5+45	0.0596	0.21	Q V	|	|	|	|
5+50	0.0610	0.21	Q V	|	|	|	|
5+55	0.0625	0.21	Q V	|	|	|	|
6+ 0	0.0639	0.21	Q V	|	|	|	|
6+ 5	0.0654	0.22	Q V	|	|	|	|
6+10	0.0670	0.23	Q V	|	|	|	|
6+15	0.0686	0.23	Q V	|	|	|	|
6+20	0.0702	0.24	Q V	|	|	|	|
6+25	0.0719	0.24	Q V	|	|	|	|
6+30	0.0735	0.24	Q V	|	|	|	|
6+35	0.0752	0.24	Q V	|	|	|	|
6+40	0.0769	0.25	|Q V	|	|	|	|
6+45	0.0787	0.26	|Q V	|	|	|	|
6+50	0.0806	0.26	|Q V	|	|	|	|
6+55	0.0824	0.27	|Q V	|	|	|	|
7+ 0	0.0842	0.27	|Q V	|	|	|	|
7+ 5	0.0861	0.27	|Q V	|	|	|	|
7+10	0.0879	0.27	|Q V	|	|	|	|
7+15	0.0898	0.27	|Q V	|	|	|	|
7+20	0.0916	0.27	|Q V	|	|	|	|
7+25	0.0936	0.28	|Q V	|	|	|	|
7+30	0.0956	0.29	|Q V	|	|	|	|
7+35	0.0976	0.29	|Q V	|	|	|	|
7+40	0.0997	0.31	|Q V	|	|	|	|
7+45	0.1018	0.31	|Q V	|	|	|	|
7+50	0.1040	0.32	|Q V	|	|	|	|
7+55	0.1063	0.33	|Q V	|	|	|	|
8+ 0	0.1087	0.34	|Q V	|	|	|	|
8+ 5	0.1110	0.35	|Q V	|	|	|	|
8+10	0.1136	0.37	|Q V	|	|	|	|
8+15	0.1163	0.39	|Q V	|	|	|	|
8+20	0.1190	0.39	|Q V	|	|	|	|
8+25	0.1217	0.40	|Q V	|	|	|	|
8+30	0.1244	0.40	|Q V	|	|	|	|
8+35	0.1272	0.40	|Q V	|	|	|	|
8+40	0.1300	0.41	|Q V	|	|	|	|
8+45	0.1329	0.42	|Q V	|	|	|	|
8+50	0.1359	0.43	|Q V	|	|	|	|
8+55	0.1389	0.44	|Q V	|	|	|	|
9+ 0	0.1420	0.45	|Q V	|	|	|	|
9+ 5	0.1451	0.46	|Q V	|	|	|	|
9+10	0.1484	0.48	|Q V	|	|	|	|
9+15	0.1518	0.49	|Q V	|	|	|	|
9+20	0.1553	0.50	| Q V	|	|	|	|
9+25	0.1588	0.52	| Q V	|	|	|	|
9+30	0.1624	0.53	| Q V	|	|	|	|
9+35	0.1661	0.53	| Q V	|	|	|	|
9+40	0.1699	0.54	| Q V	|	|	|	|
9+45	0.1737	0.55	| Q V	|	|	|	|
9+50	0.1775	0.56	| Q V	|	|	|	|
9+55	0.1815	0.57	| Q V	|	|	|	|
10+ 0	0.1855	0.58	| Q V	|	|	|	|
10+ 5	0.1894	0.57	| Q V	|	|	|	|
10+10	0.1928	0.50	|Q V	|	|	|	|
10+15	0.1960	0.45	|Q V	|	|	|	|
10+20	0.1990	0.44	|Q V	|	|	|	|
10+25	0.2019	0.43	|Q V	|	|	|	|
10+30	0.2048	0.42	|Q V	|	|	|	|
10+35	0.2077	0.43	|Q V	|	|	|	|
10+40	0.2110	0.48	|Q V	|	|	|	|
10+45	0.2145	0.51	| Q V	|	|	|	|
10+50	0.2181	0.52	| Q V	|	|	|	|



18+35	0.9437	0.11	Q	|	|	|	V |
18+40	0.9443	0.10	Q	|	|	|	V |
18+45	0.9449	0.09	Q	|	|	|	V |
18+50	0.9455	0.08	Q	|	|	|	V |
18+55	0.9460	0.07	Q	|	|	|	V |
19+ 0	0.9465	0.06	Q	|	|	|	V |
19+ 5	0.9469	0.06	Q	|	|	|	V |
19+10	0.9474	0.07	Q	|	|	|	V |
19+15	0.9479	0.08	Q	|	|	|	V |
19+20	0.9485	0.08	Q	|	|	|	V |
19+25	0.9491	0.09	Q	|	|	|	V |
19+30	0.9498	0.10	Q	|	|	|	V |
19+35	0.9504	0.10	Q	|	|	|	V |
19+40	0.9511	0.09	Q	|	|	|	V|
19+45	0.9517	0.09	Q	|	|	|	V|
19+50	0.9522	0.08	Q	|	|	|	V|
19+55	0.9527	0.07	Q	|	|	|	V|
20+ 0	0.9531	0.06	Q	|	|	|	V|
20+ 5	0.9536	0.06	Q	|	|	|	V|
20+10	0.9541	0.07	Q	|	|	|	V|
20+15	0.9546	0.08	Q	|	|	|	V|
20+20	0.9551	0.08	Q	|	|	|	V|
20+25	0.9557	0.08	Q	|	|	|	V|
20+30	0.9562	0.08	Q	|	|	|	V|
20+35	0.9568	0.08	Q	|	|	|	V|
20+40	0.9573	0.08	Q	|	|	|	V|
20+45	0.9579	0.08	Q	|	|	|	V|
20+50	0.9584	0.08	Q	|	|	|	V|
20+55	0.9589	0.07	Q	|	|	|	V|
21+ 0	0.9593	0.06	Q	|	|	|	V|
21+ 5	0.9597	0.06	Q	|	|	|	V|
21+10	0.9602	0.07	Q	|	|	|	V|
21+15	0.9607	0.08	Q	|	|	|	V|
21+20	0.9612	0.07	Q	|	|	|	V|
21+25	0.9617	0.07	Q	|	|	|	V|
21+30	0.9621	0.06	Q	|	|	|	V|
21+35	0.9625	0.06	Q	|	|	|	V|
21+40	0.9630	0.07	Q	|	|	|	V|
21+45	0.9635	0.07	Q	|	|	|	V|
21+50	0.9640	0.07	Q	|	|	|	V|
21+55	0.9645	0.07	Q	|	|	|	V|
22+ 0	0.9649	0.06	Q	|	|	|	V|
22+ 5	0.9653	0.06	Q	|	|	|	V|
22+10	0.9658	0.07	Q	|	|	|	V|
22+15	0.9663	0.07	Q	|	|	|	V|
22+20	0.9668	0.07	Q	|	|	|	V|
22+25	0.9672	0.07	Q	|	|	|	V|
22+30	0.9676	0.06	Q	|	|	|	V|
22+35	0.9680	0.06	Q	|	|	|	V|
22+40	0.9684	0.06	Q	|	|	|	V|
22+45	0.9688	0.06	Q	|	|	|	V|
22+50	0.9692	0.06	Q	|	|	|	V|
22+55	0.9696	0.05	Q	|	|	|	V|
23+ 0	0.9700	0.05	Q	|	|	|	V|
23+ 5	0.9703	0.05	Q	|	|	|	V|
23+10	0.9707	0.05	Q	|	|	|	V|
23+15	0.9711	0.05	Q	|	|	|	V|
23+20	0.9714	0.05	Q	|	|	|	V|
23+25	0.9718	0.05	Q	|	|	|	V|
23+30	0.9722	0.05	Q	|	|	|	V|
23+35	0.9726	0.05	Q	|	|	|	V|
23+40	0.9729	0.05	Q	|	|	|	V|
23+45	0.9733	0.05	Q	|	|	|	V|
23+50	0.9737	0.05	Q	|	|	|	V|
23+55	0.9740	0.05	Q	|	|	|	V|
24+ 0	0.9744	0.05	Q	|	|	|	V|
24+ 5	0.9747	0.05	Q	|	|	|	V|
24+10	0.9749	0.03	Q	|	|	|	V|
24+15	0.9750	0.02	Q	|	|	|	V|
24+20	0.9751	0.01	Q	|	|	|	V|
24+25	0.9752	0.01	Q	|	|	|	V|
24+30	0.9752	0.00	Q	|	|	|	V|
24+35	0.9752	0.00	Q	|	|	|	V|
24+40	0.9752	0.00	Q	|	|	|	V|
24+45	0.9752	0.00	Q	|	|	|	V|
24+50	0.9753	0.00	Q	|	|	|	V|
24+55	0.9753	0.00	Q	|	|	|	V|
25+ 0	0.9753	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/10/23 File: 3905PR2242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6400

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TEI JOB NUMBER 3905
PROPOSED CONDITIONS - HCOC
2-YEAR 24-HOUR STORM EVENT

Drainage Area = 33.72(Ac.) = 0.053 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 33.72(Ac.) = 0.053 Sq. Mi.
Length along longest watercourse = 2794.00(Ft.)
Length along longest watercourse measured to centroid = 1445.00(Ft.)
Length along longest watercourse = 0.529 Mi.
Length along longest watercourse measured to centroid = 0.274 Mi.
Difference in elevation = 38.13(Ft.)
Slope along watercourse = 72.0567 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.077 Hr.
Lag time = 4.60 Min.
25% of lag time = 1.15 Min.
40% of lag time = 1.84 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
33.72	1.98	66.77

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
33.72	6.50	219.18

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.980(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 1.980(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
33.720	56.00	0.900

Total Area Entered = 33.72(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	108.733	21.858	7.428

2	0.167	217.465	48.812	16.588
3	0.250	326.198	14.457	4.913
4	0.333	434.931	6.609	2.246
5	0.417	543.664	3.671	1.247
6	0.500	652.396	2.307	0.784
7	0.583	761.129	1.354	0.460
8	0.667	869.862	0.932	0.317
			Sum = 100.000	Sum= 33.983

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.016	(0.172)	0.002	0.014
2	0.17	0.07	0.016	(0.171)	0.002	0.014
3	0.25	0.07	0.016	(0.171)	0.002	0.014
4	0.33	0.10	0.024	(0.170)	0.002	0.021
5	0.42	0.10	0.024	(0.169)	0.002	0.021
6	0.50	0.10	0.024	(0.169)	0.002	0.021
7	0.58	0.10	0.024	(0.168)	0.002	0.021
8	0.67	0.10	0.024	(0.167)	0.002	0.021
9	0.75	0.10	0.024	(0.167)	0.002	0.021
10	0.83	0.13	0.032	(0.166)	0.003	0.029
11	0.92	0.13	0.032	(0.165)	0.003	0.029
12	1.00	0.13	0.032	(0.165)	0.003	0.029
13	1.08	0.10	0.024	(0.164)	0.002	0.021
14	1.17	0.10	0.024	(0.163)	0.002	0.021
15	1.25	0.10	0.024	(0.163)	0.002	0.021
16	1.33	0.10	0.024	(0.162)	0.002	0.021
17	1.42	0.10	0.024	(0.162)	0.002	0.021
18	1.50	0.10	0.024	(0.161)	0.002	0.021
19	1.58	0.10	0.024	(0.160)	0.002	0.021
20	1.67	0.10	0.024	(0.160)	0.002	0.021
21	1.75	0.10	0.024	(0.159)	0.002	0.021
22	1.83	0.13	0.032	(0.158)	0.003	0.029
23	1.92	0.13	0.032	(0.158)	0.003	0.029
24	2.00	0.13	0.032	(0.157)	0.003	0.029
25	2.08	0.13	0.032	(0.156)	0.003	0.029
26	2.17	0.13	0.032	(0.156)	0.003	0.029
27	2.25	0.13	0.032	(0.155)	0.003	0.029
28	2.33	0.13	0.032	(0.155)	0.003	0.029
29	2.42	0.13	0.032	(0.154)	0.003	0.029
30	2.50	0.13	0.032	(0.153)	0.003	0.029
31	2.58	0.17	0.040	(0.153)	0.004	0.036
32	2.67	0.17	0.040	(0.152)	0.004	0.036
33	2.75	0.17	0.040	(0.151)	0.004	0.036
34	2.83	0.17	0.040	(0.151)	0.004	0.036
35	2.92	0.17	0.040	(0.150)	0.004	0.036
36	3.00	0.17	0.040	(0.150)	0.004	0.036
37	3.08	0.17	0.040	(0.149)	0.004	0.036
38	3.17	0.17	0.040	(0.148)	0.004	0.036
39	3.25	0.17	0.040	(0.148)	0.004	0.036
40	3.33	0.17	0.040	(0.147)	0.004	0.036
41	3.42	0.17	0.040	(0.146)	0.004	0.036
42	3.50	0.17	0.040	(0.146)	0.004	0.036
43	3.58	0.17	0.040	(0.145)	0.004	0.036
44	3.67	0.17	0.040	(0.145)	0.004	0.036
45	3.75	0.17	0.040	(0.144)	0.004	0.036
46	3.83	0.20	0.048	(0.143)	0.005	0.043
47	3.92	0.20	0.048	(0.143)	0.005	0.043
48	4.00	0.20	0.048	(0.142)	0.005	0.043
49	4.08	0.20	0.048	(0.142)	0.005	0.043
50	4.17	0.20	0.048	(0.141)	0.005	0.043
51	4.25	0.20	0.048	(0.140)	0.005	0.043
52	4.33	0.23	0.055	(0.140)	0.006	0.050
53	4.42	0.23	0.055	(0.139)	0.006	0.050
54	4.50	0.23	0.055	(0.139)	0.006	0.050
55	4.58	0.23	0.055	(0.138)	0.006	0.050
56	4.67	0.23	0.055	(0.137)	0.006	0.050
57	4.75	0.23	0.055	(0.137)	0.006	0.050
58	4.83	0.27	0.063	(0.136)	0.006	0.057
59	4.92	0.27	0.063	(0.136)	0.006	0.057
60	5.00	0.27	0.063	(0.135)	0.006	0.057
61	5.08	0.20	0.048	(0.134)	0.005	0.043
62	5.17	0.20	0.048	(0.134)	0.005	0.043
63	5.25	0.20	0.048	(0.133)	0.005	0.043
64	5.33	0.23	0.055	(0.133)	0.006	0.050
65	5.42	0.23	0.055	(0.132)	0.006	0.050
66	5.50	0.23	0.055	(0.132)	0.006	0.050
67	5.58	0.27	0.063	(0.131)	0.006	0.057
68	5.67	0.27	0.063	(0.130)	0.006	0.057
69	5.75	0.27	0.063	(0.130)	0.006	0.057
70	5.83	0.27	0.063	(0.129)	0.006	0.057
71	5.92	0.27	0.063	(0.129)	0.006	0.057
72	6.00	0.27	0.063	(0.128)	0.006	0.057
73	6.08	0.30	0.071	(0.128)	0.007	0.064
74	6.17	0.30	0.071	(0.127)	0.007	0.064
75	6.25	0.30	0.071	(0.126)	0.007	0.064
76	6.33	0.30	0.071	(0.126)	0.007	0.064

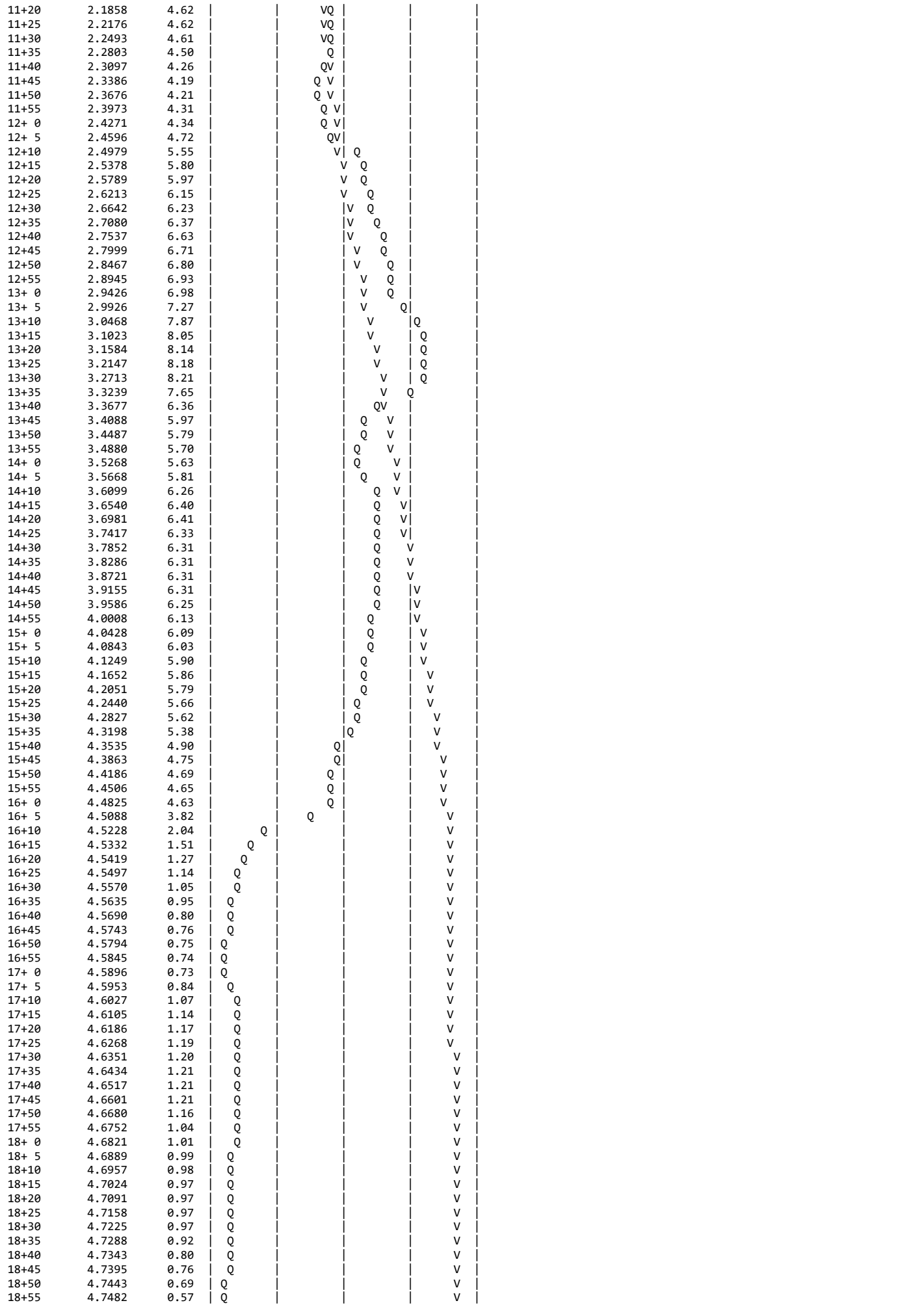
77	6.42	0.30	0.071	(	0.125)	0.007	0.064
78	6.50	0.30	0.071	(	0.125)	0.007	0.064
79	6.58	0.33	0.079	(	0.124)	0.008	0.071
80	6.67	0.33	0.079	(	0.124)	0.008	0.071
81	6.75	0.33	0.079	(	0.123)	0.008	0.071
82	6.83	0.33	0.079	(	0.122)	0.008	0.071
83	6.92	0.33	0.079	(	0.122)	0.008	0.071
84	7.00	0.33	0.079	(	0.121)	0.008	0.071
85	7.08	0.33	0.079	(	0.121)	0.008	0.071
86	7.17	0.33	0.079	(	0.120)	0.008	0.071
87	7.25	0.33	0.079	(	0.120)	0.008	0.071
88	7.33	0.37	0.087	(	0.119)	0.009	0.078
89	7.42	0.37	0.087	(	0.119)	0.009	0.078
90	7.50	0.37	0.087	(	0.118)	0.009	0.078
91	7.58	0.40	0.095	(	0.118)	0.010	0.086
92	7.67	0.40	0.095	(	0.117)	0.010	0.086
93	7.75	0.40	0.095	(	0.116)	0.010	0.086
94	7.83	0.43	0.103	(	0.116)	0.010	0.093
95	7.92	0.43	0.103	(	0.115)	0.010	0.093
96	8.00	0.43	0.103	(	0.115)	0.010	0.093
97	8.08	0.50	0.119	(	0.114)	0.012	0.107
98	8.17	0.50	0.119	(	0.114)	0.012	0.107
99	8.25	0.50	0.119	(	0.113)	0.012	0.107
100	8.33	0.50	0.119	(	0.113)	0.012	0.107
101	8.42	0.50	0.119	(	0.112)	0.012	0.107
102	8.50	0.50	0.119	(	0.112)	0.012	0.107
103	8.58	0.53	0.127	(	0.111)	0.013	0.114
104	8.67	0.53	0.127	(	0.111)	0.013	0.114
105	8.75	0.53	0.127	(	0.110)	0.013	0.114
106	8.83	0.57	0.135	(	0.110)	0.013	0.121
107	8.92	0.57	0.135	(	0.109)	0.013	0.121
108	9.00	0.57	0.135	(	0.109)	0.013	0.121
109	9.08	0.63	0.150	(	0.108)	0.015	0.135
110	9.17	0.63	0.150	(	0.108)	0.015	0.135
111	9.25	0.63	0.150	(	0.107)	0.015	0.135
112	9.33	0.67	0.158	(	0.107)	0.016	0.143
113	9.42	0.67	0.158	(	0.106)	0.016	0.143
114	9.50	0.67	0.158	(	0.105)	0.016	0.143
115	9.58	0.70	0.166	(	0.105)	0.017	0.150
116	9.67	0.70	0.166	(	0.104)	0.017	0.150
117	9.75	0.70	0.166	(	0.104)	0.017	0.150
118	9.83	0.73	0.174	(	0.103)	0.017	0.157
119	9.92	0.73	0.174	(	0.103)	0.017	0.157
120	10.00	0.73	0.174	(	0.102)	0.017	0.157
121	10.08	0.50	0.119	(	0.102)	0.012	0.107
122	10.17	0.50	0.119	(	0.101)	0.012	0.107
123	10.25	0.50	0.119	(	0.101)	0.012	0.107
124	10.33	0.50	0.119	(	0.101)	0.012	0.107
125	10.42	0.50	0.119	(	0.100)	0.012	0.107
126	10.50	0.50	0.119	(	0.100)	0.012	0.107
127	10.58	0.67	0.158	(	0.099)	0.016	0.143
128	10.67	0.67	0.158	(	0.099)	0.016	0.143
129	10.75	0.67	0.158	(	0.098)	0.016	0.143
130	10.83	0.67	0.158	(	0.098)	0.016	0.143
131	10.92	0.67	0.158	(	0.097)	0.016	0.143
132	11.00	0.67	0.158	(	0.097)	0.016	0.143
133	11.08	0.63	0.150	(	0.096)	0.015	0.135
134	11.17	0.63	0.150	(	0.096)	0.015	0.135
135	11.25	0.63	0.150	(	0.095)	0.015	0.135
136	11.33	0.63	0.150	(	0.095)	0.015	0.135
137	11.42	0.63	0.150	(	0.094)	0.015	0.135
138	11.50	0.63	0.150	(	0.094)	0.015	0.135
139	11.58	0.57	0.135	(	0.093)	0.013	0.121
140	11.67	0.57	0.135	(	0.093)	0.013	0.121
141	11.75	0.57	0.135	(	0.092)	0.013	0.121
142	11.83	0.60	0.143	(	0.092)	0.014	0.128
143	11.92	0.60	0.143	(	0.092)	0.014	0.128
144	12.00	0.60	0.143	(	0.091)	0.014	0.128
145	12.08	0.83	0.198	(	0.091)	0.020	0.178
146	12.17	0.83	0.198	(	0.090)	0.020	0.178
147	12.25	0.83	0.198	(	0.090)	0.020	0.178
148	12.33	0.87	0.206	(	0.089)	0.021	0.185
149	12.42	0.87	0.206	(	0.089)	0.021	0.185
150	12.50	0.87	0.206	(	0.088)	0.021	0.185
151	12.58	0.93	0.222	(	0.088)	0.022	0.200
152	12.67	0.93	0.222	(	0.087)	0.022	0.200
153	12.75	0.93	0.222	(	0.087)	0.022	0.200
154	12.83	0.97	0.230	(	0.087)	0.023	0.207
155	12.92	0.97	0.230	(	0.086)	0.023	0.207
156	13.00	0.97	0.230	(	0.086)	0.023	0.207
157	13.08	1.13	0.269	(	0.085)	0.027	0.242
158	13.17	1.13	0.269	(	0.085)	0.027	0.242
159	13.25	1.13	0.269	(	0.084)	0.027	0.242
160	13.33	1.13	0.269	(	0.084)	0.027	0.242
161	13.42	1.13	0.269	(	0.084)	0.027	0.242
162	13.50	1.13	0.269	(	0.083)	0.027	0.242
163	13.58	0.77	0.182	(	0.083)	0.018	0.164
164	13.67	0.77	0.182	(	0.082)	0.018	0.164
165	13.75	0.77	0.182	(	0.082)	0.018	0.164
166	13.83	0.77	0.182	(	0.081)	0.018	0.164
167	13.92	0.77	0.182	(	0.081)	0.018	0.164
168	14.00	0.77	0.182	(	0.081)	0.018	0.164

169	14.08	0.90	0.214	(0.080)	0.021	0.192
170	14.17	0.90	0.214	(0.080)	0.021	0.192
171	14.25	0.90	0.214	(0.079)	0.021	0.192
172	14.33	0.87	0.206	(0.079)	0.021	0.185
173	14.42	0.87	0.206	(0.079)	0.021	0.185
174	14.50	0.87	0.206	(0.078)	0.021	0.185
175	14.58	0.87	0.206	(0.078)	0.021	0.185
176	14.67	0.87	0.206	(0.077)	0.021	0.185
177	14.75	0.87	0.206	(0.077)	0.021	0.185
178	14.83	0.83	0.198	(0.077)	0.020	0.178
179	14.92	0.83	0.198	(0.076)	0.020	0.178
180	15.00	0.83	0.198	(0.076)	0.020	0.178
181	15.08	0.80	0.190	(0.075)	0.019	0.171
182	15.17	0.80	0.190	(0.075)	0.019	0.171
183	15.25	0.80	0.190	(0.075)	0.019	0.171
184	15.33	0.77	0.182	(0.074)	0.018	0.164
185	15.42	0.77	0.182	(0.074)	0.018	0.164
186	15.50	0.77	0.182	(0.073)	0.018	0.164
187	15.58	0.63	0.150	(0.073)	0.015	0.135
188	15.67	0.63	0.150	(0.073)	0.015	0.135
189	15.75	0.63	0.150	(0.072)	0.015	0.135
190	15.83	0.63	0.150	(0.072)	0.015	0.135
191	15.92	0.63	0.150	(0.072)	0.015	0.135
192	16.00	0.63	0.150	(0.071)	0.015	0.135
193	16.08	0.13	0.032	(0.071)	0.003	0.029
194	16.17	0.13	0.032	(0.071)	0.003	0.029
195	16.25	0.13	0.032	(0.070)	0.003	0.029
196	16.33	0.13	0.032	(0.070)	0.003	0.029
197	16.42	0.13	0.032	(0.069)	0.003	0.029
198	16.50	0.13	0.032	(0.069)	0.003	0.029
199	16.58	0.10	0.024	(0.069)	0.002	0.021
200	16.67	0.10	0.024	(0.068)	0.002	0.021
201	16.75	0.10	0.024	(0.068)	0.002	0.021
202	16.83	0.10	0.024	(0.068)	0.002	0.021
203	16.92	0.10	0.024	(0.067)	0.002	0.021
204	17.00	0.10	0.024	(0.067)	0.002	0.021
205	17.08	0.17	0.040	(0.067)	0.004	0.036
206	17.17	0.17	0.040	(0.066)	0.004	0.036
207	17.25	0.17	0.040	(0.066)	0.004	0.036
208	17.33	0.17	0.040	(0.066)	0.004	0.036
209	17.42	0.17	0.040	(0.065)	0.004	0.036
210	17.50	0.17	0.040	(0.065)	0.004	0.036
211	17.58	0.17	0.040	(0.065)	0.004	0.036
212	17.67	0.17	0.040	(0.064)	0.004	0.036
213	17.75	0.17	0.040	(0.064)	0.004	0.036
214	17.83	0.13	0.032	(0.064)	0.003	0.029
215	17.92	0.13	0.032	(0.063)	0.003	0.029
216	18.00	0.13	0.032	(0.063)	0.003	0.029
217	18.08	0.13	0.032	(0.063)	0.003	0.029
218	18.17	0.13	0.032	(0.063)	0.003	0.029
219	18.25	0.13	0.032	(0.062)	0.003	0.029
220	18.33	0.13	0.032	(0.062)	0.003	0.029
221	18.42	0.13	0.032	(0.062)	0.003	0.029
222	18.50	0.13	0.032	(0.061)	0.003	0.029
223	18.58	0.10	0.024	(0.061)	0.002	0.021
224	18.67	0.10	0.024	(0.061)	0.002	0.021
225	18.75	0.10	0.024	(0.060)	0.002	0.021
226	18.83	0.07	0.016	(0.060)	0.002	0.014
227	18.92	0.07	0.016	(0.060)	0.002	0.014
228	19.00	0.07	0.016	(0.060)	0.002	0.014
229	19.08	0.10	0.024	(0.059)	0.002	0.021
230	19.17	0.10	0.024	(0.059)	0.002	0.021
231	19.25	0.10	0.024	(0.059)	0.002	0.021
232	19.33	0.13	0.032	(0.058)	0.003	0.029
233	19.42	0.13	0.032	(0.058)	0.003	0.029
234	19.50	0.13	0.032	(0.058)	0.003	0.029
235	19.58	0.10	0.024	(0.058)	0.002	0.021
236	19.67	0.10	0.024	(0.057)	0.002	0.021
237	19.75	0.10	0.024	(0.057)	0.002	0.021
238	19.83	0.07	0.016	(0.057)	0.002	0.014
239	19.92	0.07	0.016	(0.057)	0.002	0.014
240	20.00	0.07	0.016	(0.056)	0.002	0.014
241	20.08	0.10	0.024	(0.056)	0.002	0.021
242	20.17	0.10	0.024	(0.056)	0.002	0.021
243	20.25	0.10	0.024	(0.056)	0.002	0.021
244	20.33	0.10	0.024	(0.055)	0.002	0.021
245	20.42	0.10	0.024	(0.055)	0.002	0.021
246	20.50	0.10	0.024	(0.055)	0.002	0.021
247	20.58	0.10	0.024	(0.055)	0.002	0.021
248	20.67	0.10	0.024	(0.054)	0.002	0.021
249	20.75	0.10	0.024	(0.054)	0.002	0.021
250	20.83	0.07	0.016	(0.054)	0.002	0.014
251	20.92	0.07	0.016	(0.054)	0.002	0.014
252	21.00	0.07	0.016	(0.054)	0.002	0.014
253	21.08	0.10	0.024	(0.053)	0.002	0.021
254	21.17	0.10	0.024	(0.053)	0.002	0.021
255	21.25	0.10	0.024	(0.053)	0.002	0.021
256	21.33	0.07	0.016	(0.053)	0.002	0.014
257	21.42	0.07	0.016	(0.053)	0.002	0.014
258	21.50	0.07	0.016	(0.052)	0.002	0.014
259	21.58	0.10	0.024	(0.052)	0.002	0.021
260	21.67	0.10	0.024	(0.052)	0.002	0.021

```
261  21.75     0.10      0.024       (  0.052)       0.002        0.021
262  21.83     0.07      0.016       (  0.052)       0.002        0.014
263  21.92     0.07      0.016       (  0.051)       0.002        0.014
264  22.00     0.07      0.016       (  0.051)       0.002        0.014
265  22.08     0.10      0.024       (  0.051)       0.002        0.021
266  22.17     0.10      0.024       (  0.051)       0.002        0.021
267  22.25     0.10      0.024       (  0.051)       0.002        0.021
268  22.33     0.07      0.016       (  0.051)       0.002        0.014
269  22.42     0.07      0.016       (  0.050)       0.002        0.014
270  22.50     0.07      0.016       (  0.050)       0.002        0.014
271  22.58     0.07      0.016       (  0.050)       0.002        0.014
272  22.67     0.07      0.016       (  0.050)       0.002        0.014
273  22.75     0.07      0.016       (  0.050)       0.002        0.014
274  22.83     0.07      0.016       (  0.050)       0.002        0.014
275  22.92     0.07      0.016       (  0.050)       0.002        0.014
276  23.00     0.07      0.016       (  0.049)       0.002        0.014
277  23.08     0.07      0.016       (  0.049)       0.002        0.014
278  23.17     0.07      0.016       (  0.049)       0.002        0.014
279  23.25     0.07      0.016       (  0.049)       0.002        0.014
280  23.33     0.07      0.016       (  0.049)       0.002        0.014
281  23.42     0.07      0.016       (  0.049)       0.002        0.014
282  23.50     0.07      0.016       (  0.049)       0.002        0.014
283  23.58     0.07      0.016       (  0.049)       0.002        0.014
284  23.67     0.07      0.016       (  0.049)       0.002        0.014
285  23.75     0.07      0.016       (  0.049)       0.002        0.014
286  23.83     0.07      0.016       (  0.049)       0.002        0.014
287  23.92     0.07      0.016       (  0.049)       0.002        0.014
288  24.00     0.07      0.016       (  0.049)       0.002        0.014
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    21.4
       Flood volume = Effective rainfall      1.78(In)
        times area      33.7(Ac.)/[(In)/(Ft.)] =       5.0(Ac.Ft)
       Total soil loss =      0.20(In)
       Total soil loss =     0.556(Ac.Ft)
       Total rainfall =      1.98(In)
       Flood volume =      218108.8 Cubic Feet
       Total soil loss =       24234.3 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      8.212(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0007      0.11  Q         |         |         |         |
   0+10       0.0031      0.34  VQ        |         |         |         |
   0+15       0.0059      0.41  VQ        |         |         |         |
   0+20       0.0094      0.50  VQ        |         |         |         |
   0+25       0.0137      0.63  V Q       |         |         |         |
   0+30       0.0184      0.68  V Q       |         |         |         |
   0+35       0.0232      0.70  V Q       |         |         |         |
   0+40       0.0282      0.72  V Q       |         |         |         |
   0+45       0.0331      0.72  V Q       |         |         |         |
   0+50       0.0385      0.78  V  Q      |         |         |         |
   0+55       0.0447      0.90  V  Q      |         |         |         |
   1+ 0       0.0511      0.93  V  Q      |         |         |         |
   1+ 5       0.0573      0.90  V  Q      |         |         |         |
   1+10       0.0627      0.79  V  Q      |         |         |         |
   1+15       0.0679      0.76  V  Q      |         |         |         |
   1+20       0.0731      0.74  V Q       |         |         |         |
   1+25       0.0781      0.74  V Q       |         |         |         |
   1+30       0.0832      0.73  V Q       |         |         |         |
   1+35       0.0882      0.73  V Q       |         |         |         |
   1+40       0.0932      0.73  V Q       |         |         |         |
   1+45       0.0982      0.73  V Q       |         |         |         |
   1+50       0.1036      0.78  V  Q      |         |         |         |
   1+55       0.1098      0.90  V  Q      |         |         |         |
   2+ 0       0.1162      0.93  V  Q      |         |         |         |
   2+ 5       0.1227      0.95  V  Q      |         |         |         |
   2+10       0.1293      0.96  |V Q       |         |         |         |
   2+15       0.1360      0.96  |V Q       |         |         |         |
   2+20       0.1426      0.97  |V Q       |         |         |         |
   2+25       0.1493      0.97  |V Q       |         |         |         |
   2+30       0.1560      0.97  |V Q       |         |         |         |
   2+35       0.1630      1.02  |V  Q      |         |         |         |
   2+40       0.1709      1.14  |V  Q      |         |         |         |
   2+45       0.1790      1.18  |V  Q      |         |         |         |
   2+50       0.1872      1.19  |V  Q      |         |         |         |
   2+55       0.1955      1.20  |V  Q      |         |         |         |
   3+ 0       0.2038      1.21  |V  Q      |         |         |         |
   3+ 5       0.2121      1.21  |V  Q      |         |         |         |
   3+10       0.2204      1.21  |V  Q      |         |         |         |
   3+15       0.2288      1.21  |V  Q      |         |         |         |
   3+20       0.2371      1.21  |V  Q      |         |         |         |
   3+25       0.2455      1.21  |V  Q      |         |         |         |
   3+30       0.2538      1.21  | V Q      |         |         |         |
   3+35       0.2622      1.21  | V Q      |         |         |         |
```

3+40	0.2705	1.21	V Q				
3+45	0.2789	1.21	V Q				
3+50	0.2876	1.26	V Q				
3+55	0.2971	1.38	V Q				
4+ 0	0.3069	1.42	V Q				
4+ 5	0.3167	1.43	V Q				
4+10	0.3267	1.44	V Q				
4+15	0.3367	1.45	V Q				
4+20	0.3470	1.50	V Q				
4+25	0.3582	1.63	V Q				
4+30	0.3696	1.66	V Q				
4+35	0.3812	1.68	V Q				
4+40	0.3928	1.69	V Q				
4+45	0.4044	1.69	V Q				
4+50	0.4165	1.75	V Q				
4+55	0.4293	1.87	V Q				
5+ 0	0.4424	1.90	V Q				
5+ 5	0.4549	1.81	V Q				
5+10	0.4658	1.59	V Q				
5+15	0.4763	1.52	V Q				
5+20	0.4870	1.54	V Q				
5+25	0.4983	1.65	V Q				
5+30	0.5098	1.67	V Q				
5+35	0.5218	1.73	V Q				
5+40	0.5345	1.86	V Q				
5+45	0.5476	1.90	V Q				
5+50	0.5608	1.92	V Q				
5+55	0.5741	1.93	V Q				
6+ 0	0.5874	1.93	V Q				
6+ 5	0.6011	1.99	V Q				
6+10	0.6156	2.11	V Q				
6+15	0.6304	2.15	V Q				
6+20	0.6453	2.16	V Q				
6+25	0.6602	2.17	V Q				
6+30	0.6752	2.18	V Q				
6+35	0.6906	2.23	V Q				
6+40	0.7068	2.35	V Q				
6+45	0.7232	2.39	V Q				
6+50	0.7398	2.40	V Q				
6+55	0.7564	2.41	V Q				
7+ 0	0.7730	2.42	V Q				
7+ 5	0.7897	2.42	V Q				
7+10	0.8064	2.42	V Q				
7+15	0.8231	2.42	V Q				
7+20	0.8402	2.48	V Q				
7+25	0.8580	2.59	V Q				
7+30	0.8761	2.63	V Q				
7+35	0.8947	2.70	V Q				
7+40	0.9142	2.83	V Q				
7+45	0.9339	2.87	V Q				
7+50	0.9542	2.94	V Q				
7+55	0.9753	3.07	V Q				
8+ 0	0.9967	3.11	V Q				
8+ 5	1.0190	3.23	V Q				
8+10	1.0430	3.48	V Q				
8+15	1.0675	3.56	V Q				
8+20	1.0922	3.59	V Q				
8+25	1.1171	3.61	V Q				
8+30	1.1420	3.62	V Q				
8+35	1.1674	3.68	V Q				
8+40	1.1936	3.81	V Q				
8+45	1.2201	3.84	V Q				
8+50	1.2470	3.91	V Q				
8+55	1.2748	4.04	V Q				
9+ 0	1.3029	4.08	V Q				
9+ 5	1.3319	4.20	V Q				
9+10	1.3625	4.45	V Q				
9+15	1.3937	4.53	V Q				
9+20	1.4255	4.62	V Q				
9+25	1.4582	4.75	V Q				
9+30	1.4913	4.80	V Q				
9+35	1.5248	4.88	V Q				
9+40	1.5593	5.01	V Q				
9+45	1.5941	5.05	V Q				
9+50	1.6294	5.12	V Q				
9+55	1.6655	5.25	V Q				
10+ 0	1.7019	5.29	V Q				
10+ 5	1.7360	4.94	V Q				
10+10	1.7643	4.12	V Q				
10+15	1.7911	3.88	VQ				
10+20	1.8171	3.77	VQ				
10+25	1.8426	3.71	Q				
10+30	1.8679	3.67	Q				
10+35	1.8949	3.92	Q				
10+40	1.9258	4.49	V Q				
10+45	1.9580	4.67	V Q				
10+50	1.9907	4.75	V Q				
10+55	2.0237	4.79	V Q				
11+ 0	2.0568	4.82	V Q				
11+ 5	2.0898	4.78	V Q				
11+10	2.1220	4.68	V Q				
11+15	2.1539	4.64	VQ				



19+ 0	4.7518	0.53	Q				V
19+ 5	4.7557	0.56	Q				V
19+10	4.7603	0.67	Q				V
19+15	4.7651	0.70	Q				V
19+20	4.7703	0.76	Q				V
19+25	4.7764	0.89	Q				V
19+30	4.7828	0.93	Q				V
19+35	4.7890	0.89	Q				V
19+40	4.7944	0.79	Q				V
19+45	4.7996	0.76	Q				V
19+50	4.8044	0.69	Q				V
19+55	4.8083	0.57	Q				V
20+ 0	4.8119	0.53	Q				V
20+ 5	4.8158	0.56	Q				V
20+10	4.8204	0.67	Q				V
20+15	4.8252	0.70	Q				V
20+20	4.8300	0.71	Q				V
20+25	4.8350	0.72	Q				V
20+30	4.8399	0.72	Q				V
20+35	4.8449	0.72	Q				V
20+40	4.8499	0.73	Q				V
20+45	4.8550	0.73	Q				V
20+50	4.8596	0.67	Q				V
20+55	4.8634	0.56	Q				V
21+ 0	4.8670	0.52	Q				V
21+ 5	4.8709	0.56	Q				V
21+10	4.8754	0.67	Q				V
21+15	4.8802	0.70	Q				V
21+20	4.8848	0.66	Q				V
21+25	4.8885	0.54	Q				V
21+30	4.8921	0.52	Q				V
21+35	4.8959	0.56	Q				V
21+40	4.9005	0.67	Q				V
21+45	4.9053	0.70	Q				V
21+50	4.9098	0.66	Q				V
21+55	4.9135	0.54	Q				V
22+ 0	4.9171	0.52	Q				V
22+ 5	4.9209	0.56	Q				V
22+10	4.9255	0.67	Q				V
22+15	4.9303	0.70	Q				V
22+20	4.9348	0.66	Q				V
22+25	4.9386	0.54	Q				V
22+30	4.9421	0.52	Q				V
22+35	4.9456	0.50	Q				V
22+40	4.9490	0.50	Q				V
22+45	4.9524	0.49	Q				V
22+50	4.9557	0.49	Q				V
22+55	4.9591	0.48	Q				V
23+ 0	4.9624	0.48	Q				V
23+ 5	4.9658	0.48	Q				V
23+10	4.9691	0.48	Q				V
23+15	4.9724	0.48	Q				V
23+20	4.9758	0.48	Q				V
23+25	4.9791	0.48	Q				V
23+30	4.9824	0.48	Q				V
23+35	4.9858	0.48	Q				V
23+40	4.9891	0.48	Q				V
23+45	4.9925	0.48	Q				V
23+50	4.9958	0.48	Q				V
23+55	4.9991	0.48	Q				V
24+ 0	5.0025	0.48	Q				V
24+ 5	5.0051	0.38	Q				V
24+10	5.0061	0.14	Q				V
24+15	5.0066	0.07	Q				V
24+20	5.0068	0.04	Q				V
24+25	5.0070	0.02	Q				V
24+30	5.0071	0.01	Q				V
24+35	5.0071	0.00	Q				V

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ A. **On-site storm drain inlets**	☒ **Locations of inlets.**	☒ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☒ **Maintain and periodically repaint or replace inlet markings.** ☒ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☒ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☒ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☒ B. **Interior floor drains and elevator shaft sump pumps**		☒ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☒ **Inspect and maintain drains to prevent blockages and overflow.**
☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ D1. **Need for future indoor & structural pest control**		❑ **Note building design features that discourage entry of pests.**	❑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☒ D2. **Landscape/ Outdoor Pesticide Use**	❑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☒ **Show self-retaining landscape areas, if any.** ❑ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ❑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☒ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☒ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☒ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☒ **Maintain landscaping using minimum or no pesticides.** ☒ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☒ **Provide IPM information to new owners, lessees and operators.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
❑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	❑ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☒ G. **Refuse areas**	☒ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☒ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ❑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☒ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☒ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☒ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ H. **Industrial processes.**	☐ **Show process area.**	☒ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	☒ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑ **Car dealerships and similar may rinse cars with water only.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ M. **Loading Docks**	☒ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		☒ **Move loaded and unloaded items indoors as soon as possible.** ☒ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N. **Fire Sprinkler Test Water**		❑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	❑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ❑ **Boiler drain lines** ❑ **Condensate drain lines** ❑ **Rooftop equipment** ❑ **Drainage sumps** ❑ **Roofing, gutters, and trim.** ❑ **Other sources**		❑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ❑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ❑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ❑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ❑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ P. **Plazas, sidewalks, and parking lots.**			☒ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Operation and Maintenance Plan

Project Title: Temescal Valley Commerce Center

Original Date Prepared: March 13, 2025

Revision Date(s): _____

Revision Date(s): _____

Revision Date(s): _____

Revision Date(s): _____

Contact Information:

Prepared for:
Dawson Canyon, LLC
18831 Bardeen Avenue, Suite 201
Irvine, CA 92612
Phone: (949) 842-3074
Contact: Matt Englhard

Prepared by:
Thienes Engineering, Inc.
14349 Firestone Boulevard
La Mirada, CA 90638
(714) 521-4811
Contact: Luis Prado (luisp@thieneseng.com)
Job No. 3905

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I. Inspection and Maintenance Log

Date	Observations/Actions	Inspector

Additional inspection and maintenance logs to be included in Appendix 1 of this O&M Plan.

II. Updates, Revisions, and Errata

Revision Number	Date	Brief Description of Update/Revision/Errata, include section and page number	Prepared and Approved By

Additional updates, revisions, and errata to be include in Appendix 2 of this O&M Plan.

III. Introduction

Project Description:

The overall project encompasses approximately 48.317 acres of improvements, which includes 33.72 acres of onsite improvements, 6.81 acres of Coldwater Canyon Wash realignment improvements, and 7.787 acres of offsite improvements. Proposed improvements include seven light industrial warehouses, each with their individual loading docks and vehicular parking areas. Landscape will be located throughout the site and along the perimeters.

Per the soils engineer, infiltration is feasible therefore underground infiltration chambers will be proposed to retain the runoff produced by the 85th percentile storm rainfall depth. Additional storage in the underground chambers will be provided to mitigate hydrologic conditions of concern (HCOC). DCV mitigation for the street widening improvements on the surrounding streets will be provided onsite via six separate underground infiltration chambers (located onsite).

Existing Site:

The project site is currently unpaved and barren. The site generally surface drains to the north and appears to pond stormwater prior to discharging into the Temescal Wash.

Stormwater is currently draining onto the site from offsite portions of the previous larger development and the bordering hillside to the southeast. Run-on surface drains to the north, down the vegetated slopes, and enters the site through the compacted surface of the neighboring southerly property. A gutter is proposed along the southerly property line to intercept and convey offsite run-on northeast, to the Temescal Wash.

Hydrology (see Hydrology map in Appendix 1 for visual):

In the proposed condition, the site will drain to the easterly portion of the double 12'W x 7'H RCB northeast of the Temescal Canyon Road and Dawson Canyon Road intersection.

The southerly portion of Building 5, southerly drive aisle and easterly vehicle parking area (Nodes 100-103) will drain to catch basins located in the drive aisles. Flows will be conveyed northerly around Building 5 and into the Building 6 truck yard via a proposed onsite storm drain system, Line "A". Flows from the northerly portion of Building 5, Building 6 and both truck yards (Nodes 110-114) will be collected with catch basins in the Building 6 truck yard and confluenced in Line "A". The storm drain system will continue westerly.

Flows from the drive aisle and parking areas east of Building 4 (Nodes 200-203) will be collected in a separate storm drain system, Line "D", and travel southerly. Flows will ultimately discharge into Line "A" in the Building 4 easterly drive aisle (Node 204) and continue westerly. The drive aisle and parking area west of Building 5, northerly portion of Building 3, Building 4 and both truck yards (Nodes 210-213) will drain to catch basins located in the Building 4 truck yard. Flows will confluence in Line "A" and continue southerly toward Building 2.

The parking area north of Building 2 and drive aisle west of Building 4 (Nodes 300-302) will drain to catch basins in the parking area. A proposed storm drain system, Line "C" will convey flows southerly and discharge into Line "A" (Node 303). Flows will continue southerly in the drive aisle between Building 1 and Building 3 (Node 407).

The southerly portion of Building 3, Building 3 southerly drive aisle, Building 3 easterly drive aisle and a portion of the Building 1 southerly drive aisle (Nodes 400-405). A proposed onsite storm drain system,

Line “B”, will convey flows westerly around Building 3 and northerly through the drive aisle. Flows will discharge into Line “A” in the drive aisle (Node 407) and continue westerly in Line “A”.

Building 1, Building 2 and their truck yards (Nodes 500-502) will drain to a catch basin in the Building 2 truck yard. Flows will discharge into Line “A” and continue southerly down the Building 1 westerly drive aisle. Flows will ultimately discharge into the existing double 12’W x 7’H RCB.

Building 7 and its driveway entrance (Nodes 600-601) will be collected in a proposed onsite system, Line “E”.

Runoff from approximately 0.68 acres of landscaping and some driveways (DMAs E, F and G) will sheet flow offsite onto Dawson Canyon Road and commingle with runoff from DMAs 2.1, 3.1 and 3.2 (offsite DMAs depicted in Appendix 1’s offsite WQMP exhibit, prepared by Rick Engineering and dated September 7, 2023). To accommodate the additional volume generated by DMAs E, F, and G, increased storage capacity will be provided in STC “2.1”, “3.1”, and “3.2”.

IV. Responsibility for Maintenance

IV.A General

Funding will be provided by the owner:

Dawson Canyon, LLC
18831 Bardeen Avenue, Suite 201
Irvine, CA 92612
Phone: (949) 842-3074
Contact: Matt Englhard

A copy of the Covenant Agreement will be attached in Appendix 3 of this O&M Plan.

IV.B Staff Training Program

Staff training records and descriptions will be inserted in Appendix 4 of this O&M Plan.

IV.C Records

Maintenance records are to be inserted chronologically in Appendix 1 of this O&M Plan.

IV.D Safety

All maintenance procedures shall comply with the latest OSHA standards.

V. Summary of Drainage Management Areas and Stormwater BMPs

V.A Drainage Areas

See Appendix 5 of this O&M Plan for WQMP site map.

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	Area (Acres)	DMA Type
A-1	Concrete or Asphalt	169,448	3.89	Type D
A-2	Ornamental Landscaping	9,148	0.21	Type D
B-1	Concrete or Asphalt	696,960	16.00	Type D
B-2	Ornamental Landscaping	36,590	0.84	Type D
C-1	Roofs/Conc/Asphalt	121,532	2.79	Type D
C-2	Ornamental Landscaping	6,534	0.15	Type D
D-1	Roofs/Conc/Asphalt	378,972	8.70	Type D
D-2	Ornamental Landscaping	20,038	0.46	Type D
E-1	Concrete or Asphalt	1,307	0.03	Type D
E-2	Ornamental Landscaping	11,761	0.27	Type D
F-1	Concrete or Asphalt	871	0.02	Type D
F-2	Ornamental Landscaping	6,970	0.16	Type D
G-1	Concrete or Asphalt	1,742	0.04	Type D
G-2	Ornamental Landscaping	6,970	0.16	Type D
H	Natural (B Soil)	296,644	6.81	Type A
1.1	Mixed Surface Types	139,609	3.20	Type D
1.3	Mixed Surface Types	110,953	2.55	Type D
2.1	Mixed Surface Types	39,197	0.90	Type D
3.1	Mixed Surface Types	10,234	0.23	Type D
3.2	Mixed Surface Types	26,633	0.61	Type D
3.3	Mixed Surface Types	12,558	0.29	Type D

Geo-location of the BMPs using latitude and longitude coordinates

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	Latitude	Longitude
A	On-site storm drain inlets	Conceptual Grading Plans	---	---
B	Interior floor drains and elevator shaft sump pumps	N/A	---	---
D2	Landscape / Outdoor Pesticide Use	On-site Landscape Improvement Plans	---	---
G	Refuse Areas	Conceptual Grading Plans	---	---
H	Industrial processes	Conceptual Grading Plans (indoors, if any)	---	---
M	Loading Docks	Conceptual Grading Plans	---	---
P	Plazas, sidewalks, and parking lots	Conceptual Grading Plans	---	---
STC "A"	Underground Infiltration System	Conceptual Grading Plans	33.783151	-117.487290
STC "B"	Underground Infiltration System	Conceptual Grading Plans	33.782264	-117.486124
STC "C"	Underground Infiltration System	Conceptual Grading Plans	33.781522	-117.483882
STC "D"	Underground Infiltration System	Conceptual Grading Plans	33.780473	-117.484752
STC "1.1"	Underground Infiltration System	Conceptual Grading Plans	33.780627	-117.485890
STC "1.3"	Underground Infiltration System	Conceptual Grading Plans	33.782894 33.783249	-117.488290 -117.488149
STC "2.1"	Underground Infiltration System	Conceptual Grading Plans	33.783688	-117.487343
STC "3.1"	Underground Infiltration System	Conceptual Grading Plans	33.783935	-117.486748
STC "3.2"	Underground Infiltration System	Conceptual Grading Plans	33.783084	-117.485272
STC "3.3"	Underground Infiltration System	Conceptual Grading Plans	33.782558	-117.483793

V.B Structural Post-Construction BMPs

See Appendix 5 of this O&M Plan for WQMP site map.

Additional BMP details are available in Appendix 10 of the WQMP.

V.C Self-Retaining Areas or Other

Table V.1 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
H	296,644	Natural (B Soil)	N/A

VI. Stormwater BMP Design Documentation

VI.A "As-Built" Drawings of each Stormwater BMP

See Appendix 6 of this O&M Plan for "as-built" drawings.

VI.B Manufacturer's Data, Manuals, and Maintenance Requirements

Not applicable, there are no manufactured stormwater BMPs.

VI.C Specific Operation and Maintenance Concerns and Troubleshooting

Not applicable.

VII. Maintenance Schedule or Matrix

VII.A Maintenance Schedule

Schedule (Underground Infiltration System)	Inspection and Maintenance Activity (Underground Infiltration Chambers)
The isolator row shall be inspected semi-annually (by October 1st and February 1st) and cleaned by water-flush and vacuum when solids accumulate to 3" depth. Maintenance to be conducted through service contract with the vendor or equally qualified contractor.	The isolator row shall be inspected for debris and sediment accumulations and maintained by a qualified technician and he/she will properly dispose of all wastes and inspect for standing water. A manhole is installed in order to inspect and maintain the inlet row. All entry into the chamber system must be done per OSHA codes to ensure operator and inspector safety. Inspection ports should be checked 48 hours after storm events to see that the water is draining down, at least once each rainy season, following a major storm event. Records shall be maintained by owner to document inspections.
Schedule (CDS unit)	Inspection and Maintenance Activity (CDS unit)
Visually inspect twice a year (spring and fall) or as frequently as needed. Vacuum frequency as determined by inspection.	Visual inspection to quantify the accumulation of hydrocarbons, trash, and sediment in the system. Use vacuum truck to clean and remove pollutants from the system upon reaching 75% capacity. Clean area outside of the screen if pollutant build-up exists.

VII.B Service Agreement Information

See Appendix 8 of this O&M Plan for service agreement information with any contractors regarding the O&M of BMPs at the site, if any.

Appendix 1: Inspection and Maintenance Logs

Insert Additional Inspection or Maintenance Logs Here

Date	Observations/Actions	Inspector

Appendix 2: Updates, Revisions, and Errata

Insert Additional Updates, Revisions, and Errata Logs Here

Revision Number	Date	Brief Description of Update/Revision/Errata, include section and page number	Prepared and Approved By

Appendix 3: Maintenance Mechanism

Copy of Covenant Agreement
Establishing Notification Process And Responsibility
For Water Quality Management Plan Implementation And Maintenance

Notification Process and Responsibility

1. **Name:** _____
   Title: _____
   Phone No.: _____

   WQMP Responsibilities, Duties, and Activities:
   (1) Routine inspections to evaluate BMP effectiveness.
   (2) Identifying when BMPs require maintenance.
   (3) Working with qualified contractors to maintain the BMP.
   (4) Recordkeeping of inspections and maintenance activities.

2. **Name:** _____
   Title: _____
   Phone No.: _____

   WQMP Responsibilities, Duties, and Activities:
   (1) Cleaning, repairing, servicing, and maintenance of BMP.

3. **Name:** _____
   Title: _____
   Phone No.: _____

   WQMP Responsibilities, Duties, and Activities:
   (1) In event of failure, and with City Engineer's authorization, modify or replace with an upgraded BMP to prevent future failure.
   (2) Notify successors of BMPs and maintenance requirements.

Recorded at the request of:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

THIS INSTRUMENT IS FOR THE BENEFIT OF THE COUNTY OF RIVERSIDE AND ENTITLED TO BE RECORDED WITHOUT FEE.(GOV. CODE 6103)

RETURN TO:
RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT. **STOP NO. 1080**

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN BMP, CONSENT TO INSPECT, MAINTENANCE AND INDEMNIFICATION

APN: 283-160-046 and 283-190-044 **PROJECT No.**_____ **IP No.**_____

OWNER(S): Dawson Canyon, LLC

PROPERTY ADDRESS: Temescal Canyon Road and Dawson Canyon Road, County of Riverside, CA 92883

LEGAL DESCRIPTION: See Exhibit A.

THIS AGREEMENT is made and entered into in Riverside County, California, this TBD day of TBD Year 2025, by and between Dawson Canyon, LLC, (hereinafter referred to as "Covenantor" or "Owner") and the COUNTY OF RIVERSIDE via its Department of Transportation, a political subdivision of the State of California (hereinafter referred to as "County").

RECITALS

WHEREAS, the Covenantor owns real property ("Property") in the County of Riverside, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of these exhibits is attached, and incorporated herein by this reference;

WHEREAS, the County is the owner of interests in that certain real property within the unincorporated area of the County of Riverside, State of California, containing storm drains, pipelines, and related appurtenances constituting the County's municipal separate storm sewer system (the County's "MS4");

WHEREAS, Covenantor intends to develop, improve, and/or use the Property is such a way that approval by the County for such development, improvement, and/or use is required pursuant to applicable laws;

WHEREAS, As a condition for said approval by the County, County required Covenantor, and Covenantor desires to, restrict the use of the Property according to the conditions, covenants, equitable servitudes, and restrictions contained herein for the express benefit of the County's MS4, which include requirements that the Property incorporate post construction on-site stormwater quality control measures;

WHEREAS, the Covenantor/Owner has chosen to install one or more underground infiltration chambers, hereinafter referred to as "Device", as the on-site control measure to minimize pollutants in urban runoff;

WHEREAS, said Device has been installed in accordance with plans and specifications accepted by the County;

WHEREAS, said Device, with installation on private property, is a private facility with all maintenance or replacement, therefore, the sole responsibility of the Covenantor/Owner in accordance with the terms of this Agreement;

WHEREAS, the Covenantor/Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining; to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, incorporating the foregoing Recitals and in consideration of the covenants and conditions contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and expressly for the benefit of, and to bind, their sucessors in interest, the parties hereto agree as follows:

1. Covenantor/Owner hereby provides the County or County's designee complete access to the Device and its immediate vicinity and such access onto the property to permit access to the devise at any time, upon twenty-four *(24)* hour advance notice in writing, of any duration for the purpose of inspection, sampling and testing of the Device. County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2. Covenantor/Owner shall use its best efforts diligently to maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested

from time to time by the County / Regional Water Quality Control Board (RWQCB), the Owner shall provide the RWQCB with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Covenantor/Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the County, the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs and interest thereon at the maximum rate authorized by the Civil Code from the date of notice of expense until paid in full.

4. The County may require the Covenantor/Owner to post security in a form and for a time period satisfactory to the County to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under this Agreement, the County may, in the case of a cash deposit, certificate of deposit or letter of credit, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement.

5. The County may, but shall not be obligated to, enforce this Agreement by a proceeding at law or in equity against any person or persons violating or attempting to violate any condition, covenant, equitable servitude, or restriction provided for herein, either to restrain such violation or to recover damages.

6. This Agreement constitutes the entire agreement and understanding between the parties with respect to the subject matter of this Agreement and supersedes all prior or contemporaneous agreements and understandings with respect to the subject matter hereof, whether oral or written.

7. If any part of this Agreement is declared by a final decision of a court of competent jurisdiction to be invalid for any reason, such shall not affect the validity of the rest of the Agreement. The other parts of this Agreement shall remain in effect as if this Agreement had been executed without the invalid parts(s). The parties declare that they intend and desire that the remaining parts of this Agreement continue to be effective without any part(s) that have been declared invalid.

8. This Agreement may be executed in counterparts, each of which so executed shall, irrespective of the date of its execution and delivery, be deemed an orginal, and all such counterparts together shall constitute one and the same instrument.

9. This Agreement shall be recorded in the Office of the Recorder of Riverside County, California and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth.

10. In the event of legal action occasioned by any default or action of the Covenantor/Owner, or its successors or assigns, then the Covenantor/Owner and its

successors or assigns agree(s) to pay all costs incurred by the County in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

11. Covenantor/Owner agrees to indemnify, defend, and hold harmless the County, its elected officers, employees, agents, and contractors from and against any and all liability, expense, including costs and reasonable legal fees, and claims of damage of any nature whatsoever including, but not limited to, death, bodily injury, personal injury, or property damage arising from or connected with the County inspection of the Property except where such liability, expense, or claim for damage results from the sole negligence or willful misconduct of the County.

12. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien thereon against.

13. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto and any other present or future interest holders or estate holders in the property. The term "Owner" shall include not only the present Owner, but also its heirs, successors in interest and in title to the property, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.

14. Time is of the essence in the performance of this Agreement.

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15. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two *(72)* hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

COVENANTOR/OWNER:

COUNTY:

Riverside County Department of Transportation
Attn: Transportation Assistant Director
4080 Lemon Street
Riverside, CA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

_____ _____
Patricia Romo, P.E. Date
Assistant Director of Transportation

_____ _____
(Attest) Date

COVENANTOR/OWNER

Dawson Canyon, LLC
Company/Corporation/Partnership

Matt Englhard
(Print Name)

TBD
(Print Title)

ACKNOWLEDGMENT

State of California
County of _____

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

personally appeared _____

_____

_____,

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

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

WITNESS my hand and official seal.

Signature _____

(Seal)

Appendix 4: Training Records

Insert Training Records with Brief Discussion Here

Appendix 5: Site Plan and Details

WQMP Site Map and BMP Details

Appendix 6: “As-Built” Drawings

Insert “As-Builts” Here When Available

Appendix 7: Manufacturer Information

Brochures, Manuals, and Maintenance Requirements

Appendix 8: Service Agreement Information

Insert Contractor Information (if any)

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information


WHEN IT RAINS
IT DRAINS
After the Storm
For more information contact:
or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps
EPA United States Environmental Protection Agency
EPA 833-B-03-002
January 2003
Internet Address (URL) • HTTP://www.epa.gov
Recycled/Recyclable • Printed With Vegetable
Oil Based Inks on 100% Postconsumer,
Process Chlorine Free Recycled Paper
THE YEAR OF CLEAN WATER
Celebration of Recommitment
A Citizen's Guide to
Understanding Stormwater
WHEN IT RAINS
IT DRAINS

What is stormwater runoff?



Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?



Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution



Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.



- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions



Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential





Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Lawn care



Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems



Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Pet waste



Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.



Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.



Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

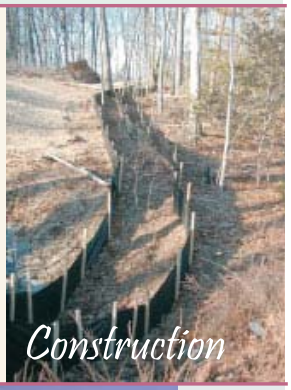
Commercial



Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

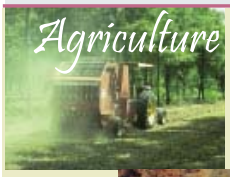
Construction



Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

Agriculture

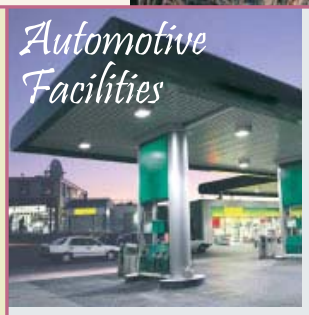


Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.



- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Forestry



Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

For Information:

For more information on the General Industrial Storm Water Permit contact:

State Water Resources Control Board (SWRCB)
(916) 657-1146 or www.swrcb.ca.gov/ or, at your Regional Water Quality Control Board (RWQCB).

Santa Ana Region (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
(909) 782-4130

San Diego Region (9)
9771 Clairemont Mesa Blvd., Ste. A
San Diego, CA 92124
(619) 467-2952

Colorado River Basin Region (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
HAZARDOUS WASTE DISPOSAL: (909) 358-5055
RECYCLING INFORMATION: 1-800-366-SAVE
TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call: (909) 955-1111.

StormWater CleanWater PROTECTION PROGRAM

Riverside County gratefully acknowledges the State Water Quality Control Board and the American Public Works Association, Storm Water Quality Task Force for the information provided in this brochure.

DID YOU KNOW . . .

YOUR FACILITY MAY NEED A STORM WATER PERMIT?



Many industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit

FIND OUT
IF YOUR FACILITY MUST OBTAIN A PERMIT

StormWater Pollution . . . What you should know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.



In recent years, awareness of the need to protect water quality has increased. As a result, federal, state, and local programs have been established to reduce polluted stormwater discharges to our waterways. The emphasis of these programs is to prevent stormwater pollution since it's much easier, and less costly, than cleaning up "after the fact."

National Pollutant Discharge Elimination System (NPDES)

In 1987, the Federal Clean Water Act was amended to establish a framework for regulating industrial stormwater discharges under the NPDES permit program. In California, NPDES permits are issued by the State Water Resources Control Board (SWRCB) and the nine (9) Regional Water Quality Control Boards (RWQCB). In general, certain industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit if the type of facilities or operations falls into one of the several categories described in this brochure.

How Do I Know If I Need A Permit?

Following are ***general descriptions*** of the industry categories types that are regulated by the Industrial Activities Storm Water General Permit. Contact your local Region Water Quality Control Board to determine if your facility/operation requires coverage under the Permit.

➜ Facilities such as cement manufacturing; feedlots; fertilizer manufacturing; petroleum refining; phosphate manufacturing; steam electric power generation; coal mining; mineral mining and processing; ore mining and dressing; and asphalt emulsion;

➜ Facilities classified as lumber and wood products (except wood kitchen cabinets); pulp, paper, and paperboard mills; chemical producers (except some pharmaceutical and biological products); petroleum and coal products; leather production and products; stone, clay and glass products; primary metal industries; fabricated structural metal; ship and boat building and repairing;

➜ Active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations;

➜ Hazardous waste treatment, storage, or disposal facilities;

➜ Landfills, land application sites and open dumps that receive or have received any industrial waste; unless there is a new overlying land use such as a golf course, park, etc., and there is no discharge associated with the landfill;

➜ Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards;

➜ Steam electric power generating facilities, facilities that generate steam for electric power by combustion;

➜ Transportation facilities that have vehicle maintenance shops, fueling facilities, equipment cleaning operations, or airport deicing operations. This includes school bus maintenance facilities operated by a school district;

➜ Sewage treatment facilities;

➜ Facilities that have areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water.

How do I obtain coverage under the Industrial Activities Storm Water General Permit?

Obtain a permit application package from your local Regional Water Quality Control Board listed on the back of this brochure or the State Water Resources Control Board (SWRCB). Submit a completed Notice of Intent (NOI) form, site map and the appropriate fee ($250 or $500) to the SWRCB. Facilities must submit an NOI thirty (30) days prior to beginning operation. Once you submit the NOI, the State Board will send you a letter acknowledging receipt of your NOI and will assign your facility a waste discharge identification number (WDID No.). You will also receive an annual fee billing. These billings should roughly coincide with the date the State Board processed your original NOI submittal.

What are the requirements of the Industrial Activities Storm Water General Permit?

The basic requirements of the Permit are:

1. The facility must eliminate any non-stormwater discharges or obtain a separate permit for such discharges.

2. The facility must develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must identify sources of pollutants that may be exposed to stormwater. Once the sources of pollutants have been identified, the facility operator must develop and implement Best Management Practices (BMPs) to minimize or prevent polluted runoff.

   Guidance in preparing a SWPPP is available from a document prepared by the California Storm Water Quality Task Force called the California Storm Water Best Management Practice Handbook.

3. The facility must develop and implement a Monitoring Program that includes conducting visual observations and collecting samples of the facility's storm water discharges associated with industrial activity. The General Permit requires that the analysis be conducted by a laboratory that is certified by the State of California.

4. The facility must submit to the Regional Board, every July 1, an annual report that includes the results of its monitoring program.

A Non-Storm Water Discharge is... *any discharge to a storm drain system that is not composed entirely of storm water. The following non-storm water discharges are authorized by the General Permit: fire hydrant flushing; potable water sources, including potable water related to the operation, maintenance, or testing of potable water systems; drinking fountain water; atmospheric condensates including refrigeration, air conditioning, and compressor condensate; irrigation drainage; landscape watering; springs; non-contaminated ground water; foundation or footing drainage; and sea water infiltration where the sea waters are discharged back into the sea water source.*

A BMP is . . . *a technique, process, activity, or structure used to reduce the pollutant content of a storm water discharge. BMPs may include simple, non-structural methods such as good housekeeping, staff training and preventive maintenance. Additionally, BMPs may include structural modifications such as the installation of berms, canopies or treatment control (e.g. setting basins, oil/water separators, etc.)*



WARNING*: There are significant penalties for non-compliance: a minimum fine of $5,000 for failing to obtain permit coverage, and, up to $10,000 per day, per violation plus $10 per gallon of discharge in excess of 1,000 gallons.*

Stormwater Pollution

What you should know for...

Industrial & Commercial Facilities

Best Management Practices (BMPS) for:

- Industrial Facilities
- Commercial Facilities



Riverside County Stormwater Program Members

City of Banning
(951) 922-3105

City of Beaumont
(951) 769-8520

City of Calimesa
(909) 795-9801

City of Canyon Lake
(951) 244-2955

City of Cathedral City
(760) 770-0340

City of Coachella
(760) 398-3502

City of Corona
(951) 736-2447

City of Desert Hot Springs
(760) 329-6411

City of Eastvale
(951) 361-0900

City of Hemet
(951) 765-2300

City of Indian Wells
(760) 346-2489

City of Indio
(760) 391-4000

City of Jurupa Valley
(951) 332-6464

City of Lake Elsinore
(951) 674-3124

City of La Quinta
(760) 777-7000

City of Menifee
(951) 672-6777

City of Moreno Valley
(951) 413-3000

City of Murrieta
(951) 304-2489

City of Norco
(951) 270-5607

City of Palm Desert
(760) 346-0611

City of Palm Springs
(760) 323-8299

City of Perris
(951) 943-6100

City of Rancho Mirage
(760) 324-4511

City of Riverside
(951) 826-5311

City of San Jacinto
(951) 487-7330

City of Temecula
(951) 694-6444

City of Wildomar
(951) 677-7751

Coachella Valley Water District
(760) 398-2651

County of Riverside
(951) 955-1000

Riverside County Flood Control District
(951) 955-1200

YOU can prevent Stormwater Pollution following these practices...

Industrial and Commercial Facilities

The Riverside County Stormwater Program has identified a number of Best Management Practices (BMPs) for Industrial and Commercial Facilities. These BMPs control and reduce stormwater pollutants from reaching our storm drain system and ultimately our local water bodies. City and County ordinances require businesses to use these BMPs to protect our water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

Prohibited Discharges

Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, debris, wastes or wastewater into the gutter, street or storm drain.

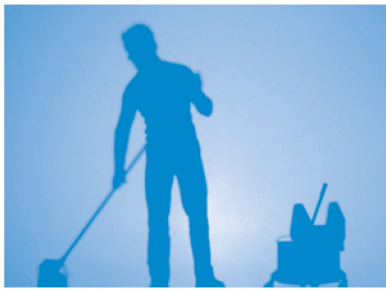
Outdoor Storage BMPs

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times when not in use.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle/equipment maintenance inside of the building or under a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards and discharged to a sanitary sewer or take them to a commercial car wash.



Spills and Clean Up BMPs

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.
- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the local Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.



- Report hazardous materials spills to 951-358-5055 or call after hours to 951-782-2973 or, if an emergency, call the Fire Department's Haz Mat Team at 911.

Plastic Manufacturing Facilities BMPs

AB 258 requires plastic product manufacturers to use BMPs, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

Training BMPs

As prescribed by your City and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable BMP examples can be found at www.cabmphandbooks.com.

Permitting

Stormwater discharges associated with specific categories for industrial facilities are regulated by the State Water Resources Control Board through an Industrial Stormwater General Permit. A copy of this General Permit and application forms are available at: www.waterboards.ca.gov, select stormwater then the industrial quick link.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: fcnpdes@rcflood.org.

Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers



Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

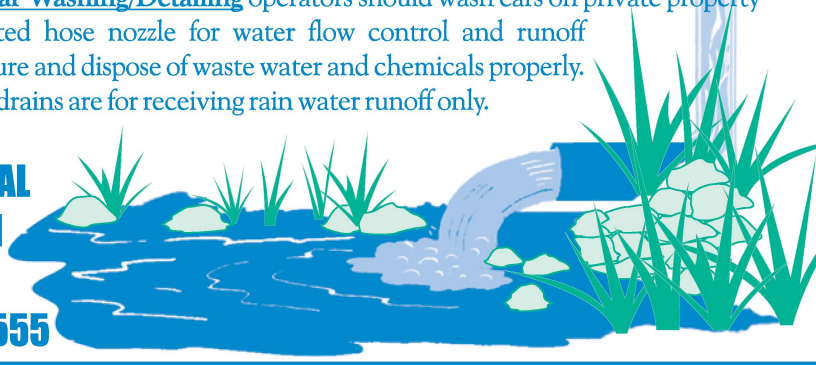
Storm drains are NOT connected to sanitary sewer systems and treatment plants!



The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.



Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.



When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.



Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
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SAMPLE STENCIL

PER BMP SD-13

3.1 INFILTRATION BASIN

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation, and Sedimentation
Maximum Treatment Area	50 acres
Other Names	Bioinfiltration Basin

Description

An Infiltration Basin is a flat earthen basin designed to capture the design capture volume, V_{BMP}. The stormwater infiltrates through the bottom of the basin into the underlying soil over a 72 hour drawdown period. Flows exceeding V_{BMP} must discharge to a downstream conveyance system. Trash and sediment accumulate within the forebay as stormwater passes into the basin. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.



Figure 1 – Infiltration Basin

See Appendix A, and Appendix C, Section 1 of *Basin Guidelines*, for additional requirements.

Siting Considerations

The use of infiltration basins may be restricted by concerns over ground water contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. To protect the basin from erosion, the sides and bottom of the basin must be vegetated, preferably with native or low water use plant species.

In addition, these basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur
- Sites with very low soil infiltration rates
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect ground water quality
- Sites with unstabilized soil or construction activity upstream
- On steeply sloping terrain
- Infiltration basins located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions

Setbacks

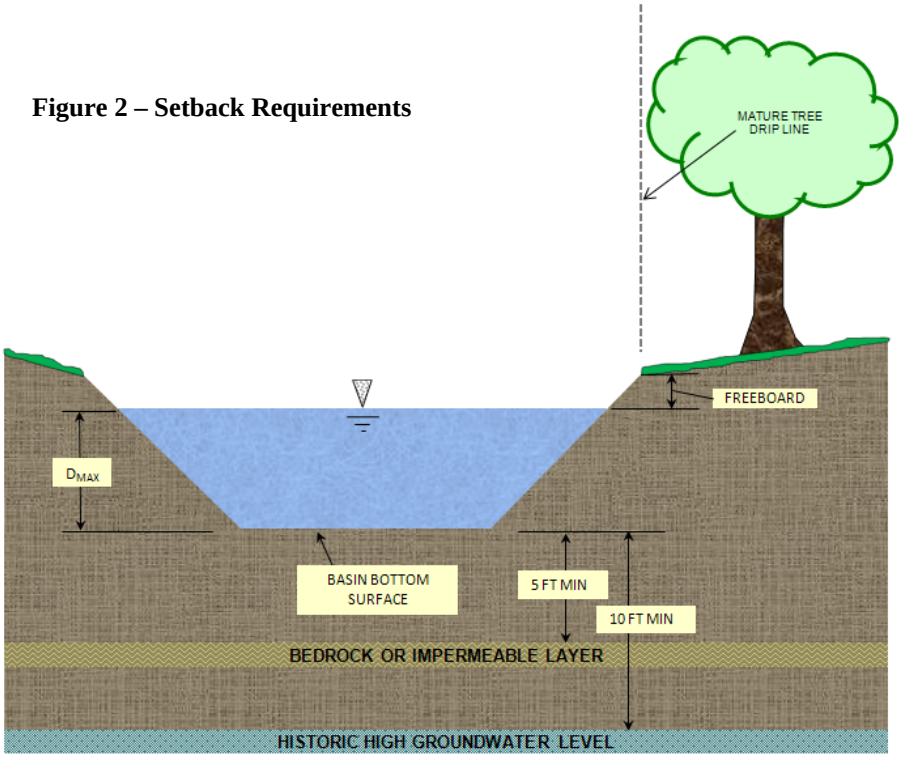
Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, existing trees, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process since they can affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration basin infeasible. In that instance, another BMP must be selected.

Infiltration basins typically must be set back:

- 10 feet from the historic high groundwater (measured vertically from the bottom of the basin, as shown in Figure 2)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the basin, as shown in Figure 2)
- From all existing mature tree drip lines as indicated in Figure 2 (to protect their root structure)
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report. All other setbacks shall be in accordance with applicable standards of the District's *Basin Guidelines* (Appendix C).

Figure 2 – Setback Requirements



Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall / berm. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting, shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

Overflow

Flows exceeding V_{BMP} must discharge to an acceptable downstream conveyance system. Where an adequate outlet is present, an overflow structure may be used. Where an embankment is present, an emergency spillway may be used instead. Overflows must be placed just above the design water surface for V_{BMP} and be near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110. Additional details may be found in the District's *Basin Guidelines* (Appendix C).

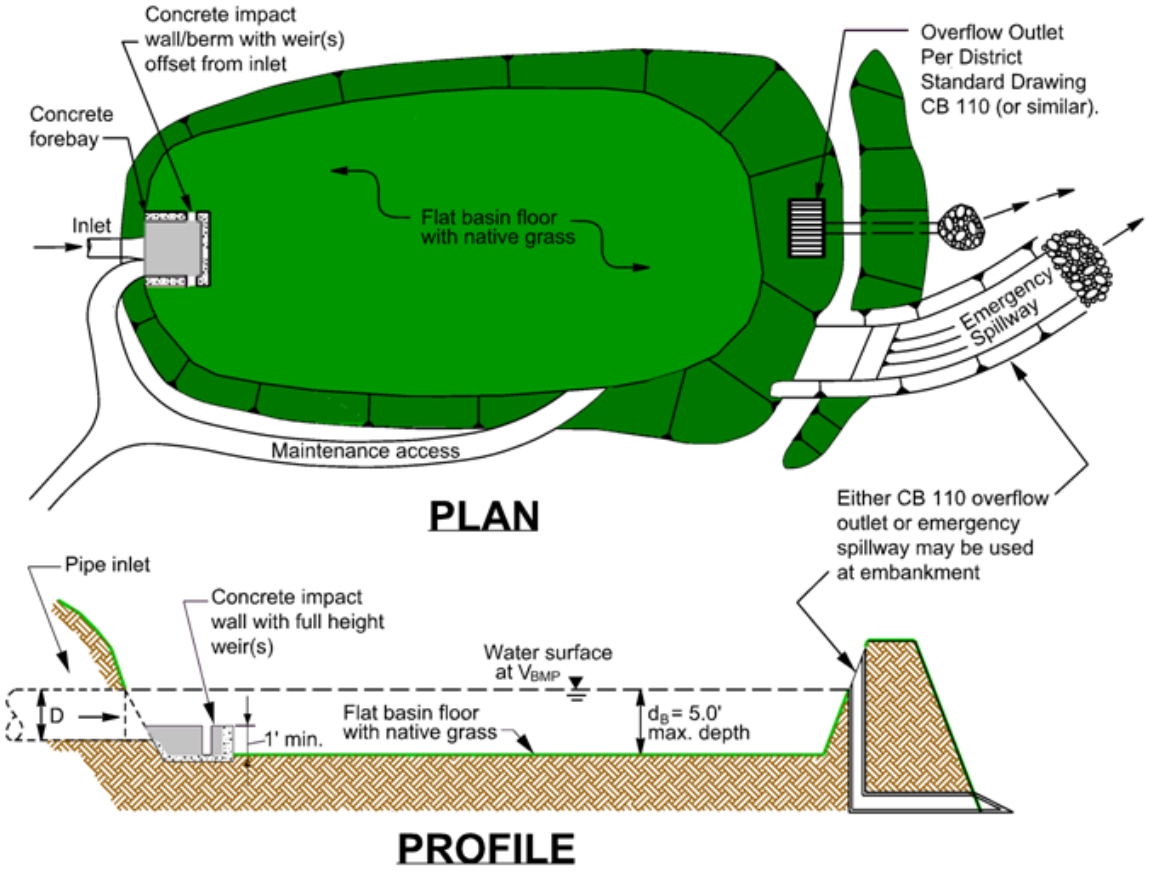


Figure 3 – Infiltration Basin

Landscaping Requirements

Basin vegetation provides erosion protection, improves sediment removal and assists in allowing infiltration to occur. The basin surface and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with County of Riverside Ordinance 859 and the District's *Basin Guidelines* (Appendix C), or other guidelines issued by the Engineering Authority.

Maintenance

Normal maintenance of an infiltration basin includes the maintenance of landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration. See the District's *Basin Guidelines* (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.).

Table 1 - Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Ongoing including just before annual storm seasons and following rainfall events.	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strenuously avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used, o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rain season. • Remove debris and litter from the entire basin to minimize clogging and improve aesthetics. • Check for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation. • Verify the basin bottom is allowing acceptable infiltration. Use a disc or other method to aerate basin bottom only if there is actual significant loss of infiltrative capacity, rather than on a routine basis[1]. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.

1. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Table 2 - Design and Sizing Criteria for Infiltration Basins

Design Parameter	Infiltration Basin
Design Volume	V_{BMP}
Forebay Volume	0.5% V_{BMP}
Drawdown time (maximum)	72 hours
Maximum tributary area	50 acres [2]
Minimum infiltration rate	Must be sufficient to drain the basin within the required Drawdown time over the life of the BMP. The WQMP may include specific requirements for minimum tested infiltration rates.
Maximum Depth	5 feet
Spillway erosion control	Energy dissipators to reduce velocities[1]
Basin Slope	0%
Freeboard (minimum)	1 foot [1]
Historic High Groundwater Setback (max)	10 feet
Bedrock/impermeable layer setback (max)	5 feet
Tree setbacks	Mature tree drip line must not overhang the basin
Set back from wells, tanks or springs	100 feet
Set back from foundations	As recommended in Geotechnical Report

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's Basin Guidelines (Appendix C). In addition, information herein may be superseded by other guidelines issued by the co-permittee.

INFILTRATION BASIN SIZING PROCEDURE

1. Find the Design Volume, V_{BMP}.
   a) Enter the Tributary Area, $A_{T.}$
   b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
2. Determine the Maximum Depth.
   a) Enter the infiltration rate. The infiltration rate shall be established as described in Appendix A: "Infiltration Testing".
   b) Enter the design Factor of Safety from Table 1 in Appendix A: "Infiltration Testing".
   c) The spreadsheet will determine D_1, the maximum allowable depth of the basin based on the infiltration rate along with the maximum drawdown time (72 hours) and the Factor of Safety.

$$D_1 = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = drawdown time (maximum 72 hours)

d) Enter the depth of freeboard.

e) Enter the depth to the historic high groundwater level measured from the top of the basin.

f) Enter the depth to the top of bedrock or other impermeable layer measured from the finished grade.

g) The spreadsheet will determine D_2, the total basin depth (including freeboard, if used) of the basin, based on restrictions to the depth by groundwater and an impermeable layer.

D_2 = Depth to groundwater – (10 + freeboard) (ft);

or

D_2 = Depth to impermeable layer – (5 + freeboard) (ft)

Whichever is least.

h) The spreadsheet will determine the maximum allowable effective depth of basin, D_{MAX}, based on the smallest value between D_1 and D_2. D_{MAX} is the maximum depth of water only and does not include freeboard. D_{MAX} shall not exceed 5 feet.

3. Basin Geometry

a) Enter the basin side slopes, z (no steeper than 4:1).

b) Enter the proposed basin depth, d_B excluding freeboard.

c) The spreadsheet will determine the minimum required surface area of the basin:

$$A_s = V_{BMP} / d_B$$

Where A_s = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
d_B= proposed depth not to exceed maximum allowable depth, D_{MAX} (ft)

d) Enter the proposed bottom surface area. This area shall not be less than the minimum required surface area.

4. Forebay

A concrete forebay with a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall shall be provided. Full-height rectangular weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

a) The spreadsheet will determine the minimum required forebay volume based on 0.5% V_{BMP}.

b) Enter the proposed depth of the forebay berm/splashwall (1foot minimum).

c) The spreadsheet will determine the minimum required forebay surface area.

d) Enter the width of rectangular weir to be used (minimum 1.5 inches). Weir width should be established based on a 5 minute drawdown time.

Isolator® Row Plus
O&M Manual



ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

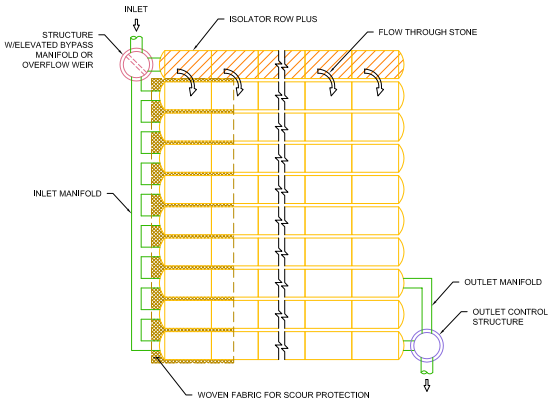
Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*



Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.



StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

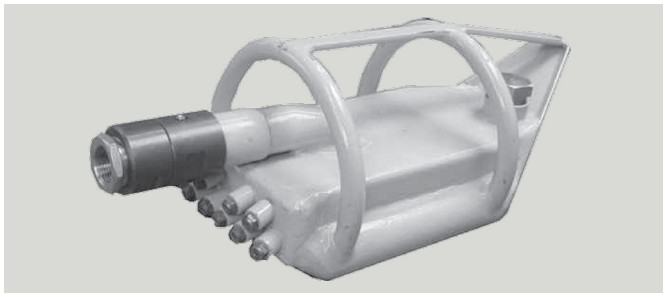
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**

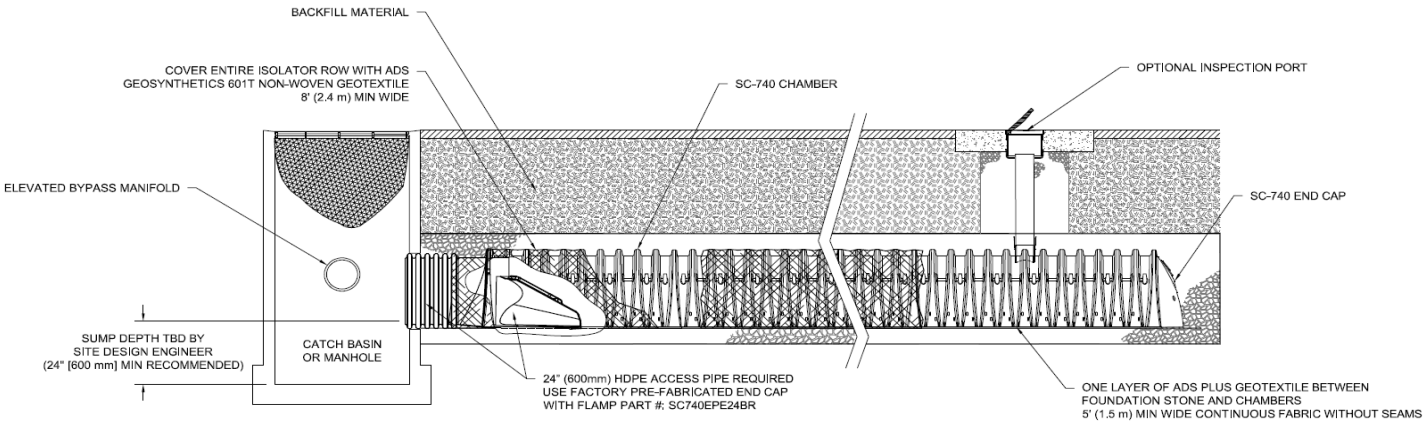






StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
- i. Remove lid from floor box frame
- ii. Remove cap from inspection riser
- iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
- iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
- i. Remove cover from manhole at upstream end of Isolator Row Plus
- ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
  1. Mirrors on poles or cameras may be used to avoid a confined space entry
  2. Follow OSHA regulations for confined space entry if entering manhole
- iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
  If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

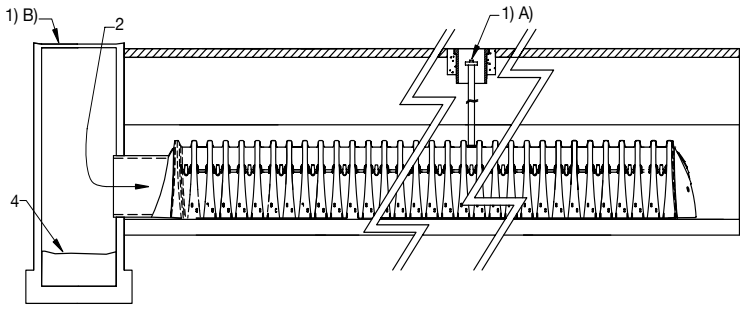
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

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StormTech® and the Isolator® Row Plus are registered trademarks of StormTech, Inc.
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CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide



CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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800.925.5240
www.ContechES.com

CDS Inspection & Maintenance Log

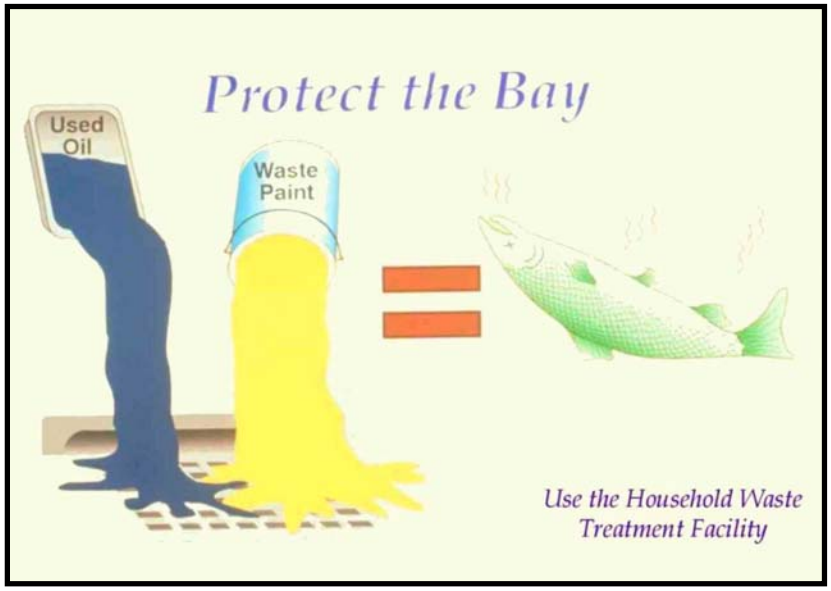
CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Non-Stormwater Discharges SC-10



Art Credit: Margie Winter

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

CASQA California Stormwater Quality Association

Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11



Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:
  - Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - Landscaping and beautification efforts may also discourage illegal dumping.
  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:
  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

  - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes

  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)

- Responsible parties

Training

- Educate employees about spill prevention and cleanup.

- Well-trained employees can reduce human errors that lead to accidental releases or spills:

  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.

- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).

- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.

- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.

- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Outdoor Loading/Unloading SC-30



Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.

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Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a deadend.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all and ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Have an emergency spill cleanup plan readily available.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.

Other Considerations (Limitations and Regulations)

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

Requirements

Costs

Costs should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Outdoor Equipment Operations SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal, are examples of process operations that can lead to contamination of stormwater runoff. Source controls for outdoor process equipment operations and maintenance include reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Approach

Pollution Prevention

- Perform the activity during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Suggested Protocols

- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer.
- Cover the work area with a permanent roof if possible.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention). If possible, connect process equipment area to public sewer or facility wastewater treatment system. Some municipalities require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- Dry clean the work area regularly.

Training

- Train employees to perform the activity during dry periods only or substituting benign materials for more toxic ones.
- Train employee and contractors in proper techniques for spill containment and cleanup. Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.

- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.
- Inspect storage areas regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.

Other Considerations

- Providing cover may be expensive.
- Space limitations may preclude enclosing some equipment.
- Storage sheds often must meet building and fire code requirements.

Requirements

Costs

Costs vary depending on the complexity of the operation and the amount of control necessary for stormwater pollution control.

Maintenance

- Conduct routine preventive maintenance, including checking process equipment for leaks.
- Clean the storm drain system regularly.

Supplemental Information

Further Detail of the BMP

Hydraulic/Treatment Modifications

If stormwater becomes polluted, it should be captured and treated. If you do not have your own process wastewater treatment system, consider discharging to the public sewer system. Use of the public sewer might be allowed under the following conditions:

- If the activity area is very small (less than a few hundred square feet), the local sewer authority may be willing to allow the area to remain uncovered with the drain connected to the public sewer.
- It may be possible under unusual circumstances to connect a much larger area to the public sewer, as long as the rate of stormwater discharges does not exceed the capacity of the wastewater treatment plant. The stormwater could be stored during the storm and then transferred to the public sewer when the normal flow is low, such as at night.

Industries that generate large volumes of process wastewater typically have their own treatment system and corresponding permit. These industries have the discretion to use their wastewater treatment system to treat stormwater within the constraints of their permit requirements for process treatment. It may also be possible for the industry to discharge the stormwater directly to an effluent outfall without treatment as long as the total loading of the discharged process

water and stormwater does not exceed the loading had a stormwater treatment device been used. This could be achieved by reducing the loading from the process wastewater treatment system. Check with your Regional Water Quality Control Board or local sewering agency, as this option would be subject to permit constraints and potentially regular monitoring.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net

Waste Handling & Disposal SC-34



Photo Credit: Geoff Brosseau

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Approach

Pollution Prevention

- Accomplish reduction in the amount of waste generated using the following source controls:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

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Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.

Run-on/Runoff Prevention

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.

- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff in pollution prevention measures and proper disposal methods.
- Train employees and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

Other Considerations (Limitations and Regulations)

Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

Capital and O&M costs for these programs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

Minimize runoff of polluted stormwater from land application by:

- Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, and there is a closed drainage system

- Avoiding application of waste to the site when it is raining or when the ground is saturated with water
- Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site
- Maintaining adequate barriers between the land application site and the receiving waters (planted strips are particularly good)
- Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins
- Performing routine maintenance to ensure the erosion control or site stabilization measures are working

Examples

The port of Long Beach has a state-of-the-art database for identifying potential pollutant sources, documenting facility management practices, and tracking pollutants.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Solid Waste Container Best Management Practices – Fact Sheet On-Line Resources – Environmental Health and Safety. Harvard University. 2002.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

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- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

- Auto Recycling Project
- Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building Repair and Construction SC-42



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

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- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

SC-42 Building Repair and Construction

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

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The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).

- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:

  - Purchase and installation of signs.

  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.

  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.

  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Site Design & Landscape Planning SD-10



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Maintenance Bays & Docks SD-31



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

Approach

In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code requirements.

Designing New Installations

Designs of maintenance bays should consider the following:

- Repair/maintenance bays and vehicle parts with fluids should be indoors; or designed to preclude urban run-on and runoff.
- Repair/maintenance floor areas should be paved with Portland cement concrete (or equivalent smooth impervious surface).

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- Repair/maintenance bays should be designed to capture all wash water leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters form entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

- Other features may be comparable and equally effective.

The following designs of loading/unloading dock areas should be considered:

- Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff.

- Direct connections into storm drains from depressed loading docks (truck wells) are prohibited.

- Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative. Pre-treatment may also be required.

- Other features may be comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

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Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

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- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

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