Preliminary Water Quality Management Plan

For:

State Street Village

APN: 1071-053-01, 02, 03, 04, 05, 06

Prepared for:

Village Partners Ventures, LLC

4340 Von Karman Ave, Suite 110

Newport Beach, CA 92660

949-527-3597

Prepared by:

Proactive Engineering Consultants, Inc.

200 S Main Street, Suite 300

Corona, CA 92882

951-280-3302

Submittal Date: 05/17/2021

Revision Date: 10/06/2021

Approval Date:_____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for Village Partners Ventures, LLC by Proactive Engineering Consultants, Inc. The WQMP is intended to comply with the requirements of the County of San Bernardino and the NPDES Areawide Stormwater Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

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Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):		Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			1071-053-01, 02, 03, 04, 05, 06

Owner's Signature			
Owner Name: Michael Morris			
Title	Principal		
Company	Village Partners Ventures, LLC		
Address	4340 Von Karman Ave, Suite 110, Newport Beach, CA 92660		
Email	Michael@villagepartners.com		
Telephone #	949-527-3597		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):		Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			1071-053-01, 02, 03, 04, 05, 06

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Scott Gilbert		PE Stamp Below
Title	Senior Associate	
Company	Proactive Engineering Consultants, Inc.	
Address	200 S Main Street, Suite 300 Corona, CA 92882	
Email	scottgilbert@proactiveengineering.net	
Telephone #	951-280-3300	
Signature		
Date		

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Section 1 Discretionary Permit(s)

Form 1-1 Project Information					
Project Name	State Street Village				
Project Owner Contact Name:	Michael Morris				
Mailing Address:	4340 Von Karman Ave, Suite 110 Newport Beach, CA 92660	E-mail Address:	Michael@villagepartners.com	Telephone:	949-527-3597
Permit/Application Number(s):		Tract/Parcel Map Number(s):			
Additional Information/ Comments:					
Description of Project:	The proposed development is bounded by Redlands Blvd, Orange St, Citrus Ave and Eureka St, in the City of Redlands, within the County of San Bernardino. The proposed development will feature 5 level structures for residents (700 Units), retail, parking and office purposes. Lower Level (beneath Ground Level) will be mainly utilized for parking in areas: B1, B3, B4A, and B4B. Ground Level will include streets, parking, retail, residential units, community centers and amenities. Level 2-4 will be residential units throughout the development and a parking structure (building area B-2) that will be screened with residential units. Level 5 will be limited to parking and residential units surrounding the plaza area. Refer to exhibits located in Section 6 of the report. The site is currently utilized by the mostly vacant Redlands Mall retail shopping center. An active CVS Pharmacy is located on the southeast portion of the retail center. The northeastern portion of the site is occupied by a Denny's restaurant, a Union Bank facility, and Mattress Showroom retail store. A subterranean parking structure is located beneath the western portion of the retail center. As a result, the site is nearly entirely impervious with the exceptions of small, scattered planter islands. Based on the historical Sanborn Map information, gasoline service stations (six separate areas) were identified at the site from at least 1949 until 1955. Additional information pertaining to the former UST facilities was not available during the course of the Phase I Environmental Site Assessment. Based on the lack of information regarding the disposition of the UST(s), and/or potential impact at the site, the historical gasoline service stations are considered recognized environmental conditions (RECs). Currently the site is primarily flat with areas beings as steep as 4 percent and being below and/ or above street level. The proposed multilevel site is essentially divided into quadrants due to the proposed extension of state street and 3rd street. Additionally, pedestrian paseos and roof drains further subdivide the building areas further. Conceptual grading for the site varies between 1-2 percent along State Street and 4-5 percent along 3rd Street. The proposed site will utilize multiple methods of water quality treatment as well as increase the pervious area therefore making a positive impact. Refer to section 6 for Existing Site Conditions, Proposed Site Conditions, and the Appendix for calculations comparing both proposed and existing conditions.				
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.					

Section 2 Project Description

2.1 Project Information

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☒ Significant re-development involving the addition or replacement of 5,000 ft² or more of impervious surface on an already developed site	☐ New development involving the creation of 10,000 ft² or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☒ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft² or more
☐ Hillside developments of 5,000 ft² or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft² of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☒ Parking lots of 5,000 ft² or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft² or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	534,916	**3** Number of Dwelling Units:	700	**4** SIC Code:	5331, 5399, 59, 1522, 7521

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☒ No ☐ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

The following SIC Codes where stated due to the proposed property being occupied by various tenants that have not yet been determined:

5331 – Variety Stores

5399 - Miscellaneous General Merchandise

59 - Miscellaneous Retail

1522 – General Contractors—Residential Buildings, Other Than Single-Family

7521 - Automobile Parking

2.2 Property Ownership/Management

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

Maintenance of the WQMP facilities will be the sole responsibility of the property owner:

Village Partners Ventures, LLC
Address: 4340 Von Karman Ave, Suite 110
Newport Beach, CA 92660
Contact: Michael Morris
Phone: 949-527-3597

The owner shall contract out the maintenance of stormwater facilities to a contractor with the proper equipment.

The proposed treatment facilities will be transferred to the POA (property owner's association). A property owner's association will be formed and will succeed Village Partners Ventures, LLC as the entity responsible for long-term maintenance. Maintenance of the WQMP facilities will be the sole responsibility of Village Partners Ventures, LLC. These facilities include any treatment control BMPs, non-structural source BMPs, and structural source BMPs. Refer to Section 5 of the WQMP for activities required and the minimum frequency of the activities. Upon completion of the project, Village Partners Ventures, LLC will transfer the operation, maintenance inspection, and funding to the POA. The owner may choose to contract out the maintenance of the storm water facilities to a contractor with the proper equipment.

2.3 Potential Stormwater Pollutants

Form 2.3-1 Pollutants of Concern			
Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Pollutant to be expected from animal waste (house pets) and/or pavement runoff. Negative effects to water runoff include human health risks.
Nutrients - Phosphorous	E ☒	N ☐	Pollutant to be expected from landscaped areas and pavement runoff. Negative effects to water runoff include the support growth of algae or unwanted microbial growth on the water surface in the storage unit.
Nutrients - Nitrogen	E ☒	N ☐	Pollutant to be expected from landscaped areas and pavement runoff. Negative effects to water runoff include the support growth of algae or unwanted microbial growth on the water surface in the storage unit.
Noxious Aquatic Plants	E ☐	N ☒	The proposed development does not include any areas where water will be standing long enough to allow the growth of aquatic plants.
Sediment	E ☒	N ☐	Potential pollutant from landscaped areas and/or open areas within project site. Negative effects to water runoff include clogging pump intake or distribution and increasing the maintenance of storage.
Metals	E ☒	N ☐	Cars, Trucks & Parking Areas. Negative effects to water runoff include plant toxicity.
Oil and Grease	E ☒	N ☐	Pollutant to be expected from vehicles and uncovered parking areas. Negative effects to water runoff include plant toxicity, human health risk, and animal health risk.
Trash/Debris	E ☒	N ☐	Pollutant to be expected from condominiums, tenants, and occupants. Negative effects to water runoff include plant toxicity, human health risk, and animal health risk.
Pesticides / Herbicides	E ☒	N ☐	Pollutant to be expected from landscaped areas. Negative effects to water runoff include plant toxicity, human health risk, and animal health risk.
Organic Compounds	E ☒	N ☐	Pollutant to be expected from landscape areas. Negative effects to water runoff include plant toxicity, human health risk, and animal health risk.
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

Form 2.4-1 Water Quality Credits

1 Project Types that Qualify for Water Quality Credits: *Select all that apply*			
☒ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☒ Vertical density [20%] ☐ 7 units/ acre [5%]	☒ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☒ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]
2 Total Credit 50% *(Total all credit percentages up to a maximum allowable credit of 50 percent)*			
Description of Water Quality Credit Eligibility (if applicable)	• Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = 4% impervious reduced] • Vertical density [20%] • Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%] • Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]		

Following Section 6.2 of the TGD, the project may incorporate for Water Quality Credits upon proof of documentation and complying with the hierarchy in said document. The proposed project site is considered to be a redevelopment project that is proposed to reduce the impervious area 3%.

Total Area = 534,016 sq. ft.

Existing Impervious Area = 497,127 sq. ft.

Proposed Impervious Area = 476,451 sq. ft.

Additionally, the proposed site will consist of approximately 700 residential units within the 11.1 acres project site with an additional property south approximately 1.20 acres. Therefore, there would be approximately 71 dwelling units per acre falling within the "higher density" category. In addition to the 700 residential units, most of the proposed first floors are commercial/retail spaces. As a result, the over 84,100 sf of commercial space provided in combination with the residential units qualifies this project as a mixed-use development. By nature, according to the TGD, high-density mixed-use developments demonstrate design principles that provide environmental benefits that would not be realized through single use projects (such as reduced vehicle trip traffic and reduced sources of water pollution). The project site is containing primarily commercial/ retail

on the first floor with residential units above. Therefore, reducing the amount of environmental impacts cause by vehicular transport. The existing site is located in the historic downtown Redlands, an area with a bustling nightlife and historically a main attraction dating for the city dating back nearly a century. The site took place of the La Posada Hotel, a Spanish style hotel that had opened in 1931, and a multitude of shops lining State Street. The proposed site will maximize its potential by including residential units above retail/ commercial space. The site is intended to increase the amount of landscape located on site while treating runoff.

The report first conducts investigations to determine whether the site is feasible to retain/treat the full LID treatment control and hydromodification requirements. Refer to Section 5.3 for Hierarchy of BMP Types. Infiltration is infeasible in majority of Drainage Areas 1 and 2 due to building setback requirements and underground structures. However, where infiltration is feasible, it was utilized to its maximum capability to treat a portion of the DCV. Both drainage areas will treat approximately 22,943 ft^3. See Form 4.3-3 for infiltration calculations. Drainage Area 3 currently fully meets the DCV via infiltration. Harvest and Use was then analyzed as a potential BMP to meet the remaining DCV. After an investigation was conducted, it was determined that Harvest and Use would be infeasible due to not being able to retain the remaining DCV. See Form 4.3-4. After Harvest and Use, we proceeded to Biotreatment to assist in meeting the remaining DCV. The proposed biotreatment system is a planter box. Refer to Form 4.3-6 for calculations. The project site will utilize storm drain inserts as a means of structural source control BMP as a method of pretreatment. Through the investigation conducted for Drainage Areas 1 and 2, it was determined the site would qualify for the use of Water Quality Credits. Refer to Form 4.3-9 for the application of the Water Quality Credits. After Credits were applied, the site was proven to fulfill the DCV and the HCOC (Hydraulic Conditions of Concern) were determined to be compliant.

Section 3 Site and Watershed Description

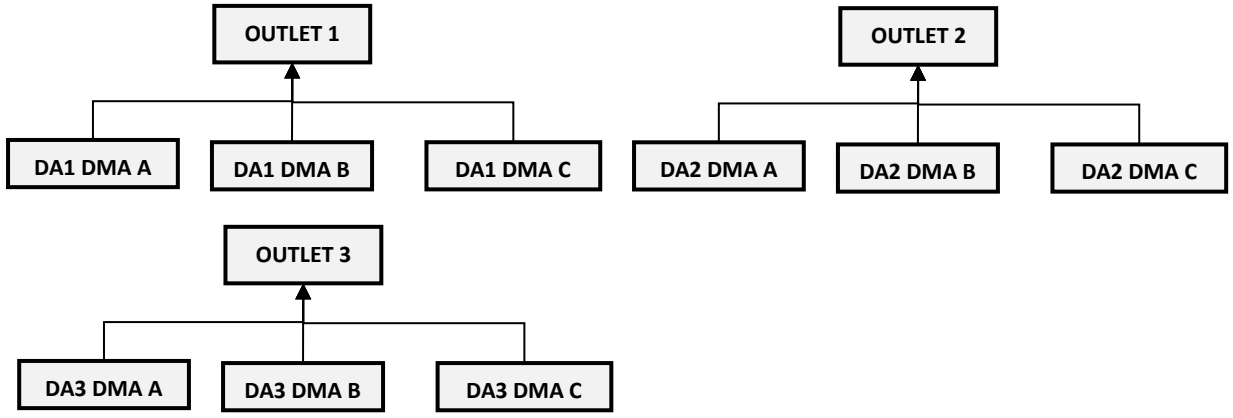
Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34° 3'23.32"N	Longitude 117°11'3.63"W	Thomas Bros Map page 608

1 San Bernardino County climatic region: ☒ Valley ☐ Mountain

2 Does the site have more than one drainage area (DA): Yes☒ No☐ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*



Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
N/A	Drainage features will be retained within the DMA

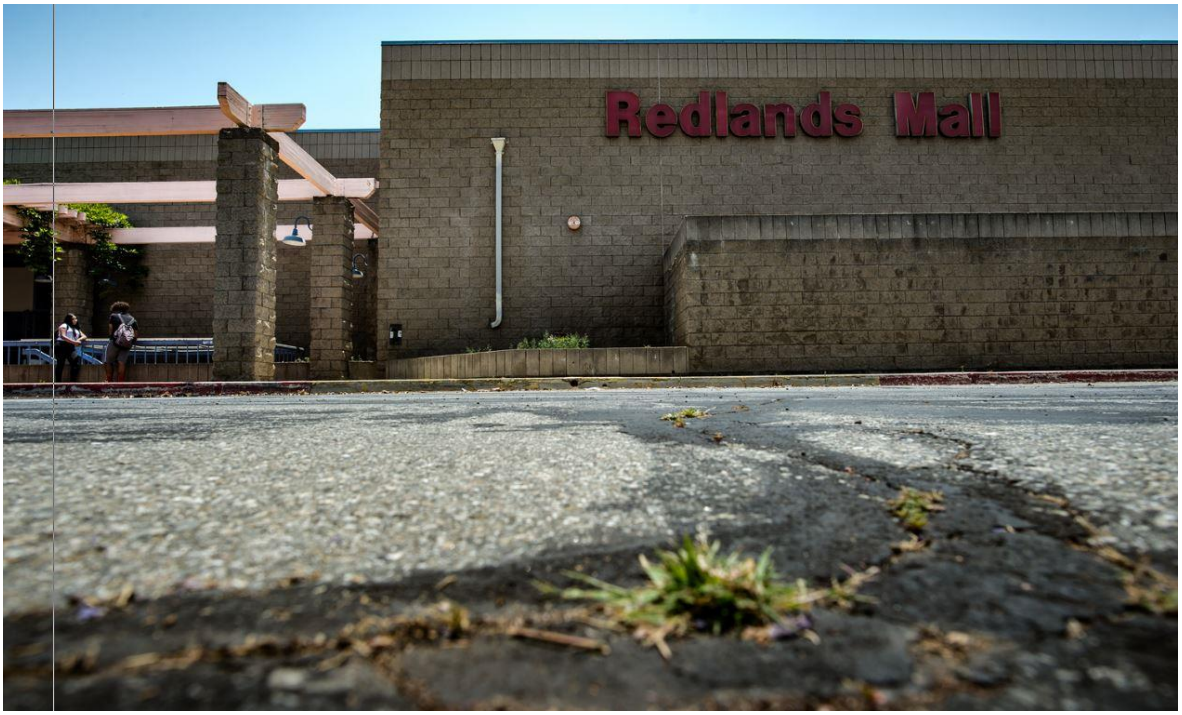
Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	A	B	C	
1 DMA drainage area (ft^2)	74,647	91,593	47,007	
2 Existing site impervious area (ft^2)	71,043	88,129	38,547	
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC # II	AMC # II	AMC # II	
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	B	B	B	
5 Longest flowpath length (ft)	222	352	340	
6 Longest flowpath slope (ft/ft)	0.0108	0.0142	0.0012	
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Commercial	Commercial	Commercial	
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Poor	Poor	Poor	

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 2				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	A	B	C	D
1 DMA drainage area (ft^2)	21,667	29,797	54,795	101,466
2 Existing site impervious area (ft^2)	21,223	26,212	51,210	97,881
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC # II	AMC # II	AMC # II	AMC # II
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	B	B	B	B
5 Longest flowpath length (ft)	192	157	**265**	411
6 Longest flowpath slope (ft/ft)	0.0318	0.0433	0.0030	0.0034
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Commercial	Commercial	Commercial	Commercial
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Poor	Poor	Poor	Poor

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 2				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	E			
1 DMA drainage area (ft^2)	58,042			
2 Existing site impervious area (ft^2)	54,457			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC # II			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	B			
5 Longest flowpath length (ft)	315			
6 Longest flowpath slope (ft/ft)	0.0117			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Commercial			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Poor			

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 3				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	A			
1 DMA drainage area (ft^2)	50,974			
2 Existing site impervious area (ft^2)	48,425			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC # II			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	B			
5 Longest flowpath length (ft)	450			
6 Longest flowpath slope (ft/ft)	0.019			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Commercial			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Poor			


Redlands Mall

TIOGA

cvs/pharmacy

Form 3-3 Watershed Description for Drainage Area

Receiving waters *Refer to Watershed Mapping Tool - http://permitrack.sbcounty.gov/wap/ See 'Drainage Facilities" link at this website*	Mission Channel, Santa Ana River Reach 5, Santa Ana River Reach 4, Santa Ana River Reach 3, Santa Ana River Reach 2, Santa Ana River Reach 1, Prado Dam
Applicable TMDLs *Refer to Local Implementation Plan*	Indicator Bacteria Santa Ana River Reach 4, Santa Ana River Reach 5
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/ and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	None for immediate receiving waters Santa Ana River, Reach 4- Pathogens
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	According to the County of San Bernardino Watershed Mapping Tool, the project site is not located within a potentially sensitive area
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	Yes Mission Channel
Hydrologic Conditions of Concern	☒ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☐ No
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	The current owner/developer and future owners and their POA shall be familiar with the contents of this WQMP and County & City ordinances. A copy of the WQMP shall be provided to the owners (present and future). San Bernardino County Stormwater program has a large selection of stormwater educational pamphlets that owners shall be familiar with. POA, Property Manager and/or owner shall educate staff, occupants and tenants.
N2	Activity Restrictions	☒	☐	Property owners and their tenants or occupants shall not be allowed to discharge chemicals, chemical residues, wastewater, or other prohibited discharges listed in the City stormwater Ordinance, to the outside, paved areas of the site; or store chemicals or other pollutant sources in a non-spill contained or covered facilities as stipulated in the CC&Rs. Any activities that are in violation of the City of Redlands Ordinances and Codes shall also be restricted, specifically those that would violate the ordinances in Chapter 13.54 of the City of Redlands Municipal Codes. Additionally, activities for which adequate BMPs have not been provided are restricted.
N3	Landscape Management BMPs	☒	☐	The POA and their landscape maintenance contractor shall inspect the irrigation system, plant health and erosion problems after each landscape procedure and shall report all. repairs and problems to the POA. All routine landscaping maintenance.
N4	BMP Maintenance	☒	☐	The POA shall inspect for standing water in the infiltration chambers and biofiltration BMPs, 48 hours after storm events. BMP maintenance shall be performed per the schedule in Form 5-1, as needed to restore free drainage.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	The POA will file appropriate hazardous material disclosures, if any storage is conducted, and must comply with all Title 22 CCR, Chapter 29 regulations.
N6	Local Water Quality Ordinances	☒	☐	Ordinances are found in Chapter 13.54 of the City of Redlands Ordinances and can be found on the City's web site, www.cityofredlands.org.
N7	Spill Contingency Plan	☐	☒	Building operators shall prepare specific plans based on materials on site for the cleanup of spills. Plans shall mandate stock piling cleanup materials, notifications of agencies, disposal, documentation, Etc. Storage shall comply with Hazmat regulations and any required contingency plans.
N8	Underground Storage Tank Compliance	☐	☒	The proposed development does not include underground storage of materials.
N9	Hazardous Materials Disclosure Compliance	☐	☒	The building owner shall require a detailed description of all planned activities and materials stored on site as part of every new lease agreement. A compliance officer shall ensure that business activities are correctly reported. The current owner and the future POA shall prohibit the storage of hazardous materials.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	This project will be developed and operated in accordance with Article 80 of the Uniform Fire Code. The current owners or the future POA shall require all fire code requirements to be implemented at this project site.
N11	Litter/Debris Control Program	☒	☐	The building operator shall prepare and implement an employee training program. This program shall include but not be limited to instruction on spill cleanup, litter control, and material storage procedures.
N12	Employee Training	☒	☐	The building operator shall prepare and implement an employee training program in accordance with California Storm Water Quality Association Standards and BMPs. This program shall be reviewed on a bi-annual basis or with every new edition of the Stormwater Best Management Practice Handbook for Industrial and Commercial sites. Owner to utilize City of Upland outreach packet included in Section 6.4.3
N13	Housekeeping of Loading Docks	☐	☒	Loading docks will not be implemented.
N14	Catch Basin Inspection Program	☒	☐	The building operator shall have the entire storm drain system inspected and cleaned a minimum of once annually prior to the start of the rainy season. Catch Basins should be checked quarterly for debris buildup and signs of illegal dumping.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	All paved areas will be swept monthly using a vacuum assisted sweeper. Frequency will depend on waste accumulations with a minimum of once annually prior to the start of the rainy season.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	This development is not part of a Public Agency Project.
N17	Comply with all other applicable NPDES permits	☐	☒	The provided documentation is a Preliminary WQMP. Final WQMP shall comply with all other permits such as a SWPP. All building occupants are required to obtain coverage under the General Permit will do so by filing a Notice of Intent preparing a SWPPP and performing all required stormwater monitoring and reporting to the State Water Board.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	The stencil shall be blue on a white background with lettering 2-1/2" in height and reading "No Dumping - Drains to river". A fish or similar water dependent creature silhouette may be included subject to City approval. In lieu of a stencil, a catch basin curb marker, circular or rectangular, at least 4" in height or diameter, may be used. The message will be the same and is subject to City approval. A Painted circular stencil shall not be bigger than 8" in diameter. Legibility will be checked and repainted annually.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	This development does not include the storage of materials outdoors.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Stormwater flows are diverted away from the trash enclosure. All dumpsters shall have working lids which shall be kept closed, at all times. Trash enclosure shall comply with CASQA SD-32 and shall have doors and a solid roof.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Landscape and irrigation shall be consistent with the State Model Water Efficient Landscape Ordinance and the City of Ontario landscape Development Standards. Plants installed will be arranged according to similar hydro zones and meet the required water budget for the site. Landscape areas used for water quality swales or infiltration areas shall have proper plants for saturated soils, drought tolerance and erosion control qualities. Shade trees shall be used to intercept rainwater and reduce heat gain on paving. Additionally, the irrigation system will include, per industry standard, devices to prevent low head drainage, overspray and run-off. This includes but is not limited to check valves, flow sensors, proper spacing, low precipitation emission device and E7 or water-based controllers.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	All landscaped areas shall comply with depressed grading requirements by finish grading to a minimum of 1" below pavement grades or top-of-curb.
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	All slopes shall be hard lined, rip-raped or vegetated to provide erosion protection and prevent sediment transport.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	No docks as part of this development
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	Maintenance bays are not proposed as part of this development.

S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Vehicle wash areas are not provided as part of this development.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	Outdoor processing is not associated with the proposed development.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Outdoor equipment is not associated with the proposed development.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	Fueling areas are not included as part of this development.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☒	☐	The hillsides along the project as well as any embankment shall be landscaped in accordance with the Hillside Landscaping BMP. All slopes/ hillsides shall withhold 2:1 slopes.
S14	Wash water control for food preparation areas	☐	☒	The proposed development does not include food preparation areas.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	The proposed development does not include community car wash areas.

4.1.2 Preventative LID Site Design Practices

The project site utilizes the minimum impervious area feasible for the site. It incorporates Infiltration Chambers that will promote onsite infiltration where feasible. The proposed systems used are large in area in order to meet the 48-hour drawdown requirement. Flows will all be directed via sheet flow into nearby catch basins and concrete v-gutters. Once the runoff is collected via proposed catch basins, it will then be directed to the proposed infiltration basin. Runoff that exceeds the proposed basin design storm, it may be discharged into the San Mateo Creek not to exceed the existing peak flow rate. Flows on the roofs will first be directed into the landscape for pretreatment via downspouts (where feasible) before reaching the storm drain system. The area in which we will have infiltration will be compacted accordingly, to allow for natural infiltration for the system. Additionally, the landscaped areas shall be staked off during construction to minimize compaction within the specified areas which would promote micro-infiltration. The project site does not preserve existing vegetation. Pervious pavement was also not considered in this project design because all of the water is being directed towards nearby catch basins and concrete v-gutters in order to reach the storm drain system.

Form 4.1-3 Preventative LID Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: Impervious areas will be minimized to the maximum extent practicable by providing pervious areas.
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: All pervious areas will be below adjacent impervious areas to maximize natural infiltration, and the project site utilizes subsurface infiltration basins.
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: Drainage pattern will be maintained to the maximum extent feasible.
Disconnect impervious areas: Yes ☒ No ☐ Explanation: Impervious areas will be disconnected from pervious areas by grading design. The stormwater runoff will be routed through the storm drain system.
Protect existing vegetation and sensitive areas: Yes ☐ No ☒ Explanation: There isn't any existing sensitive vegetation on the proposed site.
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: Any areas that are disturbed will be stabilized prior to project completion.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: Areas under stormwater infiltration BMPs shall be native un-compacted material and will be staked off during construction to minimize unnecessary compaction.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☒ No ☐ Explanation: The project site will utilize vegetated swales where applicable.
Stake off areas that will be used for landscaping to minimize compaction during construction: Yes ☒ No ☐ Explanation: Landscaping areas will be staked off after rough grading has been completed to prevent excessive compaction.

4.2 Project Performance Criteria

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)

1 Project area DA 1 (ft^2): 211,253	**2** Imperviousness after applying preventative site design practices (Imp%): 90	**3** Runoff Coefficient (Rc): 0.730 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.464 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.687 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 17,339 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA 2 (ft^2): 270,514	**2** Imperviousness after applying preventative site design practices (Imp%): 90	**3** Runoff Coefficient (Rc): 0.730 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.464 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.687 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 22,203 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 3)

1 Project area DA 2 (ft^2): 52,269	**2** Imperviousness after applying preventative site design practices (Imp%): 82	**3** Runoff Coefficient (Rc): 0.623 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.464 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.687 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 3,661 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-2 Summary of HCOC Assessment (DA 1)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)*

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 30,658 *Form 4.2-3 Item 12*	**2** 14.91 *Form 4.2-4 Item 13*	**3** 4.57 *Form 4.2-5 Item 10*
Post-developed	**4** 29,481 *Form 4.2-3 Item 13*	**5** 14.60 *Form 4.2-4 Item 14*	**6** 4.45 *Form 4.2-5 Item 14*
Difference	**7** *-1,177* *Item 4 – Item 1*	**8** *0.58* *Item 2 – Item 5*	**9** *0.12* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** 0 *Item 7 / Item 1*	**11** 4% *Item 8 / Item 2*	**12** 3% *Item 9 / Item 3*

Form 4.2-2 Summary of HCOC Assessment (DA 2)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)*

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 35,706 *Form 4.2-3 Item 12*	**2** 23.95 *Form 4.2-4 Item 13*	**3** 4.17 *Form 4.2-5 Item 10*
Post-developed	**4** 37,644 *Form 4.2-3 Item 13*	**5** 25.06 *Form 4.2-4 Item 14*	**6** 3.98 *Form 4.2-5 Item 14*
Difference	**7** *1,938* *Item 4 – Item 1*	**8** *0.82* *Item 2 – Item 5*	**9** *0.19* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** 5% *Item 7 / Item 1*	**11** 5% *Item 8 / Item 2*	**12** 5% *Item 9 / Item 3*

Form 4.2-2 Summary of HCOC Assessment (DA 3)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 4,914 *Form 4.2-3 Item 12*	**2** 10.37 *Form 4.2-4 Item 13*	**3** 1.32 *Form 4.2-5 Item 10*
Post-developed	**4** 4,591 *Form 4.2-3 Item 13*	**5** 9.85 *Form 4.2-4 Item 14*	**6** 1.99 *Form 4.2-5 Item 14*
Difference	**7** *-323* *Item 4 – Item 1*	**8** *0.52* *Item 2 – Item 5*	**9** *0.67* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *0%* *Item 7 / Item 1*	**11** *5%* *Item 8 / Item 2*	**12** *5%* *Item 9 / Item 3*

Civil D and AES is a computer software analysis that that can be utilized to assess HCOC. The methodology for the program is based off of the San Bernardino County Hydrology Manual.

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type								
2a Hydrologic Soil Group (HSG)								
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type								
2b Hydrologic Soil Group (HSG)								
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								

5 Pre-Developed area-weighted CN:	**7** Pre-developed soil storage capacity, S (in): *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN:	**8** Post-developed soil storage capacity, S (in): *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in):
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3):
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*								
2 Change in elevation (ft)								
3 Slope (ft/ft), S_o *= Item 2 / Item 1*								
4 Land cover								
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*								
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*								
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*								
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*								
12 Total time of concentration (min) T_c *= Item 5 + Item 11*								

13 Pre-developed time of concentration (min): *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): $T_{C\text{-}HCOC}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet HCOC Requirement (cfs): *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10*		

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

Due to the site constraints that exist on the project site, they would limit the type of BMP to be implemented in a DA. The project development utilized BMPS in multiple locations, to maximize on-site retention of the DCV. A combination of BMP's can mitigate the entire DCV, if a single BMP type, or combination of BMP types cannot successfully mitigate the entire DCV. The proposed BMP(s) would maximize on-site retention of the DCV within the minimum effective area. The storm drain system is designed to accommodate 2-year and 100-year storm events. All runoff that exceeds that of the basin requirements will be discharged into the San Mateo Creek to which will not exceed the existing flow rate of the project site.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)
Currently there are minimum space between buildings and right of way. There is also a proposed underground structure that does not allow for infiltration. Infiltration will be proposed at the center of the common area where infiltration is feasible.

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

Form 4.3-1 Infiltration BMP Feasibility (DA 2)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)
Currently there are minimum space between buildings and right of way. There is also a proposed underground structure that does not allow for infiltration. Infiltration will be proposed at the center of the common area where infiltration is feasible.

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

Form 4.3-1 Infiltration BMP Feasibility (DA 3)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)
Currently there are minimum space between buildings and right of way. There is also a proposed underground structure that does not allow for infiltration. Infiltration will be proposed at the center of the common area where infiltration is feasible.

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA1)			
1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA 1 DMA A BMP Type N/A		
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): N/A $V_{retention}$ *=Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA 1 DMA A BMP Type N/A		
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): N/A $V_{retention}$ *=Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA 1 DMA A BMP Type N/A		
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): N/A *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA 1 DMA A BMP Type N/A		
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): N/A *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA 1 DMA A BMP Type N/A		
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): N/A *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: N/A *Sum of Items 5, 13, 20, 25 and 29*			

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA2)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type N/A		
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): N/A *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type N/A		
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): N/A *$V_{retention}$ =Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 2)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type N/A		
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): N/A *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type N/A		
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): N/A *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type N/A		
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): N/A *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: N/A *Sum of Items 5, 13, 20, 25 and 29*			

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA3)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type N/A		
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): N/A *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type N/A		
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): N/A *$V_{retention}$ =Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type N/A		
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): N/A *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type N/A		
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): N/A *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type N/A		
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): N/A *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: N/A *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 17,339 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type: Infiltration Chamber	DA 1 DMA B BMP Type: Infiltration Chamber	DA 1 DMA C BMP Type: Infiltration Chamber
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	11.9	5.0	2.0
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2	2	2
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	6	2.5	1.0
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	48	48
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	4	4	4
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	4	4	4
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	46	121	114
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A	N/A	N/A
10 Amended soil porosity	N/A	N/A	N/A
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A	N/A	N/A
12 Gravel porosity	N/A	N/A	N/A
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	3
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	900	1260	540

16 Total Retention Volume from LID Infiltration BMPs: 8,600 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 50% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☒

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 17,191 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA D BMP Type: Infiltration Chamber		
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	1.5		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.7		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	4		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	3		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	435		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A		
10 Amended soil porosity	N/A		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A		
12 Gravel porosity	N/A		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	5,900		

16 Total Retention Volume from LID Infiltration BMPs: 8,600 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 50% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☒

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 2)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 22,203 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 2 DMA A BMP Type: Infiltration Chamber	DA 2 DMA B BMP Type: Infiltration Chamber	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	2.0	1.5	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2	2	
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	1.0	0.7	
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	48	
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	4	4	
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	4.00	3.00	
8 Infiltrating surface area, *SA_{BMP}* (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	4,378	435	
9 Amended soil depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A	N/A	
10 Amended soil porosity	N/A	N/A	
11 Gravel depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A	N/A	
12 Gravel porosity	N/A	N/A	
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	2,340	7,600	

16 Total Retention Volume from LID Infiltration BMPs: 9,920 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 45% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☒

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 3)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 3,661 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 3 DMA A BMP Type: Infiltration Chamber	DA 3 DMA B BMP Type: Infiltration Chamber	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	6.2	6.2	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2	2	
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.1	3.1	
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	48	
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	4	4	
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	12.40	12.40	
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,148	740	
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A	N/A	
10 Amended soil porosity	N/A	N/A	
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A	N/A	
12 Gravel porosity	N/A	N/A	
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	2,880	1,440	

16 Total Retention Volume from LID Infiltration BMPs: 4,300 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 117% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and Use is not utilized on the proposed project site.

Form 4.3-4 Harvest and Use BMPs (DA 1)			
1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 5,464 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type N/A		
2 Describe cistern or runoff detention facility	Underground Detention		
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*	1,500		
4 Landscaped area planned for use of harvested stormwater (ft^2)	16,725		
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day	0.1		
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*	139		
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*	48		
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*	278		
9 Total Retention Volume (ft^3) from Harvest and Use BMP: 278 *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☐ No ☒ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

Form 4.3-4 Harvest and Use BMPs (DA 2)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 9,911

V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16

BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type N/A		
2 Describe cistern or runoff detention facility	Underground Detention		
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*	2,500		
4 Landscaped area planned for use of harvested stormwater (ft^2)	39,157		
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day	0.1		
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*	326		
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*	48		
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*	652		

9 Total Retention Volume (ft^3) from Harvest and Use BMP: 652 *Sum of Item 8 for all harvest and use BMP included in plan*

10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☐ No ☒

If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.

Form 4.3-4 Harvest and Use BMPs (DA 3)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 0 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type N/A		
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP: N/A *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

Drainage Area 3 is fully retained via infriltration through the use of an underground chamber system.

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): 8,739 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.* Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume* ☐ Bioretention with underdrain ☒ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention ☐ Proprietary biotreatment	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume* ☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): 1,663 *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): 7,076 *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: 81% *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 2)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): 12,283 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.* Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☐ Bioretention with underdrain ☒ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention ☐ Proprietary biotreatment	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment

3 Volume biotreated in volume based biotreatment BMP (ft^3): 2,740 *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): 9,543 *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: 78% *Item 4 / Item 1*

6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*

7 Metrics for MEP determination:

- Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 3)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): N/A *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume* ☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention ☐ Proprietary biotreatment	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume* ☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		

7 Metrics for MEP determination:

- Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development:

  ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*

Form 4.3-6 Volume Based Biotreatment (DA 1 – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA 1 DMA E BMP Type: Planter Box w/ underdrains		
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*	Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds		
2 Amended soil infiltration rate *Typical ~ 5.0*	5		
3 Amended soil infiltration safety factor *Typical ~ 2.0*	2		
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*	2.5		
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*	48		
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1		
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*	10		
8 Amended soil surface area (ft^2)	887		
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	3		
10 Amended soil porosity, *n*	0.2		
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1		
12 Gravel porosity, *n*	0.4		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	1,663		
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: 1,663 *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-6 Volume Based Biotreatment (DA 2 – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA 2 DMA C BMP Type: Planter Box w/ underdrains	DA 2 DMA D BMP Type: Planter Box w/ underdrains	DA 2 DMA E BMP Type: Planter Box w/ underdrains
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*	Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds	Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds	Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds
2 Amended soil infiltration rate *Typical ~ 5.0*	5	5	5
3 Amended soil infiltration safety factor *Typical ~ 2.0*	2	2	2
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*	2.5	2.5	2.5
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*	48	48	48
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1	1	1
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*	10	10	10
8 Amended soil surface area (ft^2)	52	386	460
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	3	3	3
10 Amended soil porosity, *n*	0.2	0.2	0.2
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1	1	1
12 Gravel porosity, *n*	0.4	0.4	0.4
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	3
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	540	724	862
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: 2,740 *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-6 Volume Based Biotreatment (DA 2 – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA 2 DMA F BMP Type: Planter Box w/ underdrains		
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*	Sediment, Oil and Grease, Trash Debris, Pesticides/ Herbicides, Organic Compounds		
2 Amended soil infiltration rate *Typical ~ 5.0*	5		
3 Amended soil infiltration safety factor *Typical ~ 2.0*	2		
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*	2.5		
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*	48		
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1		
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*	10		
8 Amended soil surface area (ft^2)	328		
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	3		
10 Amended soil porosity, *n*	0.2		
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*	1		
12 Gravel porosity, *n*	0.4		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	614		
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: 2,740 *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment (DA 1) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type N/A			
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : N/A *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment (DA 1)			
Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type N/A		
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w *= (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} *= (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 17,339 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 8,600 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 1,663 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☐ No ☒
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture:
  ☒-*Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance,*
  V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 2)

1 Total LID DCV for the Project DA-1 (ft^3): 22,203 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 9,920 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 2,740 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☐ No ☒
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture:
  ☒-*Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance,*
  V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 3)

1 Total LID DCV for the Project DA-1 (ft^3): 3,661 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 4,300 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐-
  *Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} = (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Full DCV could not be achieved due to site constraints such as building setbacks and proposed underground structures. Infiltration is proposed where feasible and to its maximum capability. Harvest and Use was another method used to assist in meeting DCV requirements and was proven to be infeasible. Bioretention was then used to reduce the volume that is not yet met. However, portion of the DCV has yet to be met and will utilize Water Quality Credits. Refer to the Appendix for documentation for Water Credit applicability. Section 6.2.2 states the water quality credit would be calculated as the DCV of the proposed condition multiplied by the sum of the credit percentages claimed above.

Drainage Area 1:

Design Capture Volume after applying Water Quality Credits:

$$DCV = 17{,}339 * (100 - 50)\%$$
$$= 8{,}670\ ft^3$$

Volume Treated:

- Infiltration = 8,600 ft^3
- Biotreatment (Volume Based)= 1,663 ft^3

Total Volume Treated = 10,283 ft^3

After applying Water Quality Credits, full Design Capture Volume is met with the combination of both Infiltration and Biotreatment (Volume Based).

Drainage Area 2:

Design Capture Volume after applying Water Quality Credits:

$$DCV = 22{,}203 * (100 - 50)\%$$
$$= 11{,}102\ ft^3$$

Volume Treated:

- Infiltration = 9,920 ft^3
- Biotreatment (Volume Based)= 2,740 ft^3

Total Volume Treated = 12,660 ft^3

After applying Water Quality Credits, full Design Capture Volume is met with the combination of both Infiltration and Biotreatment (Volume Based).

Drainage Area 3:

Full Design Capture Volume was met via infiltration.

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for HCOC performance criteria (ft^3): 0 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 8,600 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

The current project is a redevelopment of an existing site in which will not pose HCOC risk. The project site proposes the use of BMPs such as infiltration chambers and planter boxes to assist in mitigating flow as well as volume. Currently the project site also increases in perviousness thus reducing the amount of runoff produced. The project site currently connects to an existing public storm drain which was designed to convey flows the highest peak at the projects current state. The project is intended to follow the same and/or similar drainage pattern where possible.

Form 4.3-10 Hydromodification Control BMPs (DA 2)

1 Volume reduction needed for HCOC performance criteria (ft^3): 0 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 9,920 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

The current project is a redevelopment of an existing site in which will not pose HCOC risk. The project site proposes the use of BMPs such as infiltration chambers and planter boxes to assist in mitigating flow as well as volume. Currently the project site also increases in perviousness thus reducing the amount of runoff produced. The project site currently connects to an existing public storm drain which was designed to convey flows the highest peak at the projects current state. The project is intended to follow the same and/or similar drainage pattern where possible.

Form 4.3-10 Hydromodification Control BMPs (DA 3)

1 Volume reduction needed for HCOC performance criteria (ft^3): 0 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 4,300 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

The current project is a redevelopment of an existing site in which will not pose HCOC risk. The project site proposes the use of BMPs such as infiltration chambers to assist in mitigating flows. Currently the project site also increases in perviousness thus reducing the amount of runoff produced. The project site currently connects to an existing public storm drain which was designed to convey flows the highest peak at the projects current state. The project is intended to follow the same and/or similar drainage pattern where possible.

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Catch Basin	Property Owner	Inspect for illegal dumping and /or debris accumulation. Clean filters whenever 25% of filter capacity is exceeded by debris accumulation	At least 2 times a year and before and after any Storm Event.
Landscape Maintenance	Property Owner	Maintain landscape area vegetation and grades, adjacent to hardscape and prevent discharges of landscape maintenance waste into storm drains	Weekly
Litter Control	Property Owner	Vacuum sweep drive aisles and parking areas to remove potential stormwater contamination before anticipated storm events	Weekly/Monthly and before and after any Storm Event
Signage and Stencil	Property Owner	Clean the stencil/signage surface to remove any excess dirt and Re-paint if necessary.	Annually
Irrigation System	Property Owner	Check and repair the irrigation system. Verify there are no leaks or runoff from landscape areas. Adjust irrigation heads and system run times as necessary to prevent overwatering of vegetation, overspray or run-off from landscape areas and to ensure the health and aesthetic quality of the landscape	Weekly
Infiltration Chambers	HOA	Monthly inspections should occur for debris and litter removal and signs of ponding issues such as odors, insects, and overgrowth. Prior to October 1, conduct annual inspections and maintenance for erosion, clogging of outlets, standing water issues, and adequacy of infiltration. Visually inspect infiltration basin on a monthly basis because of their importance for water quality	Inspect twice annually, once before and after the rainy season and after extreme storm events.

		management and post-construction storm water pollution prevention. One of these inspections should be before October 1 and one should be after May 1. Remove litter, debris, and dead vegetation. Revegetate as needed. Check for signs of ponding issues such as odors, clogging of outlets, standing water, erosion, and adequacy of infiltration. Remove accumulated sediment and re-grade when the accumulated sediment volume is greater than 10% of the basin volume.	Maintenance as needed.
Trash Enclosures	Property Owner	Empty trash receptacles. Clean the areas around enclosures by sweeping and /or mopping to provent discharges of cleanup water.	Weekly

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

6.1. Site Plan and Drainage Plan

Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

HYDROLOGY INFORMATION

SITE AREA: 9.15 AC

SOIL GROUP: B

IMPERVIOUS: 90%

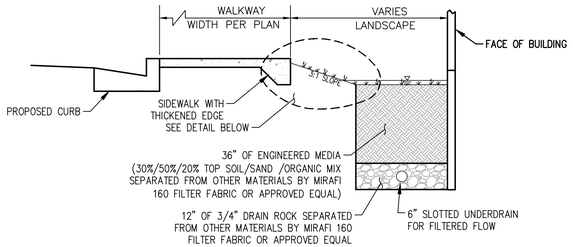
2 YEAR, 1 HOUR: 0.464

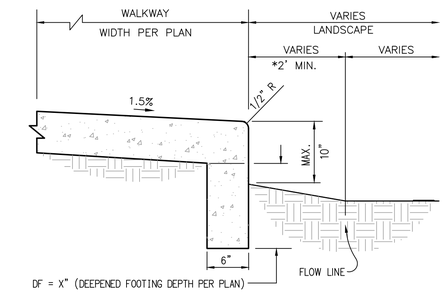
FREQUENCY: 2 YEAR

METHOD: SAN BERNARDINO COUNTY HYDROLOGY MANUAL

LEGEND

- DRAINAGE AREA BOUDARY
- DRAINAGE SUBAREA
- SD — STORM DRAIN
- PROP. PRINSCO INFILTRATION CHAMBER
- PROP. PLANTER BOX W/ UNDERDRAIN

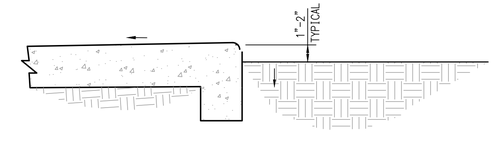




1' MIN. WHEN WALKWAY SEPARATION * FROM BUILDING IS 2'.

PLANTER BOX W/ UNDERDRAIN

N.T.S.



LANDSCAPE PARALLEL TO WALKWAY

N.T.S.

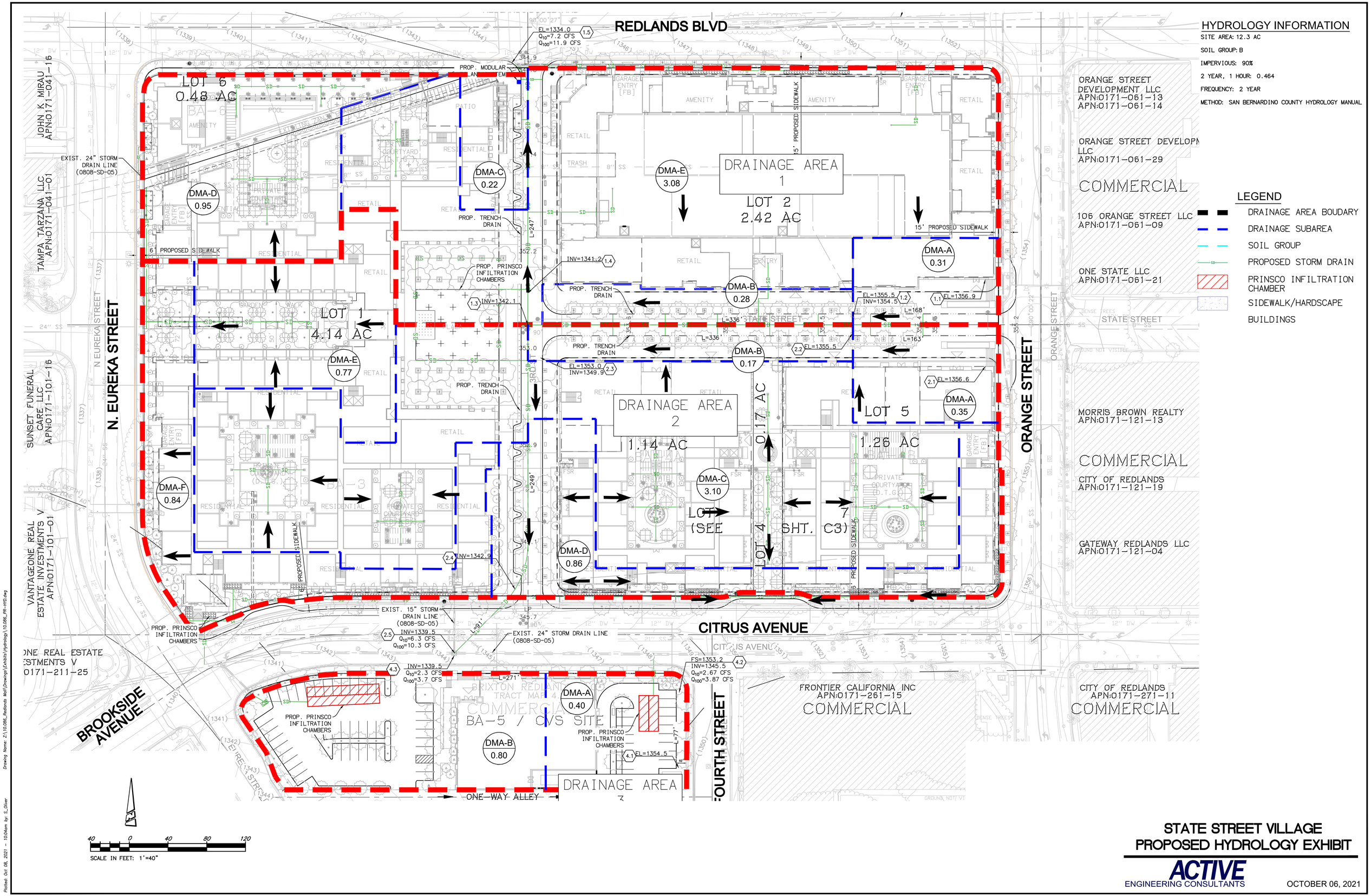
SCALE IN FEET: 1"=40"

STATE STREET VILLAGE
WQMP EXHIBIT

ACTIVE ENGINEERING CONSULTANTS

OCTOBER 06, 2021

Plotted: Oct 08, 2021 - 10:21am by: S_Oliver
Drawing Name: Z:\10.086_Redlands Mall\Drawings\Exhibits\10.086 - Conceptual WQMP v2.dwg



HYDROLOGY INFORMATION

SITE AREA: 12.3 AC

SOIL GROUP: B

IMPERVIOUS: 90%

2 YEAR, 1 HOUR: 0.464

FREQUENCY: 2 YEAR

METHOD: SAN BERNARDINO COUNTY HYDROLOGY MANUAL

LEGEND

- DRAINAGE AREA BOUDARY
- DRAINAGE SUBAREA
- SOIL GROUP
- PROPOSED STORM DRAIN
- PRINSCO INFILTRATION CHAMBER
- SIDEWALK/HARDSCAPE
- BUILDINGS

STATE STREET VILLAGE PROPOSED HYDROLOGY EXHIBIT

ACTIVE ENGINEERING CONSULTANTS

OCTOBER 06, 2021

HYDROLOGY INFORMATION

SITE AREA: 12.2 AC

SOIL GROUP: B

IMPERVIOUS: 93%

2 YEAR, 1 HOUR: 0.464

FREQUENCY: 2 YEAR

METHOD: SAN BERNARDINO COUNTY HYDROLOGY MANUAL

LEGEND

- DRAINAGE AREA BOUDARY
- DRAINAGE SUBAREA
- LANDSCAPE AREA
- EXISTING BUILDING/ STRUCTURE

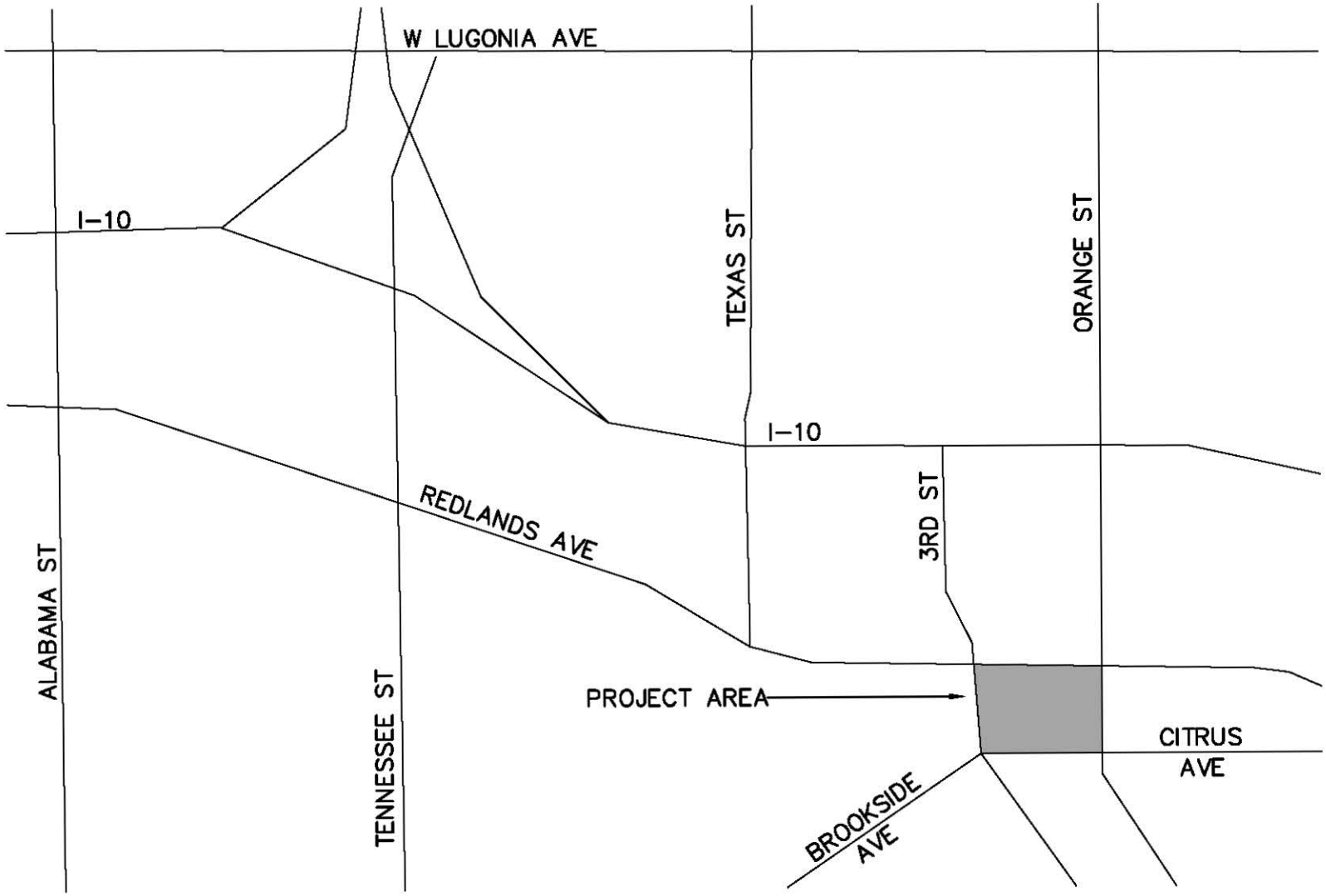
SCALE IN FEET: 1"=40"

STATE STREET VILLAGE
EXISTING HYDROLOGY EXHIBIT

PROACTIVE ENGINEERING CONSULTANTS

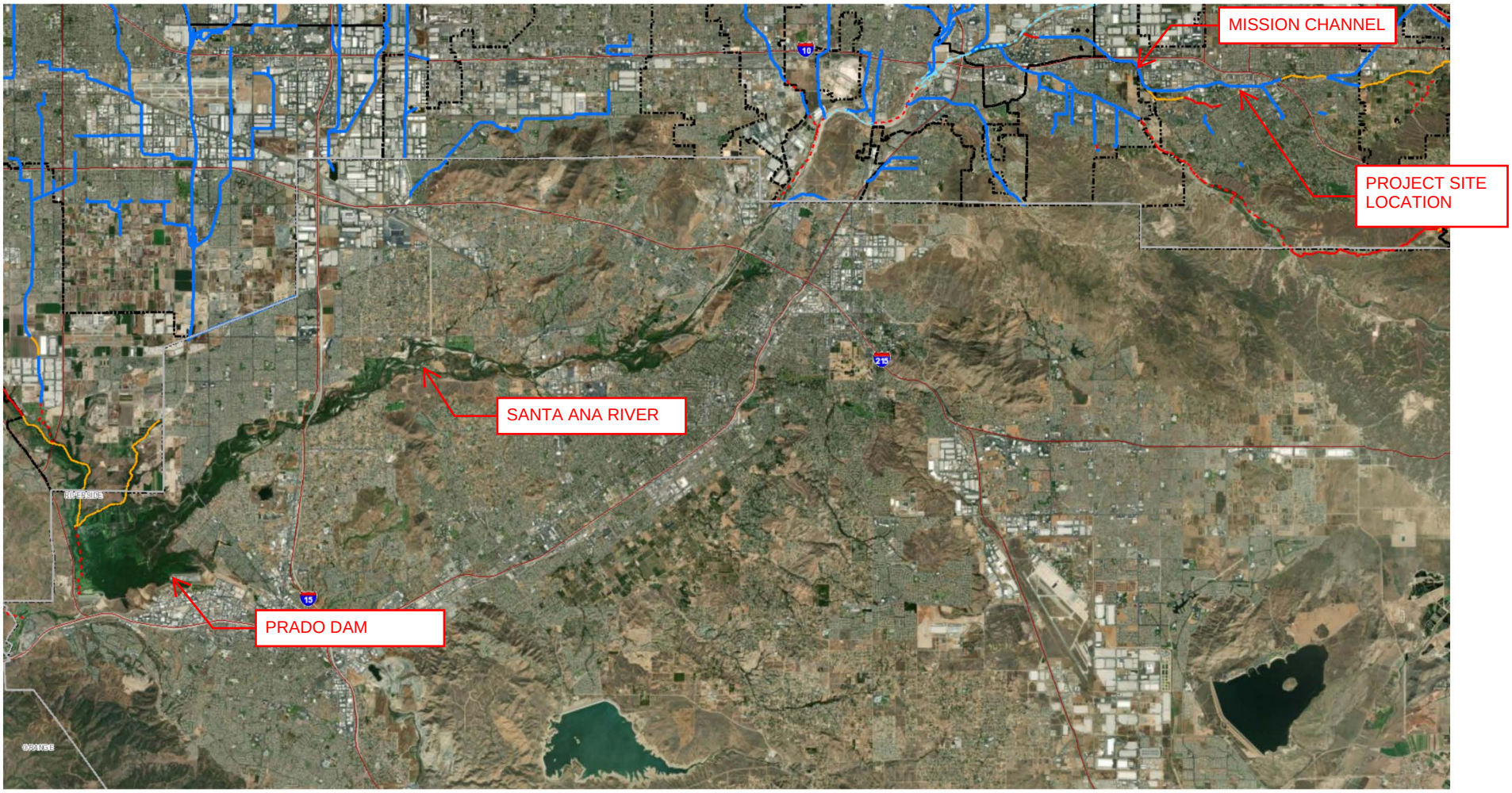
OCTOBER 5, 2021

Plotted: Oct 08, 2021 – 10:07am by: S_Oliver
Drawing Name: Z:\10.086_Redlands Mall\Drawings\Exhibits\Hydrology\10.086_EX-HYD.dwg



VICINITY MAP

N.T.S.



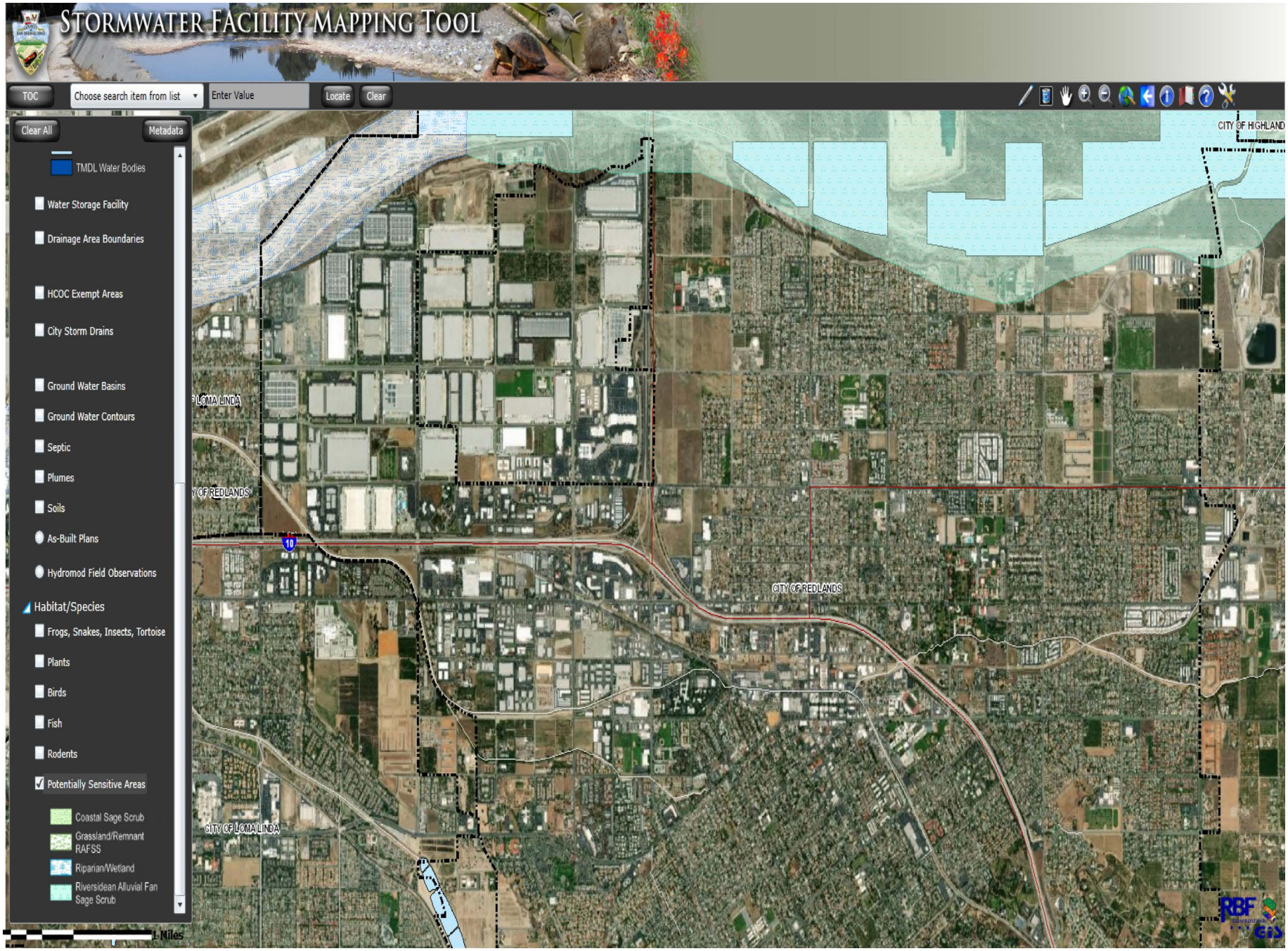
3 Miles

RBF CONSULTING GIS

Site Address: permitrack.sbcounty.gov/wap

County of San Bernardino
Stormwater Facility Mapping

Receiving Waters M


STORMWATER FACILITY MAPPING TOOL
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
TMDL Water Bodies
Water Storage Facility
Drainage Area Boundaries
HCOC Exempt Areas
City Storm Drains
Ground Water Basins
Ground Water Contours
Septic
Plumes
Soils
As-Built Plans
Hydromod Field Observations
Habitat/Species
Frogs, Snakes, Insects, Tortoise
Plants
Birds
Fish
Rodents
Potentially Sensitive Areas
Coastal Sage Scrub
Grassland/Remnant RAFSS
Riparian/Wetland
Riversidean Alluvial Fan Sage Scrub
CITY OF HIGHLAND
LOMA LINDA
CITY OF REDLANDS
CITY OF LOMA LINDA
10
1 Miles
RBF
GIS

6.2. Electronic Data Submittal

6.3. Post Construction

RECORDING REQUESTED BY:
County of San Bernardino
Department of Public Works

AND WHEN RECORDED MAIL TO:
County of San Bernardino
Department of Public Works
825 E. Third Street, Room 117
San Bernardino, CA 92415-0835

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN AND STORMWATER BEST MANAGEMENT PRACTICES TRANSFER, ACCESS AND MAINTENANCE

THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION

Covenant and Agreement Regarding Water Quality Management Plan and Stormwater Best Management Practices Transfer, Access and Maintenance

OWNER NAME: _____

PROPERTY ADDRESS: _____

_____

APN: _____

THIS AGREEMENT is made and entered into in

_____ ,California, this _____ day of

_____ , by and between

_____ , hereinafter

referred to as Owner, and the COUNTY OF SAN BERNARDINO, a political subdivision of the State of California, hereinafter referred to as "the County";

WHEREAS, the Owner owns real property ("Property") in the County of San Bernardino, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of initial approval of development project known as

_____ within the Property described herein, the County required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff; and

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, dated _____, on file with the County and incorporated herein by this reference, hereinafter referred to as "WQMP", to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff; and

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the County; and

WHEREAS, the 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 all BMPs in the WQMP 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, it is mutually stipulated and agreed as follows:

1. Owner shall comply with the WQMP.

2. All maintenance or replacement of BMPs proposed as part of the WQMP are the sole responsibility of the Owner in accordance with the terms of this Agreement.

3. Owner hereby provides the County's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the County Director of Public Works, no advance notice, for the purpose of inspection, sampling, testing of the BMPs, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 5 below. The County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property. Denial of access to any premises or facility that contains WQMP features is a breach of this Agreement and may also be a violation of the County's Pollutant Discharge Elimination System regulations, which on the effective date of this Agreement are found in County Code Sections 35.0101 et seq. If there is reasonable cause to believe that an illicit discharge or breach of this Agreement is occurring on the premises then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction in addition to other enforcement actions. Owner recognizes that the County may perform routine and regular inspections, as well as emergency inspections, of the BMPs. Owner or Owner's successors or assigns shall pay County for all costs incurred by County in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of County invoice.

4. Owner shall use its best efforts diligently to maintain all BMPs 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 any material(s) from the BMPs 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, the Owner shall provide the County with documentation identifying the material(s) removed, the quantity, and disposal destination), testing construction or reconstruction.

5. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) business 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 against the Property and/or to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the County Code from the date of the notice of expense until paid in full. Owner or Owner's successors or assigns shall pay County within thirty (30) calendar days of County invoice.

6. The County may require the owner to post security in 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 the Agreement, the County may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the surety(ies) to perform the obligations of this Agreement.

7. The County agrees, from time to time, within ten (10) business days after request of Owner, to execute and deliver to Owner, or Owner's designee, an estoppel certificate requested by Owner, stating that this Agreement is in full force and effect, and that Owner is not in default hereunder with regard to any maintenance or payment obligations (or specifying in detail the nature of Owner's default). Owner shall pay all costs and expenses incurred by the County in its investigation of whether to issue an estoppel certificate within thirty (30) calendar days after receipt of a County invoice and prior to the County's issuance of such certificate. Where the County cannot issue an estoppel certificate, Owner shall pay the County within thirty (30) calendar days of receipt of a County invoice.

8. Owner shall not change any BMPs identified in the WQMP without an amendment to this Agreement approved by authorized representatives of both the County and the Owner.

9. County and Owner shall comply with all applicable laws, ordinances, rules, regulations, court orders and government agency orders now or hereinafter in effect in carrying out the terms of this Agreement. If a provision of this Agreement is terminated or held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall remain in full effect.

10. In addition to any remedy available to County under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the County if said cure reasonably requires more than the subject time, the County may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the County may recover any damages to which the County may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. This Agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the County, including interest as herein above set forth, subject to foreclosure in event of default in payment.

12. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to hold the County harmless and 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.

13. 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 there against.

14. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, 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.

15. Time is of the essence in the performance of this Agreement.

16. 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.

17. Owner agrees to indemnify, defend (with counsel reasonably approved by the County) and hold harmless the County and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the County on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the County's "active" as well as "passive" negligence but does not apply to the County's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section 2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the County under this Agreement..

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IF TO COUNTY :

Director of Public Works

825 E. Third Street, Room 117

San Bernardino, CA 92415-0835

IF TO OWNER:

_____

_____

_____

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

OWNER:

Company/Trust:_____

Signature: _____

Name: _____

Title: _____

Date: _____

OWNER:

Company/Trust:_____

Signature: _____

Name: _____

Title: _____

Date: _____

FOR: Maintenance Agreement, dated

_____, for the

project known as

_____

_____

(APN)_____,

As described in the WQMP dated

_____.

NOTARIES ON FOLLOWING PAGE

A notary acknowledgement is required for recordation.

ACCEPTED BY:

BRENDON BIGGS, M.S., P.E., Director of Public Works

Date: _____

Attachment: Notary Acknowledgement

ATTACHMENT 1
Notary Acknowledgement)

EXHIBIT A
(Legal Description)

EXHIBIT B
(Map/illustration)

6.4. Other Supporting Documentation

STATE STREET VILLAGE

Redlands, CA

CONDITIONAL USE PERMIT NO. 1155 & 1156 COMMISSION REVIEW & APPROVALS 933 & 934
10.6.21

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GENERAL

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G0.01	PROJECT INDEX
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G0.03	CONTEXT ANALYSIS
G0.04	PROJECT DESIGN NARRATIVE
G0.05	PROJECT RENDERINGS
G0.06	PROJECT RENDERINGS
G0.07	PROJECT RENDERINGS
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G0.09	PROJECT RENDERINGS
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G0.14	PROJECT RENDERINGS

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A1.02	CVS DETAILED SITE PLAN
A2.00	LEVEL P1 BUILDING PLAN
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APPENDIX

X0.01	PROJECT DATA
X0.02	MATERIAL BOARD

PROJECT TEAM

OWNER
VILLAGE PARTNERS
4340 VON KARMAN AVENUE SUITE 110
NEWPORT BEACH, CA 92660
949.433.4557

CONTACT: KAITLIN MORRIS
KATLIN@VILLAGEPARTNERS.COM

ARCHITECTURE & MASTER PLANNING
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5837 W. ADAMS BLVD.
CULVER CITY, CA 90232
323.591.2627

CONTACT:DARIN VIEIRA
DARINV@MITHUN.COM

ARCHITECTURE & PLACEMAKING
TORTI GALLAS + PARTNERS
1300 SPRING STREET, 4TH FLOOR
SILVER SPRING, MARYLAND 20910
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JTORTI@TORTIGALLAS.COM

LANDSCAPE ARCHITECT
IMA
5281 CALIFORNIA AVE, SUITE 350
IRVINE, CA 92617
949.954.752

CONTACT: WILLIAM F. SCHULTZ
WSCHULZ@IMADESIGN.COM

CIVIL ENGINEER
PROACTIVE ENGINEERING
200 S. MAIN STREET, SUITE 300
CORONA, CA 92882
951.280.3300

CONTACT: SCOTT GILBERT
SCOTTGILBERT@PROACTIVEENGINEERING.NET

IPD
INTERNATIONAL PARKING DESIGN
16255 VENTURA BOULEVARD, SUITE 915
ENCINO, CA 91436
818.986.1494

CONTACT:SHAHIN AZMOUDEH
SAZMOUDEH@IPD-GLOBAL.COM

LIGHTING DESIGN
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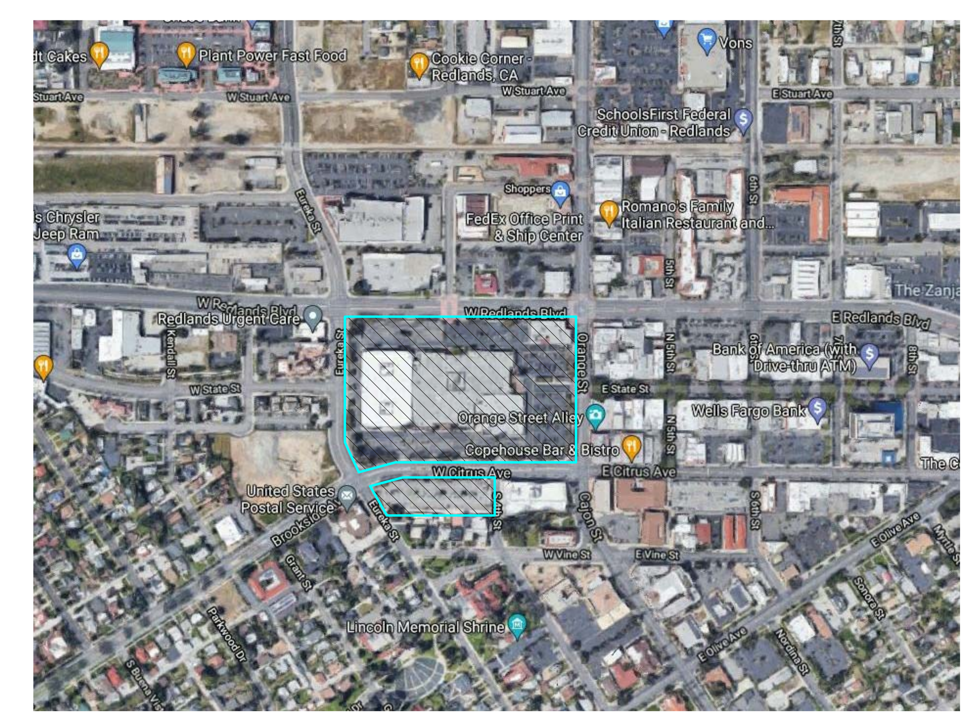
SUITE 1400
LOS ANGELES, CA 90071
(213) 608-8400

CONTACT: EILEEN THOMAS
ETHOMAS@STUDIOK1.COM

WASTE MANAGEMENT CONSULTANT
AMERICAN TRASH MANAGEMENT,
INC.1900 POWELL STREET, SUITE 220
EMERYVILLE, CA 94608
DIRECT: 1-510-607-7603

CONTACT:ANA ZARATE
ANAZARATE@TRASHMANAGE.COM



PROJECT SUMMARY

PROPOSED MIXED-USE DEVELOPMENT, INCLUDING 6 BUILDINGS ACROSS FOUR LOTS, WITH HOUSING AND COMMERCIAL RETAIL/OFFICE SPACE, PASEOS AND A LARGE PUBLIC PLAZA AT THE HEART OF A NEW TRANSIT-ORIENTED DISTRICT IN DOWNTOWN REDLANDS.

PARCEL INFORMATION

TTM# 20425

LEGAL DESCRIPTION:
PARCEL MAP NO. 2998, RECORDED JANUARY 8, 1976 IN BOOK 25, PAGES 90 THROUGH 92, INCLUSIVE OF PARCEL MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA AND LOTS 1 THRU 17 PER MAP RECORDED IN BOOK 4, PAGE 38.

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Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION
1	8/16/21	CUP SUB 2

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT INDEX

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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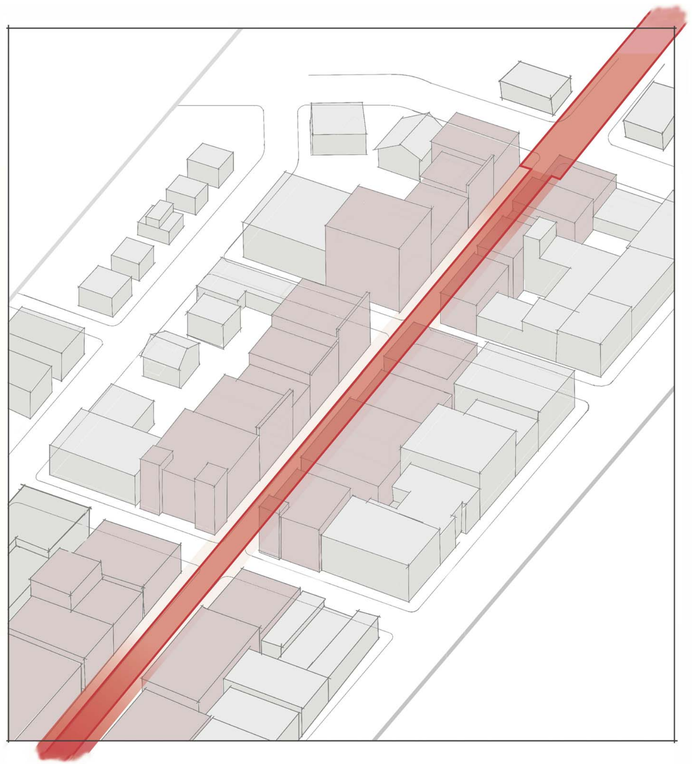
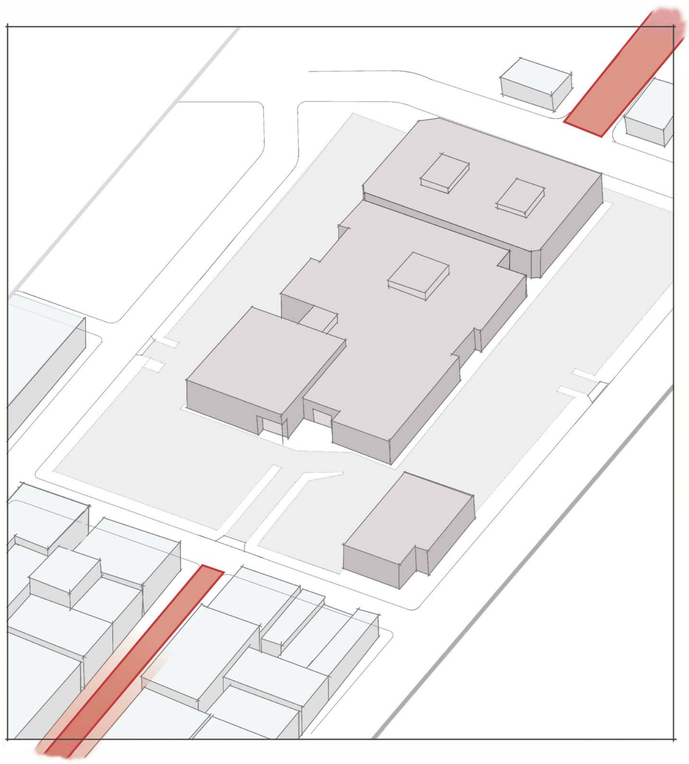


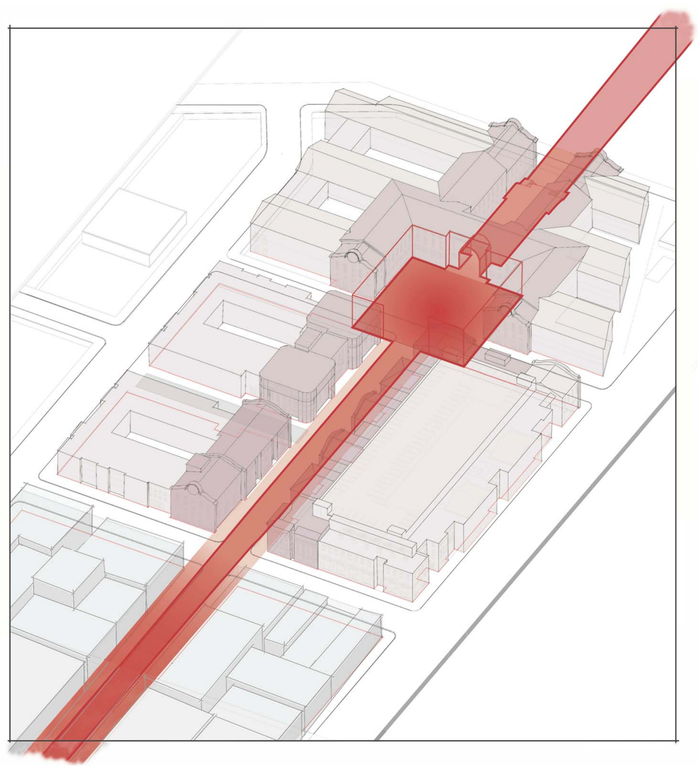
DOWNTOWN REDLANDS | PAST

This drawing depicts the heart of Redlands, California (pre-1975) as it was originally developed - a gridiron plan with blocks sub-divided into small lots with a continuous fabric of small buildings. The intersection of Orange Street (n/s) and State Street (e/w) is the center of the center, with State Street serving as the commercial main street



DOWNTOWN REDLANDS | PRESENT

This drawing shows the same blocks as they have existed since 1975, with the continuous street grid destroyed by a super-block where Redlands Mall and its parking lot is currently located. The mall is no longer commercially viable, but its moribund carcass dominates the west end of a charming downtown.



DOWNTOWN REDLANDS | FUTURE

This drawing depicts the Redlands Downtown of the near future. It is organized around a new armature of public space, consisting of a reconnected State Street terminated from the east and west by a new public plaza which becomes the new symbolic center of town. From both directions, the State Street vista terminates in a grand civic arched portal at the Plaza. West of the arch, public stairs lead State Street to Eureka Street and the Esri campus (beyond), Redland's main employer just a short walk away.

Framing the armature of public space are mixed-use buildings with housing of moderate density over retail, restaurants and services. The buildings are simple and efficient in their organization, but articulated in ways that recall the smaller buildings of the original downtown.

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STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
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PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
CONCEPT DIAGRAM

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.02

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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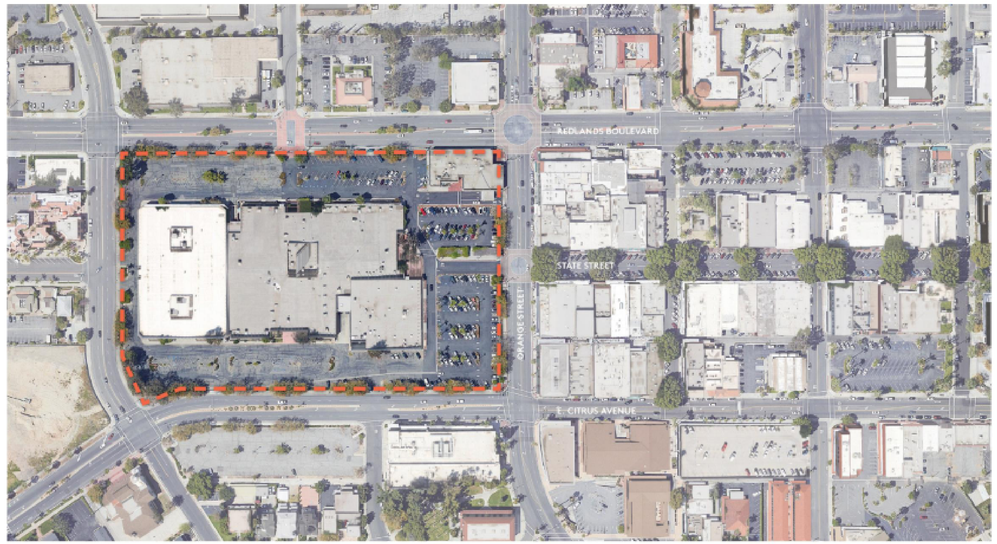
State St, Redlands CA 1955

State St, Redlands CA today

REDLANDS DOWNTOWN: EXISTING CONDITION (1975-2020)



REDLANDS PLAZA / DECEMBER 18, 2020

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REDLANDS DOWNTOWN: EXISTING CONDITION (1975-2020)

VIEW LOOKING WEST DOWN STATE STREET TOWARDS MALL

REDLANDS PLAZA / DECEMBER 18, 2020

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

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DS
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PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
CONTEXT ANALYSIS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.03

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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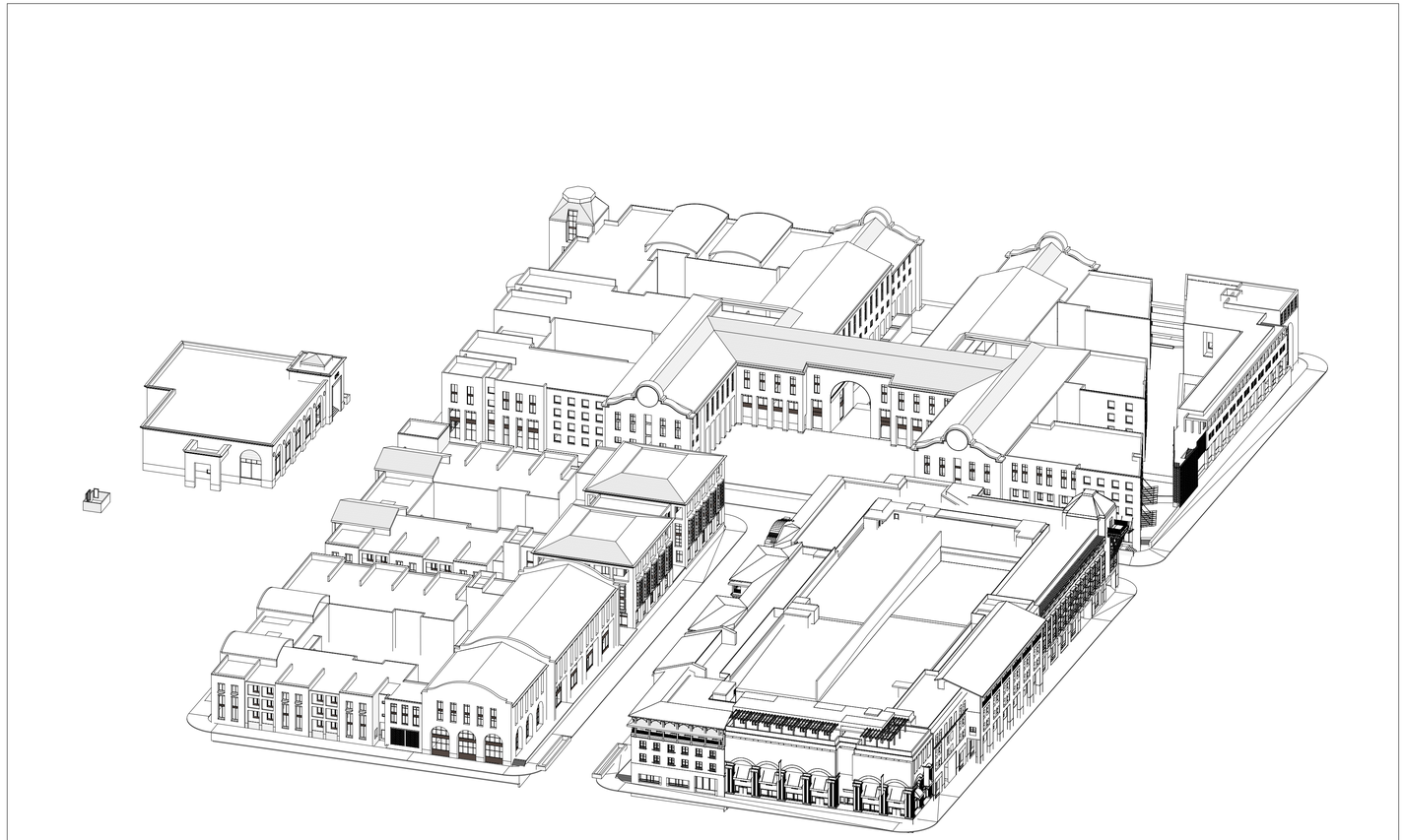

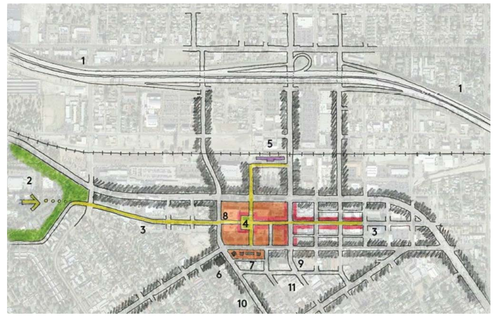

DESIGN NARRATIVE

State Street Village reconstructs the heart of the town of Redlands, California. It is a town center that that has been through generational transformations that reflect a century of American urbanism: cycles of aspiration, fulfilment, decay, new visions, new successes and new failures. The charm and soul of Redlands, why it is an interesting place cherished by its citizens, is the visible physical presence of that rich history everywhere one looks. Starting with the typically American continuous gridiron fabric of small blocks filled with small buildings housing independent family businesses, to the Post WW II era of suburban sprawl: larger scale corporate investment interrupting the original block structure with a single superblock, mall and surface parking.

Ultimately this mall failed as a viable commercial enterprise, as many have, and its moribund carcass remains as an obstacle to revitalization in the center of town. It remains during an era of new economic and cultural vitality brought to Redlands in part by the vast Esri software campus just west of downtown. The dead mall superblock is surrounded by remnants of the original small block pattern with its eclectic mix of architectural styles typical of Southern California towns: Spanish Mission Revival, the Craftsman Bungalow movement, climate-tempered Mediterranean contemporary, pragmatic brick loft commercial buildings - all have left their imprint on Redlands.

The State Street Village redevelopment proposal honors that complex history and adds new urban features expressive of and serving the town's current economic health and Esri's large and growing youthful workforce. Originally State Street with its eclectic small buildings was the town's main street linking the commercial center to residential neighborhoods to the east and west. The Mall constructed in 1975 ignored and eradicated that structure as was typical of post WW II urban redevelopment. Much of Redland's coherence, convenience, walkability and charm was lost to this modernist vision.

In the proposed design, the continuity and central importance of State Street as a vehicular, pedestrian and bicycle link is restored. The architectural expression of this new large project makes gestures and references to the eclectic small buildings of the past but avoids mimicking them with theme-park artificiality. Most importantly the project is centered on a grand new public space, Redlands Plaza, a lively new center of town.

The architecture not only houses an ambitious mixed-use program of housing, amenities, retail, restaurants and bars - the architecture shapes, defines and brings coherence to the network of public spaces centered on the plaza. Approaching Redlands Plaza from the east and from the west, the vista is terminated by a grand arch with a pedestrian and bicycle path passing thru it, from the plaza on the east to an equally grand garden walk descending to Eureka Street on the west. New State Street mixed-use frontage, the Plaza, the arch and the garden walk together constitute a new formal center-piece for Redlands. The surrounding blocks are a continuous, highly permeable mixed-use urban fabric , framing the centerpiece and knitting it into the fabric of the town providing a new chapter to a rich and complex urban history.

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
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San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT DESIGN NARRATIVE

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.04

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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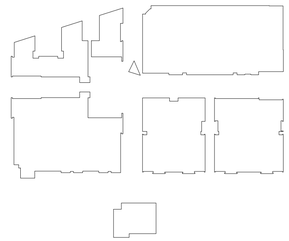

VIEW ACROSS STATE STREET FROM THE PASEO

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

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Seattle, WA 98101 / 206.623.3344

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San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.05

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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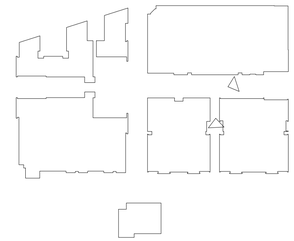

VIEW ACROSS STATE STREET FROM THE PASEO

VIEW OF STATE STREET AT PASEO

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

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Seattle, WA 98101 / 206.623.3344

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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.06

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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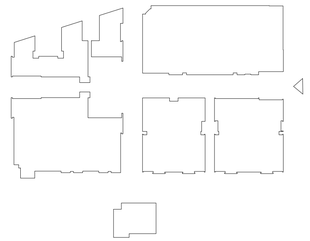

VIEW DOWN STATE STREET LOOKING WEST FROM ORANGE ST.

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.07

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COMMISSION REVIEW & APPROVALS 933 & 934

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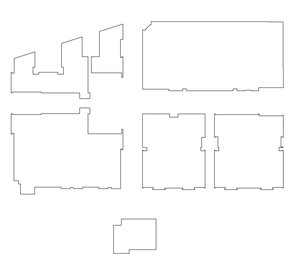

CORNER OF ORANGE ST. AND REDLANDS BLVD.

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHŪN

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SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.08

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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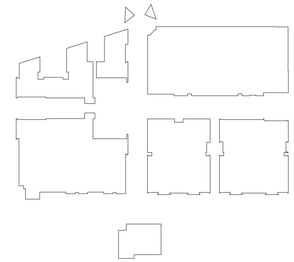

3RD STREET GATEWAY VIEWED FROM THE EAST

3RD STREET GATEWAY VIEWED FROM THE WEST

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

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San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.09

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COMMISSION REVIEW & APPROVALS 933 & 934

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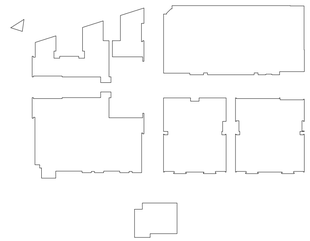
KEY PLAN



VIEW AT CORNER OF REDLANDS BLVD. AND EUREKA ST.

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.10

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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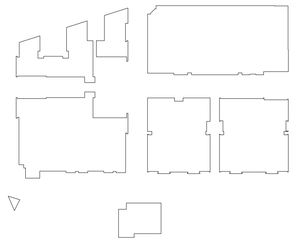
KEY PLAN



VIEW AT CORNER OF EUREKA ST. AND CITRUS AVE.

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.12

CONDITIONAL USE PERMIT NO. 1155 & 1156
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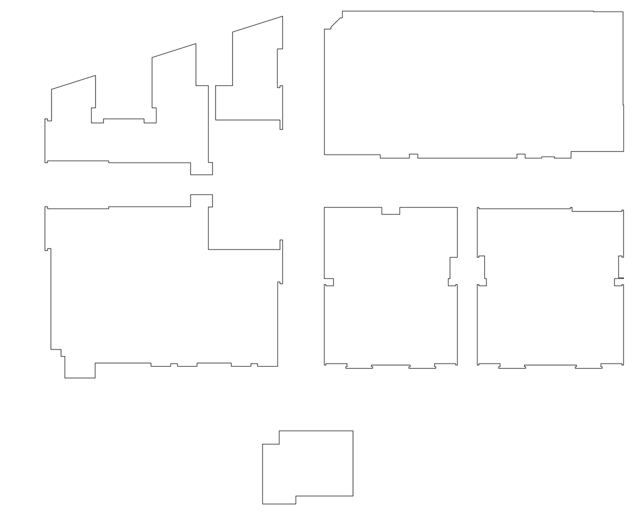
KEY PLAN



VIEW AT CORNER OF CITRUS AVE. AND ORANGE ST.

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Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.13
CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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ORIGINAL SHEET SIZE 24" x 36"

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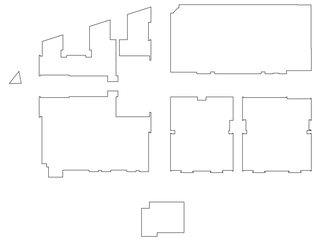
KEY PLAN



VIEW EAST TO STATE STREET FROM GARDEN WALK

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT RENDERINGS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
G0.14

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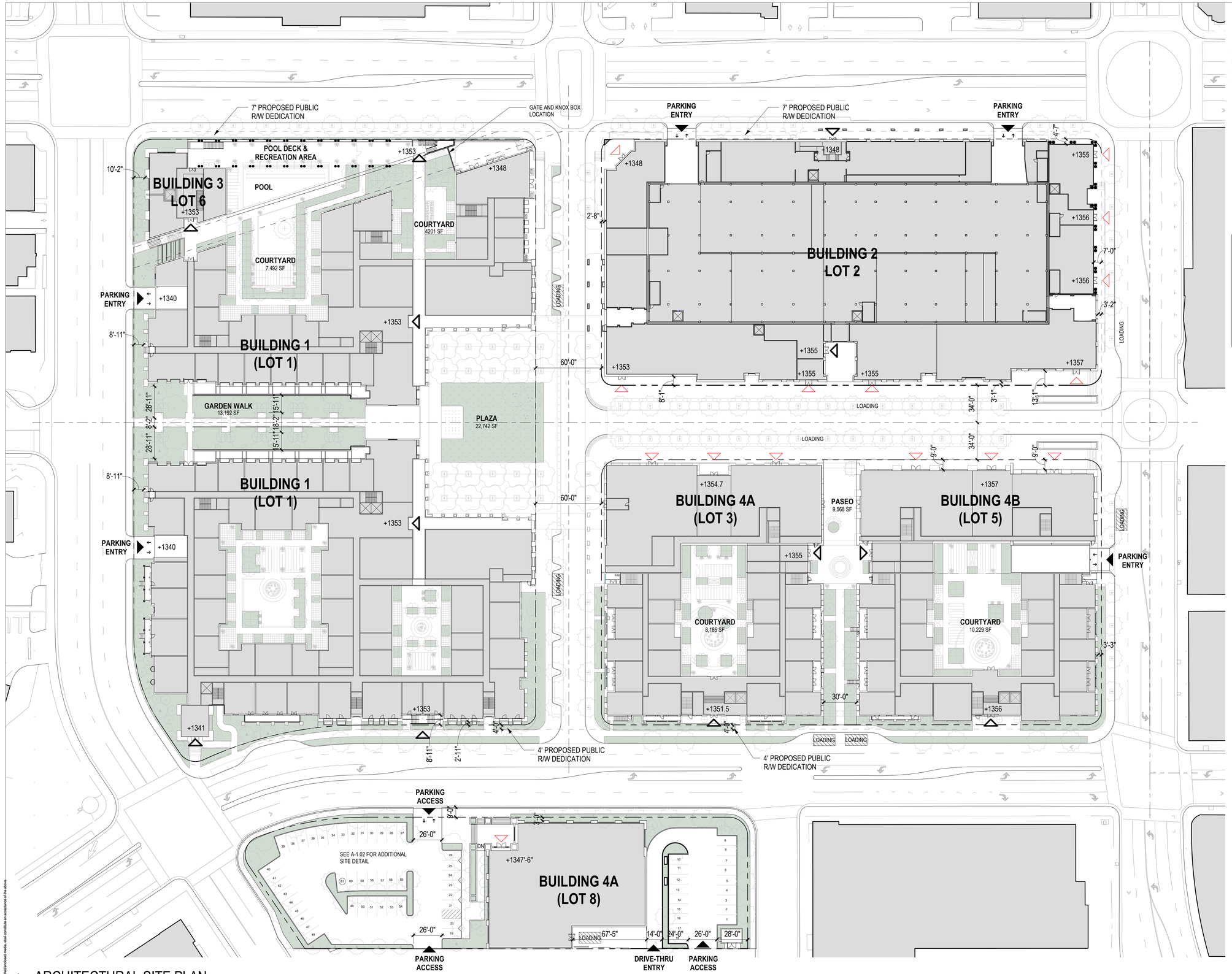

LOADING SPACES

"LOADING SPACE" OR "LOADING ZONE" MEANS THE SPACE ADJACENT TO A CURB OR EDGE OF A ROADWAY RESERVED FOR THE EXCLUSIVE USE OF VEHICLES DURING THE LOADING OR UNLOADING OF PASSENGERS OR MATERIALS (PER TVSP 4.12.C-4)
LOADING ZONE REQUIREMENTS PER TABLE 18.164.340:
1 = 3,000 - 15,000 SF COMMERCIAL AREA
2 = 15,001- 45,000 SF COMMERCIAL AREA

COMMERCIAL LOADING ZONES		
	REQUIRED	PROVIDED
B1	1	2
B2	2	2
BUILDING 3	0	0
B4A	1	1
B4B	1	1
B5	1	1
TOTALS	6	7

FAR SUMMARY

FAR SUMMARY			
BUILDING	TOTAL FLOOR AREA	LOT AREA	FAR
BUILDING 1	413,898.00	Total Lot area combines surface area of Lots 1,2,3,5 and 6. See C 01 for Lot	0.99
BUILDING 2	395,563.00		0.94
BUILDING 3	25,564.00		0.06
BUILDING 4A	117,807.00		0.28
BUILDING 4B	121,000.00		0.29
TOTALS	**1,073,832.00**		**2.85**
LOT AREA	**418,628.96**		
FAR FACTOR	**4.00**		
MAXIMUM FLOOR AREA ALLOWED	**1,674,515.84**		

ARCHITECTURAL SITE PLAN LEGEND

- PLANTING AREAS (SEE L-SERIES FOR DETAILS)
- TYPICAL LOADING ZONE 10' W X 20' L X 14' H
- RESIDENTIAL ENTRY
- RETAIL / COMMERCIAL ENTRY
- PARKING ENTRY

1 ARCHITECTURAL SITE PLAN
1" = 40'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
ARCHITECTURAL SITE PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A1.00
CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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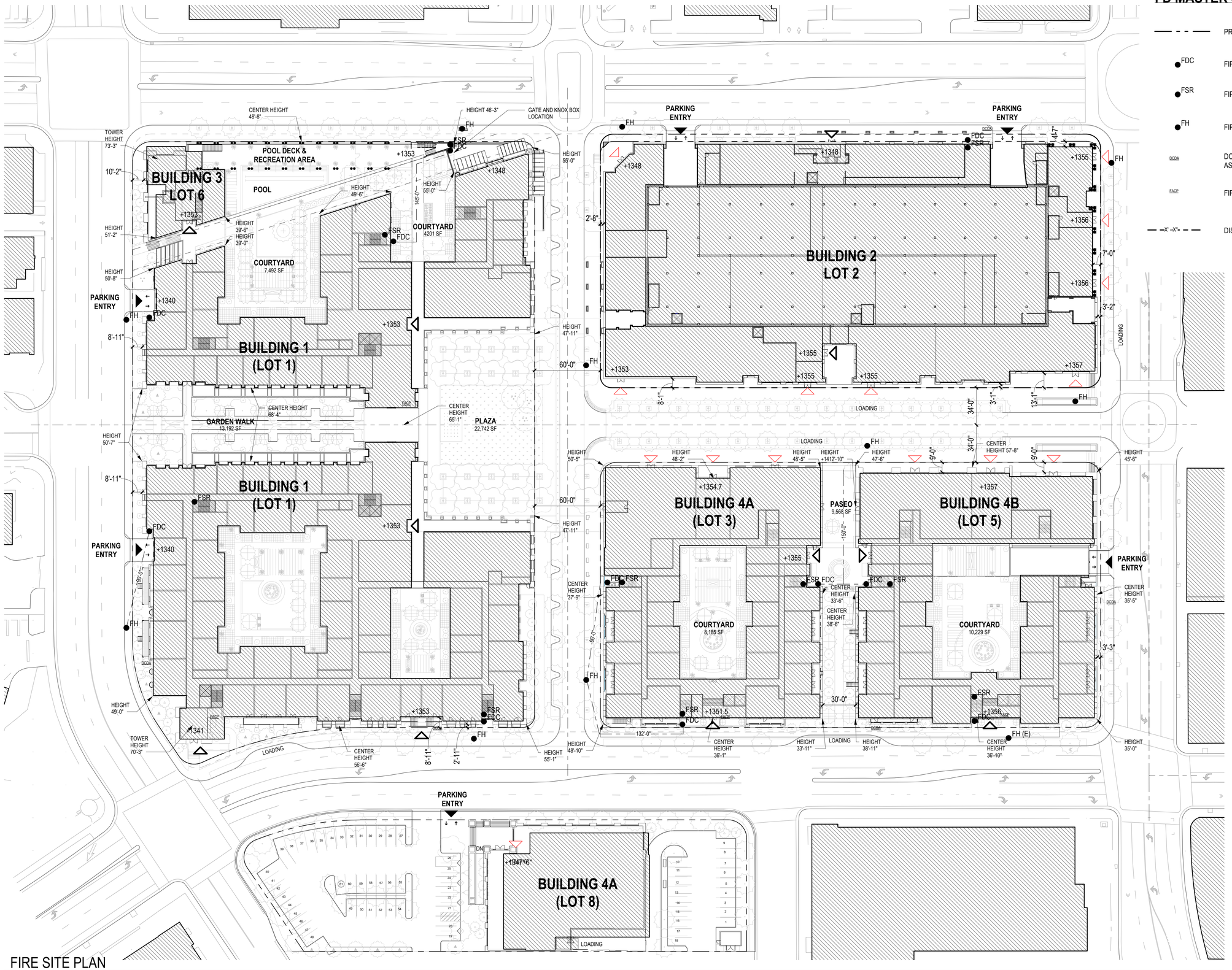

1 FIRE SITE PLAN
1" = 40'-0"

FD MASTER SITE PLAN LEGEND

- PROPERTY LINE
- FDC — FIRE DEPARTMENT CONNECTION
- FSR — FIRE SPRINKLER RISER
- FH — FIRE HYDRANT
- DCDA — DOUBLE CHECK DETECTOR ASSEMBLY
- FACP — FIRE ALARM CONTROL PANEL
- -'X'-'X'- — DISTANCE FROM FDC TO HYDRANT

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
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PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
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TITLE
FIRE DEPARTMENT MASTER SITE PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A1.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

ORIGINAL SHEET SIZE 24" x 36"

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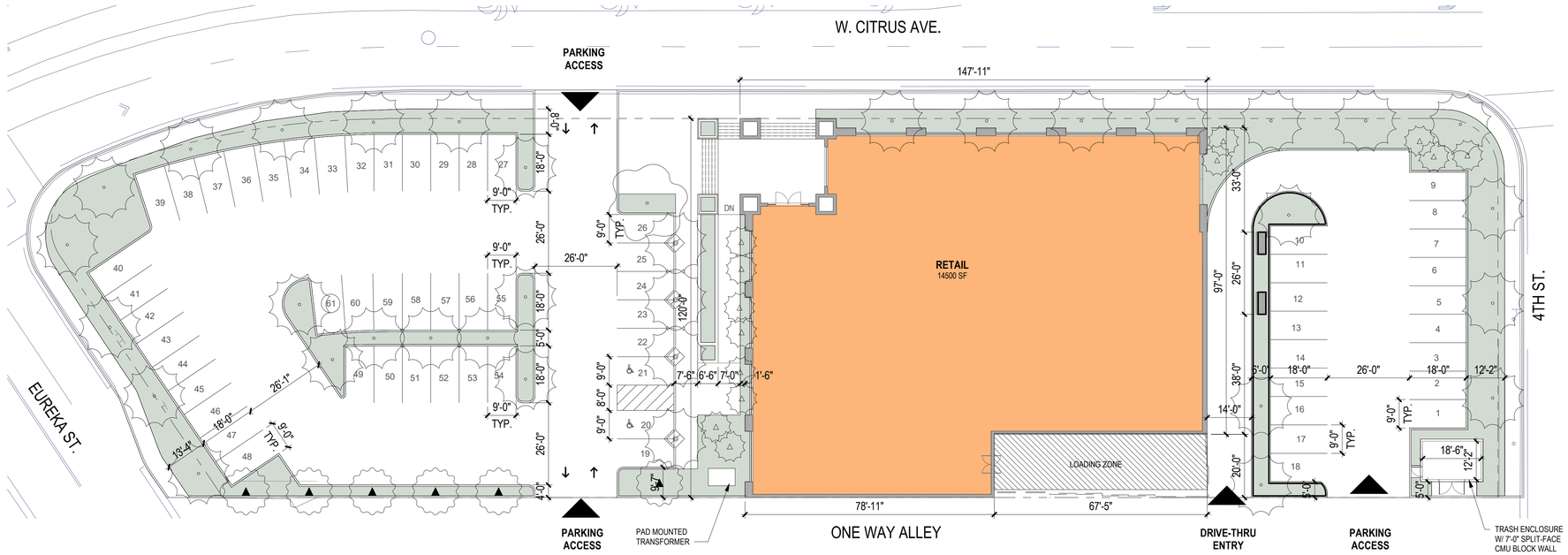

1 CVS SITE PLAN
1" = 20'-0"

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STATE STREET VILLAGE

LOCATION
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PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
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PROJECT MANAGER
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PROJECT ARCHITECT
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PROJECT DESIGNER
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PROJECT TEAM MEMBERS
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CHECK

TITLE
CVS DETAILED SITE PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
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CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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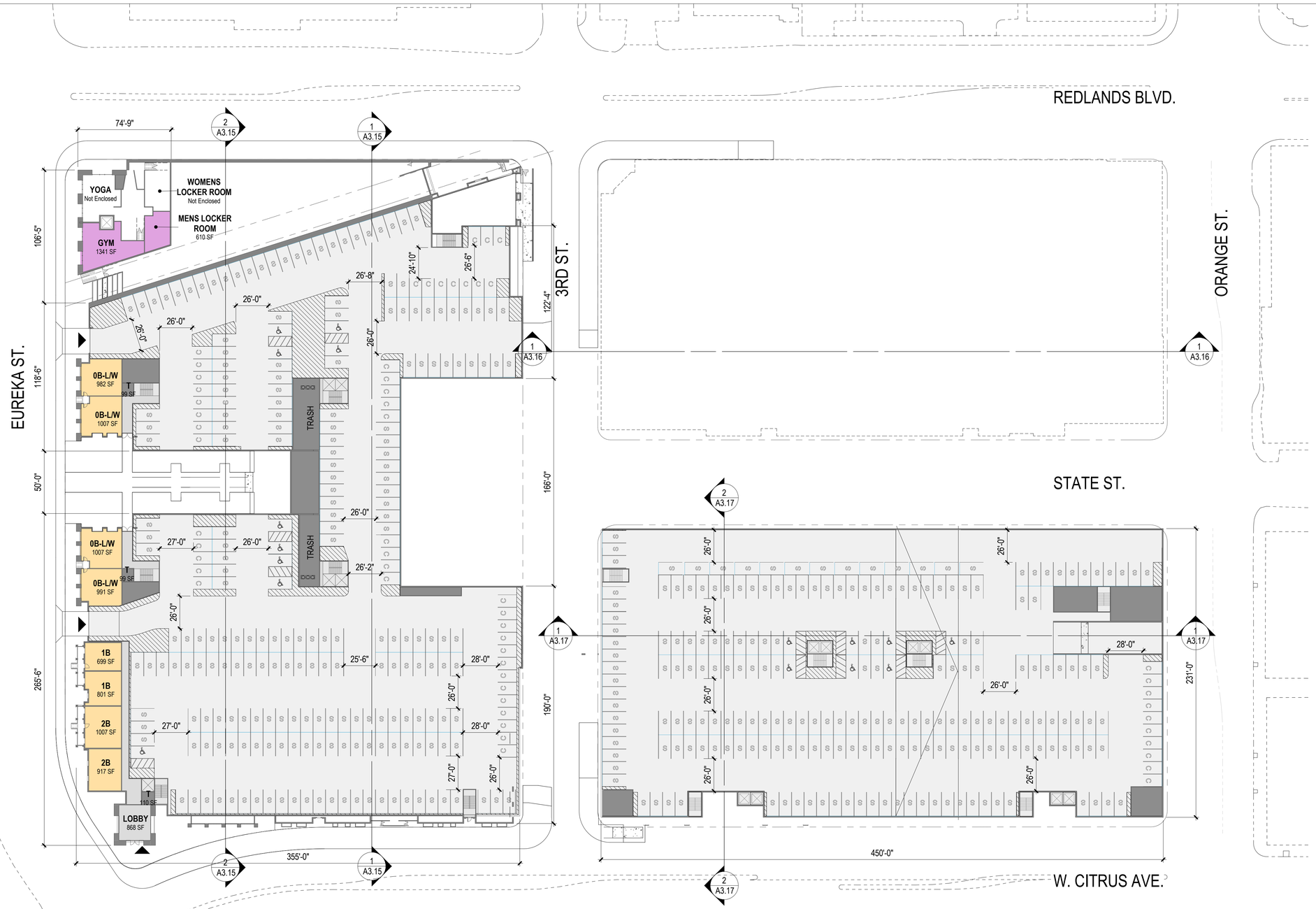

1 LEVEL P1 - OVERALL PLAN
1" = 40'-0"

LEGEND

- CIRCULATION
- COMMUNITY BUILDING
- MECHANICAL
- PARKING
- RESIDENTIAL

PARKING LEGEND

- 9'-0" x 15'-0" — COMPACT PARKING STALL
- 9'-0" x 19'-0" — STANDARD PARKING STALL
- 9'-0" + 8'-0" x 19'-0" — ADA PARKING STALL

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO. DATE REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL P1 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.00
CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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LEGEND

- AMENITY
- CIRCULATION
- COMMUNITY BUILDING
- MECHANICAL
- OFFICE
- PARKING
- PRIVATE OUTDOOR LIVING SPACE
- RESIDENTIAL
- RETAIL
- RETAIL TRASH

1 LEVEL 01 - OVERALL PLAN
1" = 40'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 1 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.01a

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

ORIGINAL SHEET SIZE 24" x 36"

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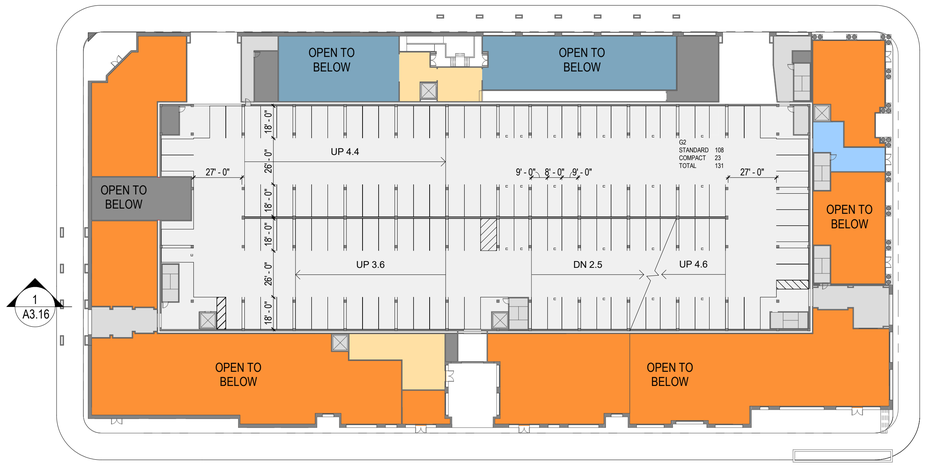

LEGEND

- AMENITY
- CIRCULATION
- MECHANICAL
- OFFICE
- PARKING
- RESIDENTIAL
- RETAIL

1 LEVEL 02 - GARAGE PLAN

1" = 40'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 2 GARAGE PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.01b

CONDITIONAL USE PERMIT NO. 1155 & 1156
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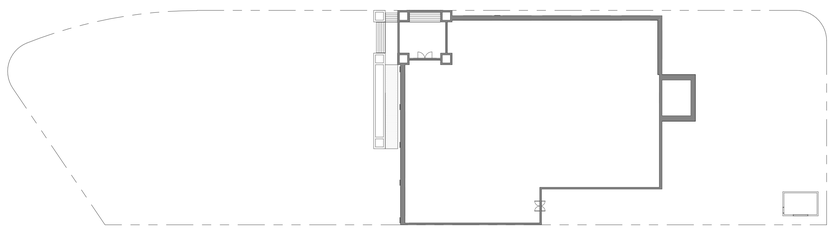

LEGEND

- CIRCULATION
- MECHANICAL
- OFFICE
- PARKING
- PRIVATE OUTDOOR LIVING SPACE
- RESIDENTIAL

1 LEVEL 02 - OVERALL PLAN
1" = 40'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 2 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.02

CONDITIONAL USE PERMIT NO. 1155 & 1156
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LEGEND

- CIRCULATION
- MECHANICAL
- OFFICE
- PARKING
- PRIVATE OUTDOOR LIVING SPACE
- RESIDENTIAL

1 LEVEL 03 - OVERALL PLAN

1" = 40'-0"

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ORIGINAL SHEET SIZE 24" x 36"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 3 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.03

CONDITIONAL USE PERMIT NO. 1155 & 1156
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LEGEND

- CIRCULATION
- MECHANICAL
- OFFICE
- PARKING
- RESIDENTIAL

1 LEVEL 04 - OVERALL PLAN
1" = 40'-0"

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ORIGINAL SHEET SIZE 24" x 36"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO. DATE REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 4 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A2.04

CONDITIONAL USE PERMIT NO. 1155 & 1156
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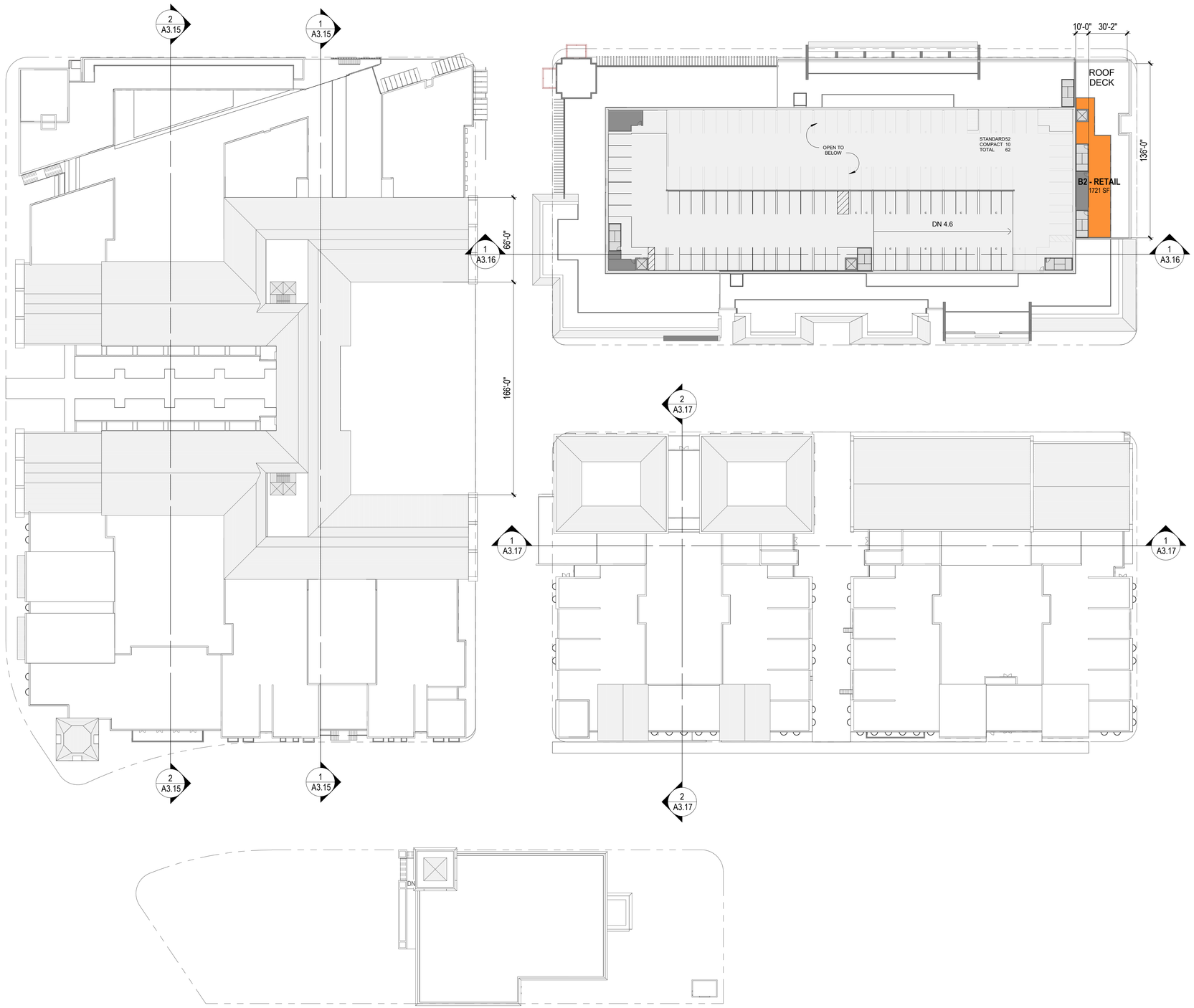

1 LEVEL 05 - OVERALL PLAN
1" = 40'-0"

LEGEND

- CIRCULATION
- MECHANICAL
- PARKING
- RESIDENTIAL
- RETAIL

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
LEVEL 5 BUILDING PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
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COMMISSION REVIEW & APPROVALS 933 & 934

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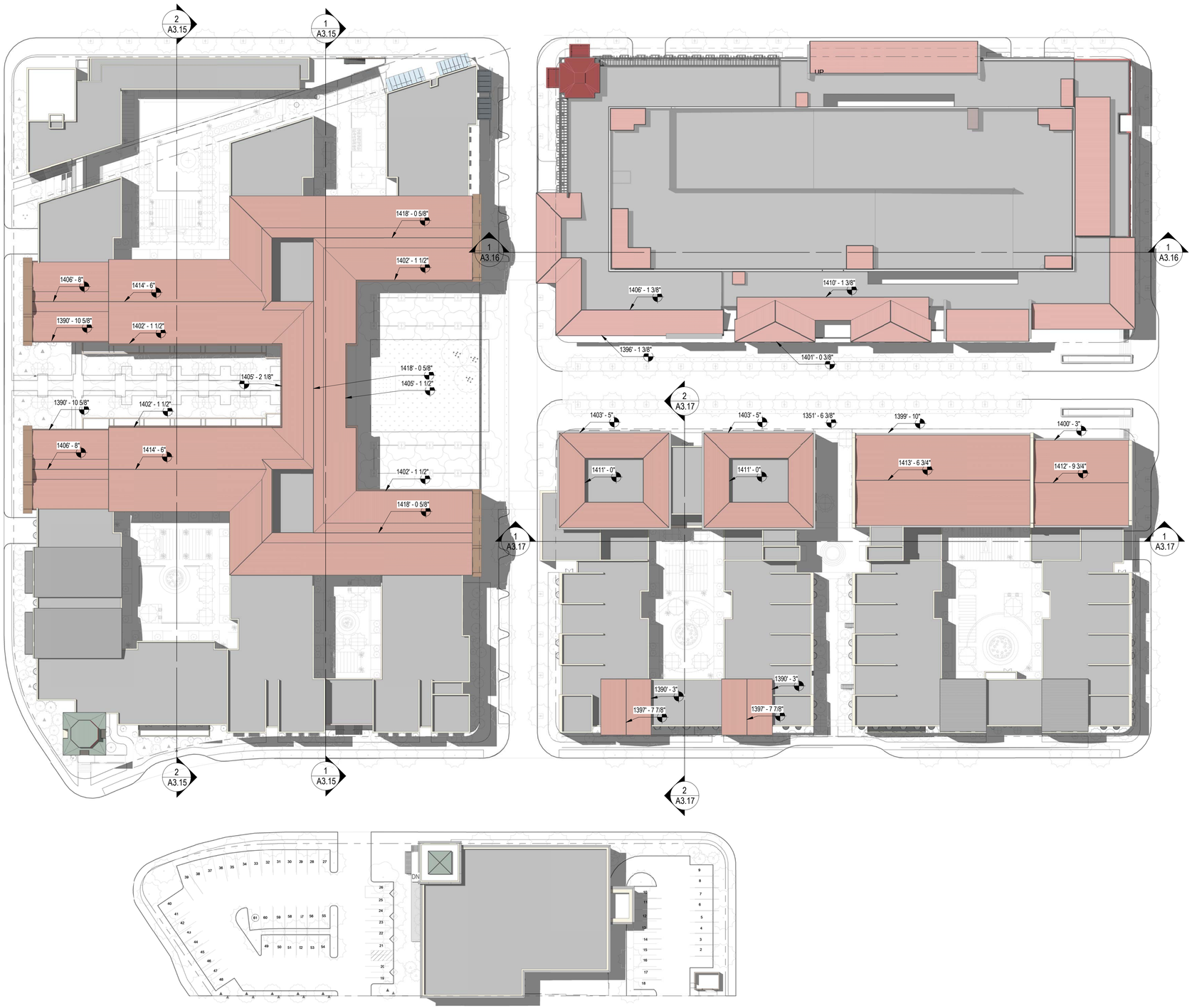

1 ROOF LEVEL - OVERALL PLAN

1" = 40'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
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TITLE
OVERALL ROOF PLAN

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
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CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

ORIGINAL SHEET SIZE 24" x 36"

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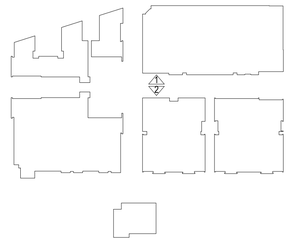
KEY PLAN



2 STATE STREET SOUTH ELEVATION
1/32" = 1'-0"

1 STATE STREET NORTH ELEVATION
1/32" = 1'-0"

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
STREET ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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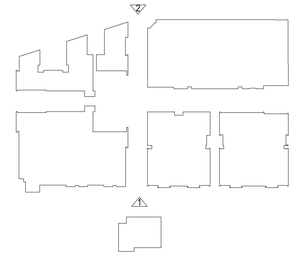
KEY PLAN



2 REDLANDS ELEVATION

1/32" = 1'-0"

1 CITRUS ELEVATION

1/32" = 1'-0"

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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
STREET ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.02

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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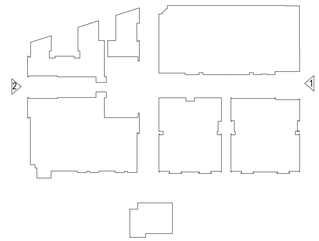

2 EUREKA STREET ELEVATION
1/32" = 1'-0"

1 ORANGE ELEVATION
1/32" = 1'-0"

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Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
STREET ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.03

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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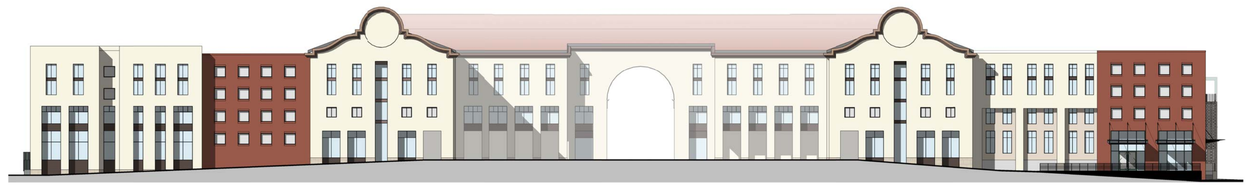
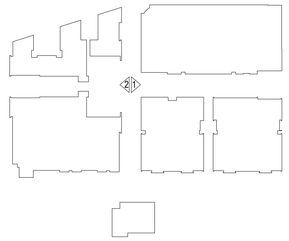


2 3RD STREET WEST ELEVATION
1/32" = 1'-0"

1 3RD ST EAST ELEVATION
1/32" = 1'-0"

KEY PLAN



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Culver City, CA 90232 / 323.937.2150

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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
STREET ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.04

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B1 GARDEN WALK LOOKING NORTH ELEVATION

1/16" = 1'-0"

2 B1 GARDEN WALK LOOKING SOUTH ELEVATION

1/16" = 1'-0"

MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- A-3. ODESSA PINK - BENJAMIN MOORE HC-59
- A-4. SOUTHFIELD GREEN - BENJAMIN MOORE HC-129
- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
- A-7. ROCK GRAY - BENJAMIN MOORE 1615
- A-8. PEWTER - BENJAMIN MOORE 2121-3

B. WINDOW MULLIONS, FRAME, FENCE, AND GUARDRAILS
- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
- C-4. GREEN - GLAZED CERAMIC TILE
- C-5. BLUE - GLAZED CERAMIC TILE
- C-6. CORRUGATED GALVANIZED METAL ROOFING
- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

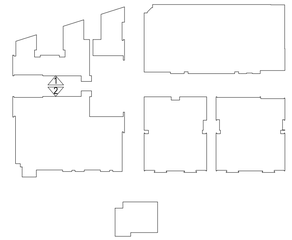
G. BRICK VENEER
- G-1. ROMAN BRICK
- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

KEY PLAN



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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.05

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B1 3RD ST LOOKING WEST ELEVATION (SOUTH)

1/16" = 1'-0"

2 B1 3RD ST LOOKING EAST ELEVATION (NORTH)

1/16" = 1'-0"

MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- A-3. ODESSA PINK - BENJAMIN MOORE HC-59
- A-4. SOUTHFIELD GREEN - BENJAMIN MOORE HC-129
- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
- A-7. ROCK GRAY - BENJAMIN MOORE 1615
- A-8. PEWTER - BENJAMIN MOORE 2121-3

B. WINDOW MULLIONS, FRAME, FENCE, AND GUARDRAILS
- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
- C-4. GREEN - GLAZED CERAMIC TILE
- C-5. BLUE - GLAZED CERAMIC TILE
- C-6. CORRUGATED GALVANIZED METAL ROOFING
- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

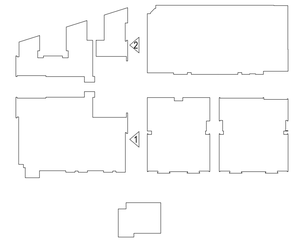
G. BRICK VENEER
- G-1. ROMAN BRICK
- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

KEY PLAN



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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.06

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B1 WEST ELEVATION (NORTH)
1/16" = 1'-0"

2 B1 WEST ELEVATION (SOUTH)
1/16" = 1'-0"

MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
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- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
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- A-8. PEWTER - BENJAMIN MOORE 2121-3

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- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
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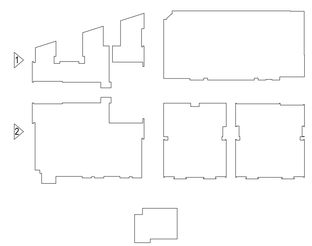
H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

KEY PLAN



NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

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Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.07

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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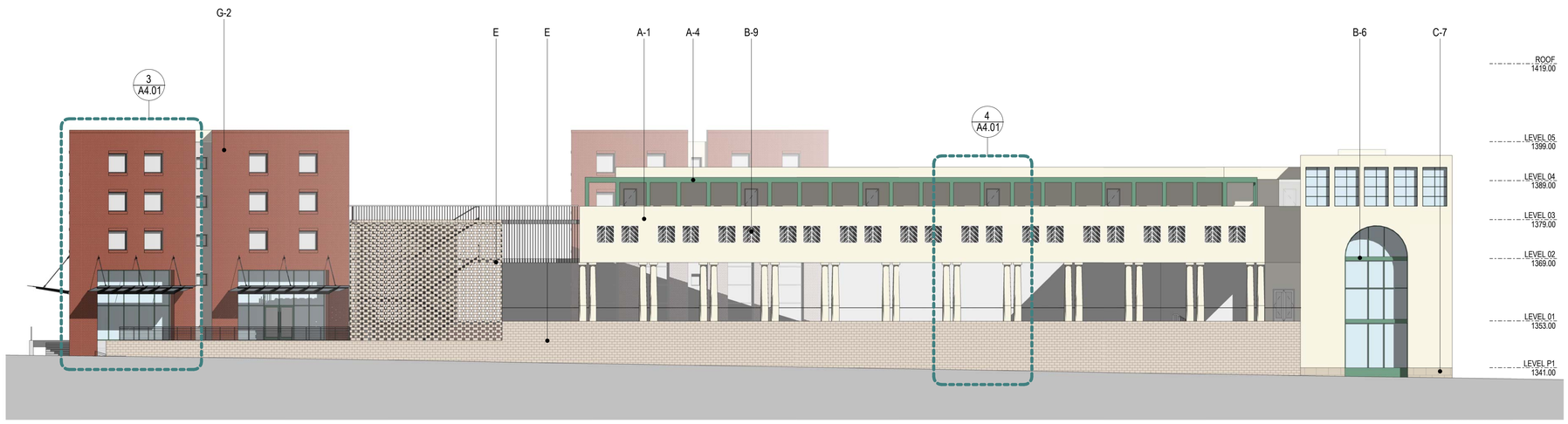
1 B1 SOUTH ELEVATION

1/16" = 1'-0"



2 B1 - B3 NORTH ELEVATION

1/16" = 1'-0"

MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- A-3. ODESSA PINK - BENJAMIN MOORE HC-59
- A-4. SOUTHFIELD GREEN - BENJAMIN MOORE HC-129
- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
- A-7. ROCK GRAY - BENJAMIN MOORE 1615
- A-8. PEWTER - BENJAMIN MOORE 2121-3

B. WINDOW MULLIONS, FRAME, FENCE, AND GUARDRAILS
- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
- C-4. GREEN - GLAZED CERAMIC TILE
- C-5. BLUE - GLAZED CERAMIC TILE
- C-6. CORRUGATED GALVANIZED METAL ROOFING
- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

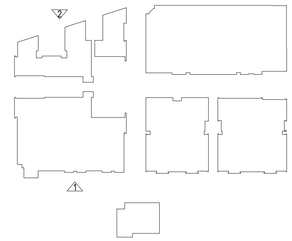
G. BRICK VENEER
- G-1. ROMAN BRICK
- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

KEY PLAN



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PROJECT TEAM MEMBERS
YB, GY, CH, MF
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PROJECT NO.
1921300
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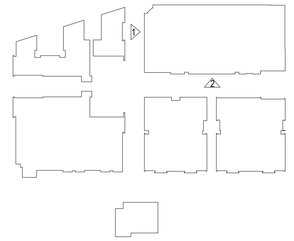
1 B2 WEST ELEVATION

1/16" = 1'-0"

2 B2 SOUTH ELEVATION

1/16" = 1'-0"

KEY PLAN



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- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
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- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
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- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
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- C-3. CONCRETE TILE
- C-4. GREEN - GLAZED CERAMIC TILE
- C-5. BLUE - GLAZED CERAMIC TILE
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- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

G. BRICK VENEER
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- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

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PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
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PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.09

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B2 EAST ELEVATION
1/16" = 1'-0"

2 B2 NORTH ELEVATION
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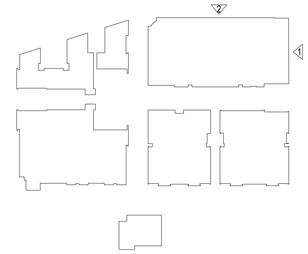
KEY PLAN



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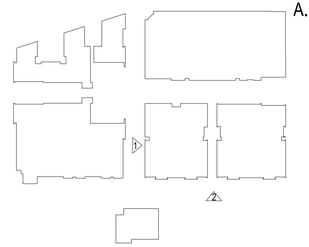

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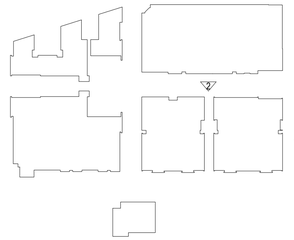
1 B4B EAST ELEVATION

1/16" = 1'-0"

2 B4A - B4B NORTH ELEVATION

1/16" = 1'-0"

KEY PLAN



MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- A-3. ODESSA PINK - BENJAMIN MOORE HC-59
- A-4. SOUTHFIELD GREEN - BENJAMIN MOORE HC-129
- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
- A-7. ROCK GRAY - BENJAMIN MOORE 1615
- A-8. PEWTER - BENJAMIN MOORE 2121-3

B. WINDOW MULLIONS, FRAME, FENCE, AND GUARDRAILS
- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
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- C-5. BLUE - GLAZED CERAMIC TILE
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- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

G. BRICK VENEER
- G-1. ROMAN BRICK
- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

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Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.12

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B4 PASEO EAST ELEVATION

1/16" = 1'-0"

2 B4A PASEO WEST ELEVATION

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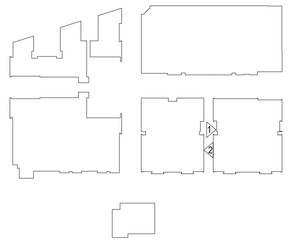

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PROJECT DESIGNER
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PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.13

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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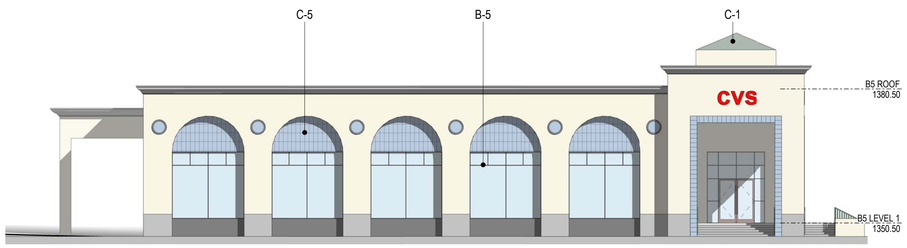
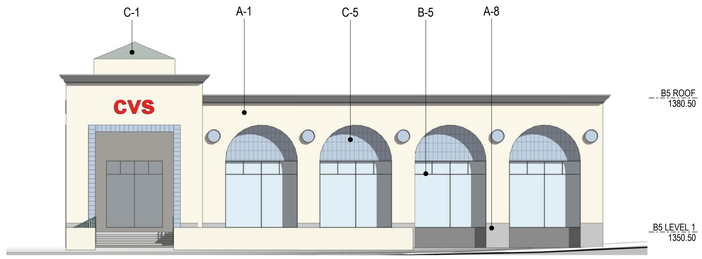
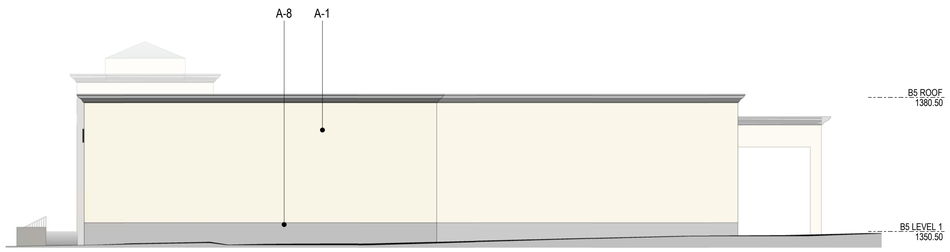


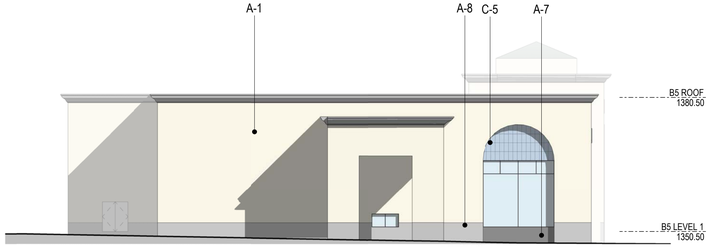
1 CVS NORTH ELEVATION
1/16" = 1'-0"



4 CVS WEST ELEVATION
1/16" = 1'-0"



2 CVS SOUTH ELEVATION
1/16" = 1'-0"



3 CVS EAST ELEVATION
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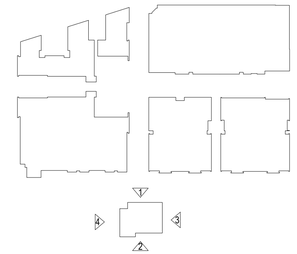
KEY PLAN



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TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILIDNG ELEVATIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.14

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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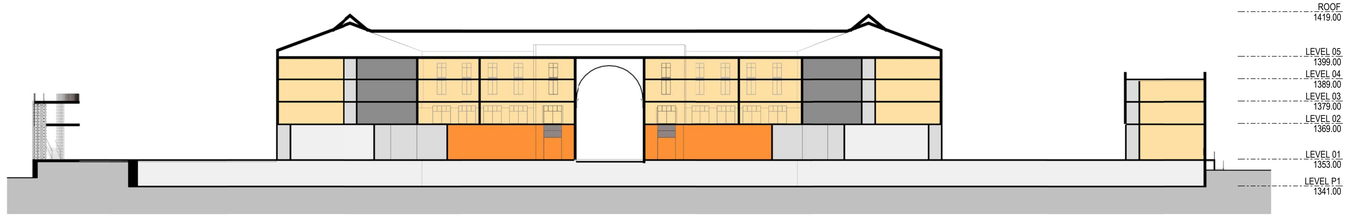


1 B1 B3 SECTION 1

1/32" = 1'-0"

2 B1 B3 SECTION 2

1/32" = 1'-0"

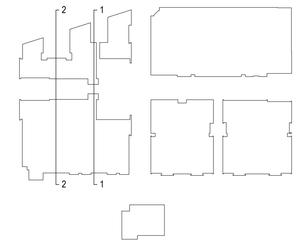
LEGEND

- CIRCULATION
- MECHANICAL
- PARKING
- RESIDENTIAL
- RETAIL

LEGEND

- CIRCULATION
- PARKING
- POOL
- RESIDENTIAL

KEY PLAN



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YB, GY, CH, MF
CHECK

TITLE
BUILDING SECTIONS

PROJECT NO.
1921300
DATE
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SHEET NUMBER
A3.15

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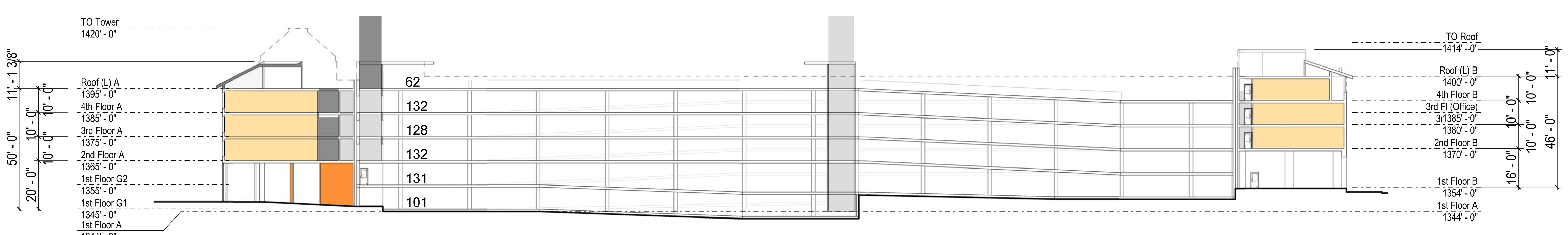
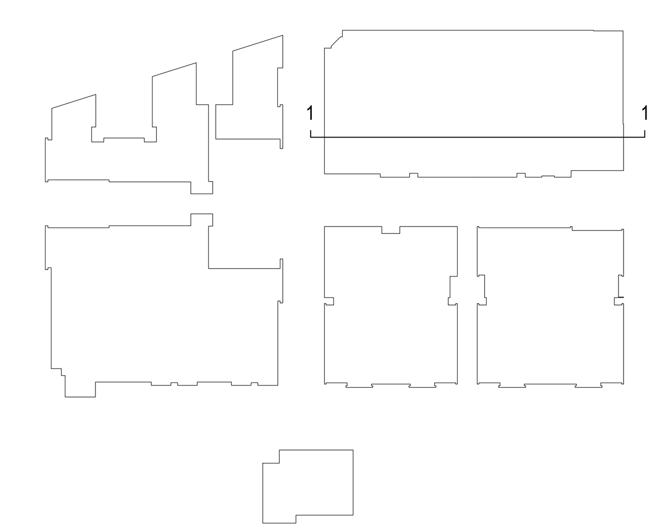


1 **B2 SECTION**
1/32" = 1'-0"

KEY PLAN



NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE 24" x 36"

MITHUN

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SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

mithun.com

TORTI GALLAS + PARTNERS

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING SECTIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.16

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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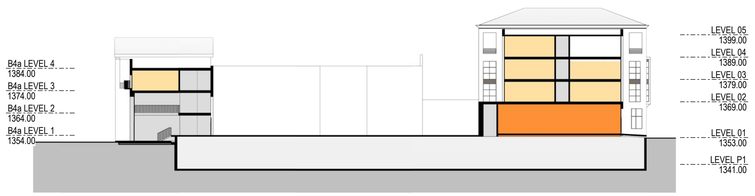
1 B4 SECTION 1

1/32" = 1'-0"



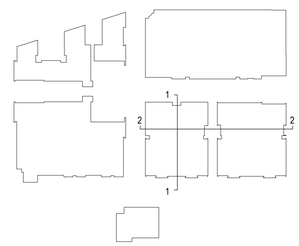
2 B4 SECTION 2

1/32" = 1'-0"

LEGEND

- AMENITY
- CIRCULATION
- PARKING
- RESIDENTIAL
- RETAIL
- RETAIL TRASH

KEY PLAN



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DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
BUILDING SECTIONS

PROJECT NO.
1921300
DATE
10.6.21

SHEET NUMBER
A3.17

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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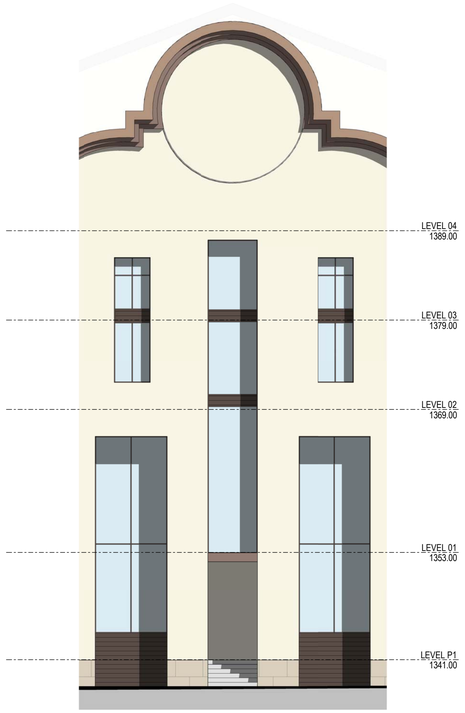
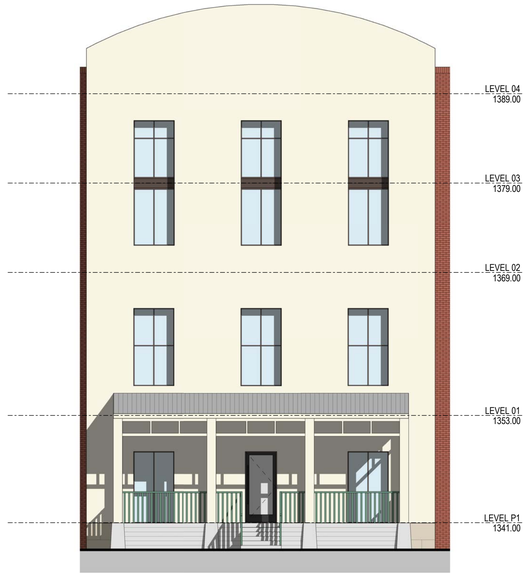
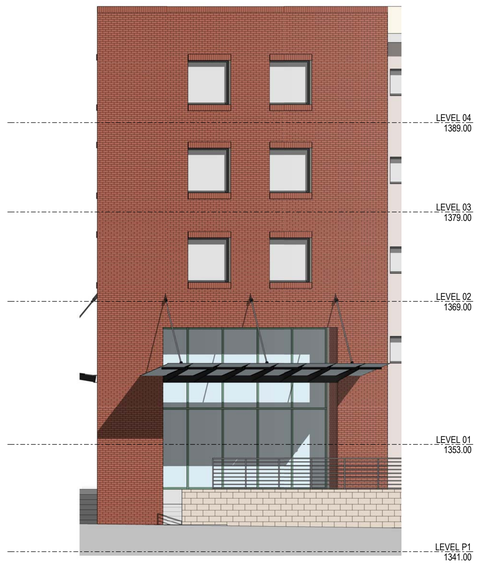


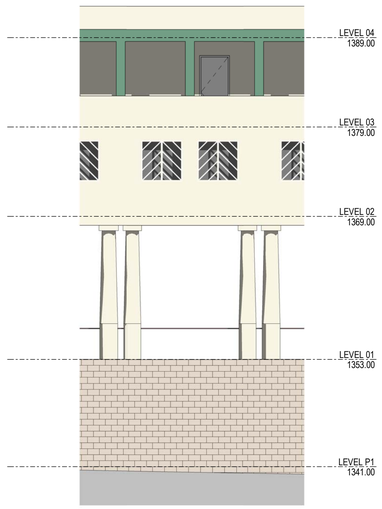
1 B1 MISSION BAY @ EUREKA STREET
1/8" = 1'-0"



2 B1 PORCH @ EUREKA STREET
1/8" = 1'-0"



3 B1 FACADE @ REDLANDS AVE.
1/8" = 1'-0"



4 B3 LOGIA @ REDLANDS AVE.
1/8" = 1'-0"

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DS
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DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
ENLARGED ELEVATIONS

PROJECT NO.
1921300
DATE
10/06/21

SHEET NUMBER
A4.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
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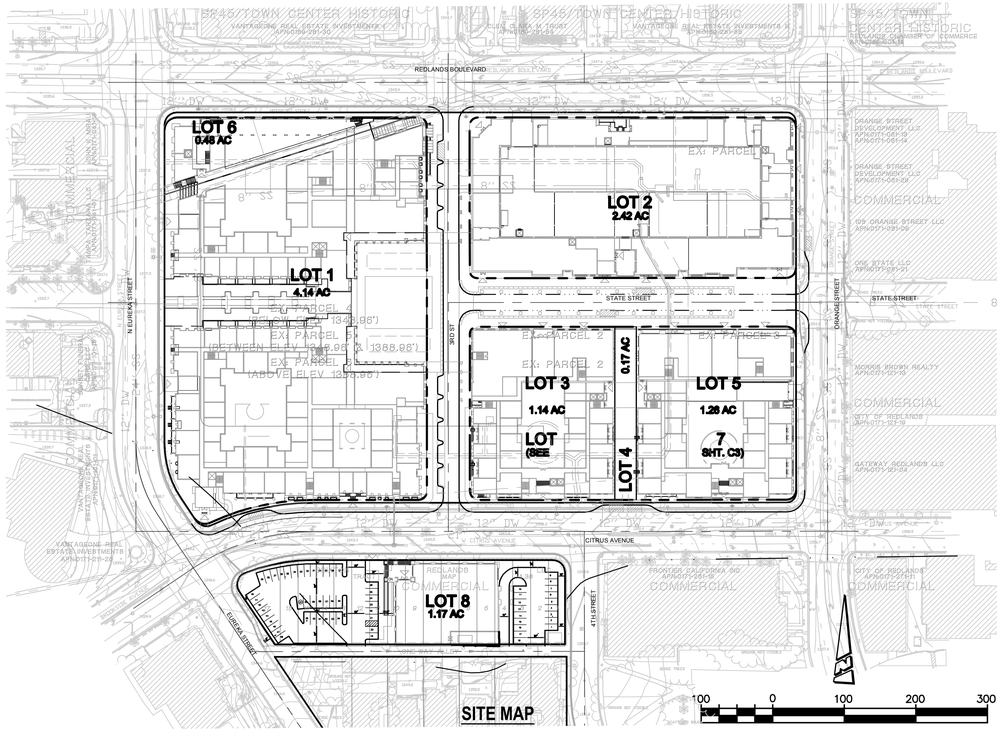


SITE MAP

LEGEND

- 2365 — EXISTING CONTOUR
- 234.5 FS — PROPOSED ELEVATION
- (234.5) FS — EXISTING ELEVATION
- 1.0% — PROPOSED GRADE
- 80 — PROPOSED LOT NUMBER
- XXX.X — PROPOSED PAD ELEVATION
- PROPOSED SLOPE (2: 1 MAX.) UNLESS NOTED OTHERWISE
- STREET CENTERLINE
- TRACT BOUNDARY
- RIGHT OF WAY
- DAYLIGHT
- ADA PATH OF TRAVEL
- SUBSURFACE PARKING
- PROPOSED INFILTRATION CHAMBERS
- PROPOSED PLANTER BOX
- PUBLIC ACCESS EASEMENT
- PRIVATE PATIO EASEMENT
- PRIVATE ARCADE EASEMENT
- EXISTING STREET LIGHTS

ABBREVIATIONS

FL	FLOW LINE	PIP	PROTECT IN PLACE
TC	TOP OF CURB	BVC	BEGIN VERTICAL CURVE
FS	FINISHED SURFACE	EVC	END VERTICAL CURVE
FG	FINISHED GRADE	MVC	MIDDLE OF VERTICAL CURVE
GB	GRADE BREAK	BC	BEGINNING OF CURVE
HP	HIGH POINT	MOC	MIDDLE OF CURVE
LP	LOW POINT	EC	END OF CURVE
EP	EDGE OF PAVEMENT	BSL	BUILDING SETBACK LINE
TW	TOP OF WALL	EX	EXISTING
TF	TOP OF FOOTING	PR	PROPOSED
EG	EXISTING GROUND	APN	ASSESSORS PARCEL NUMBER
RW	RETAINING WALL	DW	DOMESTIC WATER
PL	PROPERTY LINE	F	FIRE WATER
R/W	RIGHT-OF-WAY	SS	SANITARY SEWER
FDC	FIRE DEP. CONNECTION	SD	STORM DRAIN
FSR	FIRE SERVICE RISER	PR	PROPOSED
DTG	DRAINS TO GARAGE	[FB]	PROPOSED FLOOD BARRIER

PUBLIC UTILITY COMPANIES

SEWER:
CITY OF REDLANDS
P.O. BOX 6905
REDLANDS, CA 92375-0903
(909) 798-7516

WATER:
CITY OF REDLANDS
P.O. BOX 6905
REDLANDS, CA 92375-0903
(909) 798-7516

ELECTRIC:
SOUTHERN CALIFORNIA EDISON
287 TENNESSEE STREET
REDLANDS, CA 92373
(909) 307-6731

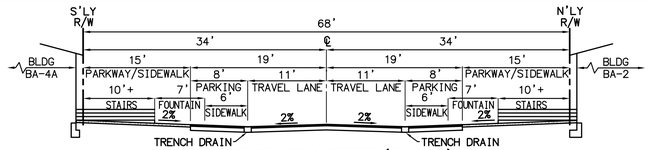
GAS:
SOUTHERN CALIFORNIA GAS
1981 W. LUGONIA AVENUE
REDLANDS, CA 92374-9720
(800) 427-2200

CABLE:
TIME WARNER CABLE
1722 ORANGE TREE LANE
REDLANDS, CA 92373
(909) 793-2321

TELEPHONE:
VERIZON INC.
1500 CRAFTON AVENUE
MENTONE, CA 92359
(909) 794-8210

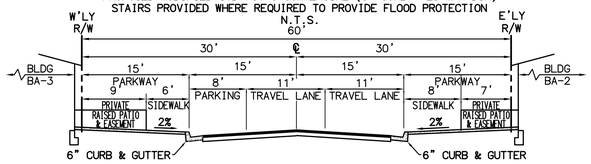
1 CIVIL TITLE AND DETAIL SHEET

1" = 100'-0"



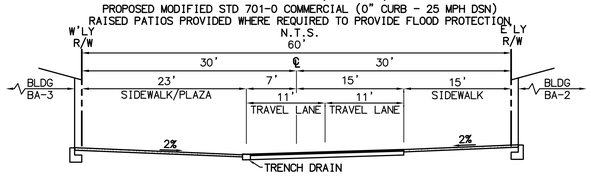
WEST STATE STREET (PUBLIC)

PROPOSED MODIFIED STD 701-0 COMMERCIAL (0" CURB - 25 MPH DSN)
STAIRS PROVIDED WHERE REQUIRED TO PROVIDE FLOOD PROTECTION
N.T.S.



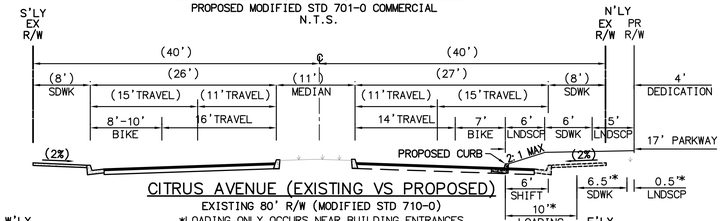
3RD STREET (PUBLIC)

PROPOSED MODIFIED STD 701-0 COMMERCIAL (0" CURB - 25 MPH DSN)
RAISED PATIOS PROVIDED WHERE REQUIRED TO PROVIDE FLOOD PROTECTION
N.T.S.



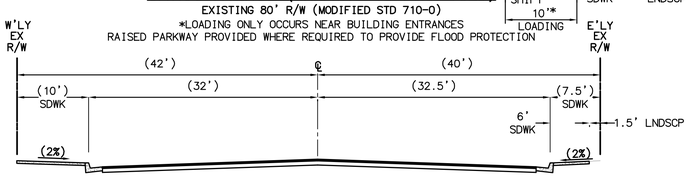
3RD STREET (PUBLIC) PLAZA AREA

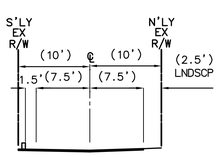
PROPOSED MODIFIED STD 701-0 COMMERCIAL
N.T.S.



CITRUS AVENUE (EXISTING VS PROPOSED)

EXISTING 80' R/W (MODIFIED STD 710-0)
*LOADING ONLY OCCURS NEAR BUILDING ENTRANCES
RAISED PARKWAY PROVIDED WHERE REQUIRED TO PROVIDE FLOOD PROTECTION



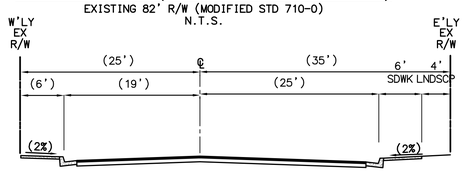


CVS ALLEY (ONE WAY)

N.T.S.

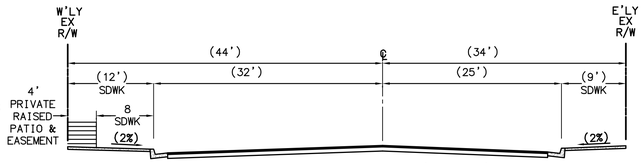
EUREKA STREET (NORTH OF CITRUS-PUBLIC)

EXISTING 82' R/W (MODIFIED STD 710-0)
N.T.S.



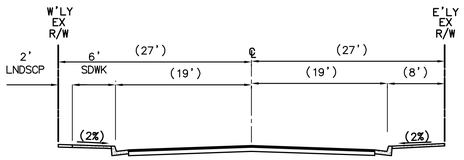
EUREKA STREET (SOUTH OF CITRUS - PUBLIC)

EXISTING 60' R/W (MODIFIED STD 710-0)
N.T.S.



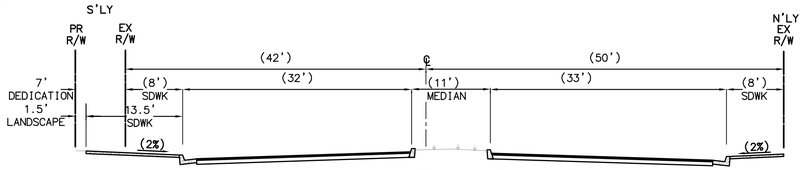
ORANGE STREET (PUBLIC)

EXISTING 78' R/W - NO PARKING - (MODIFIED STD 710-0)
RAISED PATIO PROVIDED WHERE REQUIRED TO PROVIDE FLOOD PROTECTION
N.T.S.



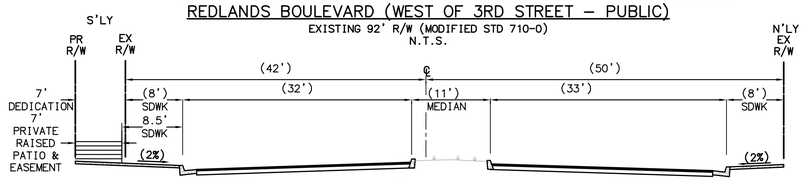
4TH STREET (PUBLIC)

EXISTING 60' R/W (MODIFIED STD 710-0)
N.T.S.



REDLANDS BOULEVARD (WEST OF 3RD STREET - PUBLIC)

EXISTING 92' R/W (MODIFIED STD 710-0)
N.T.S.

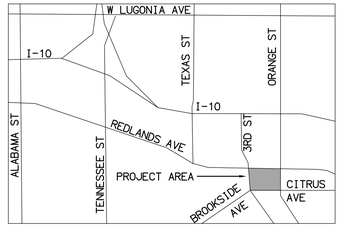


REDLANDS BOULEVARD (EAST OF 3RD STREET-PUBLIC)

EXISTING 92' R/W (MODIFIED STD 710-0)
RAISED PATIO PROVIDED WHERE FLOOD PROTECTION IS REQUIRED
N.T.S.

OWNERSHIP AND MAINTENANCE RESPONSIBILITY

LOT / STREET	RESPONSIBLE PARTY
STATE STREET EXTENSION	CITY OF REDLANDS
3RD STREET EXTENSION	CITY OF REDLANDS
LOT 1	PRIVATE ENTITY
LOT 2	PRIVATE ENTITY
LOT 3	PRIVATE ENTITY
LOT 4	PRIVATE ENTITY
LOT 5	PRIVATE ENTITY
LOT 6	PRIVATE ENTITY
LOT 7	PRIVATE ENTITY
LOT 8	PRIVATE ENTITY



VICINITY MAP
N.T.S.

CIVIL SHEET INDEX

TITLE & DETAIL SHEET	C.01
TENTATIVE TRACT MAP	C.02
TENTATIVE TRACT MAP	C.03
CONCEPTUAL GRADING	C.04
SITE PLAN	C.05
OFFSITE STRIPING	C.06

APPLICANT

VILLAGE PARTNERS VENTURES, LLC
4340 VON KARMAN AVE, SUITE 110
NEWPORT BEACH, CA 92660
(949) 478-1450 | MICHAEL MORRIS

CIVIL ENGINEER & SURVEYOR

PROACTIVE ENGINEERING CONSULTANTS INC.
200 S. MAIN STREET, SUITE 300
CORONA, CA 92882
(951) 280-3300 | SCOTT GILBERT

LANDSCAPE ARCHITECT

IMA DESIGN
5281 CALIFORNIA AVE
IRVINE, CA 92617
(949) 954-7525 | WILLIAM F. SCHULZ

AERIAL TOPOGRAPHY

VERTICAL MAPPING RESOURCES
941 ORANGE AVENUE, SUITE 126
CORONADO, CA 92118
(619) 425-1200
DATE OF AERIAL: NOVEMBER 2017

GENERAL NOTES

1. VESTING TENTATIVE TRACT MAP FOR CONDOMINIUM PURPOSES
2. TOTAL PROJECT AREA:
   2.1. GROSS AREA: 12.25 AC (DEVELOPMENT AC)
   2.2. NET AREA: 10.78 AC
3. PROJECT CONSISTS OF THE FOLLOWING APNS:
   3.1. MALL SITE APN: 0171-053-01 THRU 06
   3.2. CVS SITE APN: 0171-251-06 THRU 10
4. NUMBER OF PROPOSED LOTS: 8
5. REQUIRED LANDSCAPE AREA: SEE LANDSCAPE SHEETS
6. PROVIDED LANDSCAPE AREA: SEE LANDSCAPE SHEETS
7. LANDSCAPE LOTS/PARCELS: NONE
8. LOT COVERAGE OF PLANNED STRUCTURES: SEE ARCHITECTURAL SHEET
9. ALL STRUCTURES, IMPROVEMENTS, TREES AND LANDSCAPE WITHIN AND FRONTING THE SUBJECT PROPERTY IS TO BE REMOVED AND REPLACED UNLESS NOTED AT PROTECT IN PLACE.
10. FEMA MAP #06071C8716H DATED 8/28/2008
    ZONE DESIGNATION AO (DEPTH OF 1 FT) PANEL 8716 OF 9400
11. EASEMENTS AND RIGHTS OF RECORD PER PRELIMINARY TITLE REPORT PREPARED BY FIRST AMERICAN TITLE COMPANY DATED MARCH 18, 2021 REPORT #NCS-947677-SD
12. ALL EXISTING EASEMENTS TO BE ABANDONED UNLESS OTHERWISE NOTED.
13. SEE ARCHITECTURAL SHEETS FOR PROVIDED PARKING
14. SEE ARCHITECTURAL SHEETS FOR RESIDENTIAL UNIT COUNT AND COMMERCIAL/RETAIL AREA INFORMATION
15. SEE LANDSCAPE ARCHITECT PACKAGE FOR LANDSCAPE AREA AND INFORMATION
16. MINIMUM FIRE FLOW IS 4,000 GPM AT 20 PSI FOR 4 HOURS

BASIS OF BEARING

THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF REDLANDS BOULEVARD HAVING A BEARING OF NORTH 89°59'05" EAST, PER PARCEL MAP NO. 2998, FILED IN BOOK 25, PAGES 90 THROUGH 92, OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, STATE OF CALIFORNIA.

BENCHMARK

CITY OF REDLANDS DESIGNATION: R-59
A BRASS DISK IN TOP OF CURB AT THE WEST SIDE OF FLAGPOLE ISLAND AT THE INTERSECTION OF CAJON ST. AND VINE ST., IN FRONT OF CITY HALL.
ELEVATION (FEET): 1358.504 (NGVD29) (ADJ. 1/96)

LEGAL DESCRIPTION

PARCEL MAP NO. 2998, RECORDED JANUARY 8, 1976 IN BOOK 25, PAGES 90 THROUGH 92, INCLUSIVE OF PARCEL MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA AND LOTS 1 THRU 17 PER MAP RECORDED IN BOOK 4, PAGE 38.

SLOPE PLANTING AND EROSION CONTROL

FACES OF FINISHED CUT AND FILL SLOPES SHALL BE PREPARED AND MAINTAINED TO CONTROL AGAINST EROSION. DEVELOPER INTENDS TO PROVIDE ADEQUATE EROSION CONTROL PROTECTION FOR THE SLOPES PER CALIFORNIA SWPPP AND WATER QUALITY STANDARDS. ALL SLOPES SHOWN TO BE 2: 1 MAX UNLESS OTHERWISE SHOWN.

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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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PROACTIVE ENGINEERING CONSULTANTS
200 South Main Street. Suite 300
Corona, CA 92882 (951) 280-3300

PROJECT
STATE STREET VILLAGE
VTTM 20425

LOCATION
REDLANDS, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

REGISTERED PROFESSIONAL ENGINEER
SCOTT P. GILBERT
NO. 65194
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED
UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194
DATE

TITLE
CIVIL TITLE & DETAIL SHEET

PROJECT NO.
10.068.000
DATE
8/13/2021

SHEET NUMBER
C.01
C.U.P. APPLICATION

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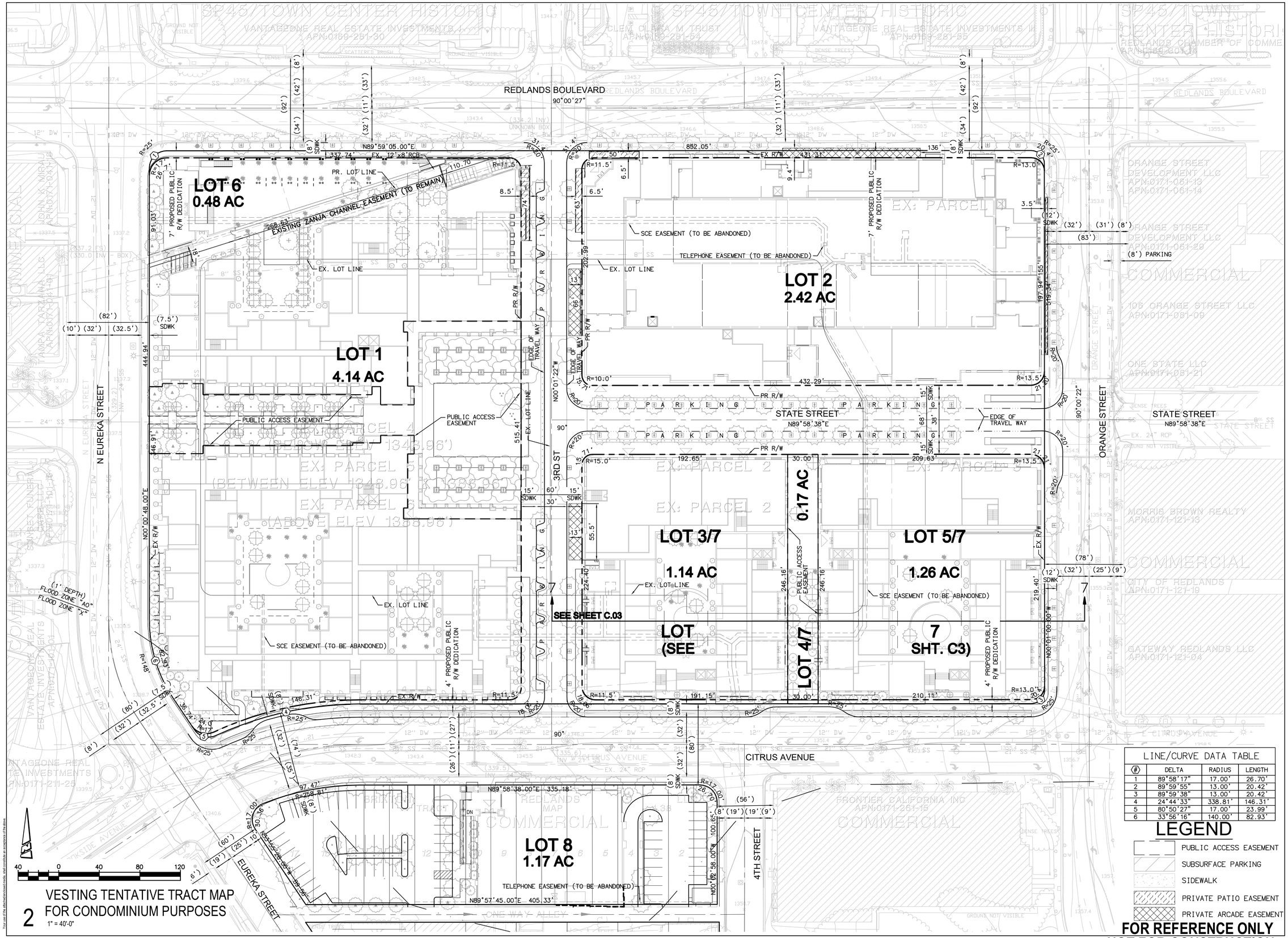

LINE/CURVE DATA TABLE

(#)	DELTA	RADIUS	LENGTH
1	89°58'17"	17.00'	26.70'
2	89°59'55"	13.00'	20.42'
3	89°59'38"	13.00'	20.42'
4	24°44'33"	338.81'	146.31'
5	80°50'27"	17.00'	23.99'
6	33°56'16"	140.00'	82.93'

LEGEND

- PUBLIC ACCESS EASEMENT
- SUBSURFACE PARKING
- SIDEWALK
- PRIVATE PATIO EASEMENT
- PRIVATE ARCADE EASEMENT

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2 VESTING TENTATIVE TRACT MAP FOR CONDOMINIUM PURPOSES
1" = 40'-0"

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200 South Main Street, Suite 300
Corona, CA 92882 (951) 280-3300

PROJECT
STATE STREET VILLAGE
VTTM 20425

LOCATION
REDLANDS, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

REGISTERED PROFESSIONAL ENGINEER
SCOTT P. GILBERT
NO. 65194
CIVIL
STATE OF CALIFORNIA

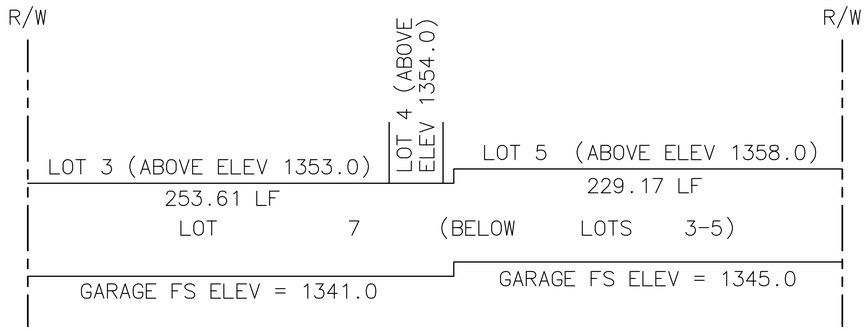
PLANS PREPARED UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194
DATE

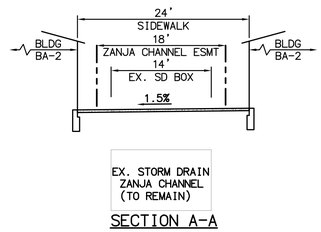
TITLE
VESTING TENTATIVE TRACT MAP FOR CONDOMINIUM PURPOSES

PROJECT NO
10.068.000
DATE
8/13/2021

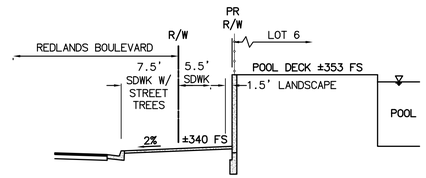
SHEET NUMBER
C.02
C.U.P. APPLICATION



LOT 7 SECTION VIEW
NOTE: ELEVATIONS SHOWN APPROXIMATE



SECTION A-A
SEE SHEET 4
N.T.S.



SECTION B-B
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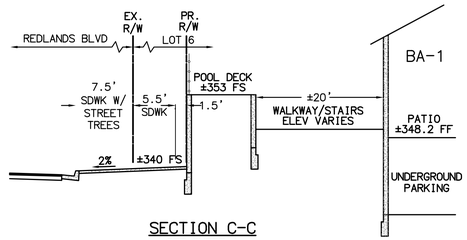

SECTION C-C
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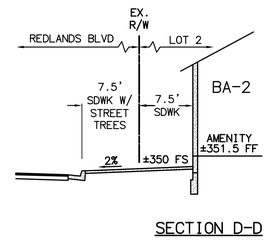

SECTION D-D
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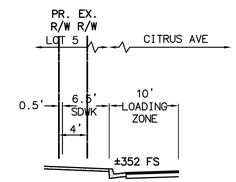
N.T.S.



SECTION E-E
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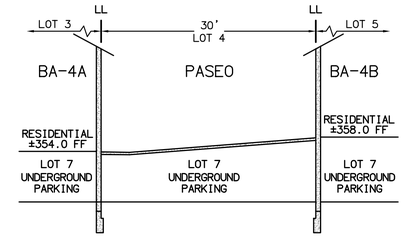

SECTION F-F
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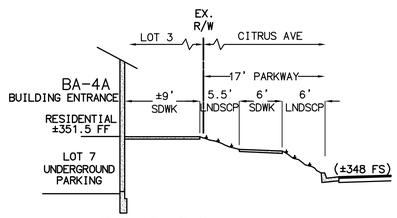
N.T.S.



SECTION G-G
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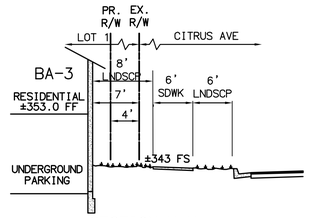

SECTION H-H
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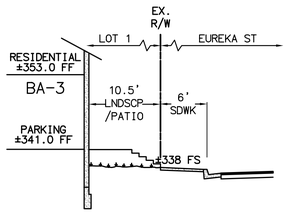
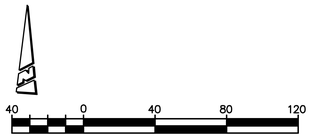


SECTION I-I
SEE SHEET 4
N.T.S.



3 VESTING TENTATIVE TRACT MAP & CONCEPTUAL GRADING SECTIONS
1" = 40'-0"

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VTTM 20425

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MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

REGISTERED PROFESSIONAL ENGINEER
SCOTT P. GILBERT
NO. 65194
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED
UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194 DATE

TITLE
VESTING TENTATIVE TRACT MAP & CONCEPTUAL GRADING CROSS SECTIONS

PROJECT NO.
10.068.000
DATE
8/13/2021

SHEET NUMBER
C.03
C.U.P. APPLICATION

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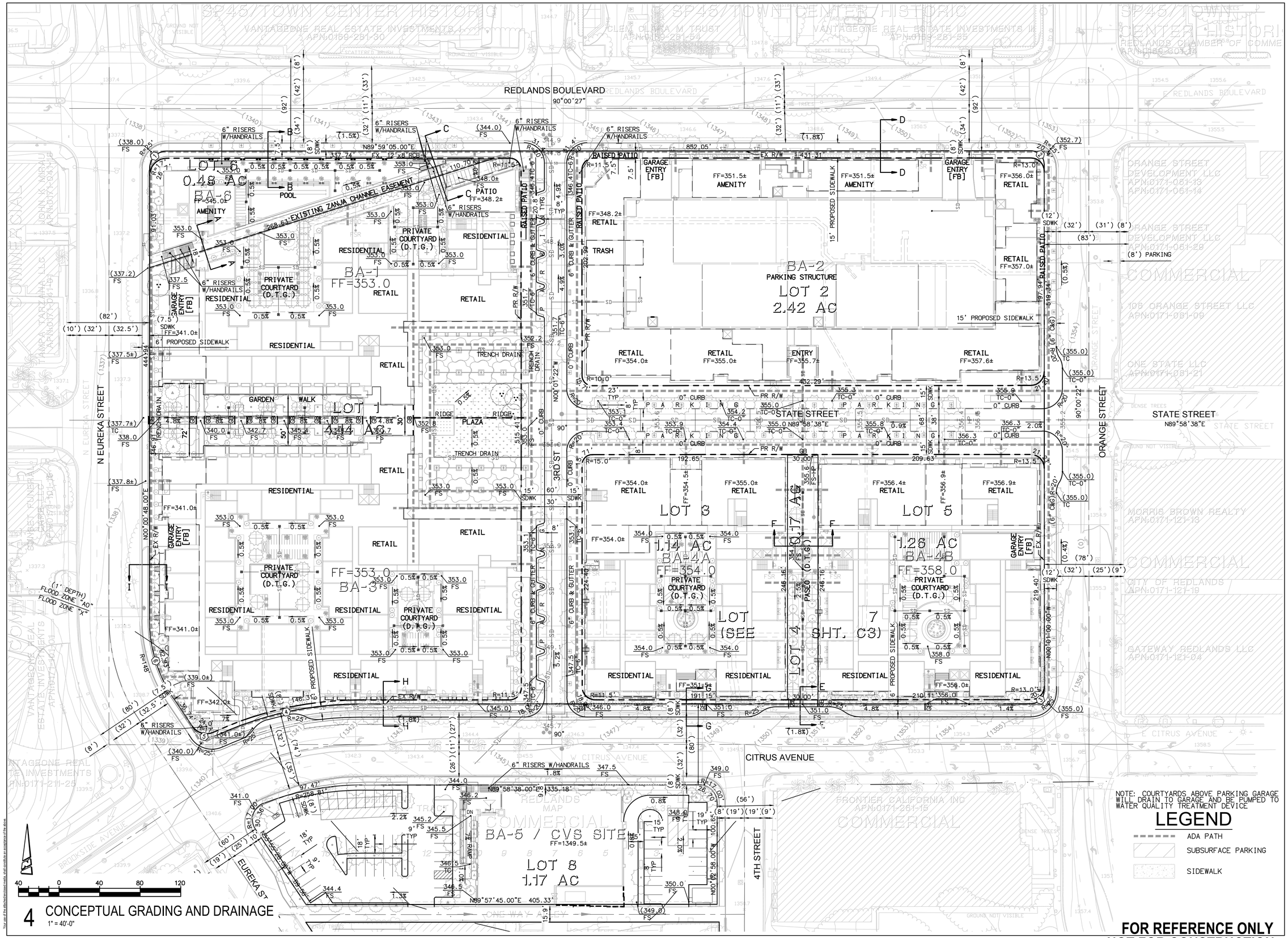

4 CONCEPTUAL GRADING AND DRAINAGE
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PROJECT
STATE STREET VILLAGE
VTTM 20425

LOCATION
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PREPARED FOR
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PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

REGISTERED PROFESSIONAL ENGINEER
SCOTT P. GILBERT
NO. 65194
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED
UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194
DATE

TITLE
CONCEPTUAL GRADING AND DRAINAGE PLAN

PROJECT NO.
10.068.000
DATE
8/13/2021

SHEET NUMBER
C.04
C.U.P. APPLICATION

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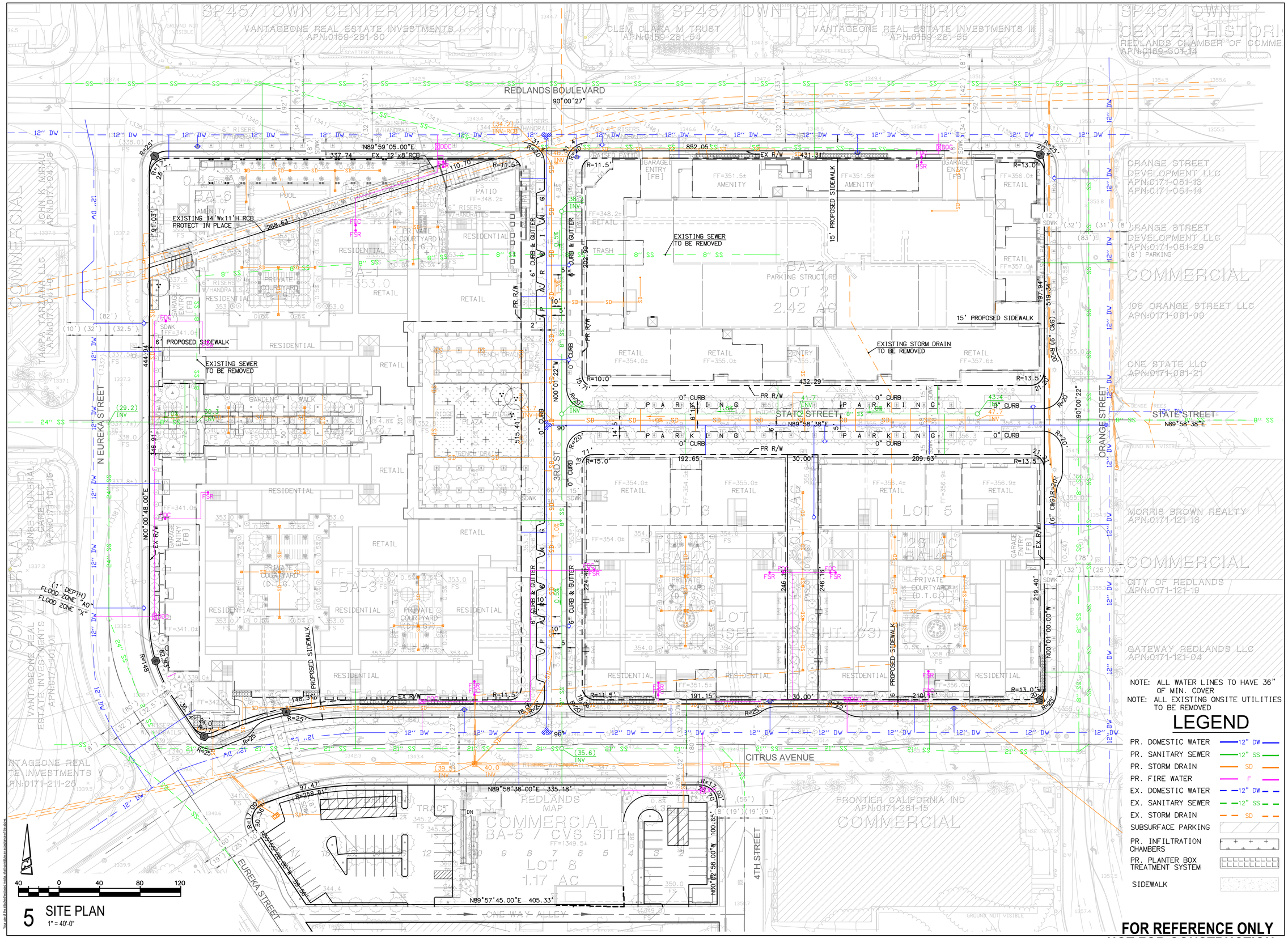

5 SITE PLAN
1" = 40'-0"

NOTE: ALL WATER LINES TO HAVE 36" OF MIN. COVER
NOTE: ALL EXISTING ONSITE UTILITIES TO BE REMOVED

LEGEND

- PR. DOMESTIC WATER — 12" DW
- PR. SANITARY SEWER — 12" SS
- PR. STORM DRAIN — SD
- PR. FIRE WATER — F
- EX. DOMESTIC WATER — 12" DW
- EX. SANITARY SEWER — 12" SS
- EX. STORM DRAIN — SD
- SUBSURFACE PARKING
- PR. INFILTRATION CHAMBERS
- PR. PLANTER BOX TREATMENT SYSTEM
- SIDEWALK

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200 South Main Street, Suite 300
Corona, CA 92882 (951) 280-3300

PROJECT
STATE STREET VILLAGE
VTTM 20425

LOCATION
REDLANDS, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

NO.	DATE	REVISION

DESIGN PARTNER: DS
PROJECT MANAGER: DV
PROJECT ARCHITECT: MM
PROJECT DESIGNER: JE
PROJECT TEAM MEMBERS: YB, GY, CH, MF
CHECK:

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

PLANS PREPARED UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194
DATE

TITLE
SITE PLAN

PROJECT NO
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5/7/2021 11:54:29 AM

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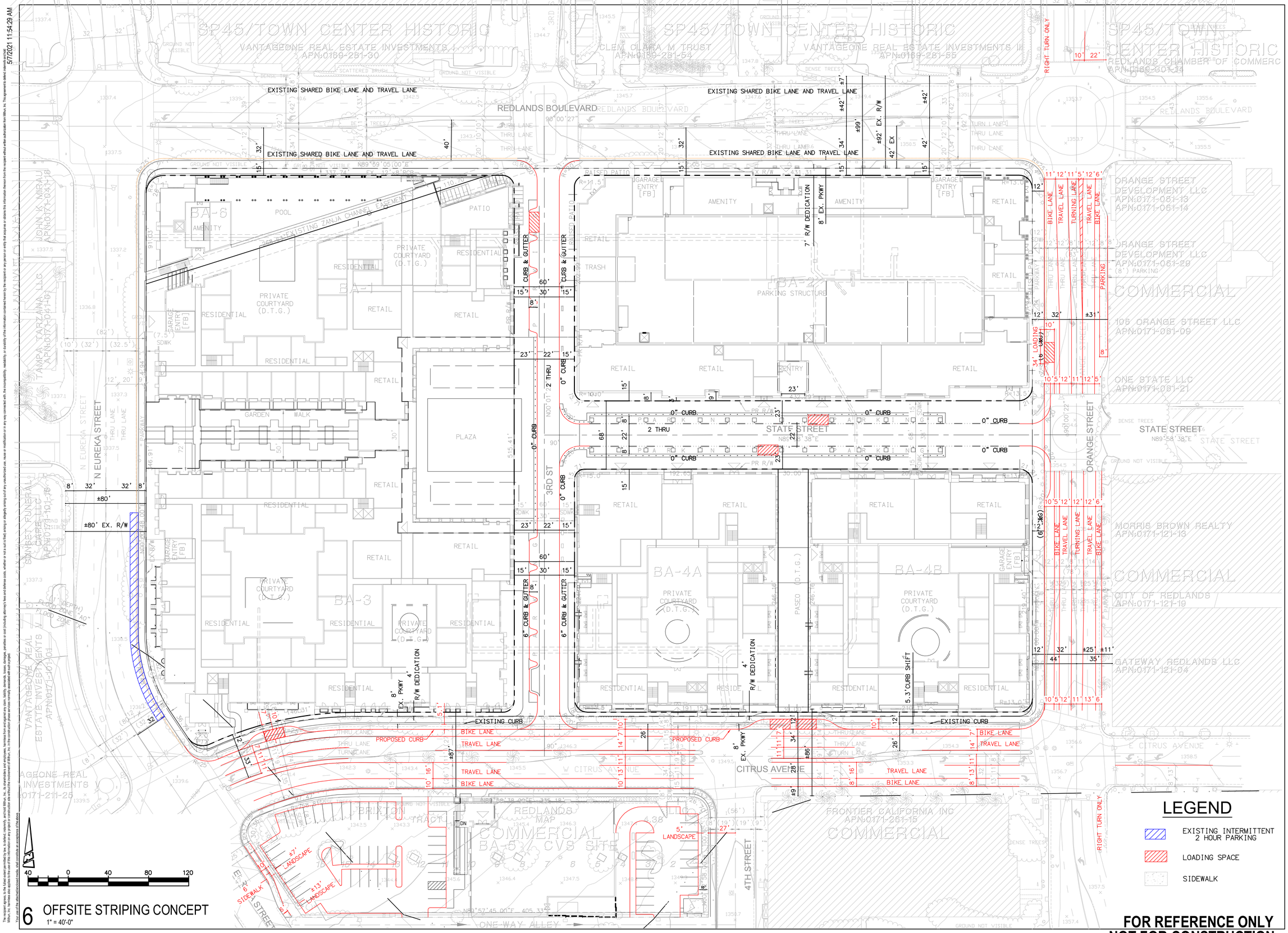

6 OFFSITE STRIPING CONCEPT
1" = 40'-0"

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PROACTIVE ENGINEERING CONSULTANTS
200 South Main Street, Suite 300
Corona, CA 92882 (951) 280-3300

PROJECT
STATE STREET VILLAGE
VTTM 20425

LOCATION
REDLANDS, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

REGISTERED PROFESSIONAL ENGINEER
SCOTT P. GILBERT
NO. 65194
CIVIL
STATE OF CALIFORNIA

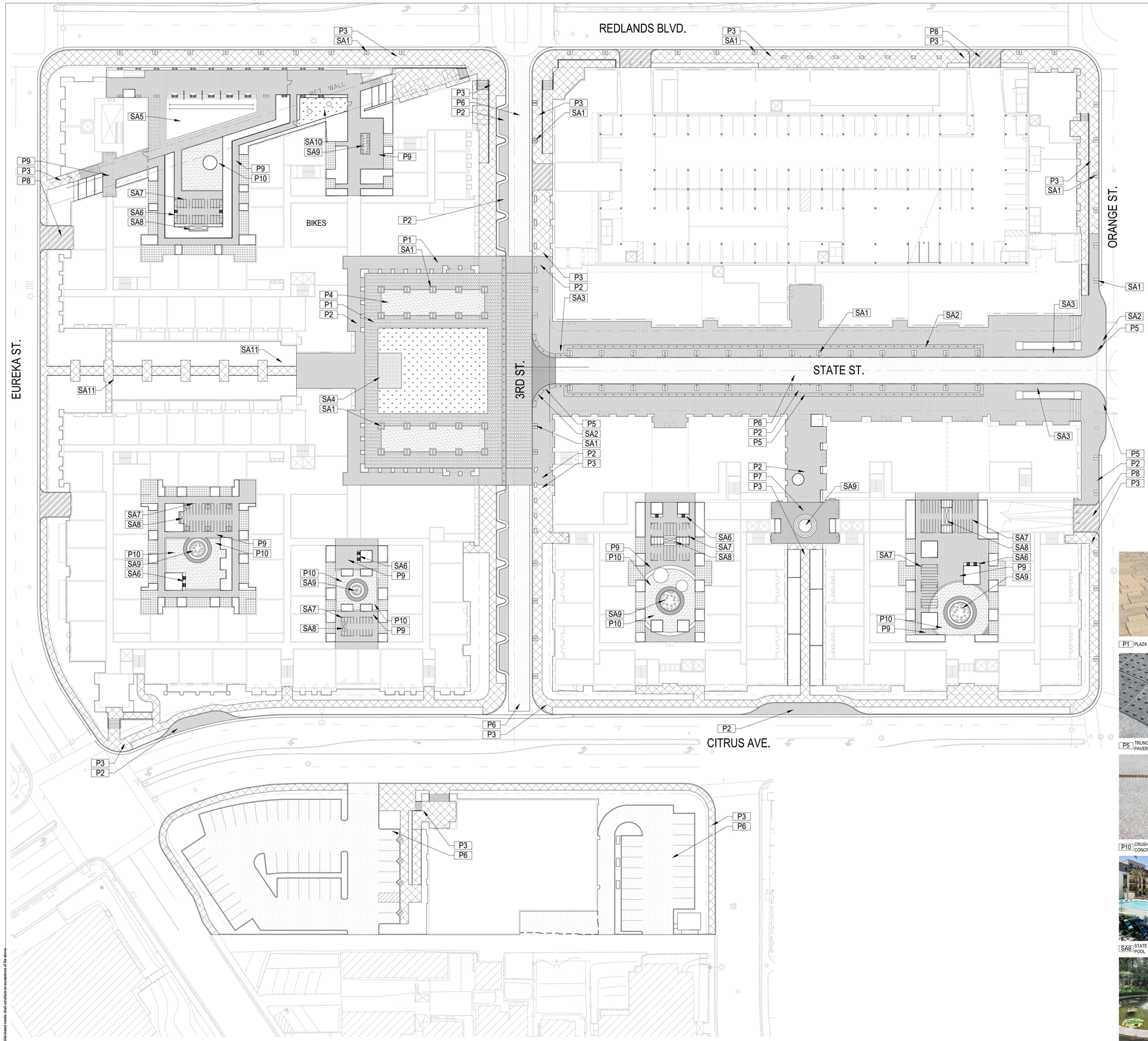
PLANS PREPARED UNDER THE SUPERVISION OF:

SCOTT P. GILBERT
R.C.E. #65194
DATE

TITLE
OFFSITE STRIPING

PROJECT NO
10.068.000
DATE
8/13/2021

SHEET NUMBER
C.06
C.U.P. APPLICATION



1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE OVERALL
1" = 40'-0"

PAVING SCHEDULE

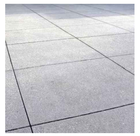
SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
P3	CONCRETE PAVING SIDEWALK	-
P4	DECOMPOSED GRANITE	-
P5	TRUNCATED DOME CONCRETE PAVER	1' SQ.
P6	ASPHALT ROADWAY	-
P7	CUT LIMESTONE PAVER	RANDOM ASHLER
P8	VEHICULAR CONCRETE DRIVEWAYS	-
P9	COURTYARD CONCRETE PAVERS, HERRINGBONE FIELD WITH DOUBLE SHOULDER COURSE BAND	4" x 8"
P10	CRUSHED LIMESTONE PAVING WITH CONCRETE BAND	-
P11	CONCRETE ADA RAMP	-
S1	CONCRETE STEPS	-

SITE AMENITY SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
SA1	METAL TREE GRATE WITH TREE GUARD	-
SA2	VEHICULAR METAL BOLLARD	-
SA3	SITE RETAINING WALLS	-
SA4	GUARDRAIL/HANDRAILS	-
SA5	WATER PLAY AREA WITH POP JETS	-
SA6	STATE STREET RESIDENTIAL POOL	-
SA7	COURTYARD BBQ'S	-
SA8	COURTYARD SHADE STRUCTURE	-
SA9	COURTYARD FIREPLACE	-
SA10	COURTYARD/PASEO WATER FEATURE	-
SA11	DOG PARK	-

P1 PLAZA CONCRETE PAVER FIELD

P2 STATE ST. AND 3RD ST. PEDESTRIAN & VEHICULAR CONCRETE PAVER


P3 CONCRETE PAVING SIDEWALK

P4 DECOMPOSED GRANITE

P5 TRUNCATED DOME CONCRETE PAVER

P7 CUT LIMESTONE PAVER

P8 VEHICULAR CONCRETE DRIVEWAYS

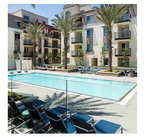
P9 COURTYARD CONCRETE PAVERS

P10 CRUSHED LIMESTONE PAVING WITH CONCRETE BAND

SA1 METAL TREE GRATE WITH TREE GUARD

SA2 VEHICULAR METAL BOLLARD

SA5 WATER PLAY AREA WITH POP JETS


SA6 STATE STREET RESIDENTIAL POOL

SA7 COURTYARD BBQ'S

SA8 COURTYARD SHADE STRUCTURE

SA9 COURTYARD FIREPLACE

SA10 COURTYARD/PASEO WATER FEATURE

SA11 DOG PARK

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2547
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE - OVERALL

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.1
C.U.P. APPLICATION

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ORIGINAL SHEET SIZE 24" x 36"

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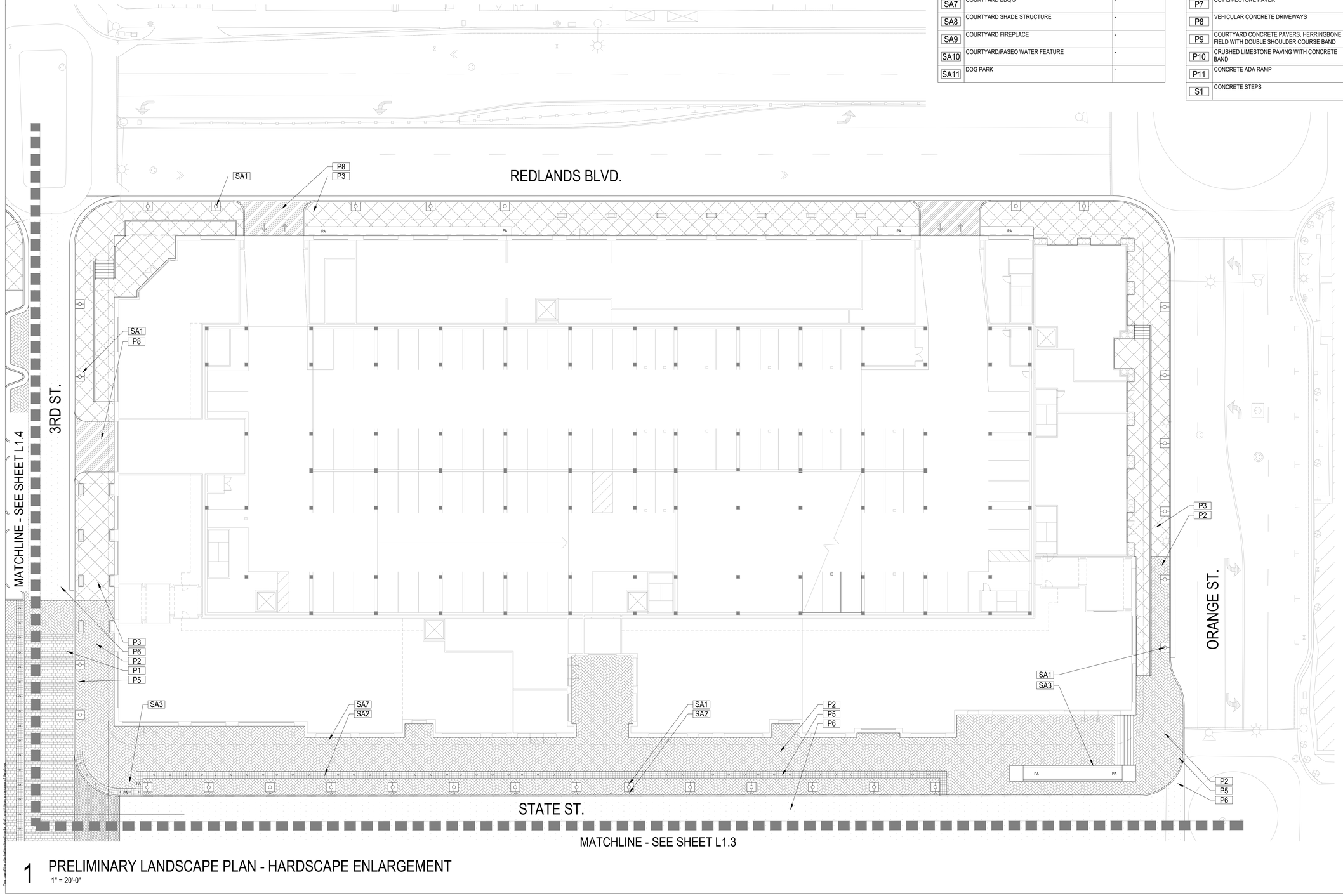
SITE AMENITY SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
SA1	METAL TREE GRATE WITH TREE GUARD	-
SA2	VEHICULAR METAL BOLLARD	-
SA3	SITE RETAINING WALLS	-
SA4	GUARDRAIL/HANDRAILS	-
SA5	WATER PLAY AREA WITH POP JETS	-
SA6	STATE STREET RESIDENTIAL POOL	-
SA7	COURTYARD BBQ'S	-
SA8	COURTYARD SHADE STRUCTURE	-
SA9	COURTYARD FIREPLACE	-
SA10	COURTYARD/PASEO WATER FEATURE	-
SA11	DOG PARK	-

PAVING SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
P3	CONCRETE PAVING SIDEWALK	-
P4	DECOMPOSED GRANITE	-
P5	TRUNCATED DOME CONCRETE PAVER	1' SQ.
P6	ASPHALT ROADWAY	-
P7	CUT LIMESTONE PAVER	RANDOM ASHLER
P8	VEHICULAR CONCRETE DRIVEWAYS	-
P9	COURTYARD CONCRETE PAVERS, HERRINGBONE FIELD WITH DOUBLE SHOULDER COURSE BAND	4" x 8"
P10	CRUSHED LIMESTONE PAVING WITH CONCRETE BAND	-
P11	CONCRETE ADA RAMP	-
S1	CONCRETE STEPS	-



1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT
1" = 20'-0"

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.2
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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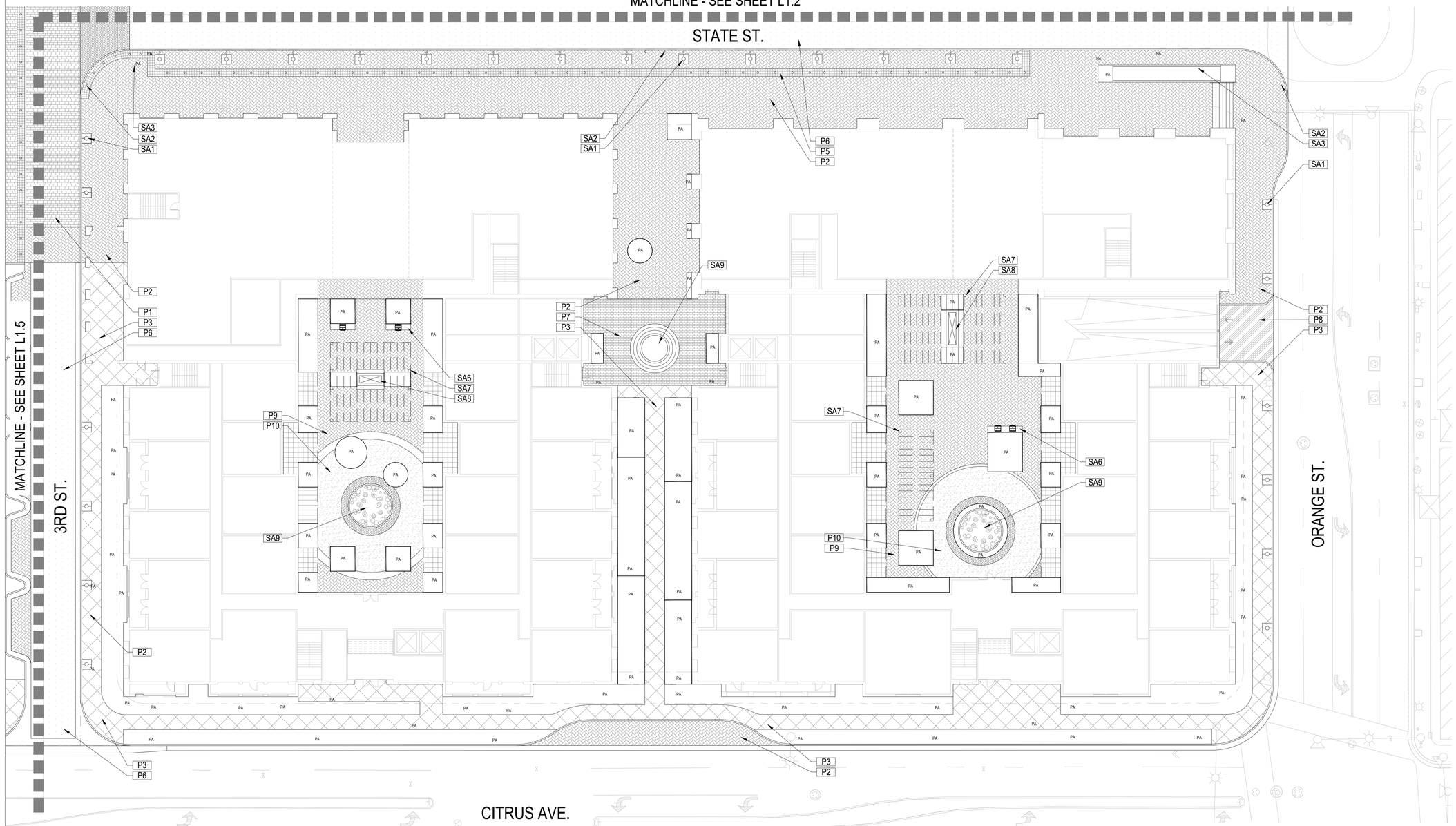
STATE ST.

MATCHLINE - SEE SHEET L1.5

3RD ST.

ORANGE ST.

CITRUS AVE.



SITE AMENITY SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
SA1	METAL TREE GRATE WITH TREE GUARD	-
SA2	VEHICULAR METAL BOLLARD	-
SA3	SITE RETAINING WALLS	-
SA4	GUARDRAIL/HANDRAILS	-
SA5	WATER PLAY AREA WITH POP JETS	-
SA6	STATE STREET RESIDENTIAL POOL	-
SA7	COURTYARD BBQ'S	-
SA8	COURTYARD SHADE STRUCTURE	-
SA9	COURTYARD FIREPLACE	-
SA10	COURTYARD/PASEO WATER FEATURE	-
SA11	DOG PARK	-

PAVING SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
P3	CONCRETE PAVING SIDEWALK	-
P4	DECOMPOSED GRANITE	-
P5	TRUNCATED DOME CONCRETE PAVER	1' SQ.
P6	ASPHALT ROADWAY	-
P7	CUT LIMESTONE PAVER	RANDOM ASHLER
P8	VEHICULAR CONCRETE DRIVEWAYS	-
P9	COURTYARD CONCRETE PAVERS, HERRINGBONE FIELD WITH DOUBLE SHOULDER COURSE BAND	4" x 8"
P10	CRUSHED LIMESTONE PAVING WITH CONCRETE BAND	-
P11	CONCRETE ADA RAMP	-
S1	CONCRETE STEPS	-

1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT
1" = 20'-0"

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 1547
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.3
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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PAVING SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
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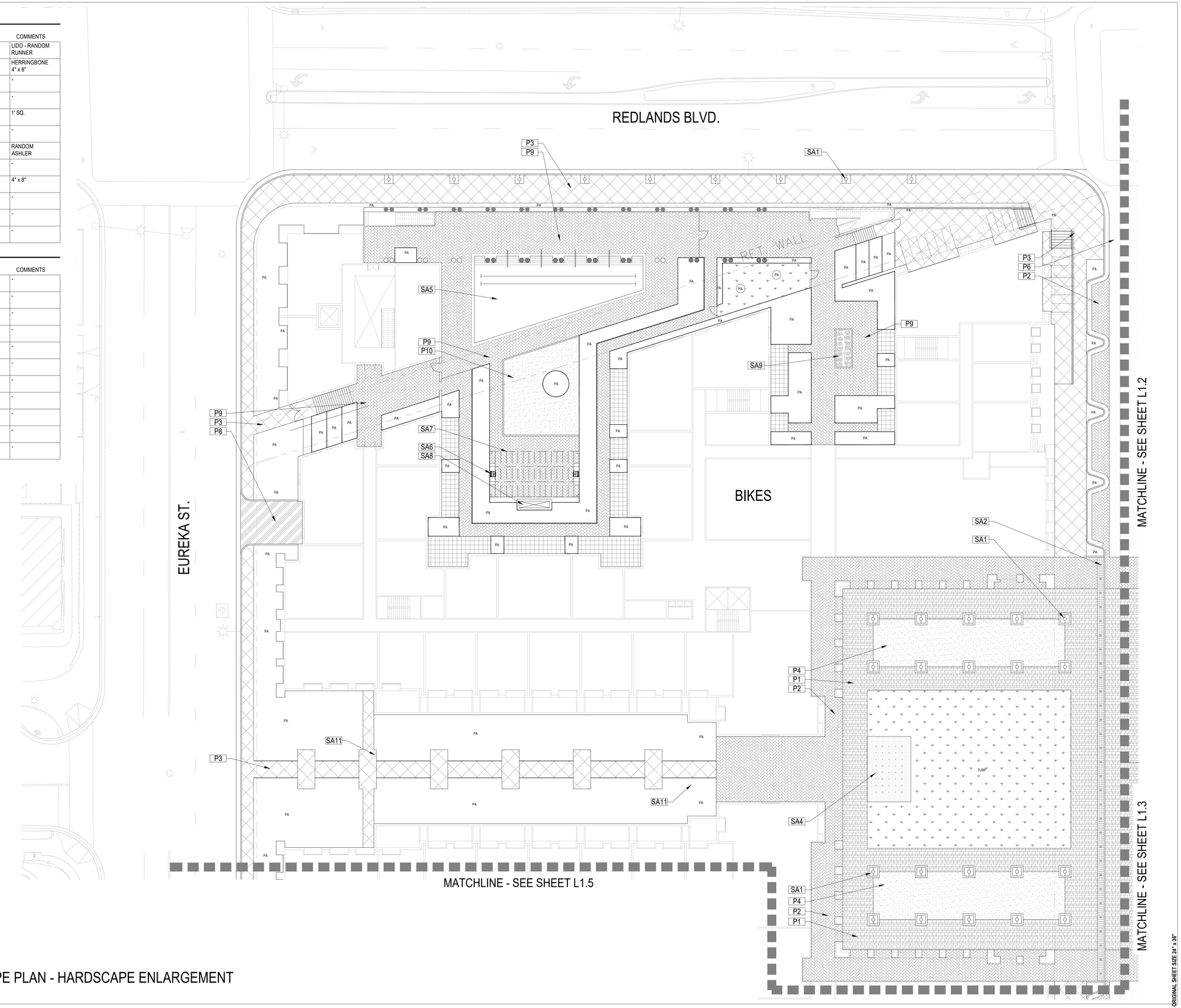

1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT
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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 1343
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.4
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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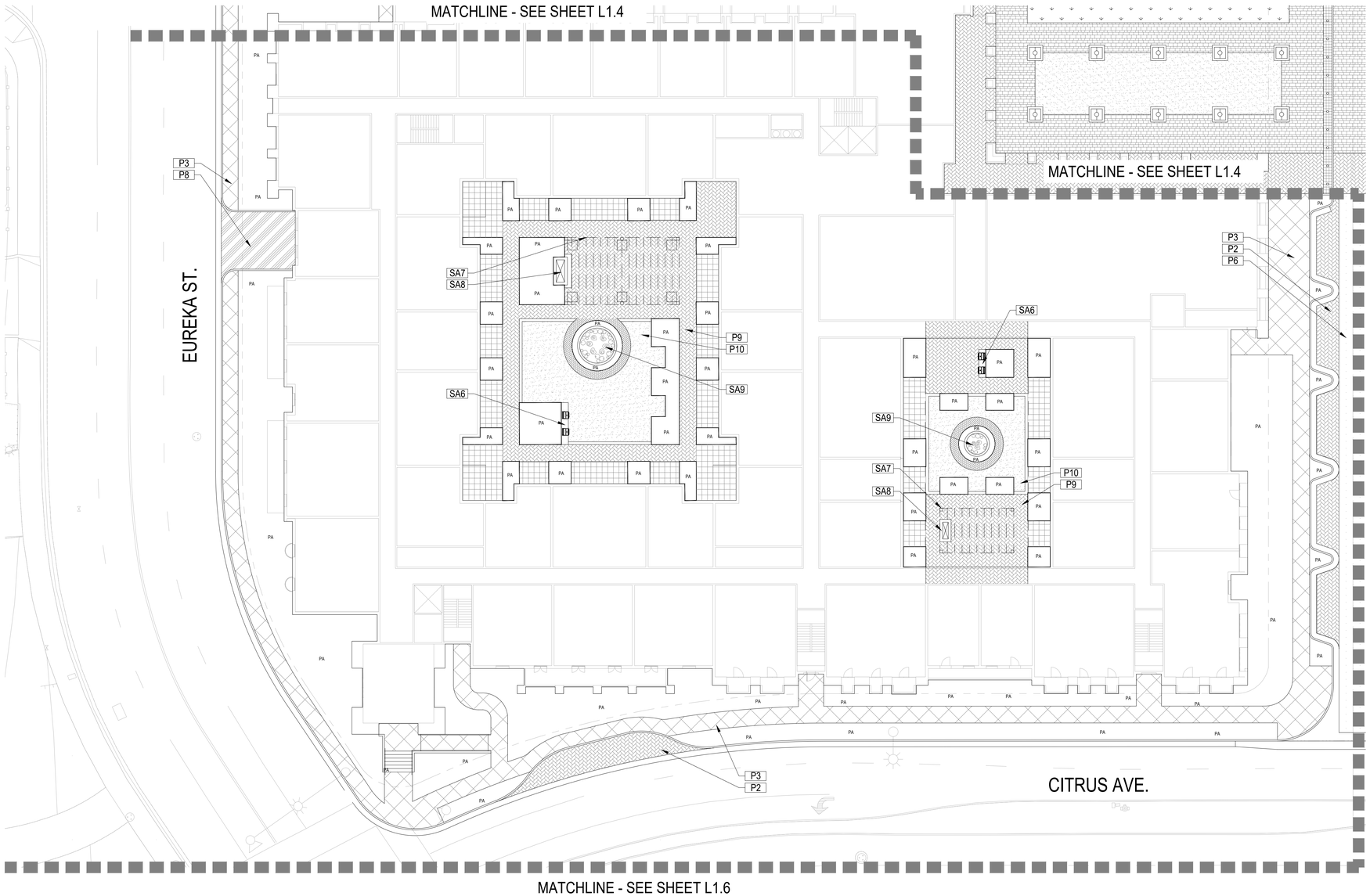

PAVING SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
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SA9	COURTYARD FIREPLACE	-
SA10	COURTYARD/PASEO WATER FEATURE	-
SA11	DOG PARK	-

1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT
1" = 20'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
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San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2547
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.5
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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SITE AMENITY SCHEDULE

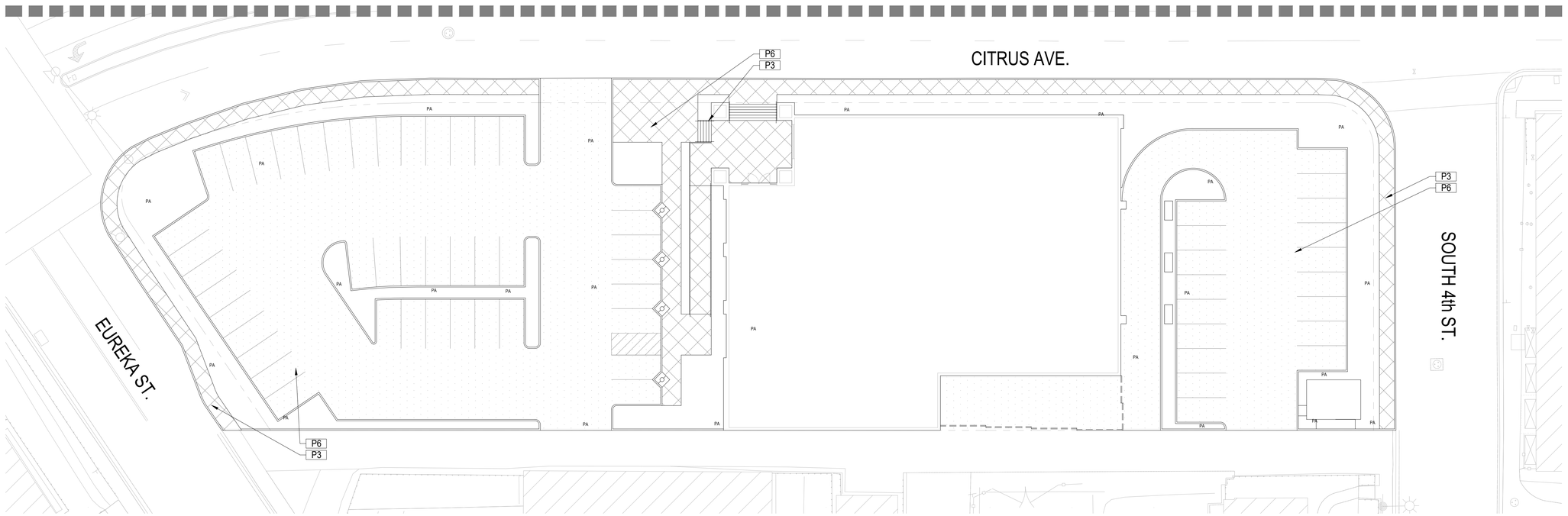
SYMBOL	DESCRIPTION	COMMENTS
SA1	METAL TREE GRATE WITH TREE GUARD	-
SA2	VEHICULAR METAL BOLLARD	-
SA3	SITE RETAINING WALLS	-
SA4	GUARDRAIL/HANDRAILS	-
SA5	WATER PLAY AREA WITH POP JETS	-
SA6	STATE STREET RESIDENTIAL POOL	-
SA7	COURTYARD BBQ'S	-
SA8	COURTYARD SHADE STRUCTURE	-
SA9	COURTYARD FIREPLACE	-
SA10	COURTYARD/PASEO WATER FEATURE	-
SA11	DOG PARK	-

PAVING SCHEDULE

SYMBOL	DESCRIPTION	COMMENTS
P1	PLAZA CONCRETE PAVER FIELD	LIDO - RANDOM RUNNER
P2	STATE STREET AND 3RD STREET PEDESTRIAN AND VEHICULAR CONCRETE PAVER	HERRINGBONE 4" x 8"
P3	CONCRETE PAVING SIDEWALK	-
P4	DECOMPOSED GRANITE	-
P5	TRUNCATED DOME CONCRETE PAVER	1' SQ.
P6	ASPHALT ROADWAY	-
P7	CUT LIMESTONE PAVER	RANDOM ASHLER
P8	VEHICULAR CONCRETE DRIVEWAYS	-
P9	COURTYARD CONCRETE PAVERS, HERRINGBONE FIELD WITH DOUBLE SHOULDER COURSE BAND	4" x 8"
P10	CRUSHED LIMESTONE PAVING WITH CONCRETE BAND	-
P11	CONCRETE ADA RAMP	-
S1	CONCRETE STEPS	-

MATCHLINE - SEE SHEET L1.5

MATCHLINE - SEE SHEET L1.3



1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT
1" = 20'-0"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - HARDSCAPE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L1.6
C.U.P. APPLICATION

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ORIGINAL SHEET SIZE 24" x 36"

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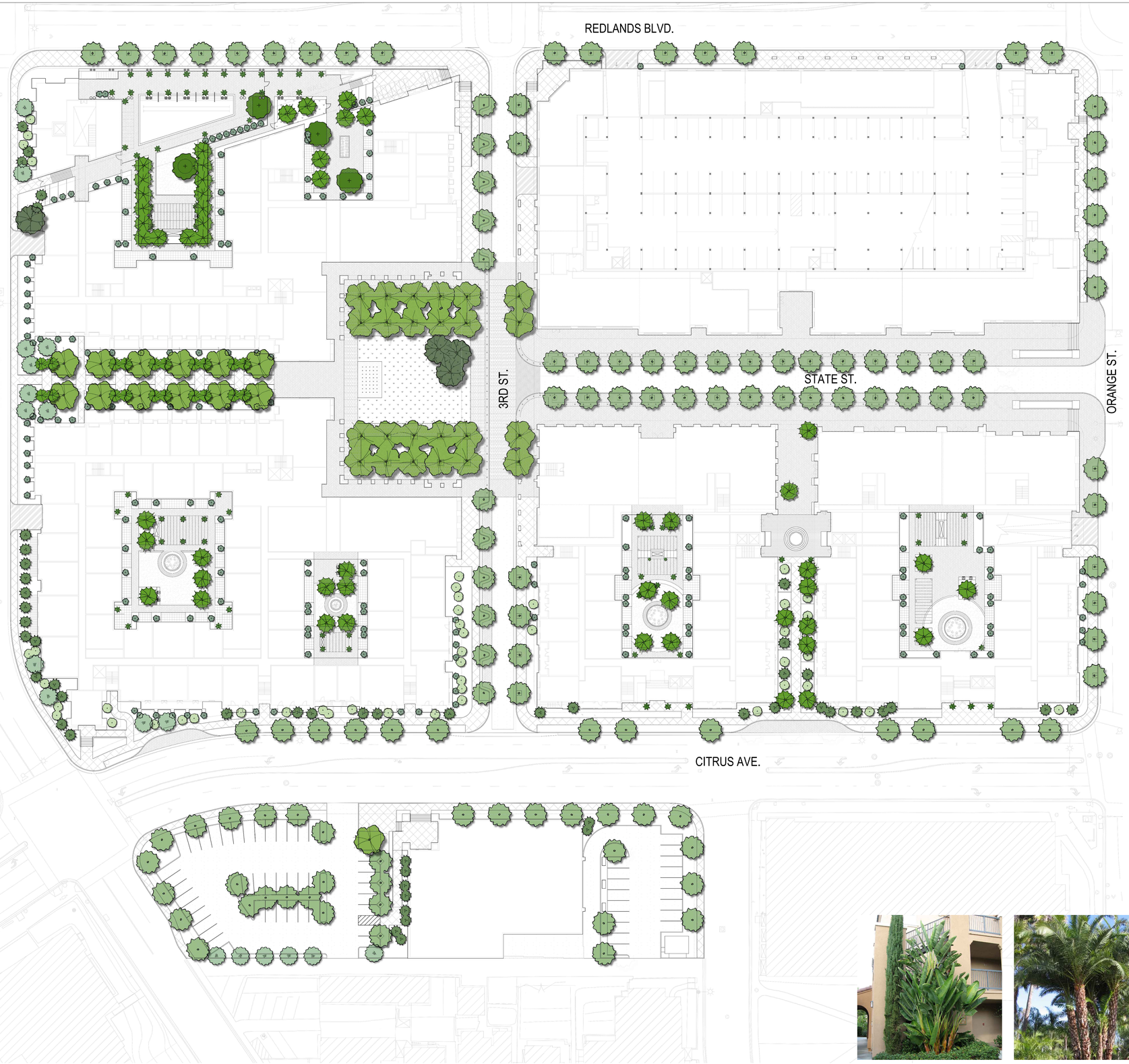

2 PRELIMINARY LANDSCAPE PLAN - TREES OVERALL
1" = 40'-0"

TREE LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX 36" BOX (CVS SITE)	EVERGREEN	86 34	M
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
	CUPRESSUS SEMPERVIRENS	24" BOX	EVERGREEN	194	L
	EUREKA AND CITRUS PERIMETER TREE				
	STRELITZIA NICOLAI	24" BOX	EVERGREEN	48	M
	COURTYARD SPECIMEN				
	PHOENIX RECLINATA	SPECIMEN	EVERGREEN	4	M
	ACCENT TREE				
	PODOCARPUS GRACILIOR ARBUTUS 'MARINA'	24" BOX	EVERGREEN	77	M
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M

QUERCUS VIRGINIANA
SOUTHERN LIVE OAK

PLATANUS X ACERIFOLIA
LONDON PLANE TREE

CINNAMOMUM CAMPHORA
CAMPHOR TREE

PINUS CANARIENSIS
CANARY ISLAND PINE

LOPHOSTEMON CONFERTUS
BRISBANE BOX

CUPRESSUS SEMPERVIRENS
ITALIAN CYPRESS

STRELITZIA NICOLAI
GIANT BIRD OF PARADISE

PHOENIX RECLINATA
SENEGAL DATE PALM

ARBUTUS 'MARINA'
MARINA MADRONE

PODOCARPUS GRACILIOR
FERN PODOCARPUS

ORIGINAL SHEET SIZE 24" x 36"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2424
Signature
10-06-2021
DATE
EXP. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - TREES - OVERALL

PROJECT NO.
19158
DATE

SHEET NUMBER
L2.1
C.U.P. APPLICATION

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2 PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT
1" = 20'-0"

TREE LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX 36" BOX (CVS SITE)	EVERGREEN	86 34	M
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
	CUPRESSUS SEMPERVIRENS	24" BOX	EVERGREEN	194	L
	EUREKA AND CITRUS PERIMETER TREE				
	STRELITZIA NICOLAI	24" BOX	EVERGREEN	48	M
	COURTYARD SPECIMEN				
	PHOENIX RECLINATA	SPECIMEN	EVERGREEN	4	M
	ACCENT TREE				
	PODOCARPUS GRACILIOR ARBUTUS 'MARINA'	24" BOX	EVERGREEN	77	M
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L2.2
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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TREE LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX	EVERGREEN	86	M
		36" BOX (CVS SITE)		34	
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
	CUPRESSUS SEMPERVIRENS	24" BOX	EVERGREEN	194	L
	EUREKA AND CITRUS PERIMETER TREE				
	STRELITZIA NICOLAI	24" BOX	EVERGREEN	48	M
	COURTYARD SPECIMEN				
	PHOENIX RECLINATA	SPECIMEN	EVERGREEN	4	M
	ACCENT TREE				
	PODOCARPUS GRACILIOR ARBUTUS 'MARINA'	24" BOX	EVERGREEN	77	M
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M

2 PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT
1" = 20'-0"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2424
Signature
10-06-2021
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Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
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PROJECT NO.
19158
DATE

SHEET NUMBER
L2.3
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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TREE LEGEND

SYMBOL	BOTANICAL NAME	SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX 36" BOX (CVS SITE)	EVERGREEN	86 34	M
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
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	COURTYARD SPECIMEN				
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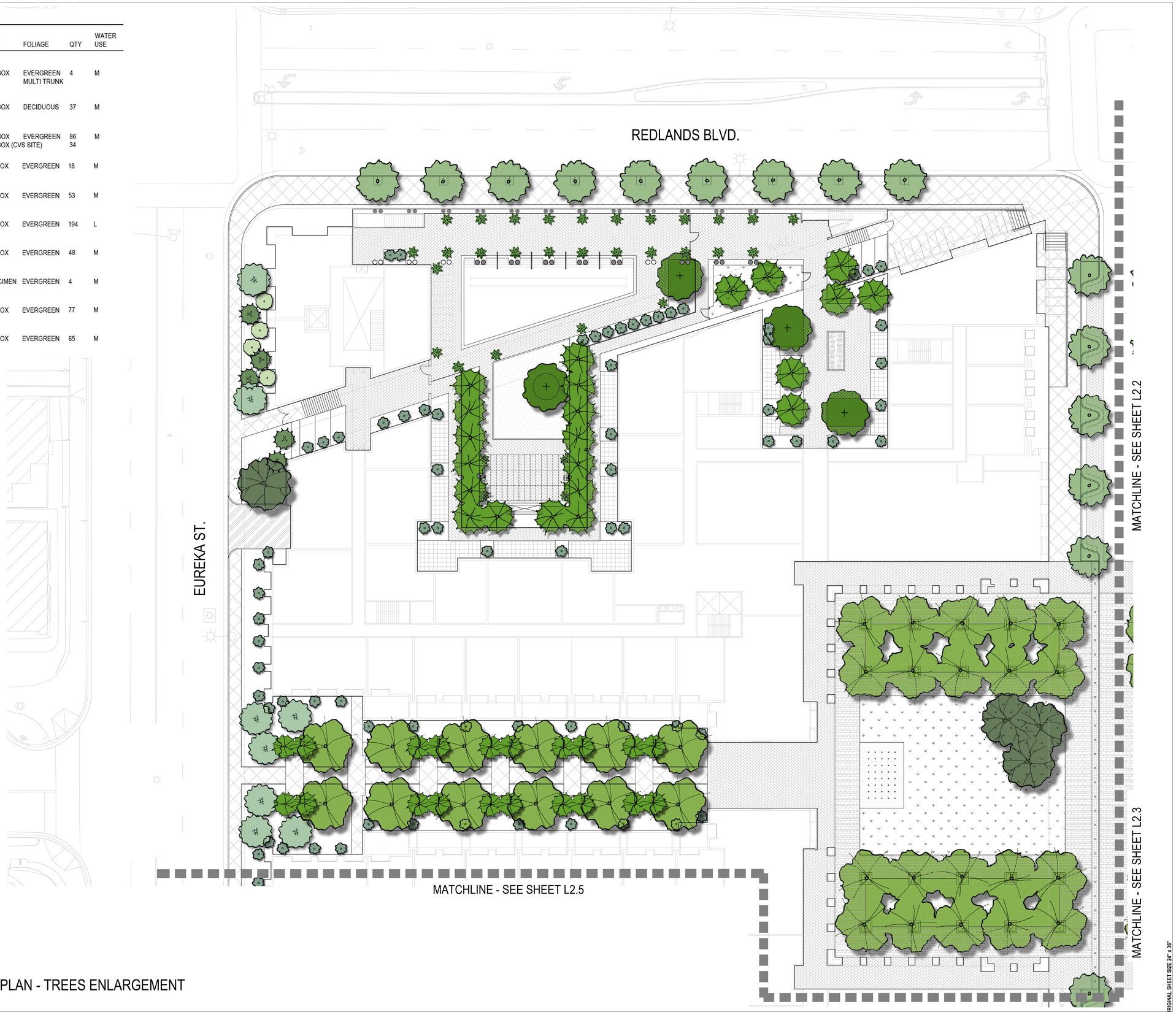
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M



2 PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT
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SHEET NUMBER
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TREE LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX	EVERGREEN	86	M
		36" BOX (CVS SITE)		34	
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
	CUPRESSUS SEMPERVIRENS	24" BOX	EVERGREEN	194	L
	EUREKA AND CITRUS PERIMETER TREE				
	STRELITZIA NICOLAI	24" BOX	EVERGREEN	48	M
	COURTYARD SPECIMEN				
	PHOENIX RECLINATA	SPECIMEN	EVERGREEN	4	M
	ACCENT TREE				
	PODOCARPUS GRACILIOR ARBUTUS 'MARINA'	24" BOX	EVERGREEN	77	M
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M

2 PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT
1" = 20'-0"

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San Francisco, CA 94104 / 415.956.0688

LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L2.5
C.U.P. APPLICATION

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ORIGINAL SHEET SIZE 24" x 36"

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TREE LEGEND

SYMBOL	BOTANICAL NAME	CATEGORY SIZE	FOLIAGE	QTY	WATER USE
	SPECIMEN TREE				
	QUERCUS VIRGINIANA	60" BOX	EVERGREEN MULTI TRUNK	4	M
	BOSQUE AND GARDEN WALK				
	PLATANUS X ACERIFOLIA	36" BOX	DECIDUOUS	37	M
	STREET TREE				
	CINNAMOMUM CAMPHORA	24" BOX 36" BOX (CVS SITE)	EVERGREEN	86 34	M
	EUREKA AND CITRUS PERIMETER TREE				
	PINUS CANARIENSIS PINUS ELDARICA	24" BOX	EVERGREEN	18	M
	EUREKA AND CITRUS PERIMETER TREE				
	LOPHOSTEMON CONFERTUS	24" BOX	EVERGREEN	53	M
	EUREKA AND CITRUS PERIMETER TREE				
	CUPRESSUS SEMPERVIRENS	24" BOX	EVERGREEN	194	L
	EUREKA AND CITRUS PERIMETER TREE				
	STRELITZIA NICOLAI	24" BOX	EVERGREEN	48	M
	COURTYARD SPECIMEN				
	PHOENIX RECLINATA	SPECIMEN	EVERGREEN	4	M
	ACCENT TREE				
	PODOCARPUS GRACILIOR ARBUTUS 'MARINA'	24" BOX	EVERGREEN	77	M
	LARGE POTTERY TREE				
	CYCAS REVOLUTA RHAPIS EXCELSA	24" BOX	EVERGREEN	65	M

MATCHLINE - SEE SHEET L2.5

MATCHLINE - SEE SHEET L2.3

2 PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT
1" = 20'-0"

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - TREES ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L2.6
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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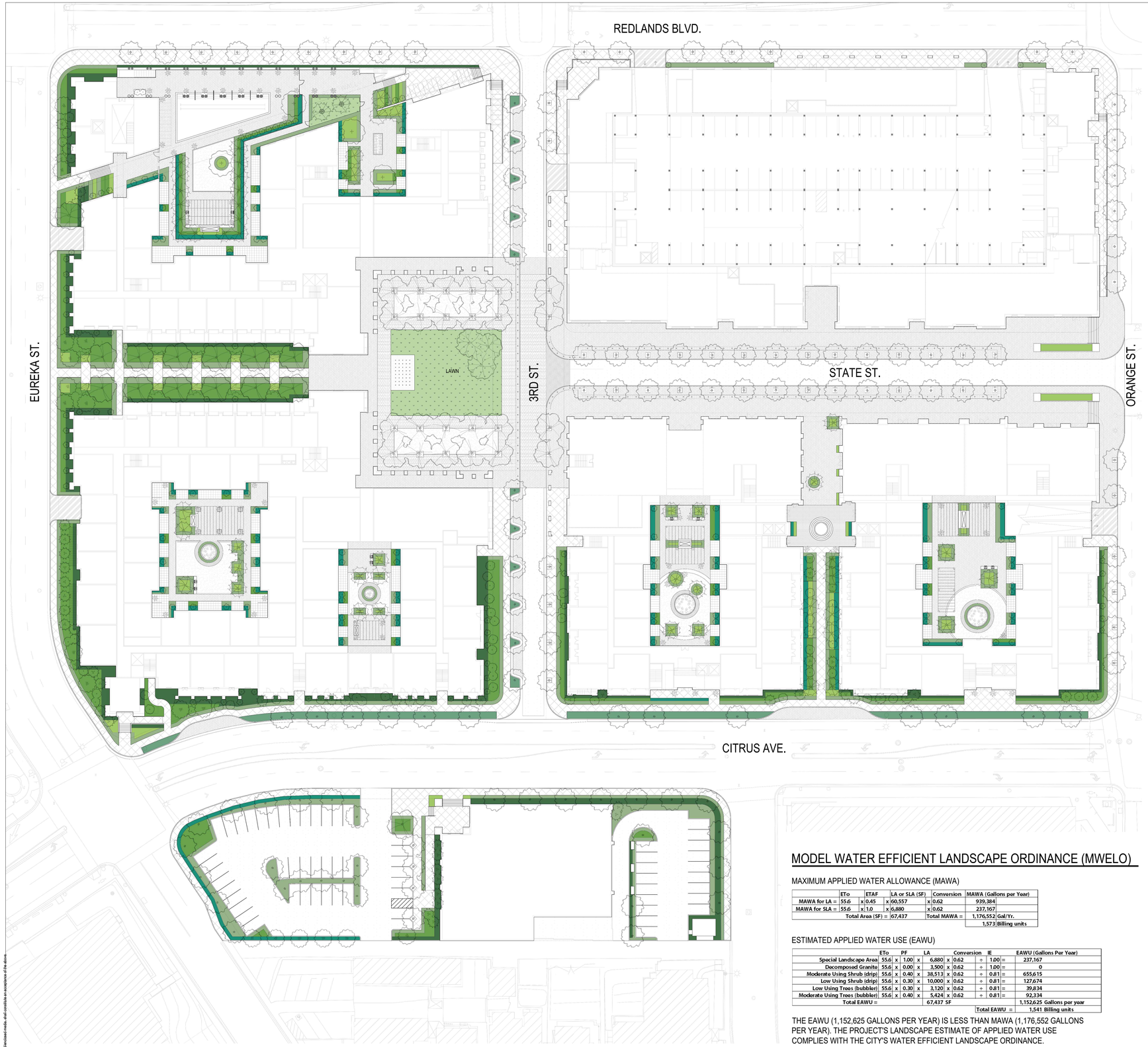


3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE OVERALL
1" = 40'-0"

SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA CARISSA MACROCARPA GREEN CARPET RHAPHIOLEPIS INDICA 'CLARA' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET ROSA X 'NOASCHNEE' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	MIDDLE ZONE			
	DIETES IRIDIOIDES PHILODENDRON XANADU PITTOSPORUM TOBIRA 'WHEELER'S DWARF' RHAPHIOLEPIS INDICA 'CLARA'	5 GAL.	36" O.C.	M
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE' CALLISTEMON VIMINALIS 'LITTLE JOHN' DIETES BICOLOR ROSA 'ICEBERG' STRELITZIA REGINAE	5 GAL.	36" O.C.	M
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM PITTOSPORUM TOBIRA RHAPHIOLEPIS UMBELLATA	5 GAL.	36" O.C.	M
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR) PITTOSPORUM TOBIRA PRUNUS CAROLINIANA	5 GAL.	36" O.C.	M

BUXUS MICROPHYLLA 'GREEN BEAUTY'
GREEN BEAUTY BOXWOOD

CARISSA MACROCARPA 'GREEN CARPET'
GREEN CARPET NATAL PLUM

RHAPHIOLEPIS INDICA 'CLARA'
INDIAN HAWTHORN

TRACHELOSPERMUM JASMINOIDES
STAR JASMINE

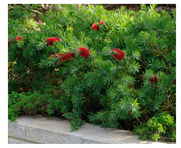
ROSA X 'NOASCHNEE'
FLOWER CARPET WHITE GROUNDCOVER ROSE

DIETES IRIDIOIDES
FORNIGHT LILY

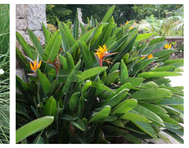
PHILODENDRON XANADU
XANADU

PITTOSPORUM TOBIRA 'WHEELER'S DWARF'
WHEELER'S DWARF PITTOSPORUM

BOUGAINVILLEA 'RASPBERRY ICE'
RASPBERRY ICE BOUGAINVILLEA


CALLISTEMON VIMINALIS 'LITTLE JOHN'
LITTLE JOHN DWARF BOTTLEBRUSH

DIETES BICOLOR
FORTNIGHT LILY


STRELITZIA REGINAE
BIRD OF PARADISE

LIGUSTRUM JAPONICUM 'TEXANUM'
WAXLEAF PRIVET

RHAPHIOLEPIS UMBELLATA
YEDDO HAWTHORNE

PRUNUS CAROLINIANA
CAROLINA CHEERY LAUREL

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO)

MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

	ETo		ETAF		LA or SLA (SF)		Conversion	MAWA (Gallons per Year)
MAWA for LA =	55.6	x	0.45	x	60,557	x	0.62	939,384
MAWA for SLA =	55.6	x	1.0	x	6,880	x	0.62	237,167
Total Area (SF) =					67,437	Total MAWA =		1,176,552 Gal/Yr.
								1,573 Billing units

ESTIMATED APPLIED WATER USE (EAWU)

	ETo		PF		LA		Conversion		IE		EAWU (Gallons Per Year)
Special Landscape Area	55.6	x	1.00	x	6,880	x	0.62	÷	1.00	=	237,167
Decomposed Granite	55.6	x	0.00	x	3,500	x	0.62	÷	1.00	=	0
Moderate Using Shrub (drip)	55.6	x	0.40	x	38,513	x	0.62	÷	0.81	=	655,615
Low Using Shrub (drip)	55.6	x	0.30	x	10,000	x	0.62	÷	0.81	=	127,674
Low Using Trees (bubbler)	55.6	x	0.30	x	3,120	x	0.62	÷	0.81	=	39,834
Moderate Using Trees (bubbler)	55.6	x	0.40	x	5,424	x	0.62	÷	0.81	=	92,334
Total EAWU =					67,437 SF						1,152,625 Gallons per year
									Total EAWU =		1,541 Billing units

THE EAWU (1,152,625 GALLONS PER YEAR) IS LESS THAN MAWA (1,176,552 GALLONS PER YEAR). THE PROJECT'S LANDSCAPE ESTIMATE OF APPLIED WATER USE COMPLIES WITH THE CITY'S WATER EFFICIENT LANDSCAPE ORDINANCE.

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2424
SIGNATURE
10-06-2021
DATE
EXP. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - SHRUBS AND GROUND PLANE - OVERALL

PROJECT NO.
19158
DATE

SHEET NUMBER
L3.1
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE ENLARGEMENT
1" = 20'-0"

SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA CARISSA MACROCARPA GREEN CARPET RHAPHIOLEPIS INDICA 'CLARA' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET ROSA X 'NOASCHNEE' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	MIDDLE ZONE			
	DIETES IRIDIOIDES PHILODENDRON XANADU PITTOSPORUM TOBIRA 'WHEELER'S DWARF' RHAPHIOLEPIS INDICA 'CLARA'	5 GAL.	36" O.C.	M
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE' CALLISTEMON VIMINALIS 'LITTLE JOHN' DIETES BICOLOR ROSA 'ICEBERG' STRELITZIA REGINAE	5 GAL.	36" O.C.	M
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM PITTOSPORUM TOBIRA RHAPHIOLEPIS UMBELLATA	5 GAL.	36" O.C.	M
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR) PITTOSPORUM TOBIRA PRUNUS CAROLINIANA	5 GAL.	36" O.C.	M

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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. SCHULZ
LICENSE NO. 1547
SIGNATURE
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - SHRUBS AND GROUND PLANE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L3.2
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA	5 GAL.	24" O.C.	M
	CARISSA MACROCARPA GREEN CARPET			
	RHAPHIOLEPIS INDICA 'CLARA'			
	TRACHELOSPERMUM JASMINOIDES			
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET	5 GAL.	24" O.C.	M
	ROSA X 'NOASCHNEE'			
	TRACHELOSPERMUM JASMINOIDES			
	MIDDLE ZONE			
	DIETES IRIDIOIDES	5 GAL.	36" O.C.	M
	PHILODENDRON XANADU			
	PITTOSPORUM TOBIRA 'WHEELER'S DWARF'			
	RHAPHIOLEPIS INDICA 'CLARA'			
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE'	5 GAL.	36" O.C.	M
	CALLISTEMON VIMINALIS 'LITTLE JOHN'			
	DIETES BICOLOR			
	ROSA 'ICEBERG'			
	STRELITZIA REGINAE			
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM	5 GAL.	36" O.C.	M
	PITTOSPORUM TOBIRA			
	RHAPHIOLEPIS UMBELLATA			
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR)	5 GAL.	36" O.C.	M
	PITTOSPORUM TOBIRA			
	PRUNUS CAROLINIANA			

3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE ENLARGEMENT
1" = 20'-0"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
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REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
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PROJECT NO.
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DATE

SHEET NUMBER
L3.3
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	BOTANICAL NAME	CATEGORY SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA CARISSA MACROCARPA GREEN CARPET RHAPHIOLEPIS INDICA 'CLARA' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET ROSA X 'NOASCHNEE' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	MIDDLE ZONE			
	DIETES IRIDIOIDES PHILODENDRON XANADU PITTOSPORUM TOBIRA 'WHEELER'S DWARF' RHAPHIOLEPIS INDICA 'CLARA'	5 GAL.	36" O.C.	M
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE' CALLISTEMON VIMINALIS 'LITTLE JOHN' DIETES BICOLOR ROSA 'ICEBERG' STRELITZIA REGINAE	5 GAL.	36" O.C.	M
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM PITTOSPORUM TOBIRA RHAPHIOLEPIS UMBELLATA	5 GAL.	36" O.C.	M
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR) PITTOSPORUM TOBIRA PRUNUS CAROLINIANA	5 GAL.	36" O.C.	M

3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE ENLARGEMENT
1" = 20'-0"

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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

mithun.com

ima

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

TITLE
PRELIMINARY LANDSCAPE PLAN - SHRUBS AND GROUND PLANE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L3.4
C.U.P. APPLICATION

© 2016 MITHUN, INC.

ORIGINAL SHEET SIZE 24" x 36"

SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	BOTANICAL NAME	SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA CARISSA MACROCARPA GREEN CARPET RHAPHIOLEPIS INDICA 'CLARA' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET ROSA X 'NOASCHNEE' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	MIDDLE ZONE			
	DIETES IRIDIOIDES PHILODENDRON XANADU PITTOSPORUM TOBIRA 'WHEELER'S DWARF' RHAPHIOLEPIS INDICA 'CLARA'	5 GAL.	36" O.C.	M
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE' CALLISTEMON VIMINALIS 'LITTLE JOHN' DIETES BICOLOR ROSA 'ICEBERG' STRELITZIA REGINAE	5 GAL.	36" O.C.	M
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM PITTOSPORUM TOBIRA RHAPHIOLEPIS UMBELLATA	5 GAL.	36" O.C.	M
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR) PITTOSPORUM TOBIRA PRUNUS CAROLINIANA	5 GAL.	36" O.C.	M

3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE ENLARGEMENT
1" = 20'-0"

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Seattle, WA 98101 / 206.623.3344

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
EXP. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - SHRUBS AND GROUND PLANE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L3.5
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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CVS SITE - LANDSCAPE AREA

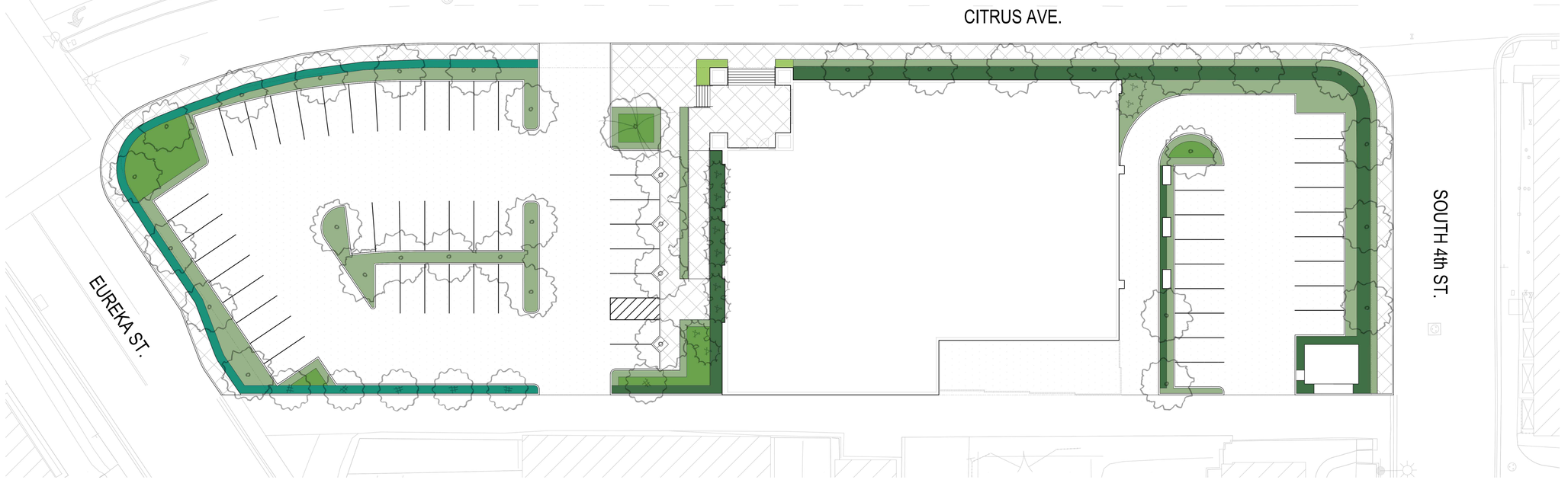
TOTAL SITE AREA OF CVS - 57,982 SF
PROPOSED LANDSCAPE AREA - 9,476 SF - 16% OF TOTAL SITE

SHRUBS AND GROUNDCOVER LEGEND

SYMBOL	CATEGORY / BOTANICAL NAME	SIZE	SPACING	WATER USE
	FOREGROUND ZONE			
	BUXUS MICROPHYLLA JAPONICA CARISSA MACROCARPA GREEN CARPET RHAPHIOLEPIS INDICA 'CLARA' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	PARKWAY ZONE			
	CARISSA MACROCARPA GREEN CARPET ROSA X 'NOASCHNEE' TRACHELOSPERMUM JASMINOIDES	5 GAL.	24" O.C.	M
	MIDDLE ZONE			
	DIETES IRIDIOIDES PHILODENDRON XANADU PITTOSPORUM TOBIRA 'WHEELER'S DWARF' RHAPHIOLEPIS INDICA 'CLARA'	5 GAL.	36" O.C.	M
	ACCENT ZONE			
	BOUGAINVILLEA 'RASPBERRY ICE' CALLISTEMON VIMINALIS 'LITTLE JOHN' DIETES BICOLOR ROSA 'ICEBERG' STRELITZIA REGINAE	5 GAL.	36" O.C.	M
	BACKGROUND/SCREENING ZONE			
	LIGUSTRUM TEXANUM PITTOSPORUM TOBIRA RHAPHIOLEPIS UMBELLATA	5 GAL.	36" O.C.	M
	BUILDING FOUNDATION SCREENING ZONE			
	LIGUSTRUM TEXANUM (COLUMNAR) PITTOSPORUM TOBIRA PRUNUS CAROLINIANA	5 GAL.	36" O.C.	M

MATCHLINE - SEE SHEET L3.5

MATCHLINE - SEE SHEET L3.3



3 PRELIMINARY LANDSCAPE PLAN - SHRUB AND GROUND PLANE ENLARGEMENT
1" = 20'-0"

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR

Village Partners

4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DOYLE
LIC. NO. 2424
Signature
10-06-2021
DATE
Exp. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - SHRUBS AND GROUND PLANE ENLARGEMENT

PROJECT NO.
19158
DATE

SHEET NUMBER
L3.6
C.U.P. APPLICATION

ORIGINAL SHEET SIZE 24" x 36"

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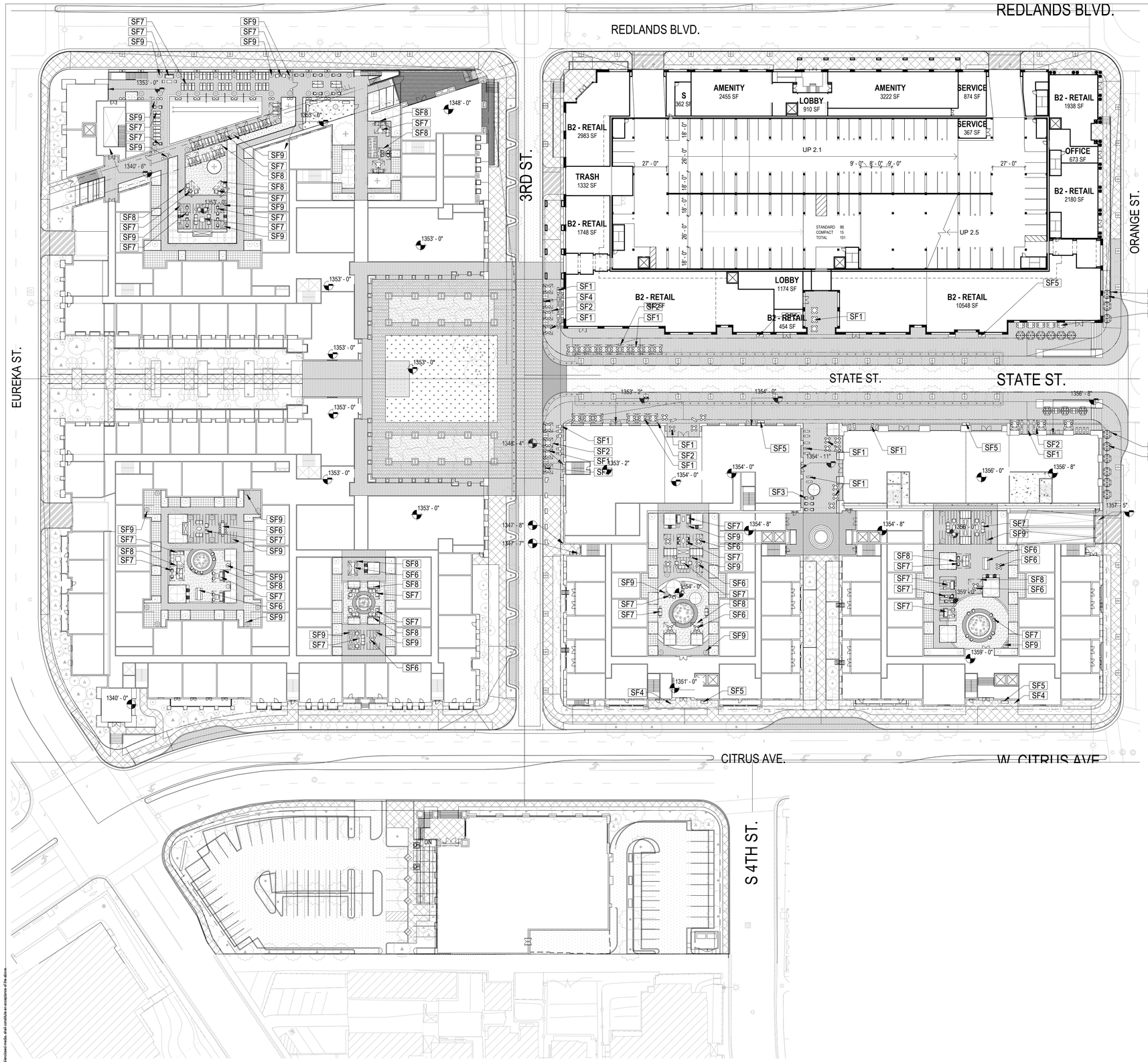


1 PRELIMINARY LANDSCAPE PLAN - HARDSCAPE OVERALL
1" = 40'-0"

SITE FURNISHINGS SCHEDULE

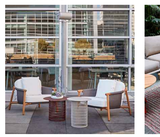
SYMBOL	DESCRIPTION	COMMENTS
SF1	STATE AND 3RD STREET DINING FURNITURE	-
SF2	STATE AND 3RD STREET UMBRELLAS	-
SF3	STATE AND 3RD STREET SOFT SEATING	-
SF4	STATE AND 3RD STREET POTTERY	-
SF5	STATE, 3RD STREET, AND CITRUS AVE BENCH	-
SF6	COURTYARD DINING FURNITURE	-
SF7	COURTYARD SOFT SEATING	-
SF8	COURTYARD UMBRELLAS	-
SF9	COURTYARD POTTERY	-

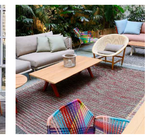
SF1 STATE AND 3RD STREET DINING FURNITURE

SF1 STATE AND 3RD STREET DINING FURNITURE

SF2 STATE AND 3RD STREET UMBRELLAS

SF2 STATE AND 3RD STREET UMBRELLAS

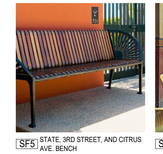

SF3 STATE AND 3RD STREET SOFT SEATING


SF3 STATE AND 3RD STREET SOFT SEATING

SF4 STATE AND 3RD STREET POTTERY

SF4 STATE AND 3RD STREET POTTERY

SF5 STATE, 3RD STREET, AND CITRUS AVE. BENCH

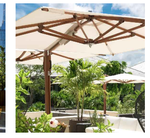

SF5 STATE, 3RD STREET, AND CITRUS AVE. BENCH

SF6 COURTYARD DINING FURNITURE

SF6 COURTYARD DINING FURNITURE

SF7 COURTYARD SOFT SEATING

SF7 COURTYARD SOFT SEATING


SF8 COURTYARD UMBRELLAS

SF8 COURTYARD UMBRELLAS

SF9 COURTYARD POTTERY

SF9 COURTYARD POTTERY

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Culver City, CA 90232 / 323.937.2150

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners
4340 Von Karmen Avenue Suite 110
Newport Beach, CA 92660

REGISTERED LANDSCAPE ARCHITECT
WILLIAM F. DAVIS
LIC. NO. 2547
SIGNATURE
10-06-2021
DATE
EXP. 01-31-23
STATE OF CALIFORNIA

TITLE
PRELIMINARY LANDSCAPE PLAN - SITE FURNISHINGS - OVERALL

PROJECT NO.
19158
DATE

SHEET NUMBER
L4.1
C.U.P. APPLICATION

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ORIGINAL SHEET SIZE 24" x 36"

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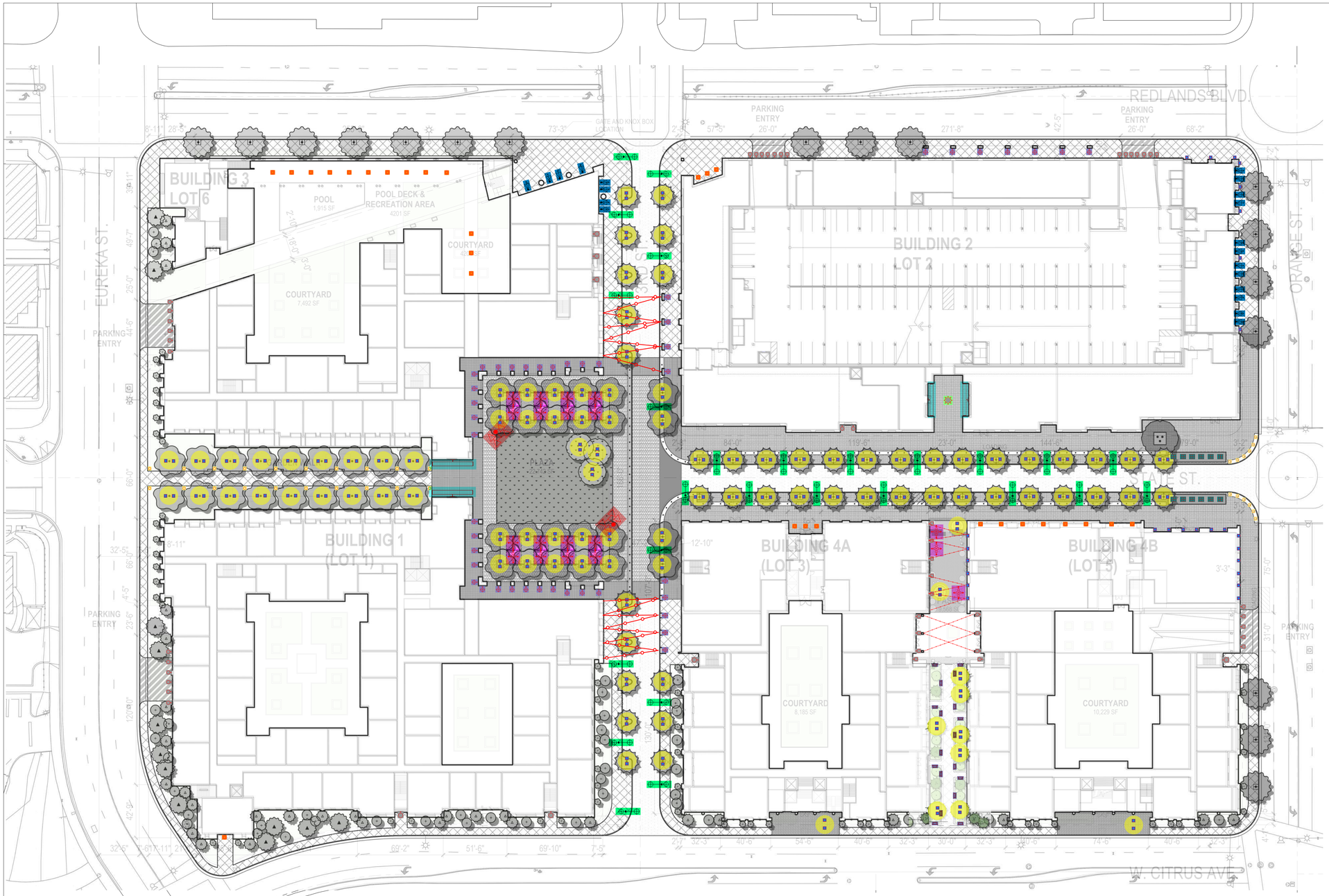

LIGHTING LEGEND:

- LIT BOLLARD FOR MAJOR INTERSECTIONS, GARDEN WALK AND PASEO
- INTERNAL STREET POLE - 2 HEADS ONE FOR ROADWAY AT 20' AND ONE FOR SIDEWALK AT 12'
- EVENT POLE AT PLAZA
- LIGHTS AT UMBRELLAS
- STEPLIGHTS AT PLANTER WALLS FOR PASEO
- CORNICE MOUNTED UPLIGHT FOR ARCH
- WALL MOUNTED DOWNLIGHT CYLINDER
- CANOPY MOUNTED BULLET DOWNLIGHT
- EXTERIOR RATED DOWNLIGHT
- UP/DOWN CYLINDER SCONCE FOR INSIDE ARCADES
- INGRADE UPLIGHT
- DECORATIVE EXTERIOR RATED CHANDELIER
- WATER FEATURE LIGHTING
- STRING LIGHTS

LIGHTING NOTES:

- ALL FIXTURES TO HAVE MAX COLOR TEMPERATURE OF 2700K WITH HIGH CRI
- RECEPTACLES TO BE PROVIDED AT BASE OF ALL TREES AT PERIMETER, STATE STREET, 3RD STREET AND PLAZA FOR SEASONAL LIGHTING
- LIGHTING AT RETAIL STORE SIGNAGE TO BE DETERMINED PER SIGNAGE VENDOR
- ALL RETAIL STORE FRONTS REQUIRE LIGHTING BEHIND THE GLASS THAT IS ON HOUSE POWER TO ILLUMINATE MERCHANDISE AND TO MAKE THE GLASS TRANSPARENT

1 SITE LIGHTING CONCEPT PLAN

1" = 40'-0"

NOT FOR CONSTRUCTION

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Culver City, CA 90232 / 323.937.2150

mithun.com

Studio K1
DESIGNING LIGHT

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
SITE LIGHTING CONCEPT PLAN

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
LT1.00

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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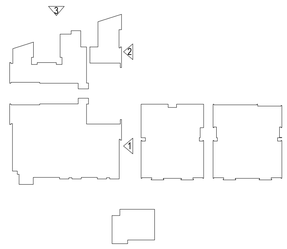
ORIGINAL SHEET SIZE 24" x 36"

1 3RD STREET WEST ELEVATION 1
1/16" = 1'-0"

2 3RD STREET ELEVATION 2
1/16" = 1'-0"

3 B6 REDLANDS ELEVATION
1/16" = 1'-0"



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LOS ANGELES / 5837 Adams Blvd
Culver City, CA 90232 / 323.937.2150

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Studio K1
DESIGNING LIGHT

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300
DATE
08/16/21

SHEET NUMBER
LT3.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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ORIGINAL SHEET SIZE 24" x 36"

NOT FOR CONSTRUCTION

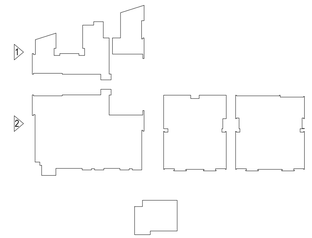
8/5/2021 2:23:03 PM

1 EUREKA STREET ELEVATION 1

1/16" = 1'-0"

2 EUREKA STREET ELEVATION 2

1/16" = 1'-0"



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ORIGINAL SHEET SIZE 24" x 36"

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DESIGNING LIGHT

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
LT3.02

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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1 B1 CITRUS ELEVATION
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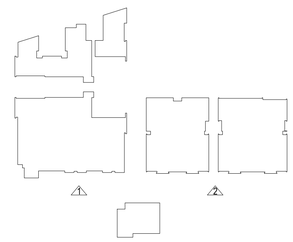
2 B4 CITRUS ELEVATION
1/16" = 1'-0"



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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
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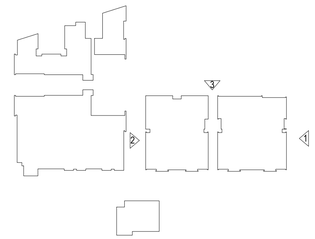
1 B4B ORANGE ELEVATION
1/16" = 1'-0"

2 B4A 3RD ST ELEVATION
1/16" = 1'-0"

3 B4 STATE ST
1/16" = 1'-0"



ORIGINAL SHEET SIZE 24" x 36"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
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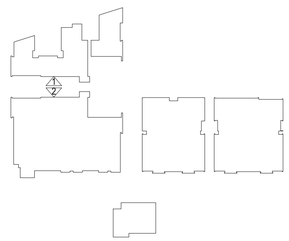
1 STATE STREET PROMENADE NORTH ELEVATION
1/16" = 1'-0"

2 STATE STREET PROMENADE SOUTH ELEVATION
1/16" = 1'-0"



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ORIGINAL SHEET SIZE 24" x 36"

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

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TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
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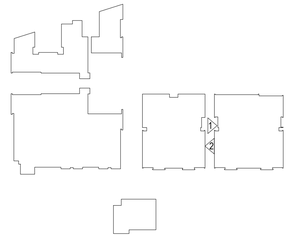
1 B4 PASEO EAST ELEVATION

1/16" = 1'-0"

2 B4A PASEO WEST ELEVATION

1/16" = 1'-0"



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PROJECT
STATE STREET VILLAGE

LOCATION
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PREPARED FOR
Village Partners

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DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

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TITLE
LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
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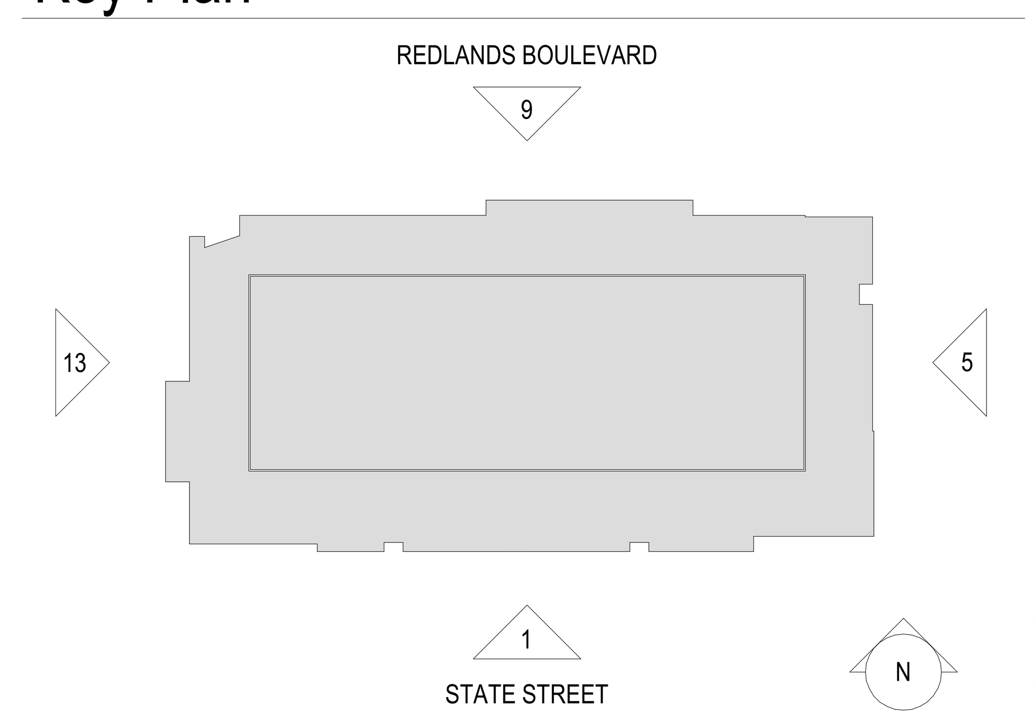
1 B2 STATE STREET ELEVATION

1/16" = 1'-0"

5 B2 ORANGE STREET ELEVATION

1/16" = 1'-0"

Key Plan



ORIGINAL SHEET SIZE 24" x 36"

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REDLANDS

LOCATION
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Village Partners

Owner

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PROJECT ARCHITECT

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PROJECT TEAM MEMBERS

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LIGHTING CONCEPT ELEVATIONS

PROJECT NO.
Project Number

DATE
08/16/21

SHEET NUMBER
LT3.07

Project Status

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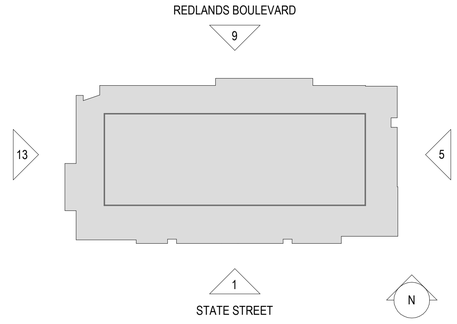
9 B2 REDLANDS BOULEVARD ELEVATION

1/16" = 1'-0"

13 B2 3RD STREET ELEVATION

1/16" = 1'-0"

Key Plan



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ORIGINAL SHEET SIZE 24" x 36"

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Owner

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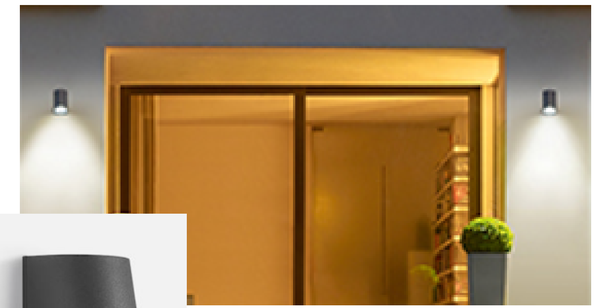
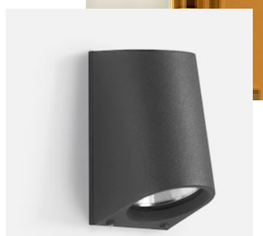
CORNICE MOUNTED UPLIGHT FOR ARCH

EVENT POLE AT PLAZA

LIT BOLLARD FOR MAJOR INTERSECTIONS, GARDEN WALK AND PASEO

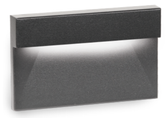


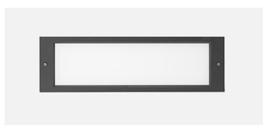


WALL MOUNTED DOWNLIGHT CYLINDER

LIGHTS AT UMBRELLAS

CANOPY MOUNTED BULLET DOWNLIGHT





STEPLIGHTS AT PLANTER WALLS FOR PASEO

INTERNAL STREET POLE - 2 HEADS ONE FOR ROADWAY AT 20' AND ONE FOR SIDEWALK AT 12'

ORIGINAL SHEET SIZE 24" x 36"

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Studio K1
DESIGNING LIGHT

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING FIXTURE IMAGES

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
LT4.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
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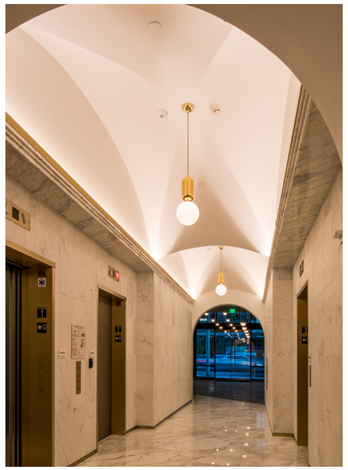
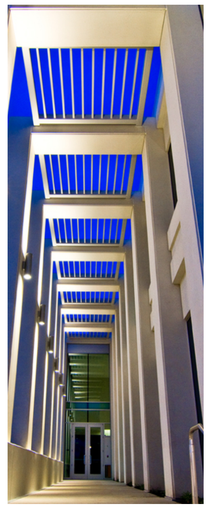


DECORATIVE EXTERIOR RATED CHANDELIER

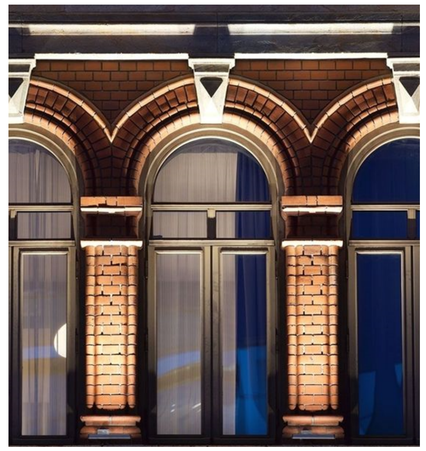
EXTERIOR RATED DOWNLIGHT

WATER FEATURE LIGHTING



UP/DOWN CYLINDER SCONCE FOR INSIDE ARCADES

STRING LIGHTS



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Studio K1
DESIGNING LIGHT

PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

TITLE
LIGHTING FIXTURE IMAGES

PROJECT NO.
1921300

DATE
08/16/21

SHEET NUMBER
LT4.02

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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LOADING SPACES

"LOADING SPACE" OR "LOADING ZONE" MEANS THE SPACE ADJACENT TO A CURB OR EDGE OF A ROADWAY RESERVED FOR THE EXCLUSIVE USE OF VEHICLES DURING THE LOADING OR UNLOADING OF PASSENGERS OR MATERIALS (PER TVSP 4.12.C-4)
LOADING ZONE REQUIREMENTS PER TABLE 18.164.340:
1 = 3,000 - 15,000 SF COMMERCIAL AREA
2 = 15,001- 45,000 SF COMMERCIAL AREA

COMMERCIAL LOADING ZONES		
	REQUIRED	PROVIDED
B1	1	2
B2	2	2
BUILDING 3	0	0
B4A	1	1
B4B	1	1
B5	1	1
TOTALS	**6**	**7**

OUTDOOR LIVING SPACE

THE OUTDOOR LIVING SPACE MAY BE PROVIDED IN THE FORM OF COMMON OPEN SPACE AREAS, PRIVATE OPEN SPACE AREAS, OR A COMBINATION THEREOF, EXCEPT THAT THERE SHALL BE AT LEAST ONE HUNDRED (100) SQUARE FEET OF COMMON OPEN SPACE FOR EACH DWELLING UNIT PER 18.60.170-A

EXCEPTION FOR B2 BUILDING:
ON-SITE OPEN SPACE (COMMON OR PRIVATE) NOT REQUIRED FOR BUILDINGS THAT LINE "BLACK BOX" BUILDINGS SUCH AS PARKING GARAGES AND THEATERS AND/OR IF BUILDING IS LOCATED WITHIN 1/4-MILE WALKING DISTANCE OF A PARK OR PLAZA THAT IS AT LEAST 0.5 ACRES IN SIZE.

COMMON OPEN SPACE AREA			
BUILDING	TOTAL UNITS	COMMON OPEN SPACE RATIO	COMMON OPEN SPACE REQUIRED
BUILDING 1	344	100 SF / UNIT	34,400
BUILDING 2	134		13,400
BUILDING 3	20		2,000
BUILDING 4A	98		9,800
BUILDING 4B	104		10,400
TOTAL REQUIRED	700	100 SF / UNIT	70,000
COMMON OPEN SPACE PROVIDED			102,525

PRIVATE OPEN SPACE AREA			
BUILDING	TOTAL UNITS	UNITS WITH PRIVATE OPEN SPACE	TOTAL PRIVATE OPEN SPACE (SF)
BUILDING 1	344	23	2,878
BUILDING 2	134	0	0
BUILDING 3	20	0	0
BUILDING 4A	98	36	3,529
BUILDING 4B	104	38	3,264
TOTAL PRIVATE OPEN SPACE PROVIDED			9,671

RESIDENTIAL UNIT MIX

BULDING 1 - UNIT COUNT AND MIX						
	L/W	ST	1BR	2BR	3BR	TOTAL
LEVEL P	4	0	2	2	0	8
LEVEL 1	3	12	35	11	7	68
LEVEL 2	0	11	43	33	10	97
LEVEL 3	0	11	42	34	10	97
LEVEL 4	0	7	30	25	6	68
TOTALS	**7**	**41**	**152**	**105**	**33**	**338**

BUILDING 2 - UNIT COUNT AND MIX						
	L/W	ST	1BR	2BR	3BR	TOTAL
LEVEL P	0	0	0	0	0	0
LEVEL 1	0	0	0	0	0	0
LEVEL 2	0	12	25	6	1	44
LEVEL 3	0	12	26	6	1	45
LEVEL 4	0	14	25	6	0	45
LEVEL 5	0	0	0	0	0	0
TOTALS	**0**	**20**	**85**	**18**	**5**	**134**

BUILDING 3 - UNIT COUNT AND MIX						
	L/W	ST	1BR	2BR	3BR	TOTAL
LEVEL 1	0	0	0	0	0	0
LEVEL 2	0	6	3	1	0	10
LEVEL 3	0	6	3	1	0	10
LEVEL 4	0	0	0	0	0	0
LEVEL 5	0	0	0	0	0	0
TOTALS		**12**	**6**	**2**		**20**

BUILDING 4a - UNIT COUNT AND MIX					
	3BR	1BR	2BR	3BR	TOTAL
LEVEL 1	4	13	2	0	19
LEVEL 2	10	18	6	0	34
LEVEL 3	11	18	6	0	35
LEVEL 4	3	4	3	0	10
TOTALS	**28**	**53**	**17**	**0**	**98**

BUILDING 4b - UNIT COUNT AND MIX					
	0BR	1BR	2BR	3BR	TOTAL
LEVEL 1	4	13	3	0	20
LEVEL 2	8	17	10	0	35
LEVEL 3	9	17	10	0	36
LEVEL 4	3	4	6	0	13
TOTALS	**24**	**51**	**29**	**0**	**104**

FLOOR AREA SUMMARY

FAR SUMMARY			
BULDING	TOTAL FLOOR AREA	LOT AREA	FAR
BUILDING 1	413,89800	Total Lot area combines surface area of Lots 1,2,3,5 and 6. See C.01 for Lot	0.99
BUILDING 2	395,56300		0.94
BUILDING 3	25,564.90		0.06
BUILDING 4A	117,80700		0.28
BUILDING 4B	121,00000		0.29
TOTALS	**1,073,832.00**	**418,628.96**	**2.85**
LOT AREA	**418,62896**		
FAR FACTOR	**4.00**		
MAXIMUM FLOOR AREA ALLOWED	**1,674,511.84**		

OVERALL PARKING SUMMARY

PARKING REQUIREMENT BY BUILDING (per TVSP 4.3.1.D)					
BUILDING	GROUND LEVEL COMMERCIAL RETAIL AREA	UPPER LEVEL COMMERCIAL OFFICE AREA	RESIDENTIAL UNIT < 1,000 SF	RESIDENTIAL UNIT > 1,000 SF	TOTAL RESIDENTIAL UNITS PER BUILDING
BUILDING 1 NORTH	9,108		100	32	132
BUILDING 1 SOUTH	6,667		159	53	212
BUILDING 2	31,667	12,328	116	18	134
BUILDING 3			20		20
BUILDING 4A	13,023		90	8	98
BUILDING 4B	11,313		84	20	104
TOTALS	**71,778**	**12,328**	**569**	**131**	**700**
PARKING RATIO	1 / 300	1 / 350	1 Per Unit	1.5 per unit	1 per 4 Total Units
REQ. PARKING	**239**	**35**	**569**	**197**	
	TOTAL COMMERCIAL = 274			**766**	**175**

SHARED GUEST/COMMERCIAL PARKING (PER 18.165.325 TABLE A)					
PEAK HOUR: 7PM WEEKDAY (BASED ON ANALYSIS OF 18.165.325 TABLE A & B)					
	RETAIL	OFFICE	GUEST	TOTAL	
	239	35	175		
PERCENTAGE OF PEAK HOUR	95%	10%	100%		
PARKING REQ.	**227**	**4**	**175**	**406**	

PARKING PROVIDED			
PARKING ZONE	SHARED COMMERCIAL / RESIDENTIAL GUEST	RESIDENTIAL	TOTAL
B1 GARAGE		269	269
B2 GARAGE	414	272	686
B4 GARAGE		225	225
STATE ST.	24		24
3RD ST	8		8
TOTAL PARKING PROVIDED	**446**	**766**	**1212**
***TOTAL ADJUSTED PARKING REQUIRED**	**406**	**761**	**1167**

ADJUSTED REQUIRED PARKING (Per TVSP 4.3.1.D.1-g)
Residential guest spaces and commercial spaces may be shared

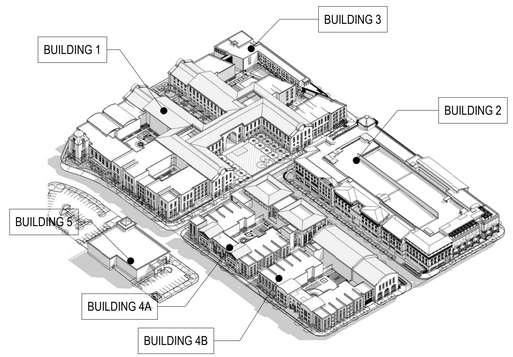
LOT 8, BUILDING B5 PARKING SUMMARY	
	GROUND LEVEL COMMERCIAL RETAIL AREA
BUILDING 5	14,500
PARKING RATIO	1/250
REQ. PARKING	**58**
PROVIDED	**61**

SHARED PARKING ANALYSIS (EXTENDED)

Non-Residential Parking Required- Shared Parking (sec 18.164.325, B)											
Weekday	Office	%	Spaces	Retail	%	Spaces	Guest	%	Spaces	Total*
1pm	35	90%	31.5	239	100%	239	171	20%	34.2	304.7
2pm	35	100%	35	239	96%	229.44	171	20%	34.2	298.64
6pm	35	25%	8.75	239	95%	227.05	171	60%	102.6	338.4
7pm	35	10%	3.5	239	95%	227.05	171	100%	171	401.55
Weekend	Office	%	Spaces	Retail	%	Spaces	Guest	%	Spaces	Total*
11am	35	100%	35	239	71%	169.69	171	20%	34.2	238.89
1pm	35	60%	21	239	100%	239	171	20%	34.2	294.2
2pm	35	80%	28	239	92%	219.88	171	20%	34.2	282.08
7pm	35	0%	0	239	76%	181.64	171	100%	171	352.64

2 ZONING MAP

1/4" = 1'-0"



1 BUILDING BLOCK KEY

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PROJECT
STATE STREET VILLAGE

LOCATION
Redlands, CA

PREPARED FOR
Village Partners

NO.	DATE	REVISION

DESIGN PARTNER
DS
PROJECT MANAGER
DV
PROJECT ARCHITECT
MM
PROJECT DESIGNER
JE
PROJECT TEAM MEMBERS
YB, GY, CH, MF
CHECK

TITLE
PROJECT DATA

PROJECT NO.
1921300
DATE
8/16/21

SHEET NUMBER
X0.01

CONDITIONAL USE PERMIT NO. 1155 & 1156
COMMISSION REVIEW & APPROVALS 933 & 934

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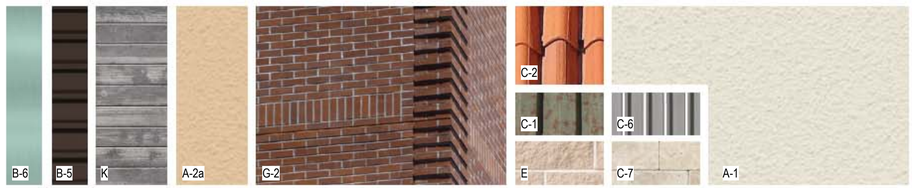
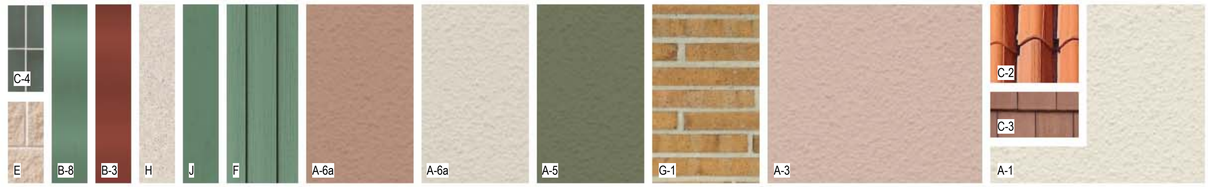
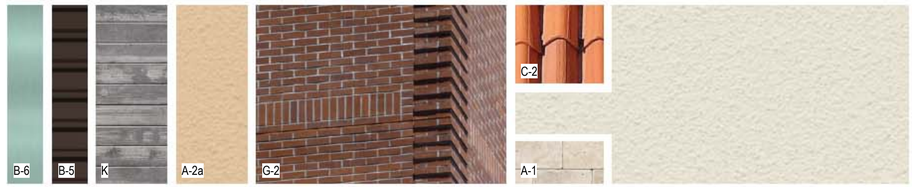


BUILDING B1

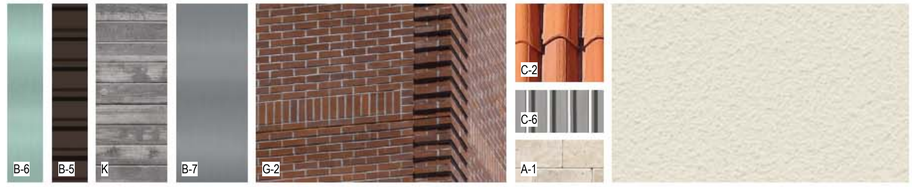
BUILDING B3



BUILDING B2



BUILDING B4a



BUILDING B4b

BUILDING CVS

MATERIAL LEGEND:

A. PLASTER CEMENT (STUCCO)
- A-1. MAYONNAISE - BENJAMIN MOORE 2152-70
- A-2a. MANILLA - BENJAMIN MOORE 2158-50
- A-2b. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- A-3. ODESSA PINK - BENJAMIN MOORE HC-59
- A-4. SOUTHFIELD GREEN - BENJAMIN MOORE HC-129
- A-5. GREAT BARRINGTON GREEN - BENJAMIN MOORE HC-122
- A-6a. WHITE DOWN - BENJAMIN MOORE OC-131
- A-6b. NUTMEG - BENJAMIN MOORE 1227
- A-7. ROCK GRAY - BENJAMIN MOORE 1615
- A-8. PEWTER - BENJAMIN MOORE 2121-3

B. WINDOW MULLIONS, FRAME, FENCE, AND GUARDRAILS
- B-1. IVORY TUSK - BENJAMIN MOORE OC-91
- B-2a. YELLOW MARIGOLD - BENJAMIN MOORE 2155-30
- B-3. MEXICANA- BENJAMIN MOORE 2172-30
- B-5. BRANCHPORT BROWN - BENJAMIN MOORE HC-72
- B-6. COPPER PATINA - BENJAMIN MOORE 619
- B-7. NOT USED
- B-8. CLEARSPRING GREEN - BENJAMIN MOORE 2121-30
- B-9. MAYONNAISE - BENJAMIN MOORE 2152-70

C. ROOFING AND TILE
- C-1. COPPER PATINA - FAUX OXIDIZED COPPER METAL ROOFING
- C-2. TERRACOTTA TILE
- C-3. CONCRETE TILE
- C-4. GREEN - GLAZED CERAMIC TILE
- C-5. BLUE - GLAZED CERAMIC TILE
- C-6. CORRUGATED GALVANIZED METAL ROOFING
- C-7. TRAVERTINE TILE

D. WIRE MESH SCREEN

E. NATURAL LIMESTONE

F. HARDIE PANEL BOARD AND BATTEN SIDING

G. BRICK VENEER
- G-1. ROMAN BRICK
- G-2. OLD TOWN RED

H. CAST STONE

J. WOOD - CLEARSPRING GREEN - BENJAMIN MOORE HC-128

K. BOARD FORMED CONCRETE

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STATE STREET VILLAGE

LOCATION
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NO.	DATE	REVISION

DESIGN PARTNER
DS
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Geotechnical Engineering Report

Redlands Mall Redevelopment (Proposed State Street Village)
Redlands, San Bernardino County, California
September 30, 2021
Terracon Project No. CB215095

Prepared for:
Village Partners Ventures, LLC
Newport Beach, California

Prepared by:
Terracon Consultants, Inc.
Colton, California

September 30, 2021

Village Partners Ventures, LLC
4340 Von Karman Avenue, Suite 110
Newport Beach, California 92660

Attn: Mr. Michael Morris
P: (949) 478-1450
E: michael@villagepartners.com

Re: Geotechnical Engineering Report
Redlands Mall Redevelopment (Proposed State Street Village)
Northwest Corner of Citrus Avenue and Orange Street
Redlands, San Bernardino County, California
Terracon Project No. CB215095

Dear Mr. Morris:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PCB215095 dated April 23, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Ali Tabatabaei, Ph.D., G.E.
Geotechnical Project Engineer

REGISTERED PROFESSIONAL ENGINEER
SEYEDALI TABATABAEI
No. 3159
GEOTECHNICAL
STATE OF CALIFORNIA

John S. McKeown, E.G. 2396
Senior Geologist

Reviewed by: Keith P. Askew
Department Manager

REPORT TOPICS

INTRODUCTION 1
SITE CONDITIONS 1
PROJECT DESCRIPTION 2
GEOTECHNICAL CHARACTERIZATION 3
SEISMIC CONSIDERATIONS 5
LIQUEFACTION AND SEISMIC SETTLEMENT 6
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FLOOR SLABS 19
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STORM WATER MANAGEMENT 24
CORROSIVITY 26
GENERAL COMMENTS 27

Note: This report was originally delivered in a web-based format. Orange Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the *GeoReport* logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS
SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Redlands Mall Redevelopment (Proposed State Street Village)
Northwest Corner of Citrus Avenue and Orange Street
Redlands, San Bernardino County, California

Terracon Project No. CB215095

September 30, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Redlands Mall Redevelopment to be located at Northwest Corner of Citrus Avenue and Orange Street in Redlands, San Bernardino County, California. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions and historic high groundwater
- 2019 California Building Code (CBC) seismic design parameters
- Subgrade preparation/earthwork recommendations
- Recommendations for foundation design and concrete slabs-on-grade
- Recommendations for preliminary pavement section design

The geotechnical engineering Scope of Services for this project included the advancement of 16 test borings drilled to depths ranging from approximately 10 to 51½ feet below existing site grades, laboratory testing, and preparation of this report.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project site is located at Northwest Corner of Citrus Avenue and Orange Street in Redlands, San Bernardino County, California. The approximate coordinates of the site are: 34.0562°N/117.1843°W See **Site Location**

Item	Description
Existing Improvements	The site is situated just north of W Citrus Avenue and west of Orange Street within the Redlands Mall center. Currently the parcel consists of retail shopping buildings that appear to be both active and inactive, asphalt concrete (AC) drive/parking areas and appurtenant improvements. A drainage culvert is located in the northwest corner of the site.
Current Ground Cover	The site is developed with retail shopping buildings, AC pavement drive/parking areas, and landscaping.
Existing Topography	The project site is relatively flat.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Proposed Development	Based on our review of the site plans provided to us, the existing buildings and utilities will be demolished and removed from the site, and a mixed-use development of 3 and 4 story structures (street front retail/commercial with residential above) and appurtenant infrastructure will be constructed, including paved roadway/parking, and drainage infiltration/retention basins. The proposed construction also include independent parking structure up to six-levels; anew subterranean parking structure, 1 level, with 2-podium buildings of 3 and 4 story on top are planned for southeast quadrant. The resulting excavation from the demolition of the existing subterranean garage will be utilized for the new subterranean garage with 3 and 4 story podium buildings above.
Proposed Structures	We anticipate the proposed buildings will be supported on conventional strip footings and isolated column pads along with slab-on-grade floors. We anticipate proposed parking structure will be supported on cast-in-place drilled shaft
Structural Loads (assumed)	Structural loads were not provided at the time of this report. For preliminary geotechnical recommendaitons, we assume that the proposed structures will have the following loads, these loads should be confirmed by the project structural engineer: ■ Columns: 100 to 200 kips ■ Walls: 1 to 4 kips per linear foot (klf) ■ Slabs: 100 to 150 pounds per square foot (psf)
Finished Floor Elevation	Anticipated to be within 5 feet of existing grade

Item	Description
Grading Requirements	Design grades are anticipated to be similar to the existing grades; however, remedial grading is anticipated and backfilling of voids resulting from demolition activities of existing structures (foundations, underground utilities) will be required. The existing conditions include a subterranean parking structure; proposed grades or infilling in this area are unknown.
Below Grade Structures	A subterranean parking structure is planned; however the configuration, dimensions, and loads are not known.
Free-Standing Retaining Walls	Not anticipated
Pavements	Paved driveway and parking will be constructed on site. We assume both rigid (concrete) and flexible (asphalt) pavement sections should be considered. Please confirm this assumption. Anticipated traffic indices (TIs) are as follows for asphalt pavement: ■ Auto Parking Areas: TI=4.5 ■ Drive Lanes TI=5.5 ■ Truck Delivery Areas: TI=6.0 ■ The pavement design period is 20 years. Anticipated average daily truck traffic (ADTT) is as follows for concrete pavement: ■ Light Duty: ADTT=1 (Category A) ■ Medium Duty: ADTT=25 (Category B) ■ Dumpster Pad: ADTT=700 (Category C)
Stormwater Infiltration Systems	Preliminary infiltration testing was performed at the site to aid in the design of the infiltration system at the previously proposed location

GEOTECHNICAL CHARACTERIZATION

Site Geology

The site is located in the San Bernardino Valley, in the northern portion of the Peninsular Ranges Geomorphic Province. The site is located between the major drainages of the Santa Ana River and San Timoteo Creek. Localized drainage occurs in the Zanja Channel, which is conveyed in a storm drain beneath the northwest portion of the site and along Redlands Boulevard. Open channel portions of the the Zanja are located as close as 1,600 feet east of the site at 9th Street, and as close as 400 feet west of the site along West State Street.

The surficial native materials at the site are mapped primarily as younger alluvium consisting of unconsolidated grayish sandy to pebbly alluvium (Morton, 1978). It appears that all of the alluvial materials encountered in our exploratory borings consists of younger alluvium.

Morton (1978) shows the southerly portion of the site as underlain by clay-bearing older alluvium of Pleistocene age. The older alluvium was apparently not found in our exploratory borings. The

older alluvium is typically reddish-brown in color. It is exposed extensively south of the site and the red color is incorporated into the name of the City.

Subsurface Profile

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the data and our understanding of the geologic setting and planned construction.In general, the site is underlan with fill soil to depths varying from 3 to 9½ feet bgs. The fill encountered was comprised of loose to medium dense, silty sand, clayey sand, and silty sand with gravel. Fill was not encountered in borings B7, B10, and P3.

Alluvial soils were encountered beneath AC (and base materials if present) in borings B7 and B10, and beneath the fill encounetered in borings B1 through B4, B6, B8, B9, P1, P2, P4, P5, and P6 to the depths of the borings. The alluvium encountered was generally loose to dense, and comprised of silty sand with varying amounts of gravel, poorly graded sand with varying amounts of silt and gravel, clayey sand, and sandy lean clay.

Boring P3 encountered refusal on gravel at a depth of approximately 1½ feet bgs; as such, percolation testing was not performed in this boring. Boring B5 encountered refusal at a depth of approximately 7½ feet bgs while still drilling within fill soils; the refusal appeared to be upon a buried structure constructed of clay brick.

The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation, foundation options and pavement options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Groundwater Conditions

The borings were advanced using continuous flight auger drilling techniques that allow short-term groundwater observations to be made while drilling. Groundwater was not observed within the maximum depths of exploration during or at the completion of drilling.

Our review of historical information regarding groundwater levels from the California Department of Water Resources (State Well No. 01S03W28J001S) indicates that groundwater . is expected to be at least 200 feet deep at the site. We do not anticipate groundwater will affect construction

at this project site. Groundwater level fluctuations may occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed.

Hydroconsolidation

To evaluate the potential deformation that may be caused by the addition of water to subsurface soils, hydroconsolidation testing was performed on a selected, representative relatively undisturbed sample (B-3 at 7½ feet). The result is shown in Exploration Results section. The test result indicate collapse potential of 0.2% for the sample tested when saturated under a surcharge pressure of 2,000 psf.

SEISMIC CONSIDERATIONS

Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our opinion that the Seismic Site Classification is D. The 2019 California Building Code (CBC) Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool. This web-based software application calculates seismic design parameters in accordance with ASCE 7-16 and 2019 CBC. The 2019 CBC requires that a site-specific ground motion study be performed in accordance with Section 21.2 of ASCE 7-16 for Site Class D sites with a mapped S_1 value greater than or equal 0.2.

However, Section 11.4.8 of ASCE 7-16 includes an exception from such analysis for specific structures on Site Class D sites. The commentary for Section 11 of ASCE 7-16 states that “In general, this exception effectively limits the requirements for site-specific hazard analysis to very tall and or flexible structures at Site Class D sites.” Based on our understanding of the proposed structures, it is our assumption that the exception in Section 11.4.8 applies to the proposed structure. However, the structural engineer should verify the applicability of this exception.

Based on this exception, the spectral response accelerations presented below were determined using the site coefficients (F_a and F_v) from Tables 1613.2.3(1) and 1613.2.3(2) presented in Section 16.4.4 of the 2019 CBC.

Description	Value
Site Classification (CBC) [1]	D [2]
Site Latitude (°N)	34.0562
Site Longitude (°W)	117.1843
S_s Spectral Acceleration for a 0.2-Second Period	1.746
S_1 Spectral Acceleration for a 1-Second Period	0.7
F_a Site Coefficient for a 0.2-Second Period	1.0

Description	Value
F_v Site Coefficient for a 1-Second Period	1.7
Site Modified Peak Ground Acceleration	0.821g
De-aggregated Mean Magnitude [3]	7.3

1. Seismic site classification in general accordance with the *2019 California Building Code*.
2. The 2019 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100-foot soil profile determination. Our borings were extended to a maximum depth of 51 ½ feet. This seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.
3. These values were obtained using on-line Unified Hazard Tool by the USGS (https://earthquake.usgs.gov/hazards/interactive/) for return period of 2% in 50 years accessed

A site-specific ground motion study may reduce design values and consequently construction costs. We recommend consulting with a structural engineer to evaluate the need for such study and its potential impact on construction costs. Terracon should be contacted if a site-specific ground motion study is desired.

Estimated Ground Motions

The site is located in the seismically active southern California area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. As calculated using the USGS Unified Hazard Tool, the San Andreas (San Bernardino S segment) Fault, which is considered to have the most significant effect at the site from a design standpoint, has a maximum earthquake magnitude of 7.54 and is located approximately 8.2 kilometers from the site.

Based on the USGS Design Maps Summary Report, using the American Society of Civil Engineers (ASCE 7-16) standard, the peak ground acceleration (PGA_M) at the project site is expected to be 0.821 g. Based on the USGS Unified Hazard Tool, the project site has a de-aggregated mode magnitude of 8.1. The site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.

LIQUEFACTION AND SEISMIC SETTLEMENT

Liquefaction Potential

Liquefaction is a mode of ground failure that results from the generation of high pore-water pressures during earthquake ground shaking, causing loss of shear strength, and is typically a hazard where loose sandy soils exist below groundwater. The County of San Bernardino has designated certain areas as potential liquefaction hazard zones. These are areas considered at

a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table.

The subsurface materials generally consist of interbeded layers of silty clayey sand, silty sand and poorly graded sand extending to the maximum depth of the borings approximately 51½ feet bgs. Groundwater was not observed within the maximum depths of exploration during or at the completion of drilling, and has historically been deeper than 100 feet bgs.

According to the County of San Bernardino Geologic Hazard Overlay maps, the site is not located within an area having liquefaction potential. Based on the County mapping and the subsurface conditions encountered including depth to groundwater, it is our opinion that the liquefaction potential for the site is low to non-existent.

GEOTECHNICAL OVERVIEW

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

Geotechnical engineering recommendations for foundation systems and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and our current understanding of the proposed project.

The subsurface materials generally consist of fill soils and alluvial soils comprised of interbeded layers of silty sand with varying amounts of gravel, poorly graded sand with varying amounts of silt and gravel, clayey sand, and sandy lean clay extending to the maximum depth of the borings. All fill soils should be removed during grading operations. Refusal at a depth of approximately 7½ feet bgs within fill soils while drilling boring B5; the refusal appeared to be upon a buried structure constructed of clay brick and additional investigation should be performed to determine the type and extent of the structure.

Based on the conditions encountered and our assumptions regarding finish grades, the proposed buildings can be supported on shallow foundations, such as conventional spread footings. The drainage culvert located within the northwest portion of the site should be accurately located, including the bottom and top elevations and horizontal extent. The design and depth of foundations for the proposed buildings and subterranean parking structure should be design such that additional stresses from loading will not impact the culvert.

Due to accessibility within the existing buildings, we were not able to drill deep borings within the proposed footprint of the new structures, We recommend that additional borings be conducted within the footprint of the proposed structures; this would ideally be performed, when existing structures are demolished and the debris cleared. The borings should be performed to confirm the findings and recommendations provided herein, and possibly supplement or modify as needed. .
No groundwater was encountered in the borings to the depths drilled at the time of drilling. Groundwater is not expected to affect shallow foundation construction on this site.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

The following recommendations include site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including foundations, slabs, and pavements are contingent upon following the recommendations outlined in this section.

Support of pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by performing additional testing and evaluation.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

Site Preparation

Strip and remove existing vegetation, debris, pavements and other deleterious materials from proposed buildings and pavement areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed building structures.

Demolition of the existing buildings should include complete removal of all foundation systems and remaining underground utilities within the proposed construction area. This should include removal of any loose backfill found adjacent to existing foundations. All materials derived from the demolition of existing structures and pavements should be removed from the site and not be

allowed for use as on-site fill, unless processed in accordance with the fill requirements included in this report.

Our explorations indicate the site has approximately 3 to 9½ feet of fill material across the majority of the site. The fill soils generally consisted of loose to medium dense, silty sand, clayey sand, and silty sand with gravel. We recommend that all fill soils within the footprint of building pads and settlement sensitive structures be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction. Although no evidence of underground facilities such as septic tanks, cesspools, and basements, was observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills, utilities, or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

We recommend that the proposed buildings be supported by a shallow foundation bearing on engineered fill extending to a minimum depth of 2 feet below the bottom of foundations, or 5 feet below the existing grades, whichever is greater. Engineered fill placed beneath the entire footprint of the buildings should extend horizontally a minimum distance of 3 feet beyond the outside edge of perimeter footings.

Subgrade soils beneath exterior slabs and pavements should be removed to a depth of 1 foot below exting grade or bottom of proposed pavement section, and replaced as engineered fil to the proposed grades. The bottom of excavation should then be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. The moisture content and compaction of subgrade soils should be maintained until slab or pavement construction.

Exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned as necessary, and compacted per the compaction requirements in this report. Compacted fill soils should then be placed to the design grades, and the moisture content and compaction of soils should be maintained until slab, pavement, or proposed improvements are constructed.

Based upon the subsurface conditions determined from the geotechnical exploration, the on site soils are suitable for the proposed fill soils provided they are free from any organics and debris. The on site soils are anticipated to be relatively workable; however, the workability of the soils may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

We anticipate that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards. Excavations adjacent to the existing culvert within the northwest portion of the site, and other existing utilities or improvements to be left in place, should be performed to prevent undermining and distress to the improvement.

Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than three inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

■ general site grading	■ foundation backfill
■ foundation areas	■ pavement areas
■ interior floor slab areas	■ exterior slab areas

Imported soils that are used as fill materials to raise grades should conform to low volume change materials and should conform to the following requirements:

Gradation	**Percent Finer by Weight (ASTM C 136)**
3”	100
No. 4 Sieve	50 - 100
No. 200 Sieve	20 - 50

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum Expansive Index* ..... 20 (max)

*ASTM D 4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0)

potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed 10 inches loose thickness.

Compaction Requirements

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
On-site soils and/or low volume change imported fill:			
Beneath foundations:	95	0%	+3%
Beneath interior slabs:	95	0%	+3%
Fill greater than 5 feet in depth	95	0%	+3%
Miscellaneous backfill:	90	0%	+3%
Beneath pavements:	95	0%	+3%
Utility Trenches*:	90	0%	+3%
Bottom of excavation receiving fill:	95	0%	+3%
Aggregate base (beneath pavements):	95	0%	+3%

* Upper 12 inches should be compacted to 95% within pavement and structural areas.

Utility Trenches

We anticipate that the on-site soils will provide suitable support for underground utilities and piping that may be installed. Any soft and/or unsuitable material encountered at the bottom of excavations should be removed and be replaced with an adequate bedding material. A non-expansive granular material with a sand equivalent greater than 30 is recommended for bedding and shading of utilities, unless otherwise allowed by the utility manufacturer.

On-site materials are considered suitable for backfill of utility and pipe trenches from one foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

We recommend a minimum horizontal setback distance of 10 feet from the perimeter of any building and the high-water elevation of the nearest storm-water retention basin. A new subterranean garage and other structures are planned; therefore, the horizontal setback distance of any stormwater storage device should consider the impacts of seepage to below ground basement walls and footings, and the final design configuration should be reviewed and approved by the geotechnical engineer. Where the appropriate setbacks cannot be accommodated, other drainage devices such as storage chambers (or holding chambers) designed to release storm water to appropriate outlets should be considered.

Roof drainage should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems and landscaped irrigation should not be installed within 5 feet of foundation walls.

Exterior Slab Design and Construction

Exterior slabs-on-grade, exterior architectural features, and utilities founded on, or in backfill may experience some movement due to the volume change of the backfill. To reduce the potential for damage caused by movement, we recommend:

- minimizing moisture increases in the backfill;
- controlling moisture-density during placement of backfill;
- using designs which allow vertical movement between the exterior features and adjoining structural elements;
- placing effective control joints on relatively close centers.

Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of floor slabs and pavements. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab and pavement construction.

Onsite soils consist of cohesionless sandy soils. Such soils have the tendency to cave and slough during excavations. Therefore, formwork may be needed for foundation excavations.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through April) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork operations may require additional mitigative measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

Construction Observation and Testing

The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, proof-rolling, placement and compaction of controlled compacted fills, backfilling of excavations to the completed subgrade.

The exposed subgrade and each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. In the event that unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the

continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Item	Description
Foundation Support	Engineered fill extending 2 feet below the bottom of foundations, or 5 feet below existing grades, whichever is greater.
Net Allowable Bearing pressure [1, 2] **(On-site soils or structural fill)**	2,000 psf
Minimum Foundation Dimensions	Columns: 24 inches Continuous: 18 inches
Minimum Footing Depth	24" below finish grade
Increments of Net Allowable Bearing Pressure	400 psf for each additional foot of width 800 psf for each additional foot of depth
Maximum Net Allowable Bearing Pressure	3,500 psf
Ultimate Passive Resistance [4]	350 pcf
Ultimate Coefficient of Sliding Friction [5]	0.36
Estimated Total Static Settlement from Structural Loads [2]	about 1 inch
Estimated Differential Settlement [2, 6]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied.
2. Values provided are for maximum loads noted in **Project Description**. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations. Allowable bearing pressure and estimated settlement are based on the fact that building construction will commence after at least 90% of the fill and underlying native soil compression occurred.
3. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork**.
4. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.
6. Differential settlements are as measured over a span of 40 feet.

Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose

soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

To ensure foundations have adequate support, special care should be taken when footings are located adjacent to trenches. The bottom of such footings should be at least 1 foot below an imaginary plane with an inclination of 1.5 horizontal to 1.0 vertical extending upward from the nearest edge of adjacent trenches.

DEEP FOUNDATIONS

Drilled pier recommendations are provided for the proposed parking structure and the three and four story structures that are interconnected. We recommend drilled piers be designed and constructed as presented below.

Drilled Pier Foundation – Design Parameters

Axial Loading: Axial compressive loads may be supported on straight-sided drilled piers. Compressive axial loads on pier foundations are resisted by both side friction along the pier and by end bearing at the base of the pier if above groundwater, while uplift loads are resisted solely by side friction along the pier and by the weight of the pier.

It may be beneficial to install a monitoring well to determine the actual depth to groundwater for both design and construction purposes. Drilled piers extending below groundwater should not be designed for end bearing since it is very difficult if not impossible to adequately clean the bottom of the excavation in sandy soils to ensure end bearing can be relied upon.

Allowable compressive side friction and axial capacity for the parking structure are provided for pile diameters of 24-inches to 48-inches in the attachments of this report. The allowable uplift capacities should only be based on two-thirds of the allowable side friction of the shaft; however, the weight of the foundation should be added to these values to obtain the actual allowable uplift capacities for drilled shafts. The allowable end bearing capacities and skin friction values are based on factors of safety of 3 and 2, respectively.

Lateral Loading: The proposed parking structure may be subjected to lateral loading. The lateral resistance of a drilled pier can be estimated using L-PILE Analysis. The lateral load design L-Pile input parameters are provided in the table below.

L-Pile Design Input Parameters					
Layer	Bottom Depth of Layer (feet)	L-PILE Soil Types*	Effective Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
1	5	4	115	29	---
2	10	4	115	30	---
3	15	4	115	35	---
4	20	4	110	34	---
5	25	4	115	35	---
6	30	4	115	36	---
7	35	4	120	33	---
8	40	4	120	33	---
9	50	4	120	34	---

1. Design depth to subsurface water is deeper than 50 feet.
2. If groundwater is present, end bearing below the encountered depth should not be used for design. If groundwater is not present, end bearing may be used.

* L-PILE Soil Type: 4 – sand (Reese)

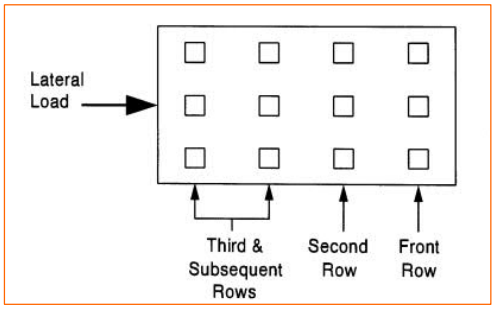
Tensile reinforcement should extend to the bottom of piers subjected to uplift loading, while maintaining appropriate concrete coverage.

Drilled piers should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piers in a group versus the capacity calculated using the perimeter and base of the pier group acting as a unit. The lesser of the two capacities should be used in design.

The loaded capacities provided herein are based on the stress induced in the supporting soils. The structural capacity of the shafts should be checked to assure that they can safely accommodate the combined stresses induced by axial and lateral forces. Furthermore, the response of the drilled shaft foundations to lateral loads is dependent upon the soil/structure interaction as well as the shaft actual diameter, length, stiffness and fixity (fixed or free-head conditions.

Post-construction settlements of drilled piers designed and constructed as described in this report are estimated to range from about ¾ to 1 inch. Differential settlement between individual piers is expected to be ½ to ⅔ of the total settlement.

When piers are used in groups, the lateral capacities of the piers in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pier. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pier foundations within a pier group are as follows:



1. Front row: $P_m = 0.8$;
2. Second row: $P_m = 0.4$
3. Third and subsequent row: $P_m = 0.3$.

For the case of a single row of piers supporting a laterally loaded grade beam, group action for lateral resistance of piers would need to be considered when spacing is less than three pier diameters (measured center-to-center). However, spacing closer than 3D (where D is the diameter of the pier) is not recommended due to the potential for the installation of a new pier disturbing an adjacent installed pier, likely resulting in axial capacity reduction.

A structural engineer licensed in the State of California should be retained to design the drilled pier foundation. Deep foundation construction should be monitored by the Geotechnical Engineer to observe that recommendations are correctly interpreted and implemented.

Drilled Pier Construction Recommendations

The Geotechnical Engineer should observe the installation of drilled piers to verify the soil conditions and the diameter and depth of piers. Drilled piers should be constructed true and plumb.

Because of the granular nature of the soils encountered, the possible presence of shallow groundwater, and the anticipated diameter of the drilled holes, it is anticipated that caving could occur during the drilling and construction of piers within the on-site soils. Appropriate precautions should therefore be taken during the construction of piers to reduce caving and raveling.

Temporary steel casing may be required to properly drill and clean drilled piers prior to concrete placement. A water and polymer displacement method may also be considered as a means of maintaining pier integrity during construction. Foundation concrete should be placed immediately

after completion of drilling and cleaning. If foundation concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for foundation construction, it should be withdrawn in a slow continuous manner, maintaining a sufficient head of concrete to prevent caving or the creation of voids in pier concrete. Foundation concrete should have a relatively high fluidity when placed in cased pier holes or through a tremie. Foundation concrete with slump in the range of 6 to 8 inches is recommended when temporary casing is utilized.

Free-fall concrete placement in drilled piers will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an “elephant's trunk” discharging near the bottom of the hole where concrete segregation will be minimized, is recommended.

Drilled pier end bearing surfaces must be thoroughly cleaned prior to concrete placement. A representative of the Geotechnical Engineer should inspect the bearing surface and foundation pier configuration. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

The contractor should check for gas and/or oxygen deficiency before any workers enter the excavation for observation and manual cleanup. All necessary monitoring and safety precautions as required by OSHA, State or local codes should be strictly enforced.

The drilling speed should be reduced as necessary to minimize vibration and caving of the silty sand materials. Based on the data developed during our investigation, drilling for the piers may need casing. as caving soils may be encountered; the contractor should be prepared to use casing or other approved means to prevent caving. The contractor should review the boring logs to make sure he is familiar with the anticipated subsurface conditions prior to beginning construction of the deep foundations.

The installation of drilled straight-shafts may likely require the use of the slurry displacement method and/or temporary steel casing with water pumps, if groundwater encountered. If drilled straight-shaft installation is attempted without utilizing slurry displacement method or temporary casing, zones of sloughing soils and/or groundwater inflow may occur during construction. Therefore, we recommend that provisions be incorporated into the plans and specifications to utilize slurry or casing to control sloughing and/or groundwater seepage during shaft construction.

The need for casing or slurry will depend on the depth of the drilled shaft and the groundwater conditions at the time of construction. If casing is used and seepage persists, the water accumulating in the foundation excavation should be pumped out. The condition of the bearing

surface should be evaluated immediately prior to placing concrete, if casing is used in lieu of slurry. If groundwater inflow is too severe to be controlled by the use of casing and pumping or significant sloughing of the sidewalls occurs, the slurry method of construction should be utilized to complete the foundation installation.

Closely spaced piers should be drilled and filled alternately, allowing the concrete to set at least eight hours before drilling the adjacent pier. All excavations should be filled with concrete as soon after drilling as possible. In no event should pier holes be left open overnight. To prevent concrete from striking the walls of the pier and causing caving, the concrete should be placed with appropriate equipment so that the concrete is not allowed to fall freely more than 5 feet. All loose materials should be thoroughly cleaned from the bottom of the pier excavation. This is especially important because end bearing has been considered in determining the provided pier capacities. If casing is necessary and is utilized, then the casing should be withdrawn concurrently with the concrete placement.

FLOOR SLABS

DESCRIPTION	RECOMMENDATION
Interior floor system	Slab-on-grade concrete
Floor slab support	Engineered fill extending 2 feet below the bottom of associated foundations, or 5 feet below existing grades, whichever is greater.
Subbase	Minimum 4-inches of Aggregate Base
Modulus of subgrade reaction	150 pounds per square inch per inch (psi/in) (The modulus was obtained based on estimates obtained from NAVFAC 7.1 design charts). This value is for a small loaded area (1 Sq. ft or less) such as for forklift wheel loads or point loads and should be adjusted for larger loaded areas.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the

length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

RETAINING WALLS

Design Parameters

The lateral earth pressure recommendations herein are applicable to the design of rigid retaining walls subject to slight rotation, such as cantilever or gravity type concrete walls. These lateral earth pressure recommendations are also applicable for the design of lateral loading against foundation walls.

For on-site soils or import materials above any free water surface, recommended equivalent fluid pressures for unrestrained walls are:

ITEM[1,2]	EFFECTIVE FLUID PRESSURE[5] (UNSATURATED) [6]
Active (K_a) (flat)	40 psf/ft
Seismic Active (K_{ae}) (flat)	80 psf/ft
Passive (K_p) (flat)	360 psf/ft
At-Rest (K_0) (flat)	60 psf/ft
Surcharge Loads[3,4]	0.33 x (S) psf
Coefficient of Friction**	0.35
Wall Foundation Support	Engineered fill extending 1-foot below the bottom of wall foundation
Net Allowable Bearing Pressure[7]	2,000 psf

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure conditions, wall movement in a range of 0.005H to 0.01H (H is the height of the wall) is required to fully mobilize passive earth pressures. If this scale of wall movement is not expected, a reduction factor of 50% may be used for passive earth pressure condition design.
2. Backfill, compacted to at least 90 percent of the ASTM D1557 maximum dry density, rendering a maximum unit weight of 120 pcf.
3. Uniform surcharge, where S is surcharge pressure. The project structural engineer should consider surcharge loadings, such as: adjacent streets and buildings.
4. Construction loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.
6. To achieve "Unsaturated" conditions, follow guidelines in Retaining Wall Drainage below. Terracon should be contacted if drainage systems will not be installed behind retaining walls or if the walls will be located below groundwater.
7. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied.

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

The design of retaining structures should consider surcharge loads imposed on the foundations. In addition, the design should take into consideration new and existing footing loads and anticipated vehicular loads in the vicinity of the proposed walls. In general, surcharge loads should be considered where they are located within a horizontal distance behind the wall equal to the height of the wall.

Surcharge loads acting at the top of the wall should be applied to the wall over the backfill as a uniform pressure over the entire wall height and should be added to the static earth pressures. Surcharge stresses due to point loads, line loads, and those of limited extent, such as compaction equipment, should be evaluated using elastic theory.

Adequate drainage should be provided behind the retaining walls to collect water from irrigation, landscaping, surface runoff, or other sources, to achieve a free-draining backfill condition. The wall back drain should consist of Class 2 permeable materials that are placed behind the entire wall height to within 18 inches of ground surface at the top of the wall. As a minimum, the width of Class 2 permeable materials behind the wall should be two feet. As an alternative, drainage panels/mats may be used in lieu of the Class 2 permeable materials. Water collected by the back drain should be directed to an appropriate outlet, such as weep drain or perforated pipes discharging beyond the retained area, for disposal. In the event that weep hole or perforated pipe is not installed behind

the wall to provide fee-draining condition, hydro-static water pressure should be considered for the design of wall and Terracon should be contacted for readjusting design parameters.

Fill against foundation and retaining walls should be compacted to densities specified in Earthwork section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Over-compaction may cause excessive lateral earth pressures which could result in wall movement.

PAVEMENTS

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

Design of asphalt concrete (AC) pavements is based on the procedures outlined in the Caltrans "Highway Design Manual for Safety Roadside Rest Areas" (Caltrans, 2016). Design of Portland cement concrete (PCC) pavements are based upon American Concrete Institute (ACI) 330R-08; "Guide for Design and Construction of Concrete Parking Lots."

During the field investigation at the site, one sample of the near surface soil taken from our borings was tested in our laboratory to determine the Hveem Stabilometer Value (R-value). The test produced an R-value of 67 and an R-value of 50 was used to calculate the AC pavement thickness sections (per Caltrans recommendations). A modulus of subgrade reaction of 120 pci and a modulus of rupture of 600 psi were used for the PCC pavement designs.

The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils as prescribed by in **Earthwork**, with the upper 12 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D 1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

The pavement designs were based upon the results of preliminary sampling and testing and should be verified by additional sampling and testing (specifically R-value testing) during construction when the actual subgrade soils are exposed. Additionally, the preliminary sections provided are minimums based on procedures previously referenced. The project civil engineer should confirm minimum Traffic Indieces and sections required by local agencies or jurisdictions if applicable.

Pavement Section Thicknesses

The following table provides options for AC and PCC Sections:

Asphalt Concrete Design		
Usage	**Assumed Traffic Index**	**Recommended Structural Section**
Auto Parking Areas	4.5	3" HMA[1]/4" Class 2 AB[2]
Drive lanes	5.5	3" HMA[1]/4" Class 2 AB[2]
Truck Delivery Areas	6.0	3" HMA[1]/5" Class 2 AB[2]

1. HMA = hot mix asphalt
2. AB = aggregate base

Portland Cement Concrete Design			
Layer	**Thickness (inches)**		
	Light Duty[1]	**Medium Duty[2]**	**Dumpster Pad[3]**
PCC	5.0	6.0	7.5
Aggregate Base [4]	--	--	--

1. Car Parking and Access Lanes, Average Daily Truck Traffic (ADTT) = 1 (Category A).
2. Truck Parking Areas, Multiple Units, ADTT = 25 (Category B)
3. In areas of anticipated heavy traffic, fire trucks, delivery trucks, or concentrated loads (e.g., dumpster pads), and areas with repeated turning or maneuvering of heavy vehicles, ADTT = 700 (Category C).
4. Aggregate base is not required. Compacted on-site material is considered competent.

Recommended structural sections were calculated based on assumed TIs and our preliminary sampling and testing.

Terracon does not practice traffic engineering. We recommend that the project civil engineer or traffic engineer verify that the TIs and ADTT traffic indices used are appropriate for this project.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2 percent.
- Subgrade and pavement surfaces should have a minimum 2 percent slope to promote proper surface drainage.
- Install below pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

STORM WATER MANAGEMENT

Five in-situ infiltration tests (falling head borehole permeability) were performed (P1, P2, P4, P5, and P6) at approximate depths of 10 and 15 feet bgs within boreholes drilled with an 8-inch diameter auger. Boring P3 encountered refusal on gravel at a depth of approximately 1½ feet bgs; as such, percolation testing was not performed in this boring. The objective of the testing is to provide infiltration rates for designing an infiltration.

A 2-inch thick, 3/4-inch gravel layer was placed in the bottom of each boring after the borings were drilled to investigate the soil profile. Three-inch diameter perforated pipes were installed on top of the gravel layer and gravel was used to backfill between the perforated pipes and the boring sidewall. The borings were then filled with water for a pre-soak period.

At the beginning of each test, the pipes were refilled with water and readings were taken at periodic time intervals as the water level dropped. The soil at the percolation test locations was classified in the field using a visual/manual procedure. The infiltration velocity is presented as the infiltration rate and is summarized in the following table. The infiltration rates provided do not include safety factors.

Test Location	Boring Depth (ft.) [1]	Test Depth Range (ft.) [1]	Soil Type	Water Head (ft)	Percolation Rate Average (in./hr.)	Infiltration Rate Average (in./hr.) [2]
P-1	15	10 to 15	SP	5	235.4	11.7
P-2	15	10 to 15	SM	5	54.96	2.0
P-4	10	5 to 10	SM/SP	5	316.8	22.3
P-5	15	10 to 15	SM/SP	5	328.8	19.0
P-6	10	5 to 10	SM/SP	5	150.2	6.2

1. Below existing ground surface.
2. If proposed infiltration system will mainly rely on vertical downward seepage, the correlated infiltration rates should be used.
3. Refusal was encountered in P-3 at depth of 1 ½ feet and we did not run percolation test at this location.

The above infiltration rates determined by the percolation test method are based on field test results utilizing clear water. Infiltration rates can be affected by silt buildup, debris, degree of soil saturation, site variability and other factors. The rate obtained at specific location and depth is representative of the location and depth tested and may not be representative of the entire site. Application of an appropriate safety factor is prudent to account for subsoil inconsistencies, possible compaction related to site grading, and potential silting of the percolating soils, depending on the application.

The design engineer should also check with the local agency for the limitation of the infiltration rate allowed in the design. If the maximum allowable design infiltration rate is lower than the above recommended rate, the maximum allowable design infiltration rate should be used. The designer of the basins should also consider other possible site variability in the design.

The percolation tests were performed with clear water, whereas the storm water will likely not be clear, but may contain organics, fines, and grease/oil. The presence of these deleterious materials will tend to decrease the rate that water percolates from the infiltration systems. Design of the storm water infiltration systems should account for the presence of these materials and should incorporate structures/devices to remove these deleterious materials.

Based on the soils encountered in our borings, we expect the percolation rates of the soils could be different than measured in the field due to variations in fines and gravel content. The design elevation and size of the proposed infiltration system should account for this expected variability in infiltration rates.

Infiltration testing should be performed after construction of the infiltration system to verify the design infiltration rates. It should be noted that siltation and vegetation growth along with other factors may affect the infiltration rates of the infiltration areas. The actual infiltration rate may vary from the values reported here. Infiltration systems should be located at least 10 feet from any existing or proposed foundation system.

CORROSIVITY

The following table lists the laboratory electrical resistivity (standard and as-received), chlorides, soluble sulfates, and pH testing results. These values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction. These results are preliminary and additional corrosivity testing should be performed within finished pads once grading is complete, and the corrosion recommendations updated accordingly.

Boring	Depth (feet)	Soluble Sulfate (mg/kg)	Soluble Chloride (mg/kg)	Total Salts (mg/kg)	pH	Resistivity (as-received) (Ohm-cm)	Resistivity (saturated) (Ohm-cm)
B-6	0 to 5	50	37	417	8.46	12,125	6,790

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 4.3.1 of the ACI Design Manual. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Consideration should be given to the use of non-metalic pipes where permitted by local building codes. For protection against corrosion to buried metals, Terracon recommends that an experienced corrosion engineer be retained to design a suitable corrosion protection system for underground metal structures or components.

If corrosion of buried metal is critical, it should be protected using a non-corrosive backfill, wrapping, coating, sacrificial anodes, or a combination of these methods, as designed by a qualified corrosion engineer.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

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ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Terracon conducted sixteen (16) soil-testing borings. These borings were drilled at the locations and to depths indicated in the table below.

Number of Borings	Boring Depth (feet) [1,2]	Planned Location
1 (B-1)	21 ½	Residential building area
1 (B-2)	51 ½	Residential building area
1 (B-3)	31 ½	Residential building area
1 (B-4)	51 ½	Parking structure
1 (B-5)	11 ½	Parking structure
2 (B-6 and B-7)	21 ½	Residential building area
2 (B-8 and B-9)	21 ½	Residential and retail building area
B-10	21 ½	South of Citrus Avenue
P-1 to P-6[3]	10 to 15	Infiltration system

1. Below ground surface.
2. P-3 located within existing subterranean parking and is not accessible with track rig. We cored concrete slab and used hand auger to advance boring for percolation testing. Boring encountered hand auger refusal at depth of 1 ½ feet.

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolation from the Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advance the borings with a truck-mounted drill rig using hollow-stem augers. Both a standard penetration test (SPT) sampler (2-inch outer diameter and 1-3/8-inch inner diameter) and a modified California ring-lined sampler (3-inch outer diameter and 2-3/8-inch inner diameter) are utilized in our investigation. The penetration resistance is recorded on the boring logs as the number of hammer blows used to advance the sampler in 6-inch increments (or less if noted). The samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches, providing up to three sets of blowcounts at each sampling interval. The sampling depths, penetration distances, and other sampling information are recorded on the field boring logs. The recorded blows are raw numbers without any corrections for hammer type (automatic vs. manual cathead) or sampler size (ring sampler vs. SPT sampler). Relatively undisturbed and bulk samples of the soils

encountered are placed in sealed containers and returned to the laboratory for testing and evaluation.

We observe and record groundwater levels during drilling and sampling. For safety purposes, all borings are backfilled with auger cuttings after their completion.

Our exploration team prepares field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs are prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- Water (Moisture) Content of Soil by Mass
- Laboratory Determination of Density (Unit Weight) of Soil Specimens
- Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- Modified Proctor test
- R-value test
- Consolidation test
- Corrosivity suite test

The laboratory testing program often included examination of soil samples by an engineer. Based on the material’s texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

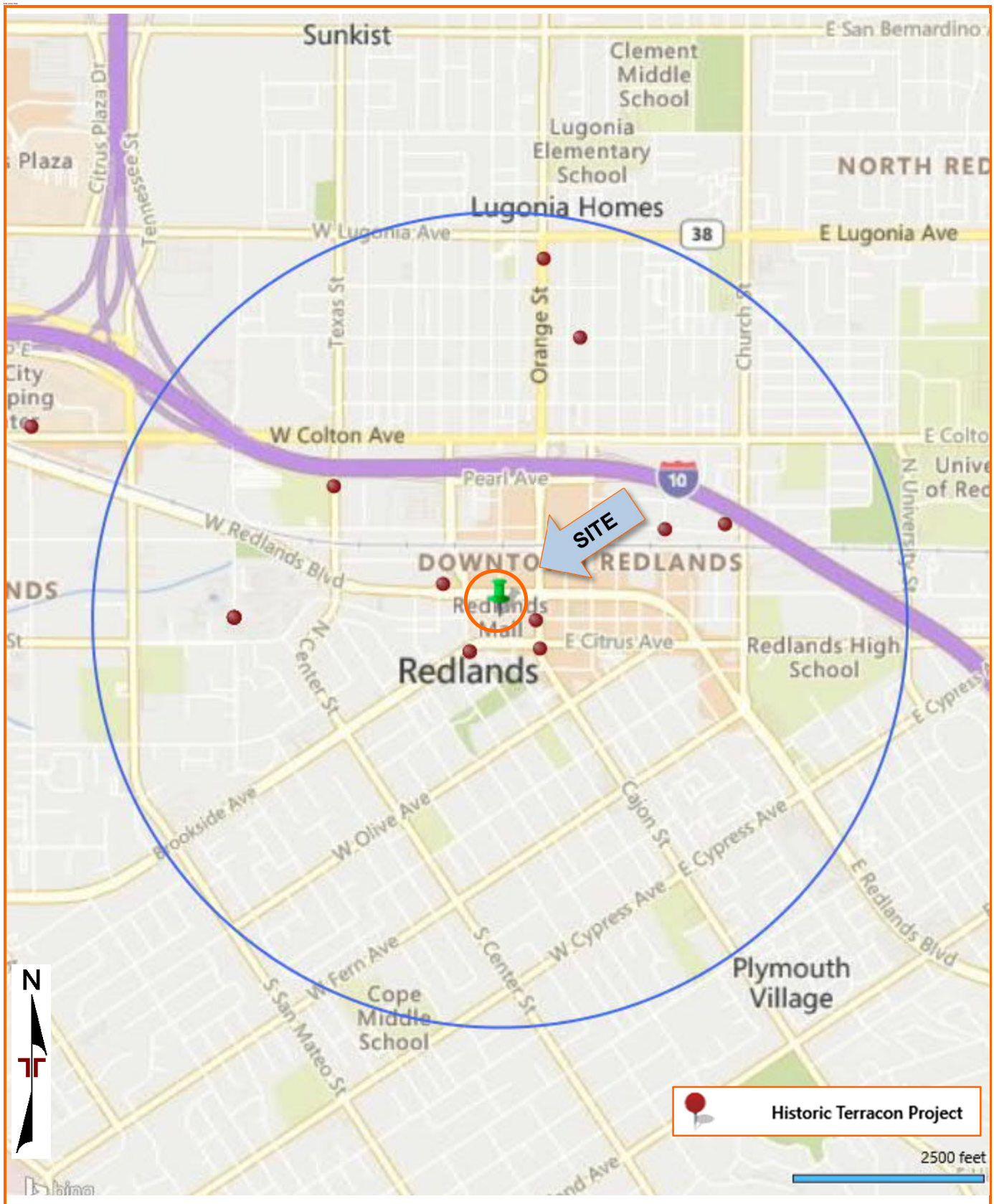


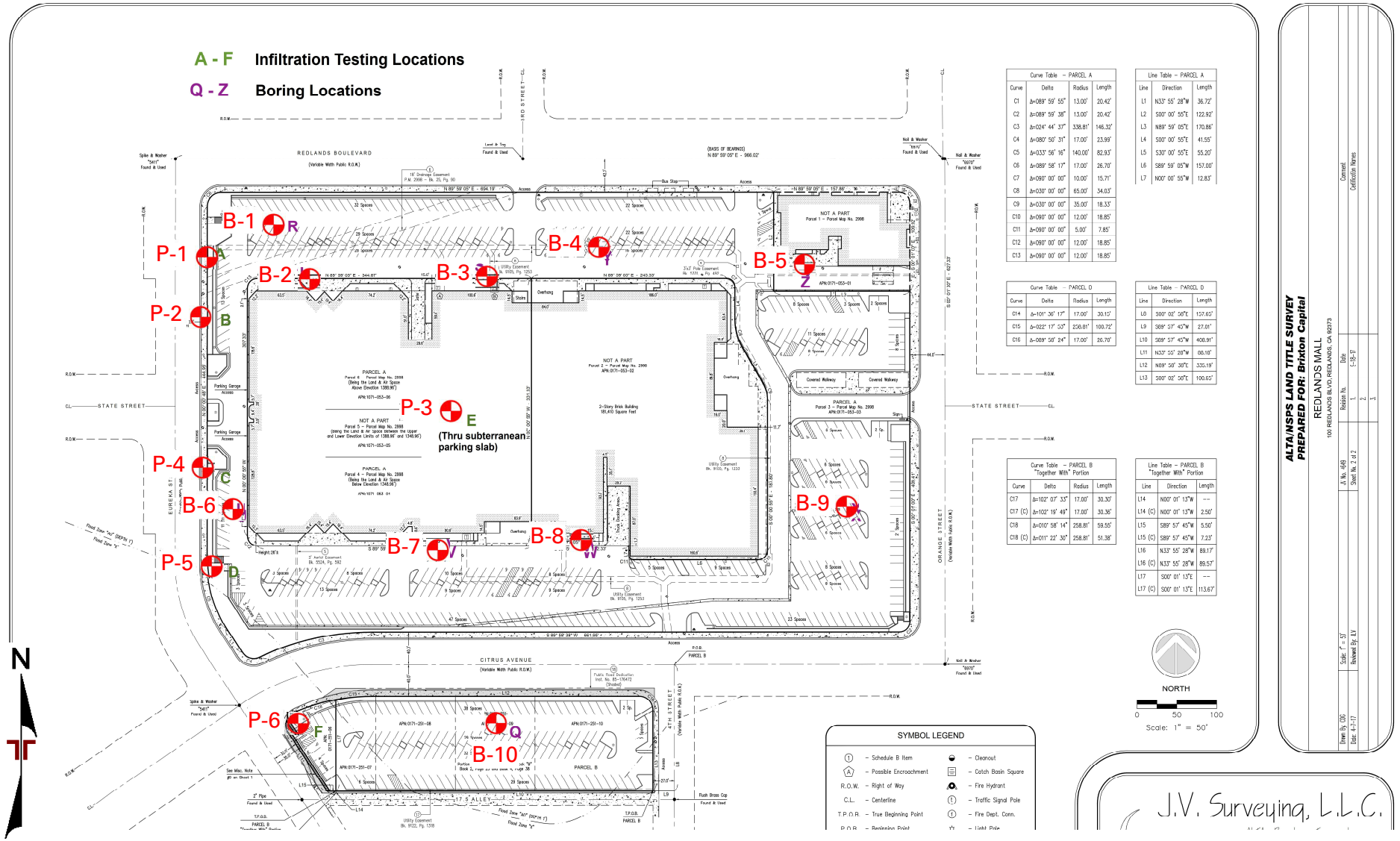
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Redlands Mall Redevelopment (Proposed State Street Village) ■ Redlands, San Bernardino County, California

September 30, 2021 ■ Terracon Project No. CB215095



Curve Table – PARCEL A			
Curve	Delta	Radius	Length
C1	Δ=089° 59' 55"	13.00'	20.42'
C2	Δ=089° 59' 38"	13.00'	20.42'
C3	Δ=024° 44' 37"	338.81'	146.32'
C4	Δ=080° 50' 31"	17.00'	23.99'
C5	Δ=033° 56' 16"	140.00'	82.93'
C6	Δ=089° 58' 17"	17.00'	26.70'
C7	Δ=090° 00' 00"	10.00'	15.71'
C8	Δ=030° 00' 00"	65.00'	34.03'
C9	Δ=030° 00' 00"	35.00'	18.33'
C10	Δ=090° 00' 00"	12.00'	18.85'
C11	Δ=090° 00' 00"	5.00'	7.85'
C12	Δ=090° 00' 00"	12.00'	18.85'
C13	Δ=090° 00' 00"	12.00'	18.85'

Line Table – PARCEL A		
Line	Direction	Length
L1	N33° 55' 28"W	36.72'
L2	S00° 00' 55"E	122.92'
L3	N89° 59' 05"E	170.86'
L4	S00° 00' 55"E	41.55'
L5	S30° 00' 55"E	55.20'
L6	S89° 59' 05"W	157.00'
L7	N00° 00' 55"W	12.83'

Curve Table – PARCEL D			
Curve	Delta	Radius	Length
C14	Δ=101° 30' 17"	17.00'	30.12'
C15	Δ=022° 17' 53"	258.81'	100.72'
C16	Δ=089° 58' 24"	17.00'	26.70'

Line Table – PARCEL D		
Line	Direction	Length
L8	S00° 02' 06"E	157.65'
L9	S89° 57' 45"W	27.01'
L10	S89° 57' 45"W	408.91'
L11	N33° 55' 28"W	88.18'
L12	N89° 58' 38"E	335.19'
L13	S00° 02' 06"E	100.65'

Curve Table – PARCEL B "Together With" Portion			
Curve	Delta	Radius	Length
C17	Δ=102° 07' 33"	17.00'	30.30'
C17 (C)	Δ=102° 19' 49"	17.00'	30.36'
C18	Δ=010° 58' 14"	258.81'	59.55'
C18 (C)	Δ=011° 22' 30"	258.81'	51.38'

Line Table – PARCEL B "Together With" Portion		
Line	Direction	Length
L14	N00° 01' 13"W	--
L14 (C)	N00° 01' 13"W	2.50'
L15	S89° 57' 45"W	5.50'
L15 (C)	S89° 57' 45"W	7.23'
L16	N33° 55' 28"W	89.17'
L16 (C)	N33° 55' 28"W	89.57'
L17	S00° 01' 13"E	--
L17 (C)	S00° 01' 13"E	113.67'

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

BORING LOG NO. B-1

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0571° Longitude: -117.1853°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND (SM), fine to coarse grained, brown, medium dense							23
						11-19-21	5	123	
			5			16-21-18	5	123	
7.0									
		FILL - CLAYEY SAND WITH GRAVEL (SC), dark brown, medium dense, with concrete fragments				13-16-16	6	114	
10.0			10						
		SILTY SAND (SM), light brown, dense				20-30-44	1		
		grayish brown, medium dense	15			27-18-13			
			20			29-27-12			
21.5		***Boring Terminated at 21.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-2

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0569° Longitude: -117.1853°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND (SM), trace gravel up to 1 1/2", fine to coarse grained, olive, medium dense							
						7-22-30	8	134	36
			5						
						14-19-33	5	126	12
7.0		**SILTY SAND (SM)**, trace gravel up to 1/2", fine to coarse grained, brown, loose, with root traces							
						5-8-8	5	130	23
9.5		**POORLY GRADED SAND (SP)**, trace gravel up to 1 1/2", fine to coarse grained, olive to gray, very dense	10						
						10-50/6"	4	105	10
13.0		**POORLY GRADED SAND WITH GRAVEL (SP)**, gravel up to 1", fine to coarse grained, brown, dense							
			15			8-14-16 N=30			5
		3 sandy silt lens							
18.0		**SILTY SAND WITH GRAVEL (SM)**, gravel up to 1", fine to coarse grained, brown, dense							
			20			12-15-21 N=36			15
23.0		**SILTY SAND (SM)**, fine to coarse grained, brown, medium dense							
			25			11-11-12 N=23			8
		4" clean sand lens							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-2

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0569° Longitude: -117.1853°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
		SILTY SAND (SM), fine to coarse grained, brown, medium dense *(continued)*							
		3" sandy silt lens	30			5-10-14 N=24			10
33.0									
		POORLY GRADED SAND (SP), fine to coarse grained, grayish brown, dense	35			12-17-22 N=39			4
38.0									
		POORLY GRADED SAND WITH GRAVEL (SP), gravel up to 1 1/2", fine to coarse grained, gray, very dense							
		4" silty sand lens	40			12-50/6"			8
			45			50/6"			9
		sandy clay lens							
48.0									
		SANDY LEAN CLAY (CL), brown, very stiff	50			5-12-15 N=27			61
51.5									
		Boring Terminated at 51.5 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-3

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0569° Longitude: -117.1845°

DEPTH	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND (SM), trace gravel up to 2", fine to coarse grained, brown, medium dense							18
						10-15-18	5	126	
		brick debris	5			12-16-28	9	133	
7.0		**SILTY SAND (SM)**, trace gravel up to 1/2", fine to coarse grained, reddish brown, loose				4-4-3	5	122	
11.3		**POORLY GRADED SAND (SP)**, fine to coarse grained, gray, medium dense	10			9-16-29	3	111	
13.0		**POORLY GRADED SAND WITH GRAVEL (SP)**, gravel up to 1 1/2", fine to coarse grained, grayish brown, dense	15			11-16-18 N=34			
16.5		**SILTY SAND (SM)**, fine to medium grained, reddish brown, medium dense	20			9-10-12 N=22			
		4" clean sand lens	25			10-11-12 N=23			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-3

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 34.0569° Longitude: -117.1845° DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	SILTY SAND (SM), fine to medium grained, reddish brown, medium dense *(continued)*							
	occasional sandy silt lenses	30			6-7-13 N=20			
	31.5 ***Boring Terminated at 31.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-4

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.057° Longitude: -117.184°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
		FILL - SILTY SAND (SM), trace gravel up to 1", fine to coarse grained, brown, medium dense, with brick debris							
						10-12-12	5	119	28
4.5		**SILTY SAND (SM)**, fine to coarse grained, brown, loose							
		root traces	5			2-3-4	4	120	26
7.0		**CLAYEY SAND (SC)**, trace gravel up to 1.5", fine to medium grained, reddish brown, loose							
						4-7-9	6	113	50
		very dense	10						
						10-18-50/5"	4	138	34
13.0		**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, gravel greater than 1.5", fine to coarse grained, reddish brown, dense							
			15			15-16-23 N=39			10
18.0		**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel up to 1/2", fine to coarse grained, reddish brown, medium dense							
			20			7-11-14 N=25			7
23.0		**POORLY GRADED SAND (SP)**, fine to coarse grained, brown, dense							
		2" gravel lens	25			7-14-17 N=31			6

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-4

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.057° Longitude: -117.184°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
		POORLY GRADED SAND (SP), fine to coarse grained, brown, dense *(continued)*							
		trace gravel up to 1"	30		X	18-18-14 N=32			9
35.0		**SILTY SAND (SM)**, fine to coarse grained, olive, medium dense	35		X	8-9-12 N=21			24
38.0		**POORLY GRADED SAND (SP)**, fine to medium grained, olive, medium dense							
		occasional silt lenses	40		X	7-10-12 N=22			14
		fine to coarse grained, dense	45		X	9-13-19 N=32			9
48.0		**SILTY SAND (SM)**, trace gravel up to 1", fine to medium grained, olive, medium dense	50		X	8-11-15 N=26			32
51.5		3" sandy silt lens							
		Boring Terminated at 51.5 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-5

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0569° Longitude: -117.1832°

DEPTH		GRAPHIC LOG	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3	**ASPHALT**, 4"							
0.7	**AGGREGATE BASE COURSE**, 4"							
	FILL - SILTY SAND (SM), trace gravel up to 1.5", fine to coarse grained, olive brown, medium dense							
3.0	**FILL - CLAYEY SAND (SC)**, trace gravel up to 1/4", fine to medium grained, brown, medium dense, with red brick and concrete debris				10-8-15	9	124	
5					8-20-15	12	108	
	concrete debris							
7.5	**BURIED STRUCTURE**, large, textured brick pieces				5-8-5	12		
10								
	Auger contacting with plastic structure, with deteriorated fiber cloth mesh on end of drillstring. No recovery with ring sampler. Void at bottom of hole, no discernable noise when dropping rock down hole.				1-2-3			
11.5	***Auger Refusal at 11.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-26-2021 | Boring Completed: 08-26-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-6

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0561° Longitude: -117.1855°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
0.7		**AGGREGATE BASE COURSE**, 5"							
		FILL - SILTY SAND WITH GRAVEL (SM), fine to coarse grained, brown, medium dense				12-24-32	3	119	16
5.0		**SILTY SAND (SM)**, fine to coarse grained, brown, medium dense	5			18-20-16	2	114	19
		loose				5-7-10	2	111	14
		medium dense, with gravel and cobbles	10			8-10-12	1		3
		coarse grained	15			7-8-9 N=17			50
			20			7-13-13 N=26			41
21.5		***Boring Terminated at 21.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-7

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.056° Longitude: -117.1846°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
0.6		**AGGREGATE BASE COURSE**, 4"							
		FILL - CLAYEY SAND (SC), dark brown, loose				5-8-10	10	111	40
5.0		**SILTY SAND (SM)**, dark brown, medium dense	5			8-13-17	4	114	13
		grayish brown				6-12-11	2	113	3
		medium dense	10			6-7-10	4	110	5
		gray, medium dense	15			9-12-13 N=25			6
		brown	20			6-8-7 N=15			12
21.5		***Boring Terminated at 21.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-8

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.056° Longitude: -117.1841°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
0.5		**AGGREGATE BASE COURSE**, 3"							
		FILL - SILTY SAND (SM), trace gravel up to 3/4", fine to coarse grained, brown, medium dense, with brick debris				11-17-17	5	122	
4.5		**SILTY SAND (SM)**, trace gravel up to 3/8", fine to coarse grained, brown, loose	5			4-7-7	3	104	
7.0		**POORLY GRADED SAND (SP)**, trace gravel up to 1/2", medium to coarse grained, gray, medium dense				6-10-14	2	107	
			10			10-16-22	2	122	
12.0		**CLAYEY SAND (SC)**, fine to coarse grained, reddish brown, medium dense	15			4-6-7 N=13			
18.0		**LEAN CLAY WITH SAND (CL)**, reddish brown, soft	20			2-2-2 N=4			
21.5		***Boring Terminated at 21.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-9

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0561° Longitude: -117.183°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 4"							
		FILL - SILTY SAND (SM), trace gravel up to 2", fine to coarse grained, olive, medium dense							
		red brick and concrete debris				10-16-14	21	87	7
		no gravel	5			7-16-24	2	89	11
		reddish brown to olive, with 3" gravel				6-13-45	5	132	16
9.5		**SILTY SAND (SM)**, fine to medium grained, reddish brown to brown, medium dense	10			7-10-15	4	112	13
		fine to coarse grained	15			5-7-8 N=15			10
18.0		**POORLY GRADED SAND (SP)**, fine to coarse grained, brown, dense	20			8-12-21 N=33			5
21.5		***Boring Terminated at 21.5 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. B-10

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0554° Longitude: -117.1844°

DEPTH	GRAPHIC LOG		WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"						
		FILL - SILTY SAND (SM), trace gravel up to 1", fine to medium grained, reddish brown, loose						
					4-5-6	5	113	19
4.5		**POORLY GRADED SAND (SP)**, fine to coarse grained, brown to gray, medium dense						
5					5-7-10	1	109	5
					5-7-14	1		4
10					8-8-13	1	108	10
13.0		**SILTY SAND (SM)**, trace gravel up to 1", fine to coarse grained, reddish brown, medium dense						
15					7-9-10 N=19			6
		dense						
20					11-16-16 N=32			12
21.5		***Boring Terminated at 21.5 Feet***						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-26-2021 | Boring Completed: 08-26-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-1

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.057° Longitude: -117.1856°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND WITH GRAVEL (SM), gravel up to 3/8", fine to coarse grained, brown, medium dense	5			11-10-8 N=18			
8.0		**POORLY GRADED SAND WITH SILT (SP-SM)**, fine to coarse grained, brown, dense							
		2" reddish brown silty sand lens	10			5-13-30 N=43			
12.5		**POORLY GRADED SAND WITH GRAVEL (SP)**, gravel up to 1.5", fine to coarse grained, gray, medium dense							17
14.5						8-6-12 N=18			
15.2		**LEAN CLAY (CL)**, reddish brown, very stiff	15						
		Boring Terminated at 15.2 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-2

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0568° Longitude: -117.1856°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND (SM), trace gravel up to 1.5", fine to coarse grained, brown, medium dense	5			6-7-6 N=13			
8.0		**POORLY GRADED SAND (SP)**, fine to coarse grained, gray, medium dense	10			4-5-7 N=12			
11.0		**SILTY SAND (SM)**, fine to coarse grained, reddish brown, medium dense							24
		trace gravel up to 1.5", dense	15			10-13-24 N=37			
15.2		***Boring Terminated at 15.2 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-3

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0564° Longitude: -117.1845°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	0.3	**CONCRETE**, 4"							
	1.5	**FILL - SILTY SAND WITH GRAVEL (SM)**, brown							
		Auger Refusal at 1.5 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
6" Hand Auger

Abandonment Method:
Boring backfilled with bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-27-2021 | Boring Completed: 08-27-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-4

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0562° Longitude: -117.1856°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.5		**ASPHALT**, 6"							
		FILL - SILTY SAND (SM), trace gravel up to 1.5", fine to coarse grained, brown, loose							
6.0		**SILTY SAND (SM)**, fine to medium grained, reddish brown, loose	5			3-3-5 N=8			
7.5		**POORLY GRADED SAND (SP)**, trace gravel up to 3/4", fine to coarse grained, gray, medium dense				5-9-13 N=22			13
10.2		***Boring Terminated at 10.2 Feet***	10						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-5

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0559° Longitude: -117.1855°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 4"							
		FILL - SILTY SAND (SM), trace gravel, fine to coarse grained, brown, medium dense, with brick debris	5			6-7-11 N=18			
8.0		**SILTY SAND (SM)**, trace gravel up to 1.5", fine to coarse grained, brown, medium dense	10			3-3-6 N=9			
12.0		**POORLY GRADED SAND (SP)**, trace gravel up to 3/4", fine to coarse grained, brownish gray, medium dense							13
15.2		***Boring Terminated at 15.2 Feet***	15			5-5-7 N=12			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-25-2021 | Boring Completed: 08-25-2021

Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

BORING LOG NO. P-6

PROJECT: State Street Village

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

LOCATION See Exploration Plan

Latitude: 34.0554° Longitude: -117.1852°

DEPTH	GRAPHIC LOG		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
0.3		**ASPHALT**, 3"							
		FILL - SILTY SAND (SM), trace gravel up to 1.5", fine to coarse grained, brown							
3.0		**SILTY SAND (SM)**, trace gravel up to 1", fine to coarse grained, brown, medium dense	5			7-11-8 N=19			
7.0		**POORLY GRADED SAND WITH GRAVEL (SP)**, gravel up to 1.5", fine to coarse grained, gray, medium dense				5-5-12 N=17			19
10.2		***Boring Terminated at 10.2 Feet***	10						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Started: 08-26-2021 | Boring Completed: 08-26-2021

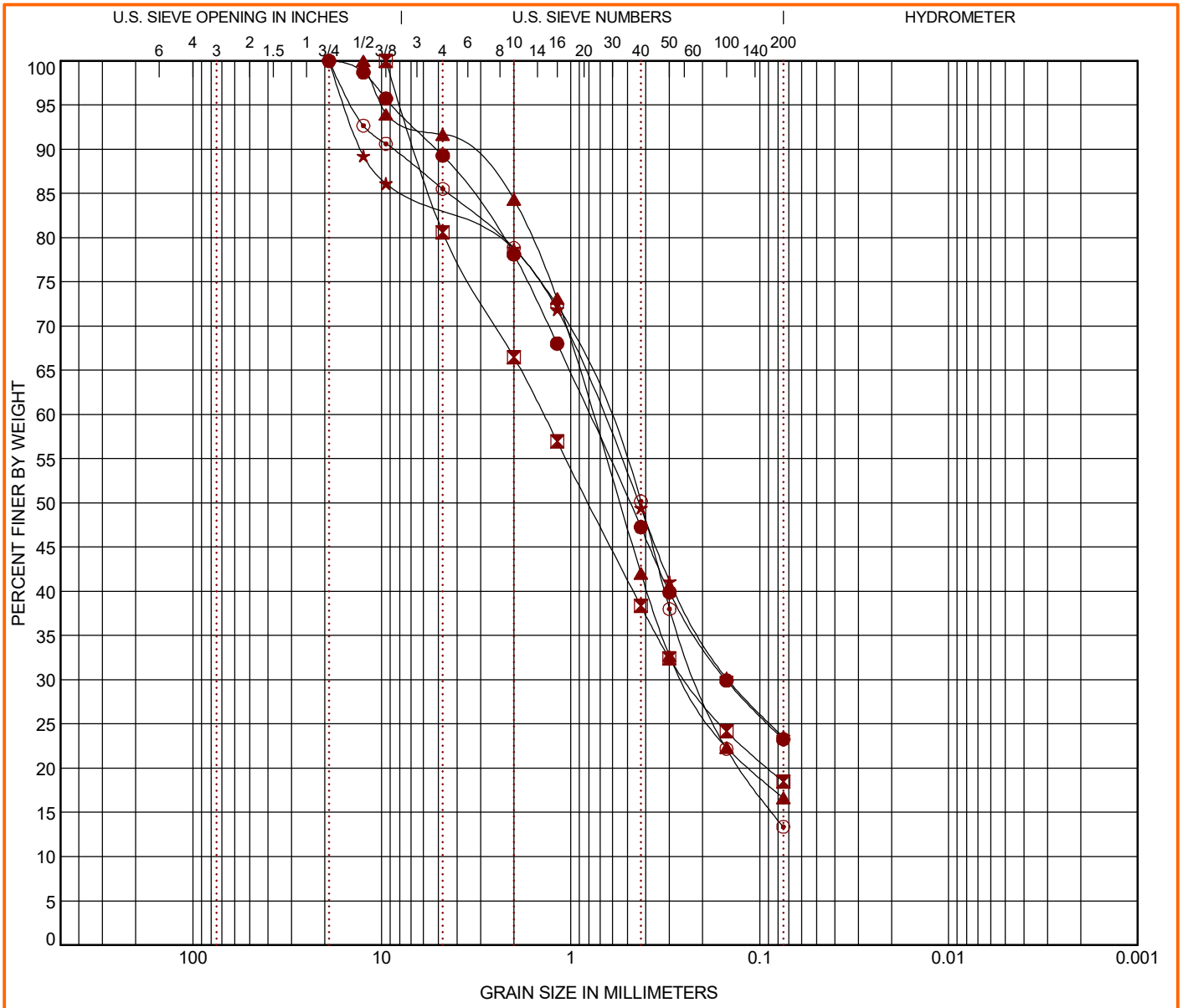
Drill Rig: B-61 | Driller: California Pacific Drilling

Project No.: CB215095

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	B-1	0 - 5	Silty Sand (SM)						
⊠	B-3	0 - 5	Silty Sand (SM)						
▲	P-1	10.1 - 15	Poorly Graded Sand with Gravel (SP)						
★	P-2	10.1 - 15	Silty Sand (SM)						
⊙	P-4	5.1 - 10	Silty Sand (SM)						

Boring ID		Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	B-1	0 - 5	19	0.795	0.151		0.0	10.7	66.0		23.3	
⊠	B-3	0 - 5	9.5	1.396	0.245		0.0	19.4	62.1		18.5	
▲	P-1	10.1 - 15	12.5	0.767	0.251		0.0	8.3	75.0		16.7	
★	P-2	10.1 - 15	19	0.687	0.147		0.0	17.2	59.3		23.6	
⊙	P-4	5.1 - 10	19	0.668	0.211		0.0	14.5	72.1		13.4	

PROJECT: State Street Village

PROJECT NUMBER: CB215095

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

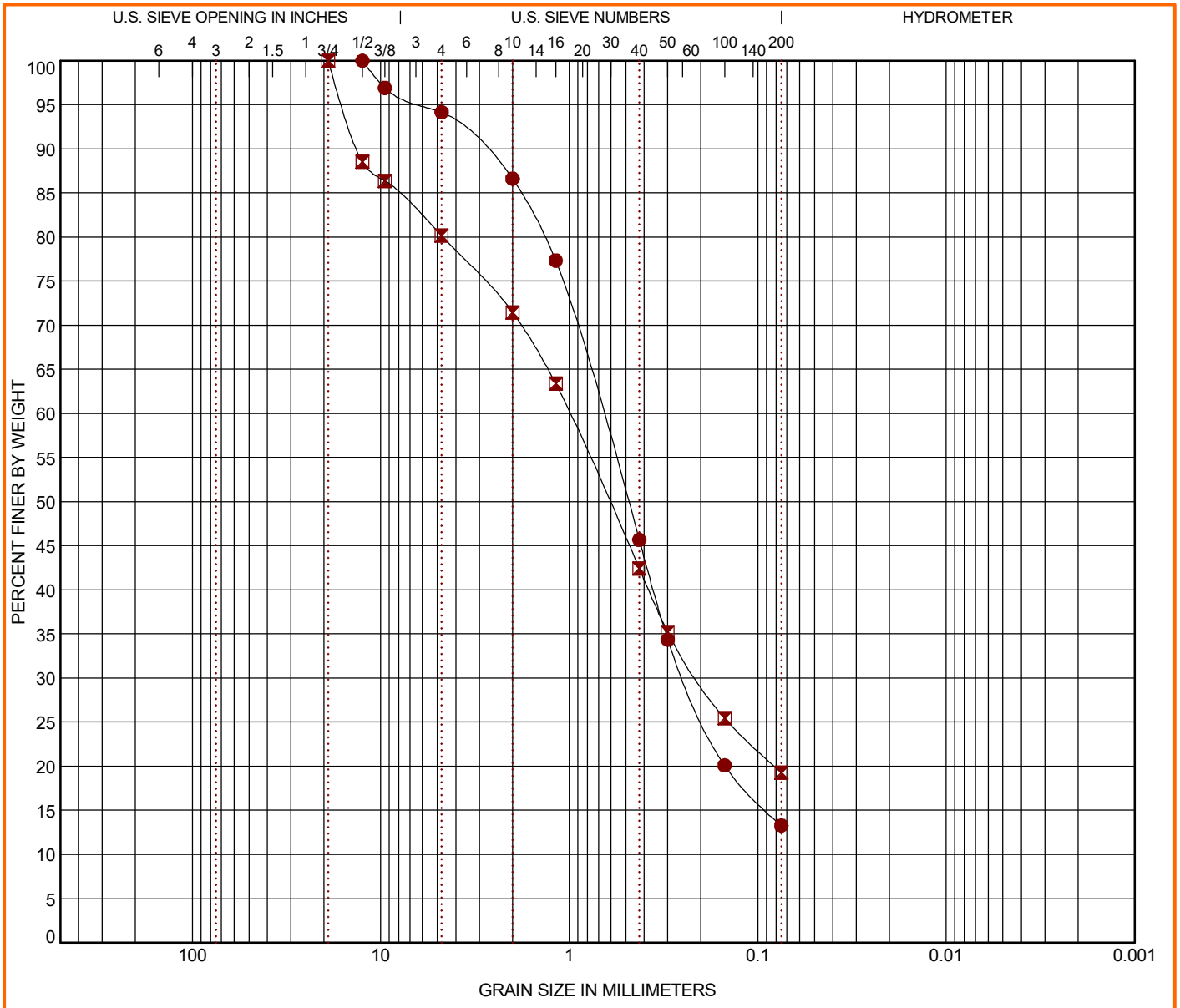
Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	P-5	10.1 - 15	Silty Sand (SM)						
⊠	P-6	5.1 - 10	Silty Sand (SM)						

Boring ID		Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	P-5	10.1 - 15	12.5	0.674	0.243		0.0	5.8	80.9		13.3	
⊠	P-6	5.1 - 10	19	1.001	0.207		0.0	19.8	60.9		19.3	

PROJECT: State Street Village

PROJECT NUMBER: CB215095

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

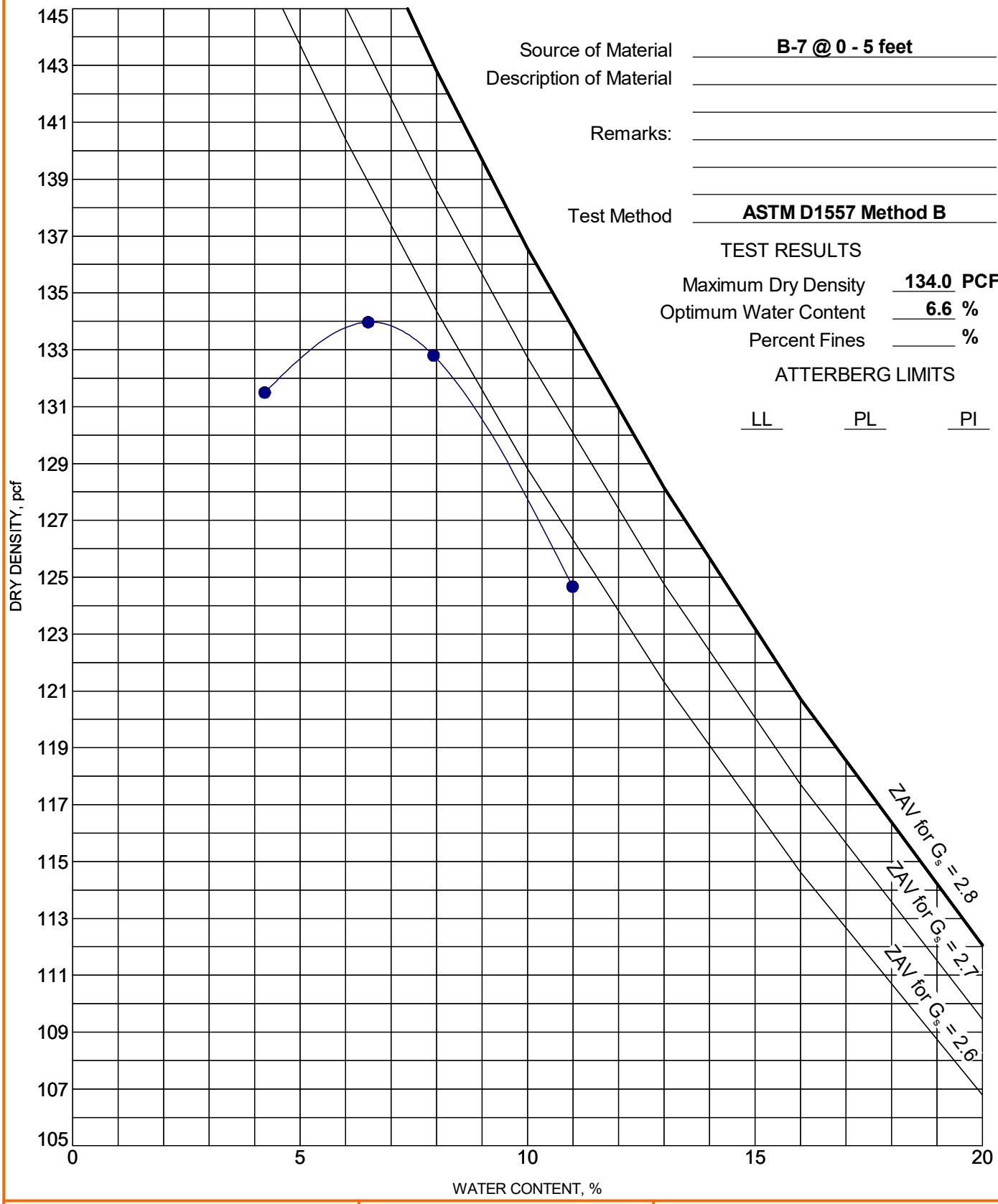
Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/27/21

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **B-7 @ 0 - 5 feet**

Description of Material:

Remarks:

Test Method: **ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density	**134.0**	**PCF**
Optimum Water Content	**6.6**	**%**
Percent Fines		**%**

ATTERBERG LIMITS

LL	PL	PI

PROJECT: State Street Village

PROJECT NUMBER: CB215095

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V1 CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/24/21

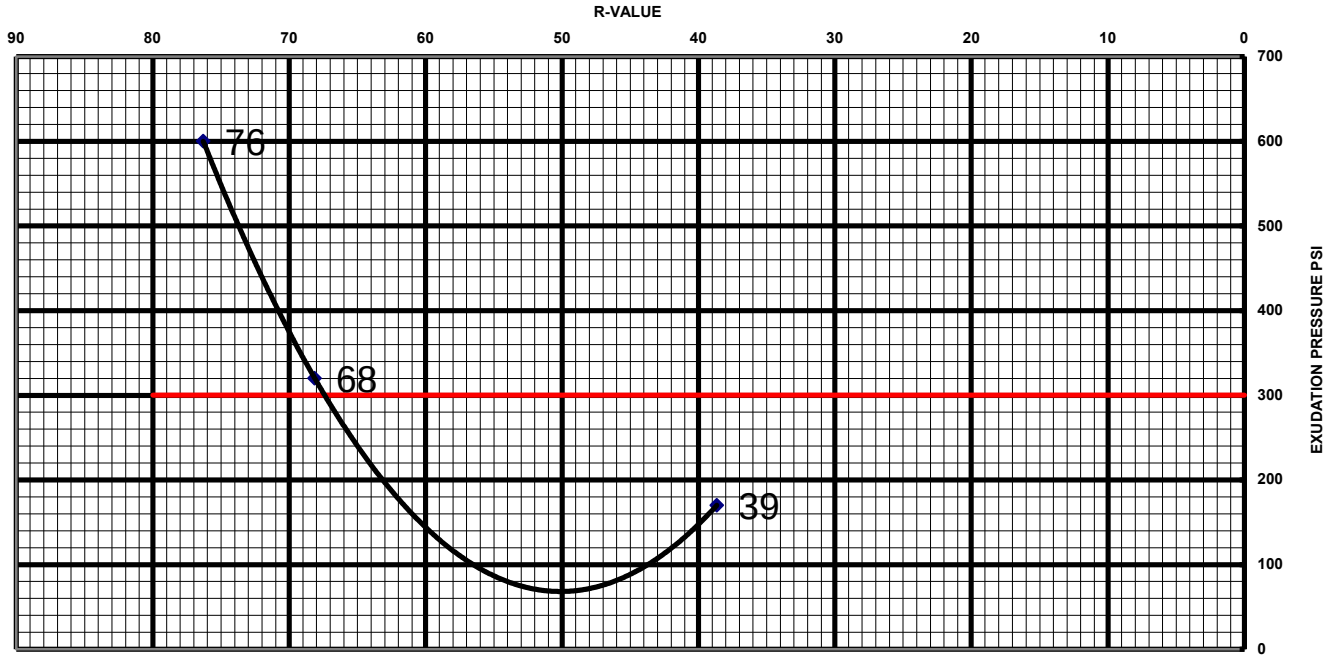
Job No. CB215095
Date. 9/9/2021

LABORATORY RECORD OF TESTS MADE ON BASE, SUBBASE, AND BASEMENT SOILS

CLIENT: **Village Partners Ventures, LLC**
PROJECT **State Street Village**
LOCATION: **Redlands, CA**
R-VALUE # : **B-1 (0 to 5')**
T.I. :

	A	B	C	D
COMPACTOR AIR PRESSURE P.S.I.	350	350	350	
INITIAL MOISTURE %	6.0	6.0	6.0	
WATER ADDED, ML	40	30	20	
WATER ADDED %	3.5	2.7	1.8	
MOISTURE AT COMPACTION %	9.5	8.7	7.8	
HEIGHT OF BRIQUETTE	2.48	2.45	2.51	
WET WEIGHT OF BRIQUETTE	1197	1179	1200	
DENSITY LB. PER CU.FT.	133.5	134.1	134.4	
STABILOMETER PH AT 1000 LBS.	34	22	14	
2000 LBS.	70	33	24	
DISPLACEMENT	5.10	4.50	4.40	
R-VALUE	39	68	76	
EXUDATION PRESSURE	170	320	600	
THICK. INDICATED BY STAB.	0.00	0.00	0.00	
EXPANSION PRESSURE	2	8	30	
THICK. INDICATED BY E.P.	0.07	0.27	1.00	

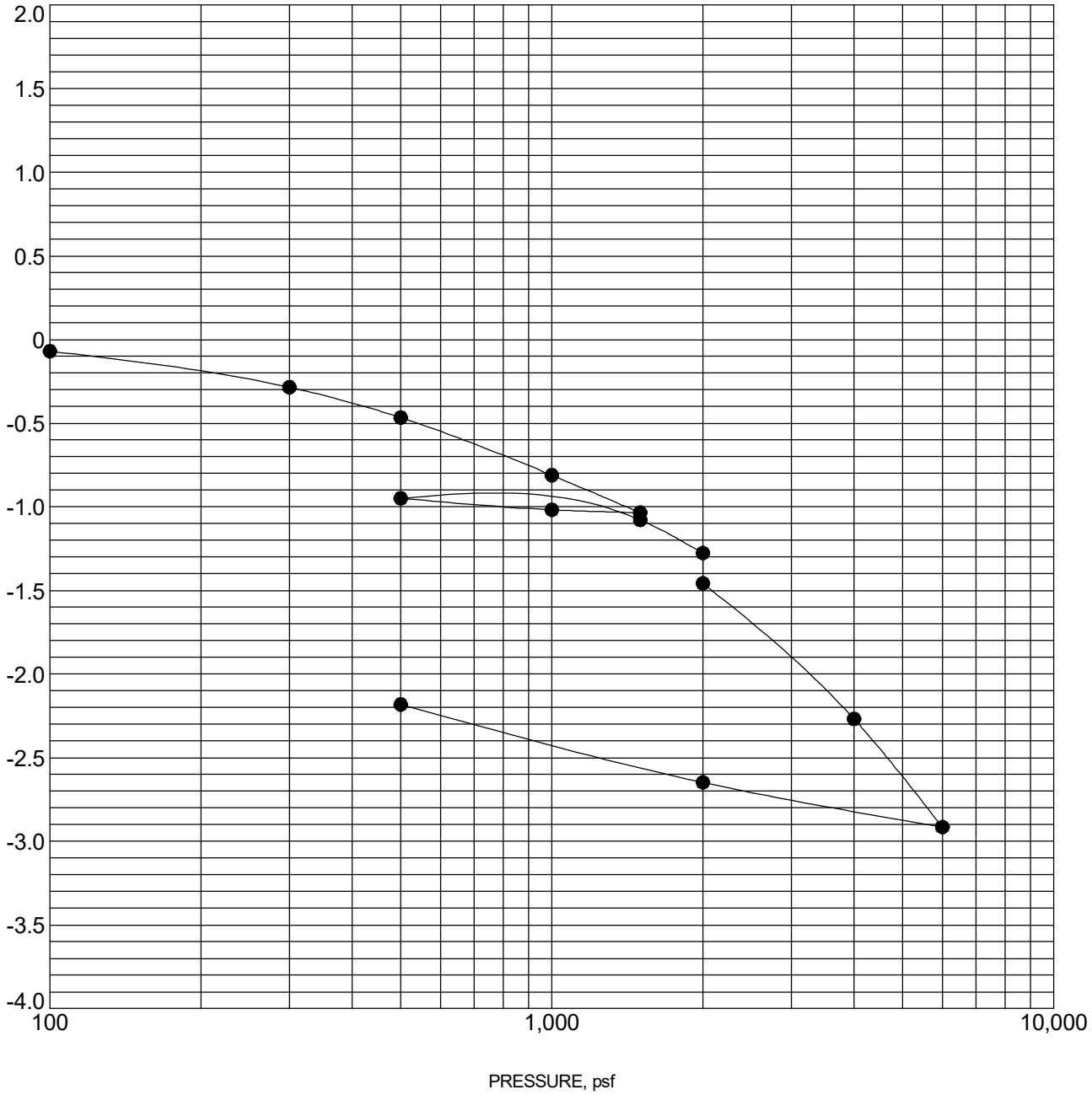
EXUDATION CHART



R-Value: **67**

SWELL CONSOLIDATION TEST

ASTM D2435



Specimen Identification			Classification	γ_d, pcf	WC, %
●	B-3	7.5 - 9 ft	Silty Sand (SM)		

NOTES: sample was saturated at surcharge pressure of 2,000 psf

PROJECT: State Street Village

SITE: (Redevelopment of Redlands Mall)
Redlands, CA

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

PROJECT NUMBER: CB215095

CLIENT: Village Partners Ventures LLC
Newport Beach, CA

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS CB215095 STATE STREET VILL.GPJ TERRACON_DATATEMPLATE.GDT 9/23/21

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client
Village Partners Ventures LLC
Newport Beach, CA

Project
State Street Village

Sample Submitted By: Terracon (CB) **Date Received:** 9/9/2021 **Lab No.: 21-0685**

Results of Corrosion Analysis

Sample Number	6-A
Sample Location	B-6
Sample Depth (ft.)	0.0-5.0
pH Analysis, ASTM G 51	8.46
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	50
Chlorides, ASTM D 512, (mg/kg)	37
Total Salts, AWWA 2540, (mg/kg)	417
As-Received Resistivity, ASTM G 57, (ohm-cm)	12125
Saturated Minimum Resistivity, ASTM G 57, (ohm-cm)	6790

Analyzed By: Trisha Campo
Chemist

The tests were performed in general accordance with applicable ASTM and AWWA test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

CB215095

PERCOLATION TEST DATA

BORING NUMBER: P-1
LOT No: N/A
TRACT No: N/A

CLIENT: Redlands Mall Redevelopment
PROJECT: Village Partners Ventures LLC

DATE OF DRILLING: August 25, 2021
DATE OF TESTING: August 26, 2021
DRILLED BY: SP
TESTED BY: GA

DEPTH BEFORE (ft.): 14.8
DEPTH AFTER (ft.): 14.8
PVC PIPE DIA. (in.): 3.0
PERC HOLE DIA. (in.): 8.0

Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (ft.)	Final Water Level (ft.)	Change in Water Level (ft.)	Initial Hole Depth (ft.)	Final Hole Depth (ft.)	Percolation Rate (in/hr)	Infiltration rate (Porchet Method) (in/hr)
30	30	10	14.80	4.80	14.8	14.8	115.20	7.48
30	60	10	14.80	4.80	14.8	14.8	115.20	7.48
10	70	10	13.19	3.19	14.8	14.8	229.68	11.35
10	80	10	12.87	2.87	14.8	14.8	206.64	9.75
10	90	10	13.08	3.08	14.8	14.8	221.76	10.79
10	100	10	13.21	3.21	14.8	14.8	231.12	11.46
10	110	10	13.31	3.31	14.8	14.8	238.32	11.99
10	120	10	13.29	3.29	14.8	14.8	236.88	11.89
				Average of last 3 readings:			235.44	11.78

CB215095

PERCOLATION TEST DATA

BORING NUMBER: P-2
LOT No: N/A
TRACT No: N/A

CLIENT: Redlands Mall Redevelopment
PROJECT: Village Partners Ventures LLC

DATE OF DRILLING: August 25, 2021
DATE OF TESTING: August 26, 2021
DRILLED BY: SP
TESTED BY: GA

DEPTH BEFORE (ft.): 14.8
DEPTH AFTER (ft.): 14.8
PVC PIPE DIA. (in.): 3.0
PERC HOLE DIA. (in.): 8.0

Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (ft.)	Final Water Level (ft.)	Change in Water Level (ft.)	Initial Hole Depth (ft.)	Final Hole Depth (ft.)	Percolation Rate (in/hr)	Infiltration rate (Porchet Method) (in/hr)
30	30	10	13.29	3.29	14.8	14.8	78.96	3.96
30	60	10	13.23	3.23	14.8	14.8	77.52	3.85
10	70	10	10.79	0.79	14.8	14.8	56.88	2.07
10	80	10	10.81	0.81	14.8	14.8	58.32	2.13
10	90	10	10.75	0.75	14.8	14.8	54.00	1.96
10	100	10	10.77	0.77	14.8	14.8	55.44	2.02
10	110	10	10.75	0.75	14.8	14.8	54.00	1.96
10	120	10	10.77	0.77	14.8	14.8	55.44	2.02
				Average of last 3 readings:			54.96	2.00

CB215095

PERCOLATION TEST DATA

BORING NUMBER: P-4
LOT No: N/A
TRACT No: N/A

CLIENT: Redlands Mall Redevelopment
PROJECT: Village Partners Ventures LLC

DATE OF DRILLING: August 25, 2021
DATE OF TESTING: August 26, 2021
DRILLED BY: SP
TESTED BY: GA

DEPTH BEFORE (ft.): 9.4
DEPTH AFTER (ft.): 9.4
PVC PIPE DIA. (in.): 3.0
PERC HOLE DIA. (in.): 8.0

Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (ft.)	Final Water Level (ft.)	Change in Water Level (ft.)	Initial Hole Depth (ft.)	Final Hole Depth (ft.)	Percolation Rate (in/hr)	Infiltration rate (Porchet Method) (in/hr)
30	30	5	9.4	4.40	9.4	9.4	105.60	7.44
30	60	5	9.4	4.40	9.4	9.4	105.60	7.44
10	70	5	9.4	4.40	9.4	9.4	316.80	22.31
10	80	5	9.4	4.40	9.4	9.4	316.80	22.31
10	90	5	9.4	4.40	9.4	9.4	316.80	22.31
10	100	5	9.4	4.40	9.4	9.4	316.80	22.31
10	110	5	9.4	4.40	9.4	9.4	316.80	22.31
10	120	5	9.4	4.40	9.4	9.4	316.80	22.31
				Average of last 3 readings:			316.80	22.31

CB215095

PERCOLATION TEST DATA

BORING NUMBER: P-5
LOT No: N/A
TRACT No: N/A

CLIENT: Redlands Mall Redevelopment
PROJECT: Village Partners Ventures LLC

DATE OF DRILLING: August 25, 2021
DATE OF TESTING: August 26, 2021
DRILLED BY: SP
TESTED BY: GA

DEPTH BEFORE (ft.): 15.0
DEPTH AFTER (ft.): 15.0
PVC PIPE DIA. (in.): 3.0
PERC HOLE DIA. (in.): 8.0

Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (ft.)	Final Water Level (ft.)	Change in Water Level (ft.)	Initial Hole Depth (ft.)	Final Hole Depth (ft.)	Percolation Rate (in/hr)	Infiltration rate (Porchet Method) (in/hr)
30	30	10	15.00	5.00	15.0	15.0	120.00	7.50
30	60	10	15.00	5.00	15.0	15.0	120.00	7.50
10	70	10	14.79	4.79	15.0	15.0	344.88	20.74
10	80	10	14.73	4.73	15.0	15.0	340.56	20.26
10	90	10	14.68	4.68	15.0	15.0	336.96	19.87
10	100	10	14.62	4.62	15.0	15.0	332.64	19.41
10	110	10	14.56	4.56	15.0	15.0	328.32	18.96
10	120	10	14.52	4.52	15.0	15.0	325.44	18.66

Average of last 3 readings: 328.80 19.01

CB215095

PERCOLATION TEST DATA

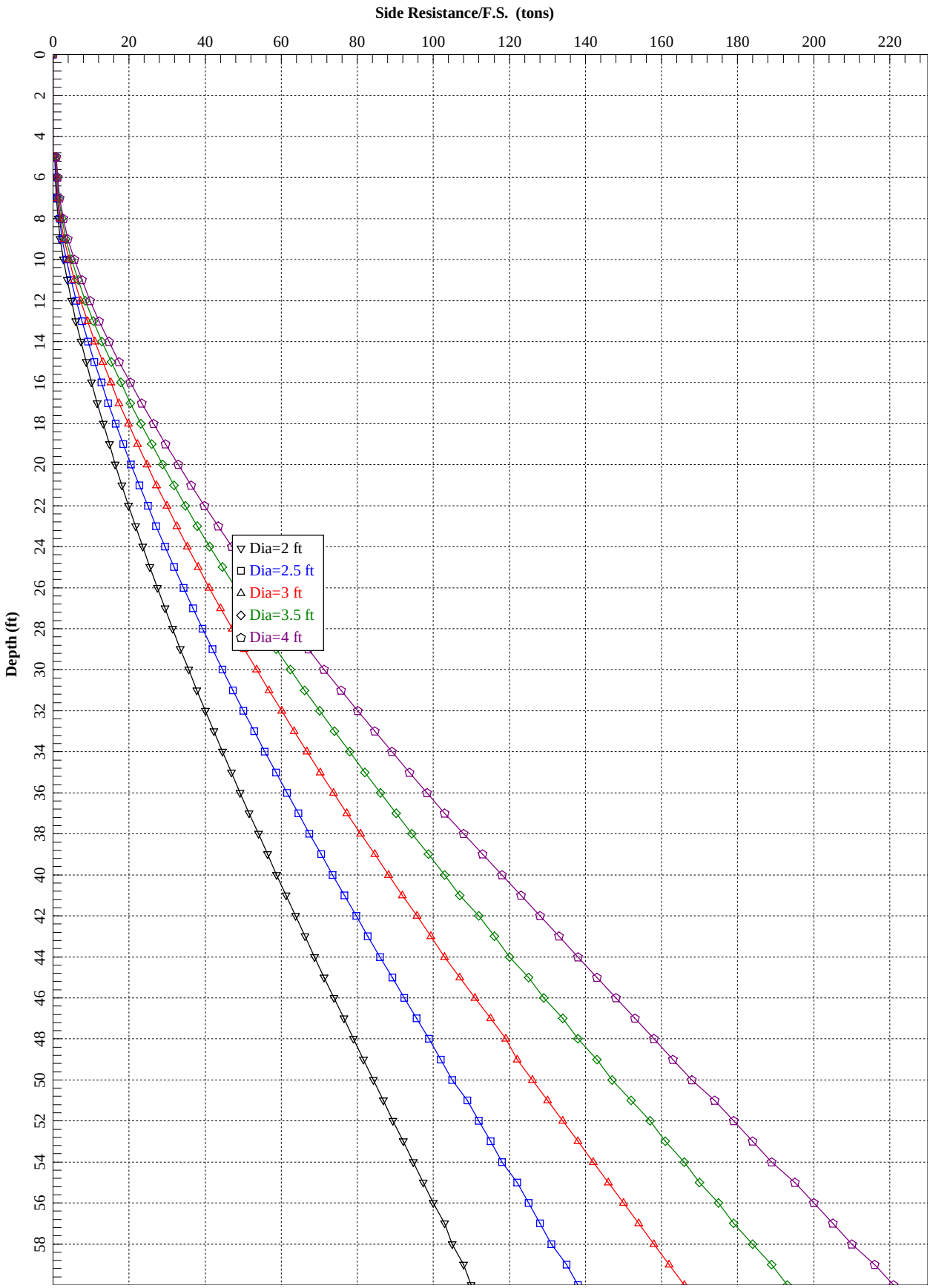
BORING NUMBER: P-6
LOT No: N/A
TRACT No: N/A

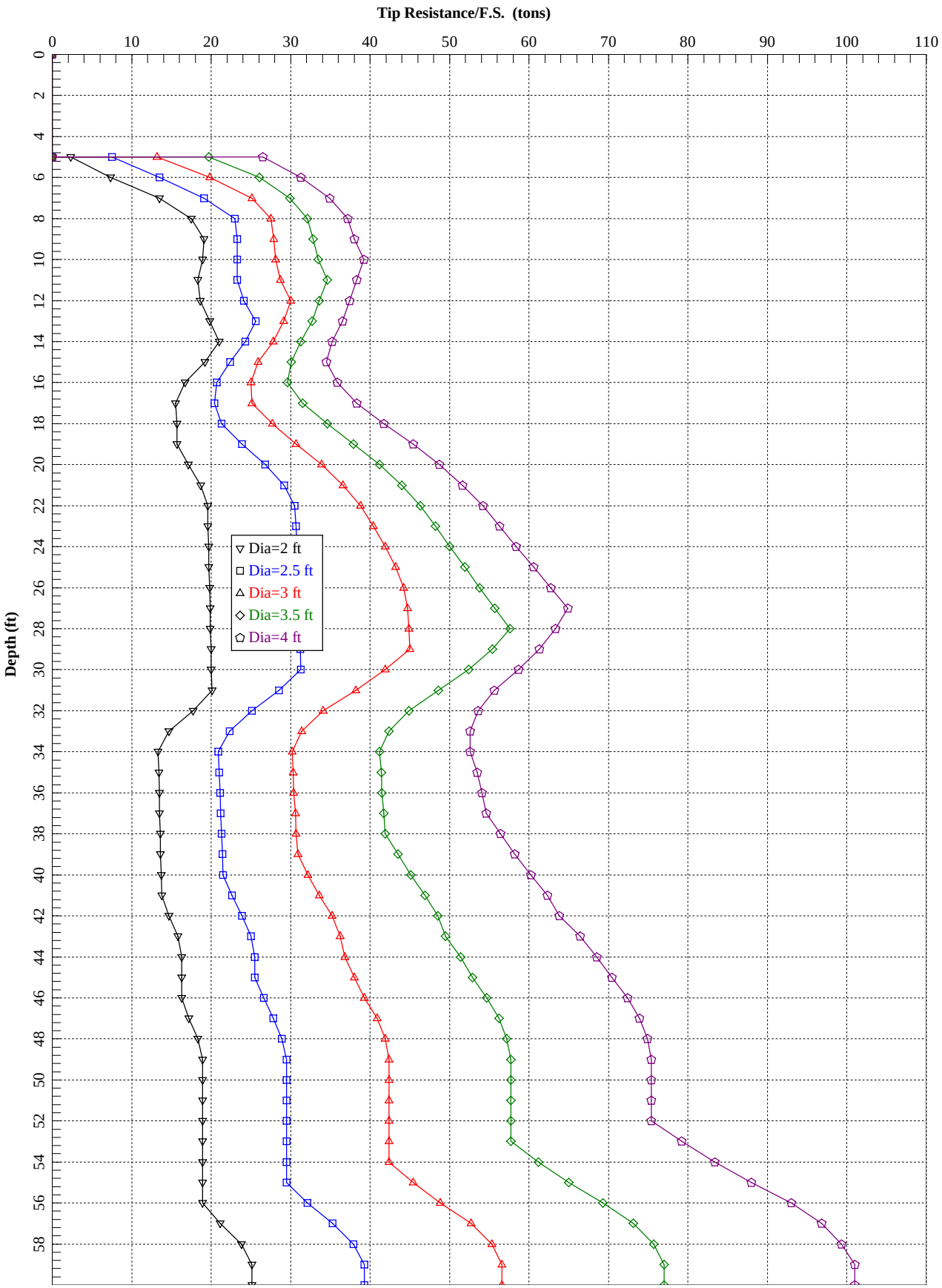
CLIENT: Redlands Mall Redevelopment
PROJECT: Village Partners Ventures LLC

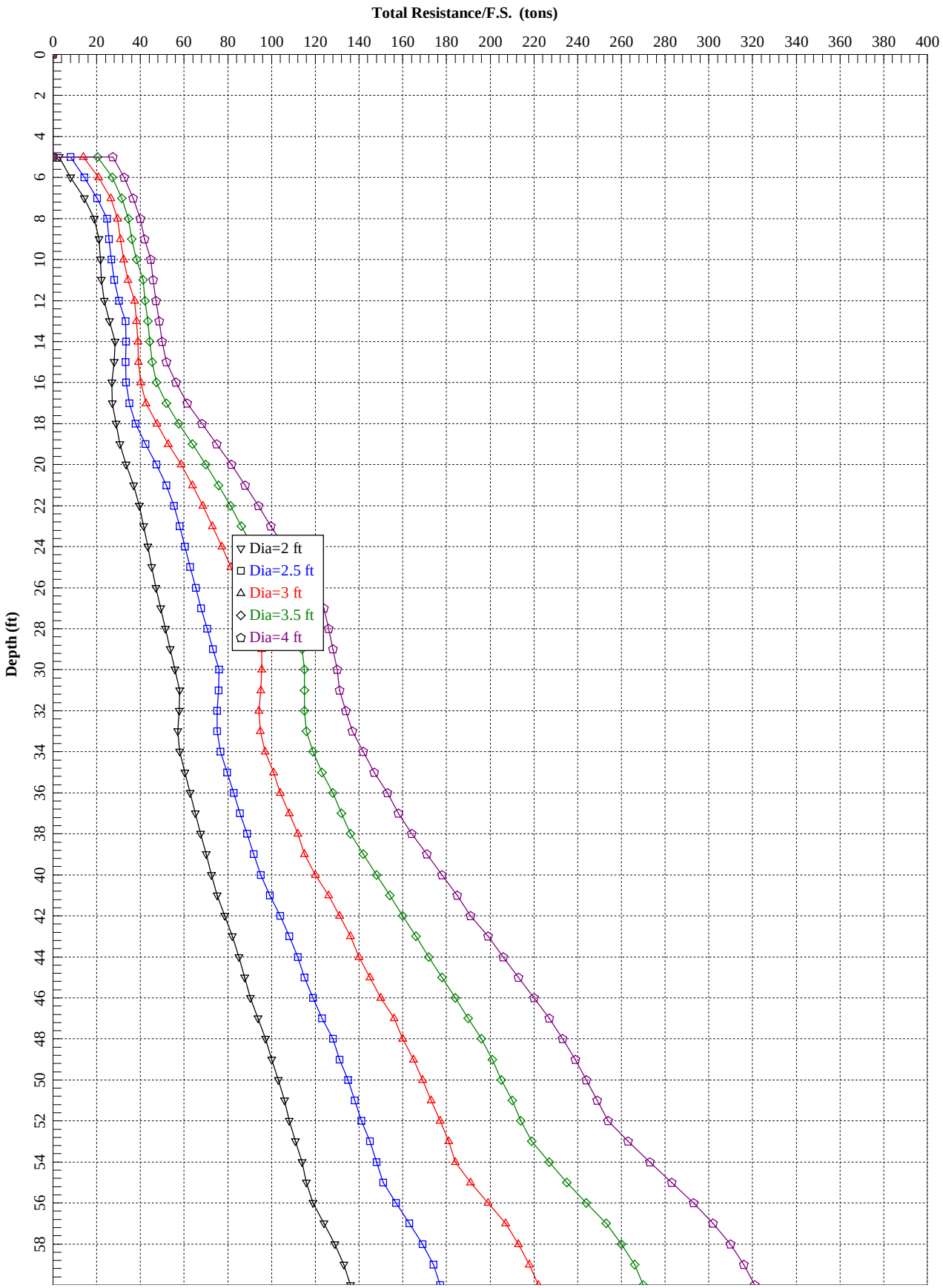
DATE OF DRILLING: August 26, 2021
DATE OF TESTING: August 27, 2021
DRILLED BY: SP
TESTED BY: GA

DEPTH BEFORE (ft.): 10.0
DEPTH AFTER (ft.): 9.9
PVC PIPE DIA. (in.): 3.0
PERC HOLE DIA. (in.): 8.0
% VOID (Rock Backfill): 0.50
GRAVEL PACKING 0.57

Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (ft.)	Final Water Level (ft.)	Change in Water Level (ft.)	Initial Hole Depth (ft.)	Final Hole Depth (ft.)	Percolation Rate (in/hr)	Infiltration rate (Porchet Method) (in/hr)
30	30	5	9.90	4.90	10.0	9.9	117.60	7.21
30	60	5	9.54	4.54	9.9	9.9	108.96	6.49
10	70	5	7.33	2.33	9.9	9.9	167.76	7.17
10	80	5	7.21	2.21	9.9	9.9	159.12	6.69
10	90	5	7.15	2.15	9.9	9.9	154.80	6.46
10	100	5	7.12	2.12	9.9	9.9	152.64	6.35
10	110	5	7.04	2.04	9.9	9.9	146.88	6.05
10	120	5	7.10	2.10	9.9	9.9	151.20	6.27
				Average of last 3 readings:			150.24	6.22


Side Resistance/F.S. (tons)
0
20
40
60
80
100
120
140
160
180
200
220
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
Dia=2 ft
Dia=2.5 ft
Dia=3 ft
Dia=3.5 ft
Dia=4 ft


Tip Resistance/F.S. (tons)
0
10
20
30
40
50
60
70
80
90
100
110
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
Dia=2 ft
Dia=2.5 ft
Dia=3 ft
Dia=3.5 ft
Dia=4 ft


Total Resistance/F.S. (tons)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
Dia=2 ft
Dia=2.5 ft
Dia=3 ft
Dia=3.5 ft
Dia=4 ft

SUPPORTING INFORMATION

Contents:

General Notes
Unified Soil Classification System

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
State Street Village ■ Redlands, CA
Terracon Project No. CB215095

Terracon GeoReport

SAMPLING

- Auger Cuttings
- Modified California Ring Sampler
- Standard Penetration Test

WATER LEVEL

- **Water Initially Encountered**
- **Water Level After a Specified Period of Time**
- **Water Level After a Specified Period of Time**
- **Cave In Encountered**

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

N	**Standard Penetration Test Resistance (Blows/Ft.)**
(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
UC	**Unconfined Compressive Strength**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium Stiff	0.50 to 1.00	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18
Very Dense	> 50	> 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42
			Hard	> 4.00	> 30	> 42

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

UNIFIED SOIL CLASSIFICATION SYSTEM

Terracon GeoReport

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

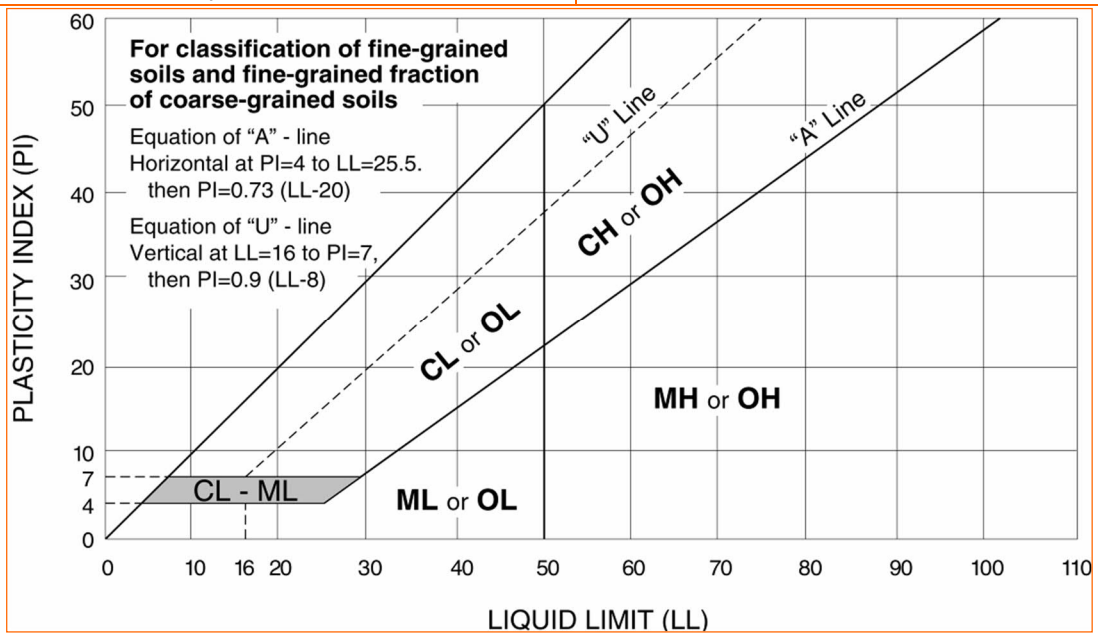
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

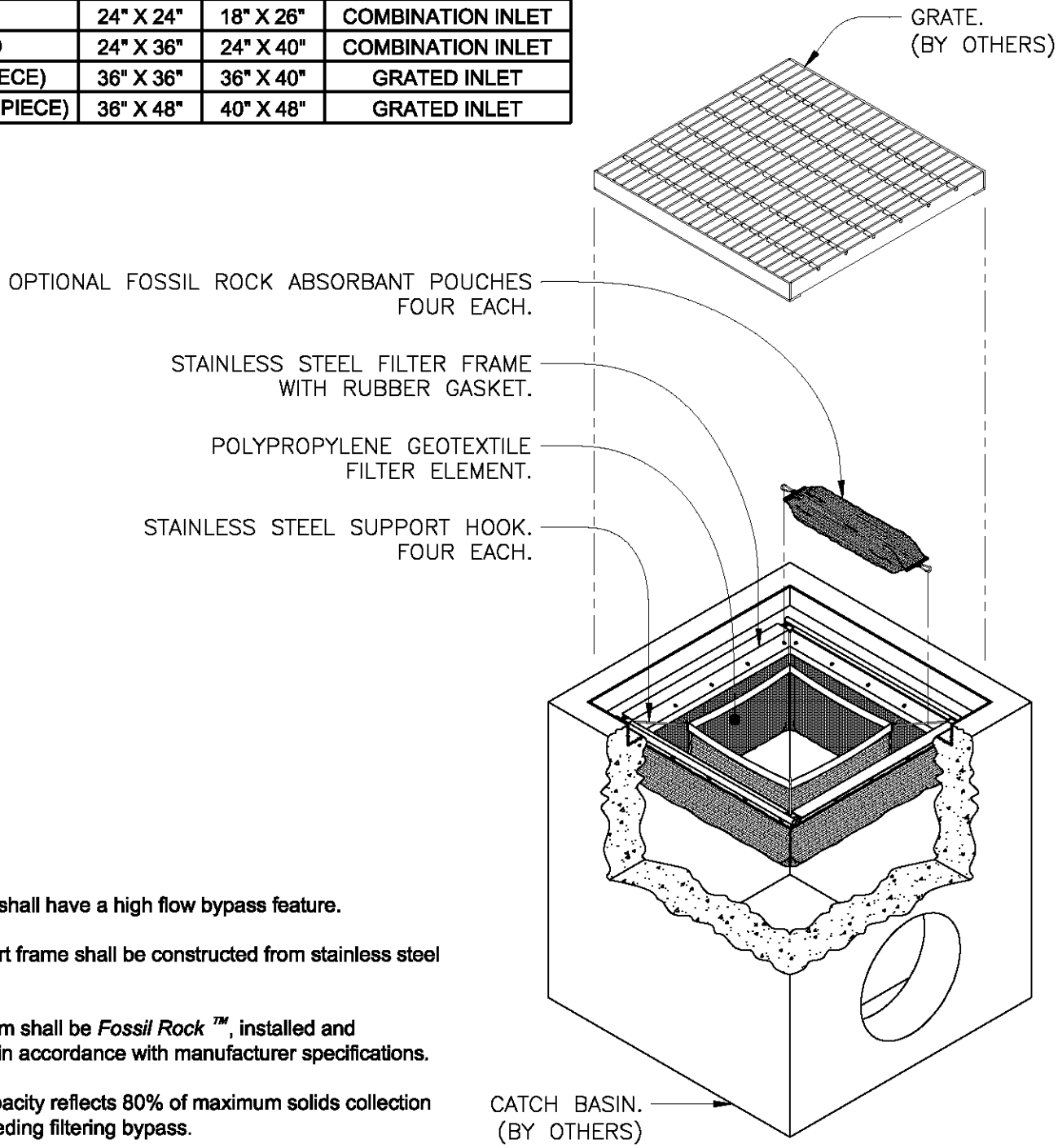
[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



FG-0001

SPECIFIER CHART			
MODEL	INLET ID	GRATE OD	COMMENTS
FF-12D	12" X 12"	15" X 15"	GRATED INLET
FF-16D	16" X 16"	18" X 18"	GRATED INLET
FF-18D	18" X 18"	20" X 20"	GRATED INLET
FF-1836SD	18" X 36"	18" X 40"	GRATED INLET
FF-1836DGO	18" X 36"	18" X 40"	COMBINATION INLET
FF-24D	24" X 24"	26" X 26"	GRATED INLET
FF-2436SD	24" X 36"	24" X 40"	GRATED INLET
FF-24DGO	24" X 24"	18" X 26"	COMBINATION INLET
FF-2436DGO	24" X 36"	24" X 40"	COMBINATION INLET
FF-36D (2 PIECE)	36" X 36"	36" X 40"	GRATED INLET
FF-3648D (2 PIECE)	36" X 48"	40" X 48"	GRATED INLET



NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

Inlet Filtration

FloGard®

Catch Basin Insert Filter

Grated Inlet Style

Oldcastle®
Stormwater Solutions

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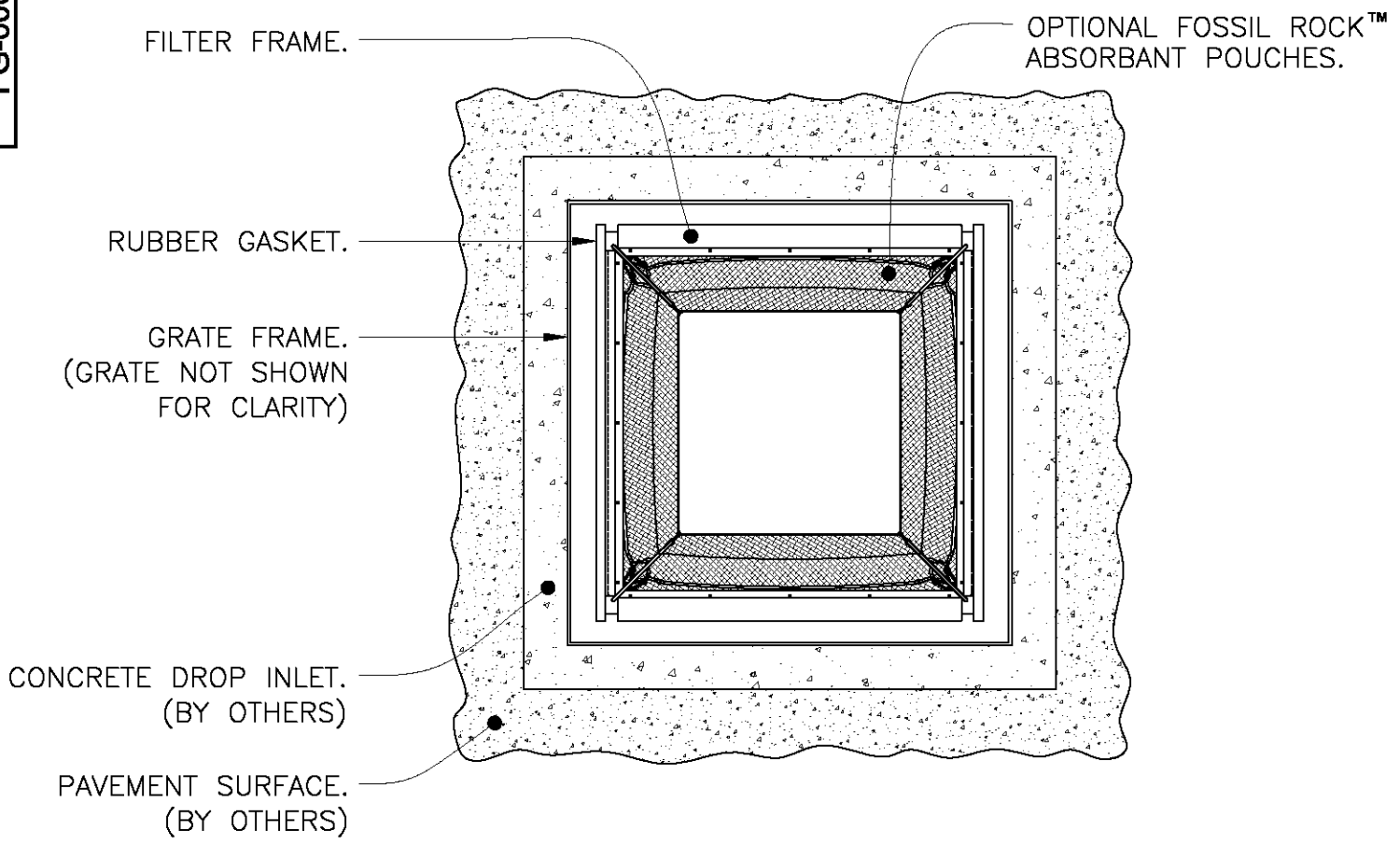
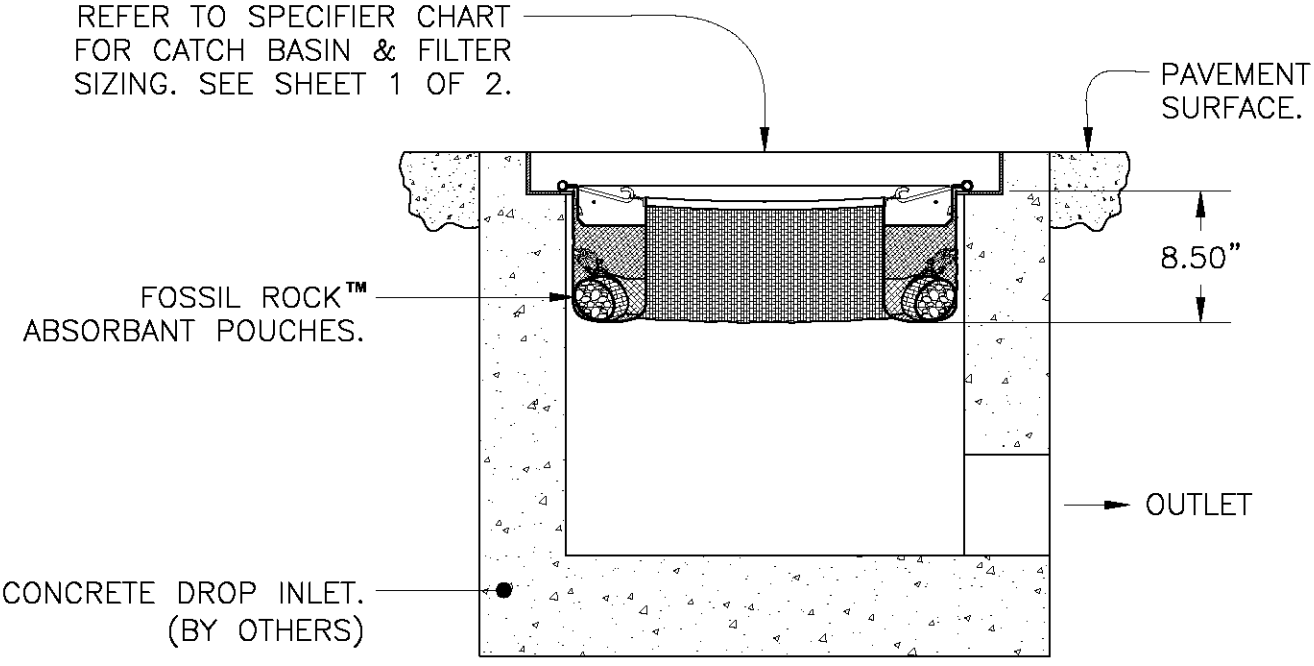
DRAWING NO.	REV	ECO	DATE	
FG-0001	E	ECO-0142 JPR 7/13/16	JPR 12/18/06	SHEET 1 OF 2

FG-0001





SECTION VIEW

Inlet Filtration

FloGard®

Catch Basin Insert Filter

Grated Inlet Style

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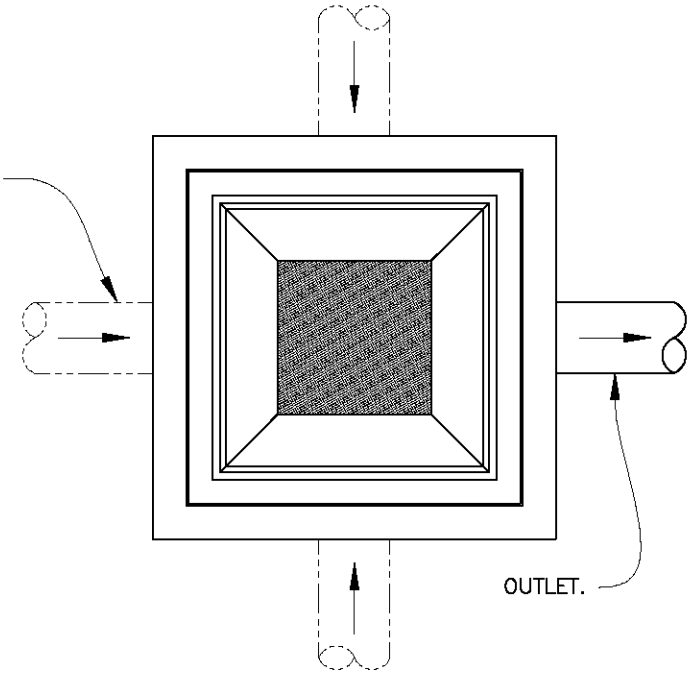
DRAWING NO.	REV	ECO	DATE	
FG-0001	E	ECO–0142 JPR 7/13/16	JPR 12/18/06	SHEET 2 OF 2

FG-LP-0001

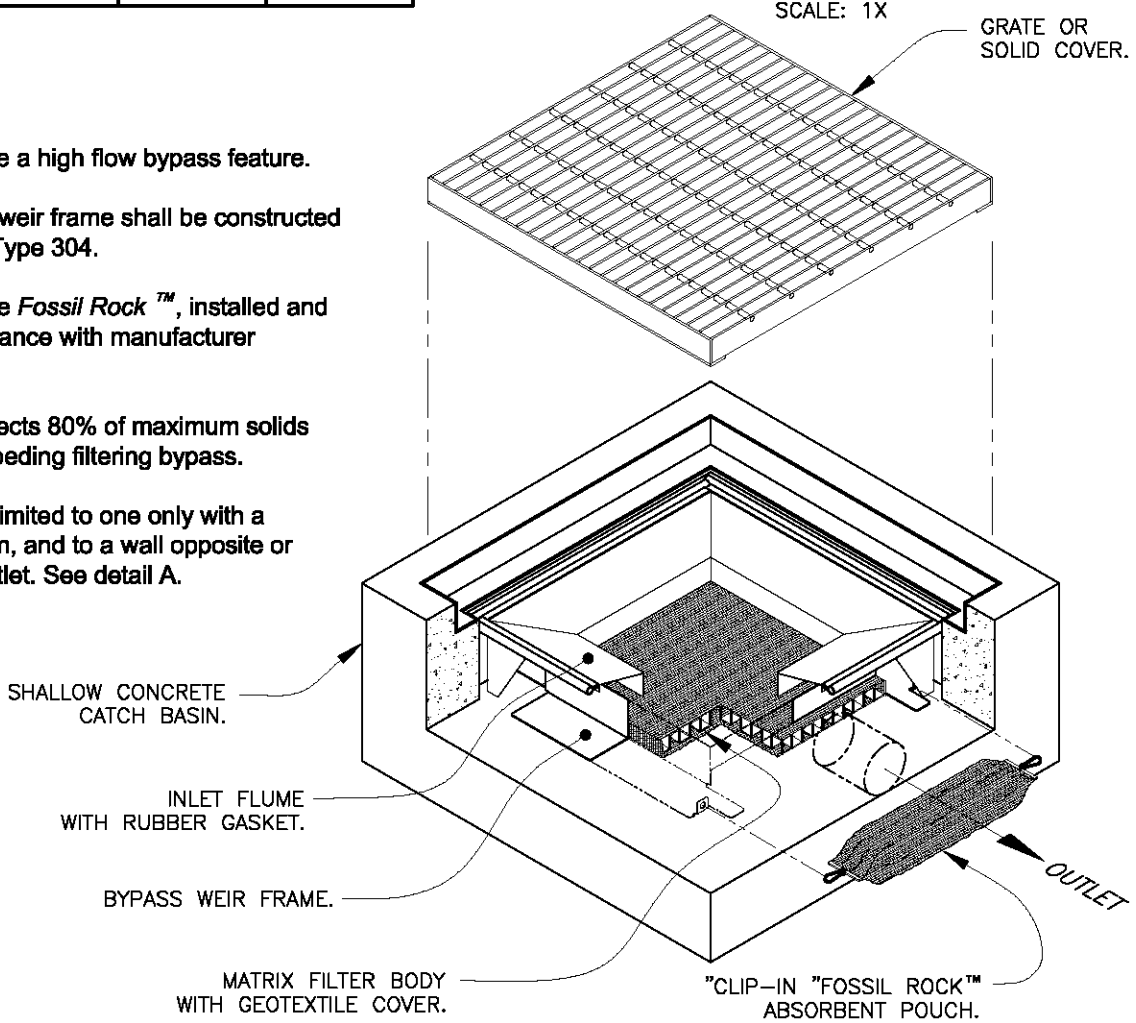


DETAIL A
ADDITIONAL INLETS
SCALE: 1X

SPECIFIER CHART				
MODEL	CATCH BASIN ID	SOLIDS STORAGE CAPACITY CUBIC FEET	FILTERED FLOW CUBIC FEET / SECOND	TOTAL BYPASS CAPACITY CUBIC FEET /SECOND
FG-M12	12" X 12"	0.05	0.05	0.50
FG-M18	18" X 18"	0.10	0.10	1.00
FG-M24	24" X 24"	0.30	0.30	1.70
FG-M2436	24" X 36"	0.40	0.50	2.30
FG-M30	30" X 30"	0.60	0.60	2.60
FG-M36	36" X 36"	0.80	0.90	4.10
FG-M3648	36" X 48"	1.10	1.30	4.60
FG-M48	48" X 48"	1.60	1.80	6.60

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Inlet flume & bypass weir frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
5. Additional inlets are limited to one only with a 6" diameter maximum, and to a wall opposite or at a right angle to outlet. See detail A.



Inlet Filtration

FloGard®

Catch Basin Insert Filter

Shallow Catch Basin Style

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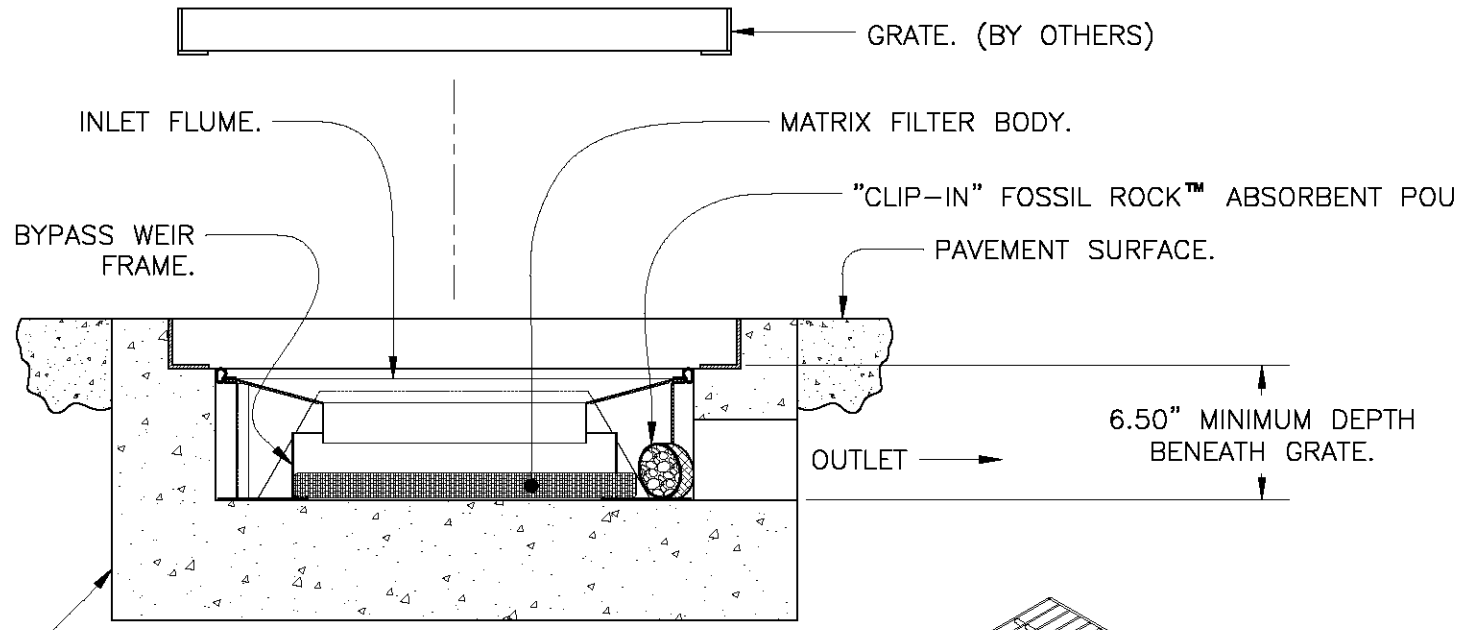
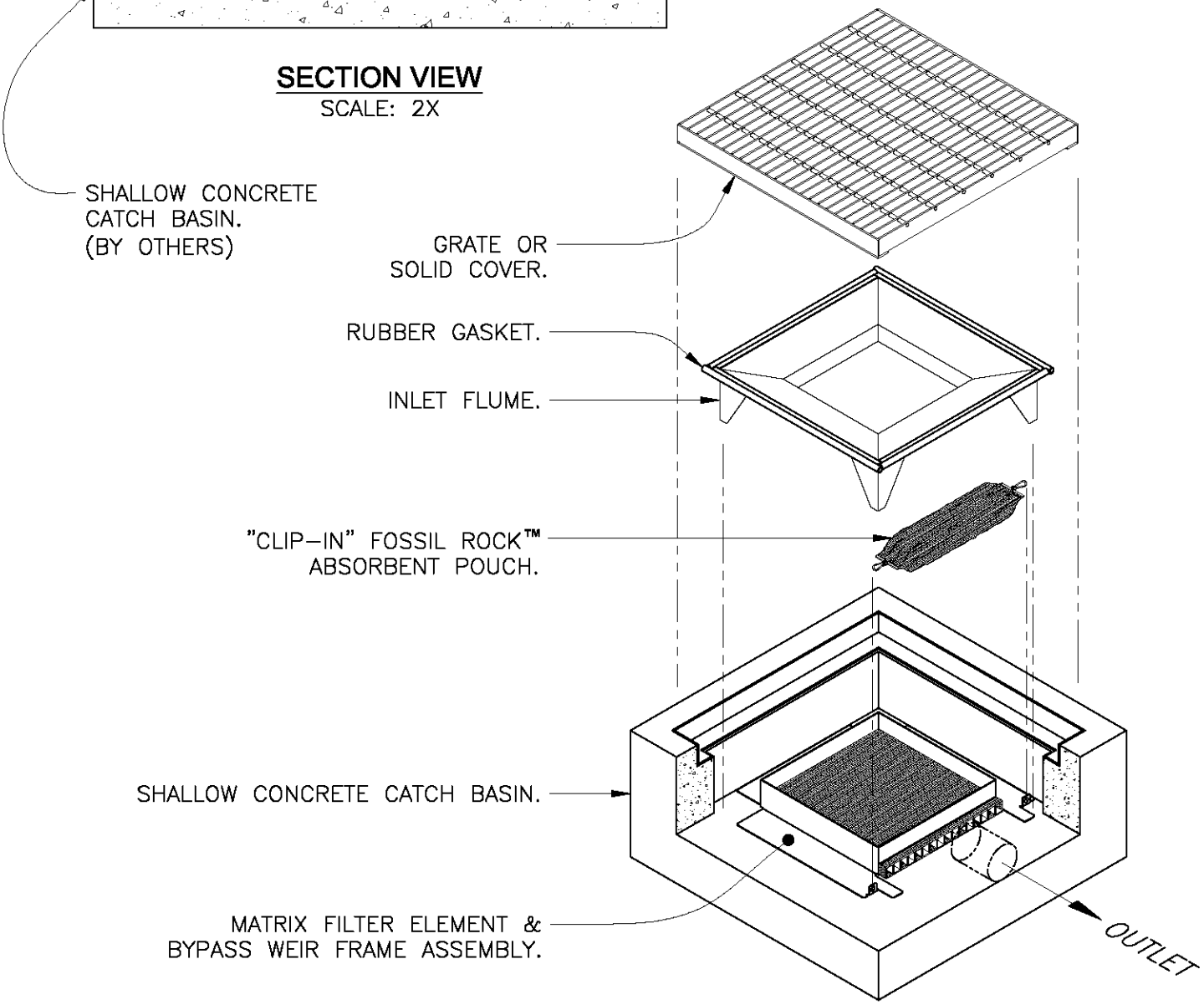
DRAWING NO.	REV	ECO	DATE	
FG-LP-0001	F	ECO–0142 JPR 7/13/16	JPR 12/18/06	SHEET 1 OF 2

FG-LP-0001



SECTION VIEW
SCALE: 2X



Inlet Filtration

FloGard®

Catch Basin Insert Filter

Shallow Catch Basin Style

Oldcastle®
Stormwater Solutions

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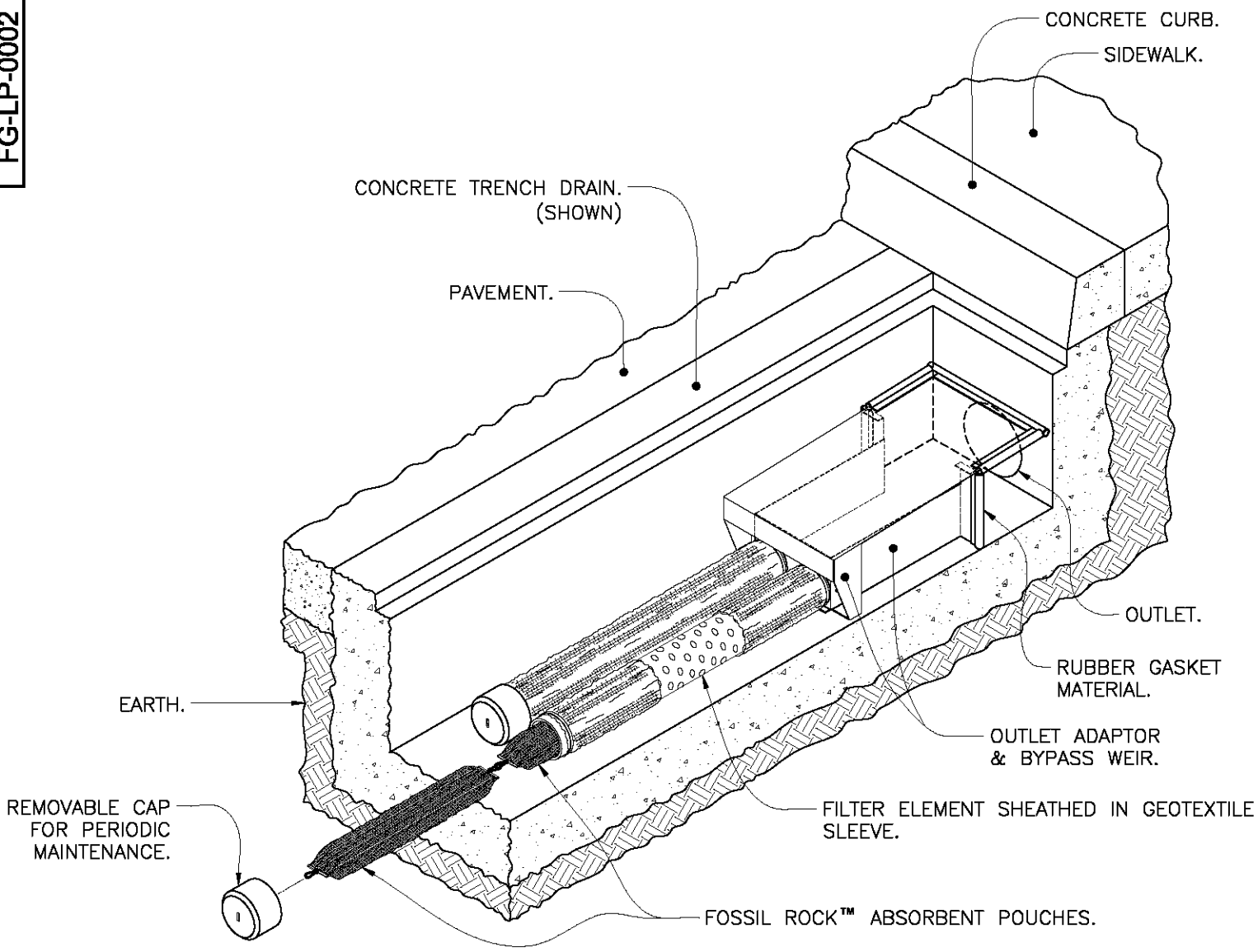
DRAWING NO.	REV	ECO	DATE	
FG-LP-0001	F	ECO–0142 JPR 7/13/16	JPR 12/18/06	SHEET 2 OF 2

FG-LP-0002



NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter outlet adapter shall be constructed from stainless steel Type 304.
   Alternate outlet adaptor for shallow installations shall be PVC SCH-40. See detail B, sheet 2 of 2.
3. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
5. For alternate outlet adapter configurations used for extremely shallow trench drains contact Oldcastle Stormwater Solutions for engineering assistance.
6. Filter element should be a minimum of one half the length of trench. Confirm flow rate upon order.

Inlet Filtration

FloGard®

Catch Basin Insert Filter

Trench Drain Style

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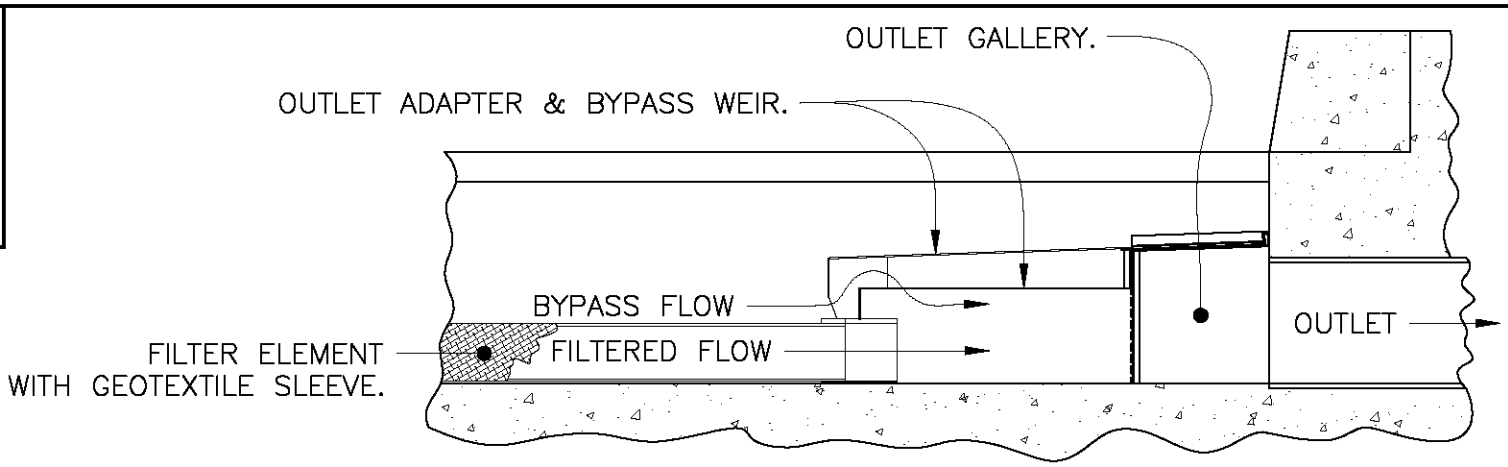
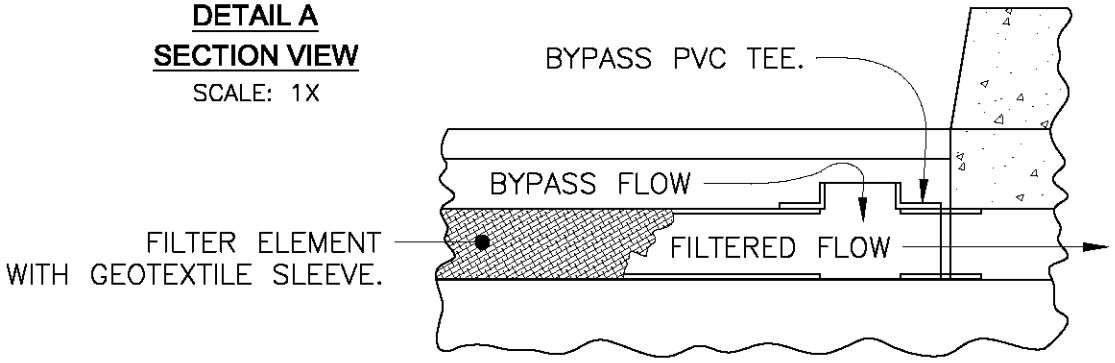
DRAWING NO.	REV	ECO	DATE	
FG-LP-0002	H	ECO–0142 JPR 7/13/16	JPR 2/21/07	SHEET 1 OF 2

FG-LP-0002



DETAIL A
SECTION VIEW
SCALE: 1X



DETAIL B
SECTION VIEW
ALTERNATE ADAPTER CONFIGURATION
SCALE: 1X

SPECIFIER CHART

MODEL	FILTER TYPE	TRENCH WIDTH "ID" (CLEAR OPENING)	MINIMUM TRENCH DEPTH (FROM BOTTOM OF GRATE)	SOLIDS STORAGE CAPACITY CUBIC FEET **	FILTERED FLOW CUBIC FEET / SECOND **	TOTAL BYPASS CAPACITY CUBIC FEET /SECOND
FG-TDOF3	PIPE *	3.0	6.5	0.1	0.5	0.1
FG-TDOF4	PIPE *	4.0	6.5	0.2	0.5	0.1
FG-TDOF6	PIPE	6.0	6.5	0.4	0.5	0.2
FG-TDOF8	PIPE	8.0	6.5	0.7	0.5	0.3
FG-TDOF10	PIPE	10.0	6.5	0.9	0.5	0.5
FG-TDOF12	PIPE	12.0	6.5	0.9	1.0	0.6
FG-TDOF18	PIPE	18.0	6.5	1.3	1.5	1.1
FG-TDOF24	PIPE	24.0	6.5	1.8	2.0	1.5
FG-TDOA6	PANEL	6.0	4.5	0.4	0.2	0.2
FG-TDOA8	PANEL	8.0	4.5	0.7	0.2	0.3
FG-TDOA10	PANEL	10.0	4.5	0.8	0.3	0.5
FG-TDOA12	PANEL	12.0	4.5	1.0	0.4	0.6
FG-TDOA18	PANEL	18.0	4.5	1.4	0.8	1.1
FG-TDOA24	PANEL	24.0	4.5	1.8	1.1	1.5

* ALTERNATE ADAPTER CONFIGURATION. SEE DETAIL B.
**CAPACITY PER 5-FT. SEGMENT USED.

Inlet Filtration

FloGard®

Catch Basin Insert Filter

Trench Drain Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

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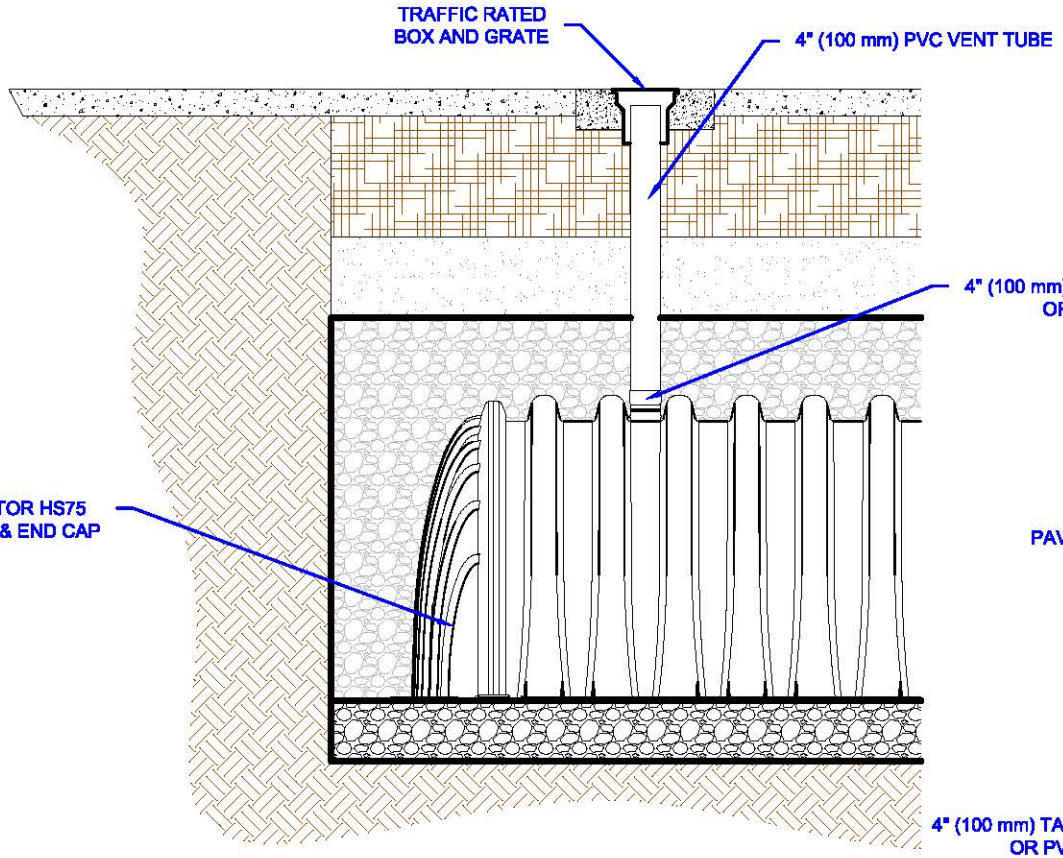
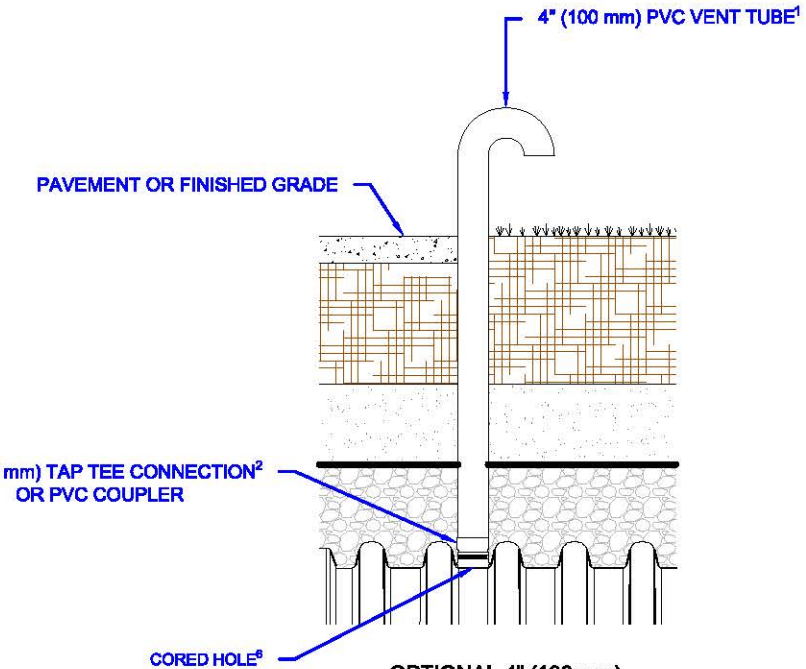
DRAWING NO.	REV	ECO	DATE	
FG-LP-0002	H	ECO-0142 JPR 7/13/16	JPR 2/21/07	SHEET 2 OF 2





OPTIONAL 4" (100 mm)
VENT DETAIL

NOTES:

1. 4" (100 mm) VENT TUBE MAY BE CONNECTED THROUGH ANY CHAMBER CIRCULAR CUT OUT POINT, LOCATED AT THE CENTER OF EACH HS75 CHAMBER.
2. TAP TEE CONNECTION MAY CONSIST OF QWICKSEAL, INSERTA TEE OR APPROVED EQUAL.
3. ALL PVC FITTINGS TO BE SOLVENT CEMENTED.
4. PVC MAY BE EITHER SDR 35 or SCH 40.
5. PVC PIPE MAY BE SOLID OR PERFORATED PER ENGINEER.
6. CORE HOLE SIZE AS FOLLOWS: 4" (100 mm) CUT TO 5" (125 mm)

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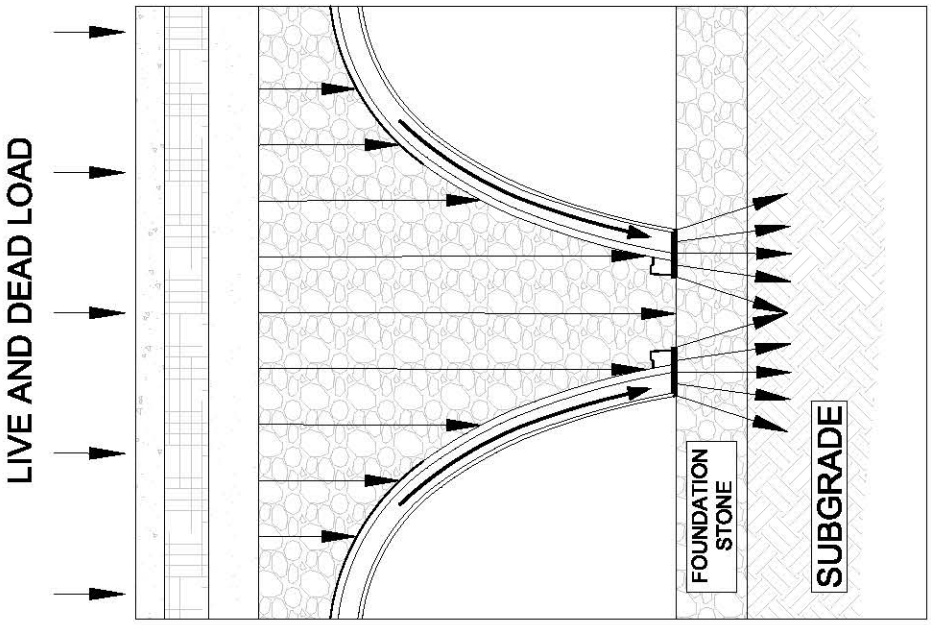
TITLE:	HYDROSTOR HS75 - VENT TUBE			REV:
DRAWN BY: ARB	DATE: 05-Jun-17	DRAWING NUMBER: D-7-308		B
SCALE: NTS	SHEET: 1 OF 1			



HS75 Minimum Required Stone Foundation Depth, in (mm)

Cover Height ft (m)	Minimum Required Bearing Capacity of Native Soil Subgrade, kpf (kPa)																					
	4.1 (196)	4.0 (192)	3.9 (187)	3.8 (182)	3.7 (177)	3.6 (172)	3.5 (168)	3.4 (163)	3.3 (158)	3.2 (153)	3.1 (148)	3.0 (144)	2.9 (139)	2.8 (134)	2.7 (129)	2.6 (124)	2.5 (120)	2.4 (115)	2.3 (110)	2.2 (105)	2.1 (101)	2.0 (96)
1.5 (0.46)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)
2.0 (0.61)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)
2.5 (0.76)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)
3.0 (0.91)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)
3.5 (1.07)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)
4.0 (1.22)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)
4.5 (1.37)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)
5.0 (1.52)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)
5.5 (1.68)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)
6.0 (1.83)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)	21.0 (533)
6.5 (1.98)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	18.0 (457)	21.0 (533)	24.0 (610)
7.0 (2.13)	6.0 (152)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)	21.0 (533)	24.0 (610)
7.5 (2.29)	6.0 (152)	6.0 (152)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)	21.0 (533)	24.0 (610)	27.0 (686)
8.0 (2.44)	6.0 (152)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	9.0 (229)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	12.0 (305)	15.0 (381)	15.0 (381)	15.0 (381)	18.0 (457)	18.0 (457)	21.0 (533)	21.0 (533)	24.0 (610)	24.0 (610)	27.0 (686)

REFERENCE HYDROSTOR DESIGN GUIDE SECTION 4.1 FOR
MORE INFORMATION REGARDING FOUNDATION REQUIREMENTS.

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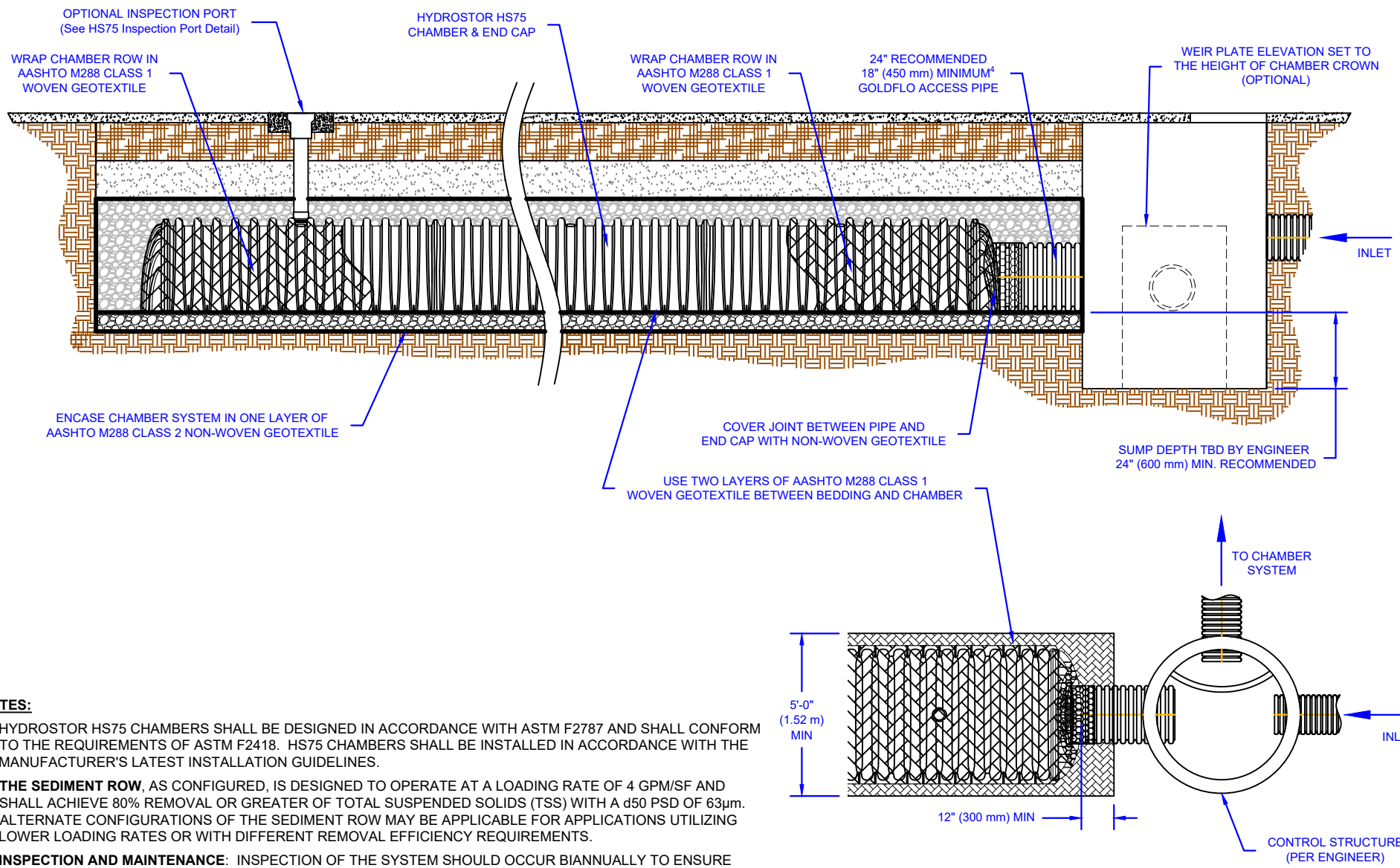
TITLE: HYDROSTOR HS75 - SUB-GRADE MINIMUM REQUIREMENTS
REV: B
DRAWN BY: ARB
DATE: 05-Jun-17
DRAWING NUMBER: D-7-304
SCALE: NTS
SHEET: 1 OF 1



NOTES:

1. HYDROSTOR HS75 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418. HS75 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION GUIDELINES.
2. **THE SEDIMENT ROW**, AS CONFIGURED, IS DESIGNED TO OPERATE AT A LOADING RATE OF 4 GPM/SF AND SHALL ACHIEVE 80% REMOVAL OR GREATER OF TOTAL SUSPENDED SOLIDS (TSS) WITH A d50 PSD OF 63µm. ALTERNATE CONFIGURATIONS OF THE SEDIMENT ROW MAY BE APPLICABLE FOR APPLICATIONS UTILIZING LOWER LOADING RATES OR WITH DIFFERENT REMOVAL EFFICIENCY REQUIREMENTS.
3. **INSPECTION AND MAINTENANCE**: INSPECTION OF THE SYSTEM SHOULD OCCUR BIANNUALLY TO ENSURE LARGE AMOUNTS OF SEDIMENT OR DEBRIS HAVE NOT BEEN DEPOSITED IN THE SEDIMENT ROW. DURING THE FIRST YEAR, INSPECTION SHOULD OCCUR MORE FREQUENTLY DUE TO CONSTRUCTION SEDIMENT LOADING. TO CLEAN THE SYSTEM, A JET/VAC PROCESS CAN BE USED TO REMOVE SEDIMENT AND DEBRIS FROM THE SEDIMENT ROW. FOR MORE INFORMATION, REFER TO PRINSCO'S "RETENTION/DETENTION CLEANING AND MAINTENANCE" TECHNICAL NOTE.
4. **ACCESS PIPE**: PRINSCO RECOMMENDS A 24 INCH (600 mm) DIAMETER ACCESS PIPE TO THE SEDIMENT ROW. A 24 INCH (600 mm) INTERNAL SLEEVE ADAPTER (PART # HS75A-24) WILL BE REQUIRED TO CONNECT TO HS75 END CAPS. CONTACT YOUR LOCAL SALES REPRESENTATIVE WITH ANY QUESTIONS.

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WATER MANAGEMENT SOLUTIONS
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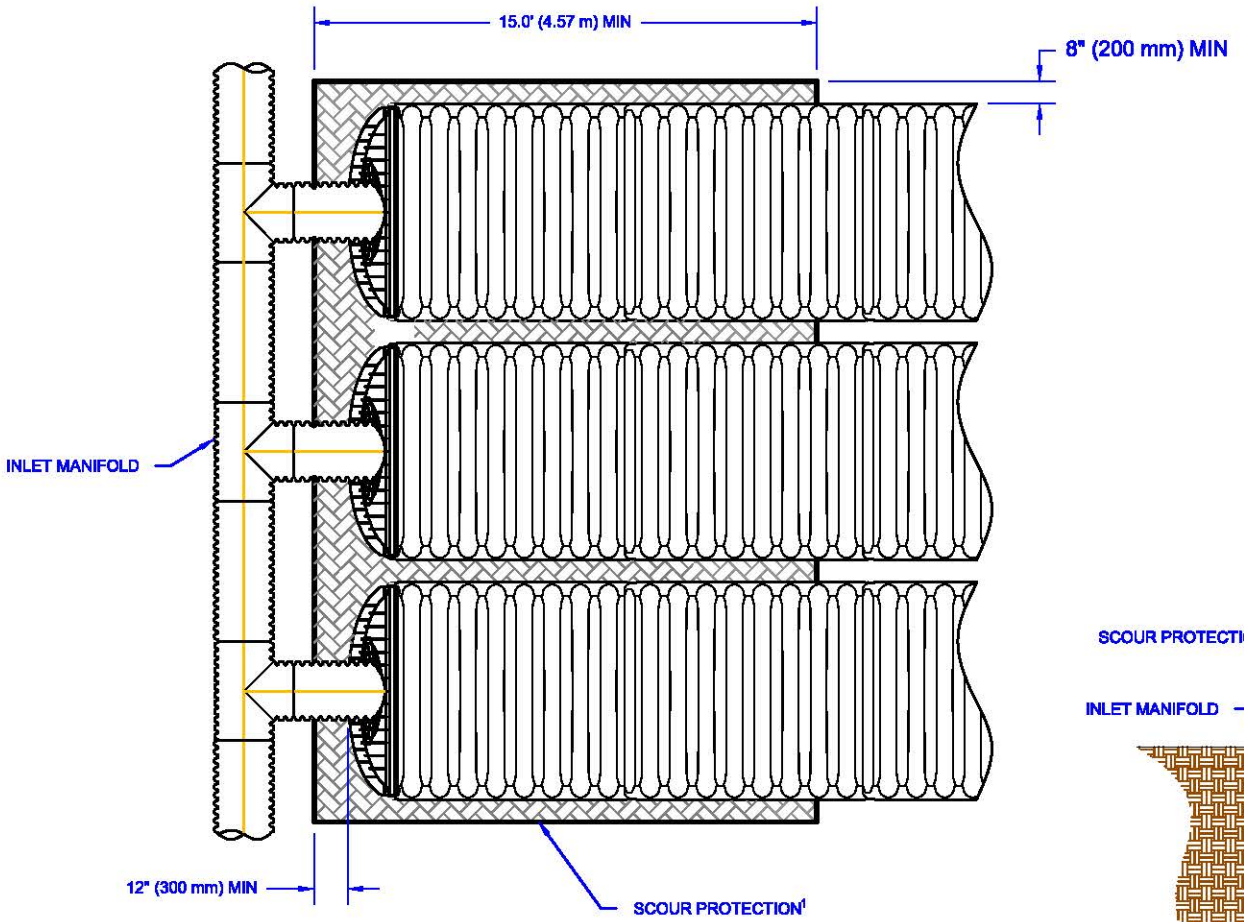
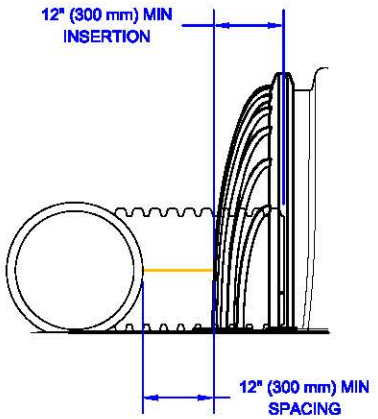
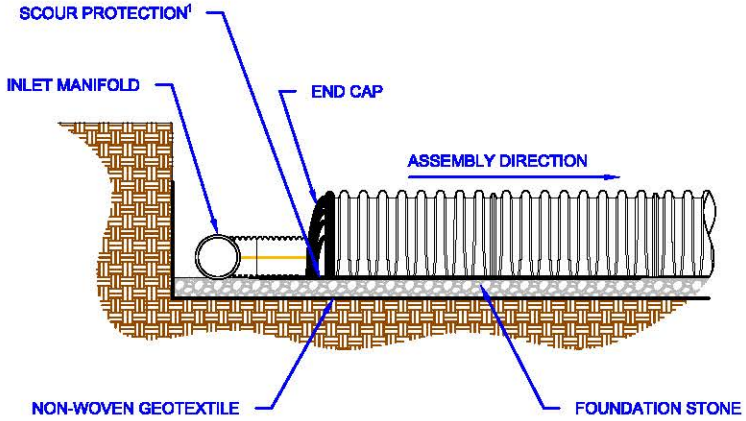
TITLE:	HYDROSTOR HS75 - SEDIMENT ROW WRAPPED (NJCAT)			
DRAWN BY:	TJW	DATE:	22-Apr-20	DRAWING NUMBER: D-7-305
SCALE:	NTS	SHEET:	1 OF 1	







NOTES:

1. SCOUR PROTECTION SHOULD USE A MIN 6 oz/yd² (203 g/m²) WOVEN GEOTEXTILE. GEOTEXTILE SHOULD MEET AASHTO M288 CLASS 1 SPECIFICATION.
2. SCOUR PROTECTION IS ONLY NEEDED WITH CHAMBER ROWS CONNECTED TO THE INLET MANIFOLD.

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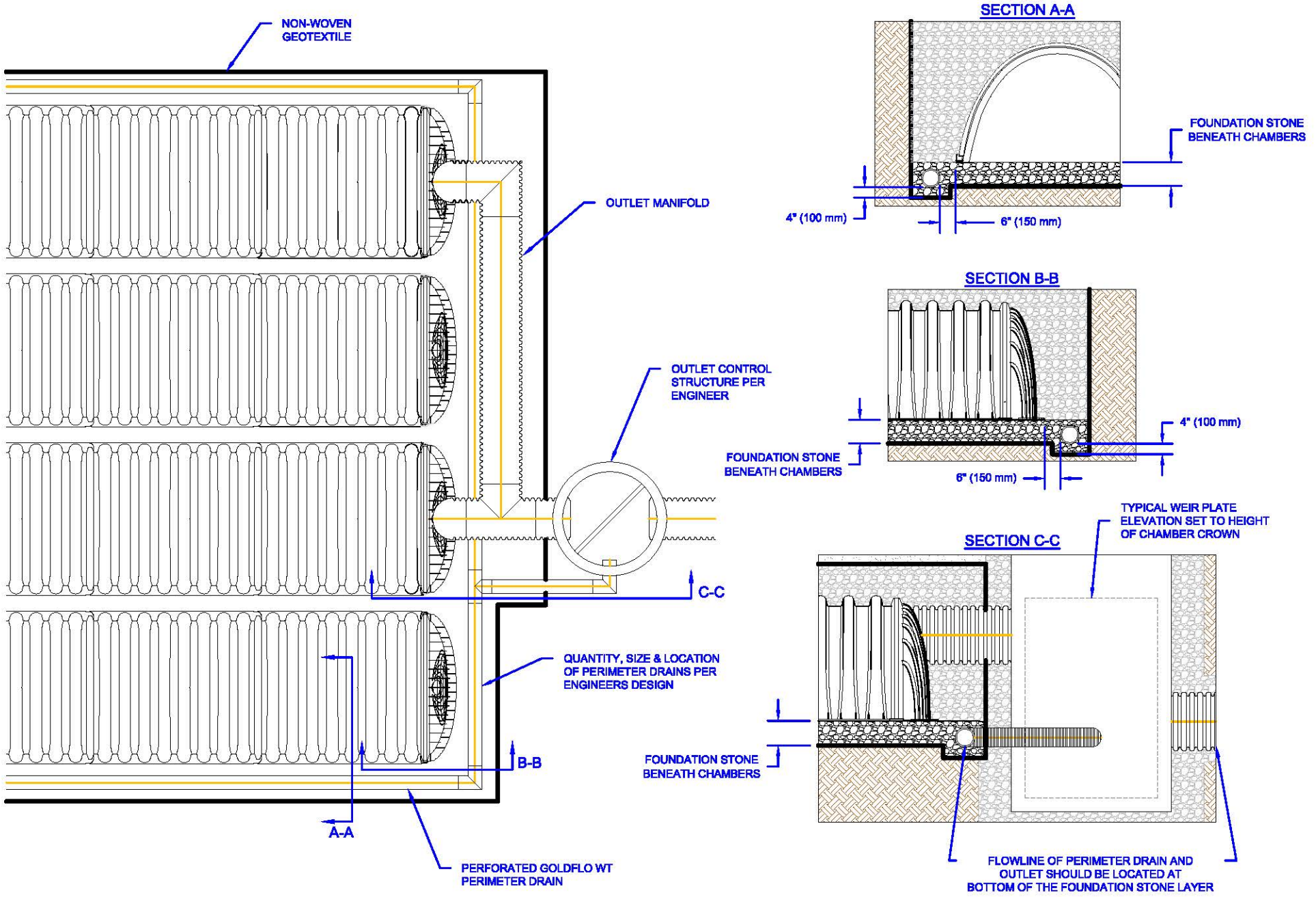
TITLE:				REV:
HYDROSTOR HS75 - SCOUR PROTECTION				
DRAWN BY: TSS	DATE: 11-Oct-18	DRAWING NUMBER: D-7-307		
SCALE: NTS	SHEET: 1 OF 1			



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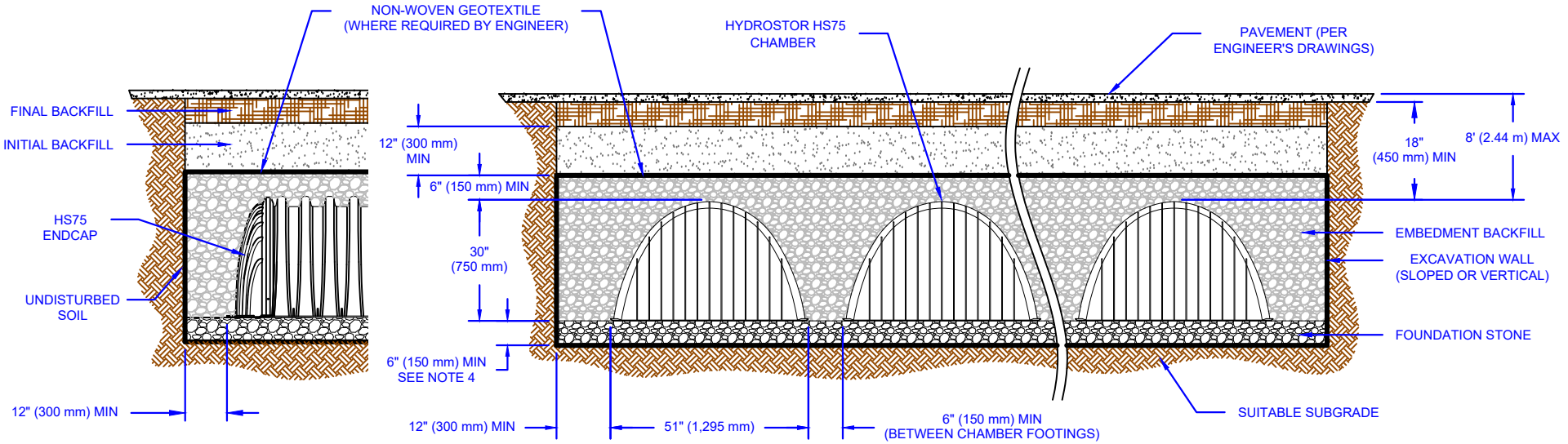
TITLE: HYDROSTOR HS75 - PERIMETER DRAIN
REV: B

DRAWN BY:	ARB	DATE:	05-Jun-17	DRAWING NUMBER:	D-7-306
SCALE:	NTS	SHEET:	1 OF 1		



NOTES:

1. HYDROSTOR HS75 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418. HS75 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION GUIDELINES.
2. **SUBGRADE:** TRENCH BOTTOMS WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL. FOR UNSTABLE MATERIALS, GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM, IF DIRECTED BY THE ENGINEER. THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING SUBGRADE SUITABILITY.
3. **GEOTEXTILE:** A 4 oz/yd² (136 g/m²) OR HEAVIER NON-WOVEN GEOTEXTILE FILTER FABRIC SHOULD BE USED FOR EMBEDMENT BACKFILL MATERIAL SIZED 3/4 - 1 1/2 INCH (19 - 38 mm). A 6 oz/yd² (203 g/m²) NON-WOVEN GEOTEXTILE FILTER FABRIC SHOULD BE USED FOR EMBEDMENT BACKFILL MATERIAL SIZED 1 1/2 - 2 INCH (38 - 51 mm). GEOTEXTILE FILTER FABRIC IS PLACED AROUND THE SYSTEM TO PREVENT NATIVE SOIL FROM MIGRATING INTO THE EMBEDMENT BACKFILL MATERIAL. TO ENSURE FABRIC IS SUITABLE WITH IN SITU SOILS, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED.
4. **FOUNDATION STONE:** SUITABLE MATERIAL SHALL BE A 3/4 - 2 INCH (19 - 51 mm), WASHED, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57) WITH WASHED, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., WASHED, CRUSHED, ANGULAR #3 (AASHTO M43) STONE. MINIMUM FOUNDATION STONE THICKNESS TO BE DETERMINED BY DESIGN ENGINEER. MINIMUM OF 6" (150 mm) RECOMMENDED. REFER TO PRINSCO DESIGN MANUAL FOR ADDITIONAL GUIDANCE. COMPACTION SHOULD BE DONE IN LIFTS OF NO MORE THAN 6 INCHES (150 mm) TO A DENSITY OF 95% STANDARD PROCTOR DENSITY.
5. **EMBEDMENT BACKFILL:** SUITABLE MATERIAL SHALL BE A 3/4 - 2 INCH (19 - 51 mm), WASHED, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57) WITH WASHED, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., WASHED, CRUSHED, ANGULAR #3 (AASHTO M43) STONE. EMBEDMENT BACKFILL SHALL EXTEND FROM TOP OF BEDDING TO NOT LESS THAN 6" (150 mm) INCHES ABOVE THE TOP OF THE CHAMBER. NO COMPACTION IS REQUIRED BUT AN EFFORT SHOULD BE MADE TO HAND KNIFE STONE IN BETWEEN ALL CORRUGATIONS.
6. **INITIAL BACKFILL:** SUITABLE MATERIAL SHALL BE A GRANULAR, WELL GRADED SOIL WITH LESS THAN 35% FINES OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10). MOST PAVEMENT SUBBASE MATERIALS FALL WITHIN THIS GRADING CRITERIA. INITIAL BACKFILL SHALL EXTEND FROM TOP OF EMBEDMENT BACKFILL TO NOT LESS THAN 18 INCHES (450 mm) ABOVE THE TOP OF THE CHAMBER. COMPACT TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY.
7. **FINAL BACKFILL:** SUITABLE MATERIALS SHALL BE ANY SOIL DIRECTED BY THE ENGINEER. FINAL BACKFILL SHALL EXTEND FROM TOP OF INITIAL BACKFILL TO NO MORE THAN 8 FEET (2.44 m) ABOVE THE TOP OF THE CHAMBER. COMPACTION LEVELS SHOULD FOLLOW ENGINEERS RECOMMENDATIONS.
8. **MINIMUM COVER:** FOR TRAFFIC APPLICATIONS A MINIMUM COVER OF 18 INCHES (450 mm) IS REQUIRED, MEASURED FROM THE TOP OF THE CHAMBER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR TO THE TOP OF RIGID PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING MAY OCCUR, INCREASE COVER TO 24 INCHES (600 mm). ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS.
9. **MAXIMUM COVER:** A COVER HEIGHT OF OVER 8 FEET (2.44 m) IS NOT RECOMMENDED. COVER HEIGHT IS MEASURED FROM THE TOP OF THE CHAMBER TO THE TOP OF THE PAVEMENT
10. **LOAD RATING:** HS75 CHAMBERS ARE TRAFFIC RATED FOR H-20 VEHICLES WITH ADDITIONAL CONSIDERATION FOR LANE LOADING, COMMONLY REFERRED TO AS HL-93 LOAD RATING (AASHTO DESIGN TRUCK).

THIS DETAIL DEPICTS RECOMMENDED INSTALLATION PRACTICES AND IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS. PRINSCO BEARS NO RESPONSIBILITY FOR ANY ALTERATIONS, REVISION AND/OR DEVIATION FROM THIS STANDARD DETAIL. PRINSCO HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICE FOR THIS PROJECT. THE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION TO VERIFY SUITABILITY. © PRINSCO, INC.

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WILLMAR, MN 56201
www.prinsco.com

TITLE:	HYDROSTOR HS75 - CROSS SECTION			
DRAWN BY:	TJW	DATE:	22-Apr-20	DRAWING NUMBER: D-7-300A
SCALE:	NTS	SHEET:	1 OF 1	

Existing Condition

```
____________________________________________________________________________
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2015 Advanced Engineering Software (aes)
             Ver. 22.0  Release Date: 07/01/2015  License ID 1673

                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* STATE STREET VILLAGE                                                     *
* RATIONAL METHOD                                                          *
* 2 YEAR STORM - EXISTING CONDITION                                        *
 **************************************************************************

  FILE NAME: 10086P.DAT
  TIME/DATE OF STUDY: 17:42 10/07/2021
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.4640

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

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

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE      1.10 TO NODE      1.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   222.00
  ELEVATION DATA: UPSTREAM(FEET) =   1349.00  DOWNSTREAM(FEET) =   1346.60
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.526
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.756
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        0.90      0.75     0.100    56    6.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.36
  TOTAL AREA(ACRES) =      0.90   PEAK FLOW RATE(CFS) =      1.36

****************************************************************************
  FLOW PROCESS FROM NODE      1.20 TO NODE      1.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.53
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.756
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                B        0.82      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.82      SUBAREA RUNOFF(CFS) =    1.24
  EFFECTIVE AREA(ACRES) =      1.72   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.7       PEAK FLOW RATE(CFS) =       2.60

****************************************************************************
  FLOW PROCESS FROM NODE      1.20 TO NODE      1.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1340.60  DOWNSTREAM(FEET) =  1335.70
  FLOW LENGTH(FEET) =    53.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.24
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.60
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    6.92
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.30 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.30 TO NODE      1.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1335.70  DOWNSTREAM(FEET) =  1331.50
  FLOW LENGTH(FEET) =   419.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.97
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.60
  PIPE TRAVEL TIME(MIN.) =   7.17    Tc(MIN.) =   14.09
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.40 =     694.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      1.40 TO NODE      1.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.09
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.107
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.10      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    1.95
  EFFECTIVE AREA(ACRES) =      3.82   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.8       PEAK FLOW RATE(CFS) =       3.55

****************************************************************************
  FLOW PROCESS FROM NODE      1.40 TO NODE      1.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1331.50  DOWNSTREAM(FEET) =  1330.00
  FLOW LENGTH(FEET) =    68.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.38
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.55
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   14.91
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.50 =     762.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.50 TO NODE      1.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.91
  RAINFALL INTENSITY(INCH/HR) =   1.07
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       3.82
  TOTAL STREAM AREA(ACRES) =       3.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.55

****************************************************************************
  FLOW PROCESS FROM NODE      2.10 TO NODE      2.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   340.00
  ELEVATION DATA: UPSTREAM(FEET) =   1346.70  DOWNSTREAM(FEET) =   1346.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.061
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.215
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.68      0.75     0.100    56   12.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.68   PEAK FLOW RATE(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE      2.20 TO NODE      2.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.06
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.215
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.40      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    0.41
  EFFECTIVE AREA(ACRES) =      1.08   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.1       PEAK FLOW RATE(CFS) =       1.11

****************************************************************************
  FLOW PROCESS FROM NODE      2.20 TO NODE      1.50 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1338.00  DOWNSTREAM(FEET) =   1337.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   124.00   CHANNEL SLOPE =  0.0065
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =  12.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.11
  FLOW VELOCITY(FEET/SEC.) =   1.81   FLOW DEPTH(FEET) =   0.16
  TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =   13.20
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      1.50 =     464.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.50 TO NODE      1.50 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.20
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.08
  TOTAL STREAM AREA(ACRES) =       1.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.11
```

```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.55   14.91    1.070  0.75( 0.07) 0.10       3.8       1.10
      2        1.11   13.20    1.151  0.75( 0.07) 0.10       1.1       2.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.51   13.20    1.151  0.75( 0.07) 0.10       4.5       2.10
      2        4.57   14.91    1.070  0.75( 0.07) 0.10       4.9       1.10

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.57    Tc(MIN.) =    14.91
  EFFECTIVE AREA(ACRES) =       4.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.9
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.50 =     762.00 FEET.

+----------------------------------------------------------------------------+
| END OF DRAINAGE AREA 1                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      3.10 TO NODE      3.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   192.00
  ELEVATION DATA: UPSTREAM(FEET) =   1355.10  DOWNSTREAM(FEET) =   1349.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.50      0.75     0.100    56    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.89
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      0.89

****************************************************************************
  FLOW PROCESS FROM NODE      3.20 TO NODE      3.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1344.00  DOWNSTREAM(FEET) =  1342.70
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.75
```

```
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.89
 PIPE TRAVEL TIME(MIN.) =   2.86    Tc(MIN.) =    7.86
 LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.30 =     320.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.30 TO NODE      3.30 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    7.86
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.571
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        0.68      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.68      SUBAREA RUNOFF(CFS) =    0.92
 EFFECTIVE AREA(ACRES) =      1.18   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       1.59

****************************************************************************
 FLOW PROCESS FROM NODE      3.30 TO NODE      3.40 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1342.70  DOWNSTREAM(FEET) =  1340.10
 FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   0.84
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.59
 PIPE TRAVEL TIME(MIN.) =   5.25    Tc(MIN.) =   13.11
 LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.40 =     585.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.40 TO NODE      3.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   13.11
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.156
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        1.26      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =    1.23
 EFFECTIVE AREA(ACRES) =      2.44   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        2.4       PEAK FLOW RATE(CFS) =       2.37

****************************************************************************
 FLOW PROCESS FROM NODE      3.40 TO NODE      3.50 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1340.10  DOWNSTREAM(FEET) =  1338.00
  FLOW LENGTH(FEET) =   411.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.72
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.37
  PIPE TRAVEL TIME(MIN.) =   9.48    Tc(MIN.) =   22.59
  LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.50 =     996.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.50 TO NODE      3.50 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   22.59
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.834
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.66      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.66      SUBAREA RUNOFF(CFS) =    2.50
  EFFECTIVE AREA(ACRES) =      6.10   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.1       PEAK FLOW RATE(CFS) =       4.17

****************************************************************************
  FLOW PROCESS FROM NODE      3.50 TO NODE      3.60 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1338.00  DOWNSTREAM(FEET) =  1337.70
  FLOW LENGTH(FEET) =    66.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.81
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.17
  PIPE TRAVEL TIME(MIN.) =   1.36    Tc(MIN.) =   23.95
  LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.60 =    1062.00 FEET.

+----------------------------------------------------------------------------+
| END OF DRAINAGE AREA 2                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.10 TO NODE      4.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  ELEVATION DATA: UPSTREAM(FEET) =   1349.80  DOWNSTREAM(FEET) =   1349.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.10      0.75     0.100    56    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1349.00  DOWNSTREAM(FEET) =   1341.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   401.00   CHANNEL SLOPE =  0.0200
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.330
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.07      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.24
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.37
  Tc(MIN.) =   10.37
  SUBAREA AREA(ACRES) =     1.07       SUBAREA RUNOFF(CFS) =    1.21
  EFFECTIVE AREA(ACRES) =      1.17     AREA-AVERAGED Fm(INCH/HR) =   0.07
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       1.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.50
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =     450.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     10.37
  EFFECTIVE AREA(ACRES) =      1.17  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       1.32
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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 10/06/21

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - EXISTING
DRAINAGE AREA 1

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
4.89	1	0.71
Rainfall data for year 2		
4.89	6	1.14
Rainfall data for year 2		
4.89	24	2.06
Rainfall data for year 100		
4.89	1	1.10
Rainfall data for year 100		
4.89	6	2.68
Rainfall data for year 100		
4.89	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.89	1.000	0.734	0.073	0.053

Area-averaged adjusted loss rate Fm (In/Hr) = 0.053

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.36	0.073	56.0	56.0	7.86	0.014
4.54	0.927	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.826
Area-averaged low loss fraction, Yb = 0.174
User entry of time of concentration = 0.249 (hours)
++
Watershed area = 4.89(Ac.)
Catchment Lag time = 0.199 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 125.7545
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.053(In/Hr)
Average low loss rate fraction (Yb) = 0.174 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 4.89(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.161(In)
30-minute factor = 1.000 Adjusted rainfall = 0.330(In)
1-hour factor = 1.000 Adjusted rainfall = 0.436(In)
3-hour factor = 1.000 Adjusted rainfall = 0.786(In)
6-hour factor = 1.000 Adjusted rainfall = 1.140(In)
24-hour factor = 1.000 Adjusted rainfall = 2.060(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 19.73 (CFS))		
1	26.157	5.161
2	90.376	12.672
3	100.000	1.899

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)

1	0.2502	0.0375
2	0.3301	0.0232
3	0.3883	0.0179
4	0.4356	0.0149
5	0.4911	0.0179
6	0.5416	0.0164
7	0.5883	0.0152
8	0.6320	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9769	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3060	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4621	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5048	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6114	0.0043
55	1.6241	0.0042
56	1.6366	0.0042
57	1.6491	0.0041
58	1.6613	0.0041
59	1.6735	0.0040
60	1.6856	0.0040

61	1.6975	0.0040
62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7555	0.0038
67	1.7668	0.0038
68	1.7781	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9359	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0016	0.0076
2	0.0093	0.0016	0.0077
3	0.0094	0.0016	0.0077
4	0.0094	0.0016	0.0078
5	0.0095	0.0017	0.0079
6	0.0096	0.0017	0.0080
7	0.0097	0.0017	0.0080
8	0.0098	0.0017	0.0081
9	0.0099	0.0017	0.0082
10	0.0100	0.0017	0.0083
11	0.0101	0.0018	0.0084
12	0.0102	0.0018	0.0085
13	0.0104	0.0018	0.0086
14	0.0105	0.0018	0.0087
15	0.0106	0.0018	0.0088
16	0.0107	0.0019	0.0089
17	0.0109	0.0019	0.0090
18	0.0110	0.0019	0.0091
19	0.0111	0.0019	0.0092

20	0.0113	0.0020	0.0093
21	0.0114	0.0020	0.0094
22	0.0116	0.0020	0.0096
23	0.0117	0.0020	0.0097
24	0.0119	0.0021	0.0098
25	0.0121	0.0021	0.0100
26	0.0122	0.0021	0.0101
27	0.0124	0.0022	0.0103
28	0.0126	0.0022	0.0104
29	0.0128	0.0022	0.0106
30	0.0130	0.0023	0.0108
31	0.0133	0.0023	0.0110
32	0.0135	0.0023	0.0111
33	0.0137	0.0024	0.0113
34	0.0140	0.0024	0.0115
35	0.0143	0.0025	0.0118
36	0.0145	0.0025	0.0120
37	0.0148	0.0026	0.0123
38	0.0151	0.0026	0.0125
39	0.0155	0.0027	0.0128
40	0.0158	0.0027	0.0131
41	0.0162	0.0028	0.0134
42	0.0166	0.0029	0.0137
43	0.0171	0.0030	0.0141
44	0.0175	0.0030	0.0145
45	0.0181	0.0031	0.0149
46	0.0186	0.0032	0.0154
47	0.0192	0.0033	0.0159
48	0.0198	0.0034	0.0164
49	0.0258	0.0045	0.0213
50	0.0266	0.0046	0.0220
51	0.0275	0.0048	0.0227
52	0.0285	0.0049	0.0235
53	0.0296	0.0051	0.0245
54	0.0308	0.0054	0.0255
55	0.0323	0.0056	0.0267
56	0.0340	0.0059	0.0281
57	0.0360	0.0063	0.0298
58	0.0384	0.0067	0.0317
59	0.0415	0.0072	0.0343
60	0.0454	0.0079	0.0375
61	0.0511	0.0089	0.0422
62	0.0491	0.0085	0.0406
63	0.0604	0.0105	0.0499
64	0.1152	0.0134	0.1018
65	0.2127	0.0134	0.1994
66	0.0532	0.0092	0.0439
67	0.0448	0.0078	0.0371
68	0.0381	0.0066	0.0314
69	0.0337	0.0059	0.0279
70	0.0306	0.0053	0.0253
71	0.0283	0.0049	0.0234
72	0.0265	0.0046	0.0219
73	0.0197	0.0034	0.0163
74	0.0185	0.0032	0.0153
75	0.0175	0.0030	0.0144
76	0.0166	0.0029	0.0137
77	0.0158	0.0027	0.0130
78	0.0151	0.0026	0.0125
79	0.0145	0.0025	0.0120

80	0.0139	0.0024	0.0115
81	0.0134	0.0023	0.0111
82	0.0130	0.0023	0.0107
83	0.0126	0.0022	0.0104
84	0.0122	0.0021	0.0101
85	0.0119	0.0021	0.0098
86	0.0115	0.0020	0.0095
87	0.0112	0.0020	0.0093
88	0.0110	0.0019	0.0091
89	0.0107	0.0019	0.0088
90	0.0105	0.0018	0.0086
91	0.0102	0.0018	0.0085
92	0.0100	0.0017	0.0083
93	0.0098	0.0017	0.0081
94	0.0096	0.0017	0.0079
95	0.0094	0.0016	0.0078
96	0.0093	0.0016	0.0077

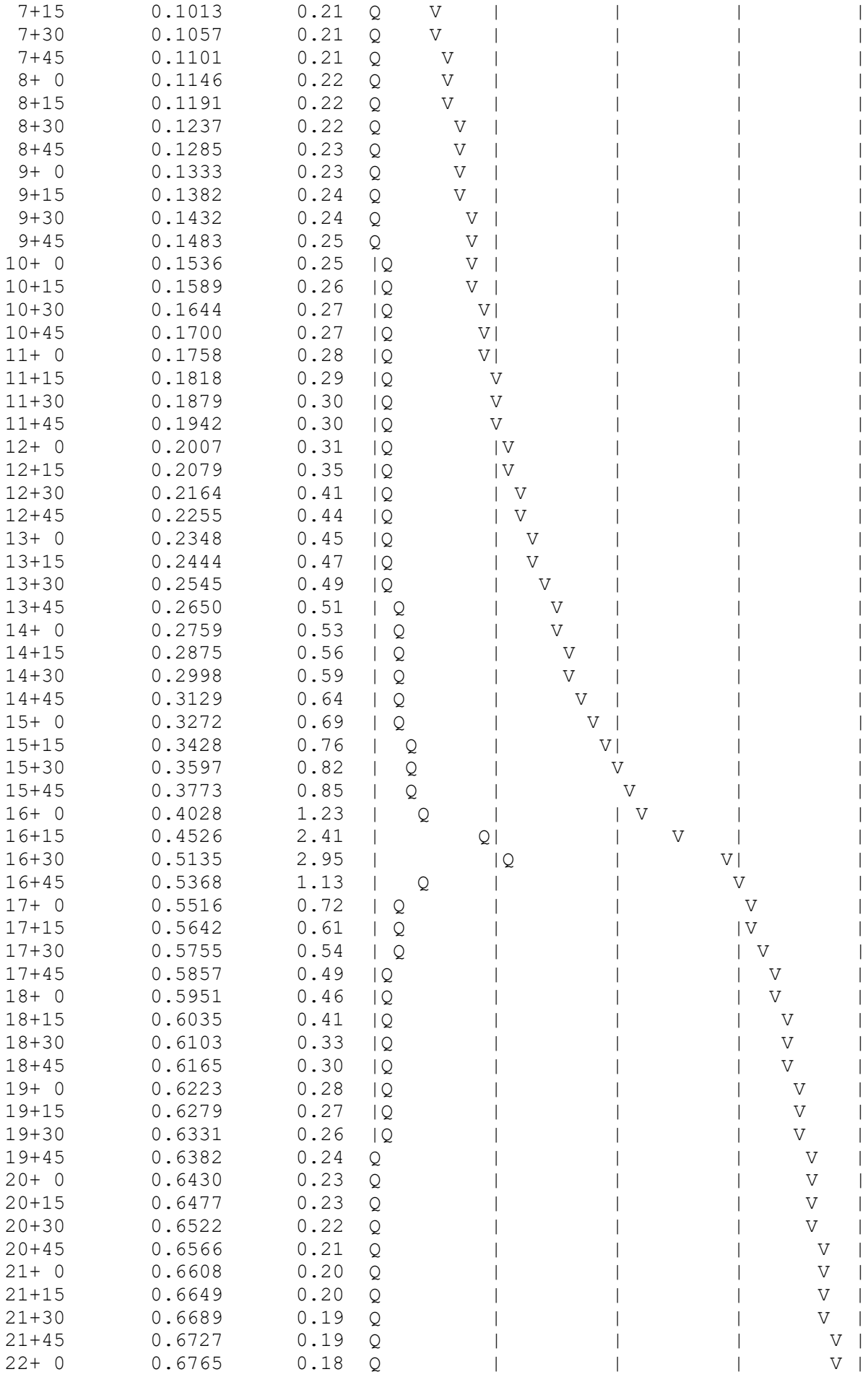
Total soil rain loss = 0.33(In)
Total effective rainfall = 1.73(In)
Peak flow rate in flood hydrograph = 2.95(CFS)

++

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 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0008	0.04	Q				
0+30	0.0036	0.14	Q				
0+45	0.0067	0.15	Q				
1+ 0	0.0099	0.15	Q				
1+15	0.0131	0.15	Q				
1+30	0.0163	0.16	Q				
1+45	0.0196	0.16	QV				
2+ 0	0.0228	0.16	QV				
2+15	0.0262	0.16	QV				
2+30	0.0295	0.16	QV				
2+45	0.0329	0.16	QV				
3+ 0	0.0363	0.17	Q V				
3+15	0.0398	0.17	Q V				
3+30	0.0433	0.17	Q V				
3+45	0.0468	0.17	Q V				
4+ 0	0.0504	0.17	Q V				
4+15	0.0540	0.18	Q V				
4+30	0.0577	0.18	Q V				
4+45	0.0614	0.18	Q V				
5+ 0	0.0651	0.18	Q V				
5+15	0.0689	0.18	Q V				
5+30	0.0728	0.19	Q V				
5+45	0.0767	0.19	Q V				
6+ 0	0.0807	0.19	Q V				
6+15	0.0847	0.19	Q V				
6+30	0.0887	0.20	Q V				
6+45	0.0929	0.20	Q V				
7+ 0	0.0971	0.20	Q V				



```
   22+15       0.6802      0.18  Q          |          |          |        V |
   22+30       0.6838      0.17  Q          |          |          |        V |
   22+45       0.6873      0.17  Q          |          |          |        V |
   23+ 0       0.6907      0.17  Q          |          |          |         V|
   23+15       0.6941      0.16  Q          |          |          |         V|
   23+30       0.6974      0.16  Q          |          |          |         V|
   23+45       0.7006      0.16  Q          |          |          |         V|
   24+ 0       0.7038      0.15  Q          |          |          |         V|
   24+15       0.7061      0.11  Q          |          |          |         V|
   24+30       0.7064      0.01  Q          |          |          |         V|
------------------------------------------------------------------------------
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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 10/06/21

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - EXISTING CONDITION
DRAINAGE AREA 2

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
5.60	1	0.71
Rainfall data for year 2		
5.60	6	1.14
Rainfall data for year 2		
5.60	24	2.06
Rainfall data for year 100		
5.60	1	1.10
Rainfall data for year 100		
5.60	6	2.68
Rainfall data for year 100		
5.60	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	5.60	1.000	0.734	0.054	0.040

Area-averaged adjusted loss rate Fm (In/Hr) = 0.040

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.30	0.054	56.0	56.0	7.86	0.014
5.30	0.946	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.843
Area-averaged low loss fraction, Yb = 0.157
User entry of time of concentration = 0.399 (hours)
++
Watershed area = 5.60(Ac.)
Catchment Lag time = 0.319 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 78.2816
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.040(In/Hr)
Average low loss rate fraction (Yb) = 0.157 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 5.60(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall =	0.161(In)
30-minute factor = 1.000	Adjusted rainfall =	0.330(In)
1-hour factor = 1.000	Adjusted rainfall =	0.436(In)
3-hour factor = 1.000	Adjusted rainfall =	0.786(In)
6-hour factor = 1.000	Adjusted rainfall =	1.140(In)
24-hour factor = 1.000	Adjusted rainfall =	2.060(In)

U n i t H y d r o g r a p h

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 22.57 (CFS))		
1	10.853	2.450
2	62.088	11.566
3	93.366	7.061
4	98.727	1.210
5	100.000	0.287

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2502	0.0375
2	0.3301	0.0232
3	0.3882	0.0179
4	0.4356	0.0149
5	0.4910	0.0179
6	0.5416	0.0164
7	0.5883	0.0152
8	0.6320	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9768	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3060	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4621	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5048	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6114	0.0043
55	1.6241	0.0042
56	1.6366	0.0042
57	1.6491	0.0041
58	1.6613	0.0041

59	1.6735	0.0040
60	1.6856	0.0040
61	1.6975	0.0040
62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7555	0.0038
67	1.7668	0.0038
68	1.7780	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9359	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0014	0.0077
2	0.0093	0.0015	0.0078
3	0.0094	0.0015	0.0079
4	0.0094	0.0015	0.0080
5	0.0095	0.0015	0.0080
6	0.0096	0.0015	0.0081
7	0.0097	0.0015	0.0082
8	0.0098	0.0015	0.0083
9	0.0099	0.0016	0.0084
10	0.0100	0.0016	0.0085
11	0.0101	0.0016	0.0085
12	0.0102	0.0016	0.0086
13	0.0104	0.0016	0.0087
14	0.0105	0.0016	0.0088
15	0.0106	0.0017	0.0089
16	0.0107	0.0017	0.0090
17	0.0109	0.0017	0.0091

18	0.0110	0.0017	0.0093
19	0.0111	0.0017	0.0094
20	0.0113	0.0018	0.0095
21	0.0114	0.0018	0.0096
22	0.0116	0.0018	0.0097
23	0.0117	0.0018	0.0099
24	0.0119	0.0019	0.0100
25	0.0121	0.0019	0.0102
26	0.0122	0.0019	0.0103
27	0.0124	0.0020	0.0105
28	0.0126	0.0020	0.0106
29	0.0128	0.0020	0.0108
30	0.0130	0.0020	0.0110
31	0.0133	0.0021	0.0112
32	0.0135	0.0021	0.0114
33	0.0137	0.0022	0.0116
34	0.0140	0.0022	0.0118
35	0.0143	0.0022	0.0120
36	0.0145	0.0023	0.0122
37	0.0148	0.0023	0.0125
38	0.0151	0.0024	0.0128
39	0.0155	0.0024	0.0131
40	0.0158	0.0025	0.0133
41	0.0162	0.0025	0.0137
42	0.0166	0.0026	0.0140
43	0.0171	0.0027	0.0144
44	0.0175	0.0028	0.0148
45	0.0181	0.0028	0.0152
46	0.0186	0.0029	0.0157
47	0.0192	0.0030	0.0162
48	0.0198	0.0031	0.0167
49	0.0258	0.0041	0.0218
50	0.0266	0.0042	0.0224
51	0.0275	0.0043	0.0232
52	0.0285	0.0045	0.0240
53	0.0296	0.0047	0.0250
54	0.0308	0.0048	0.0260
55	0.0323	0.0051	0.0272
56	0.0340	0.0053	0.0286
57	0.0360	0.0057	0.0304
58	0.0384	0.0060	0.0324
59	0.0415	0.0065	0.0350
60	0.0454	0.0071	0.0382
61	0.0511	0.0080	0.0430
62	0.0491	0.0077	0.0414
63	0.0603	0.0095	0.0509
64	0.1152	0.0099	0.1053
65	0.2127	0.0099	0.2028
66	0.0532	0.0084	0.0448
67	0.0448	0.0070	0.0378
68	0.0381	0.0060	0.0321
69	0.0337	0.0053	0.0284
70	0.0306	0.0048	0.0258
71	0.0283	0.0044	0.0239
72	0.0265	0.0042	0.0223
73	0.0197	0.0031	0.0166
74	0.0185	0.0029	0.0156
75	0.0175	0.0027	0.0147
76	0.0166	0.0026	0.0140
77	0.0158	0.0025	0.0133

78	0.0151	0.0024	0.0127
79	0.0145	0.0023	0.0122
80	0.0139	0.0022	0.0117
81	0.0134	0.0021	0.0113
82	0.0130	0.0020	0.0110
83	0.0126	0.0020	0.0106
84	0.0122	0.0019	0.0103
85	0.0119	0.0019	0.0100
86	0.0115	0.0018	0.0097
87	0.0112	0.0018	0.0095
88	0.0110	0.0017	0.0092
89	0.0107	0.0017	0.0090
90	0.0105	0.0016	0.0088
91	0.0102	0.0016	0.0086
92	0.0100	0.0016	0.0084
93	0.0098	0.0015	0.0083
94	0.0096	0.0015	0.0081
95	0.0094	0.0015	0.0080
96	0.0093	0.0015	0.0078

Total soil rain loss = 0.29(In)
Total effective rainfall = 1.77(In)
Peak flow rate in flood hydrograph = 3.27(CFS)

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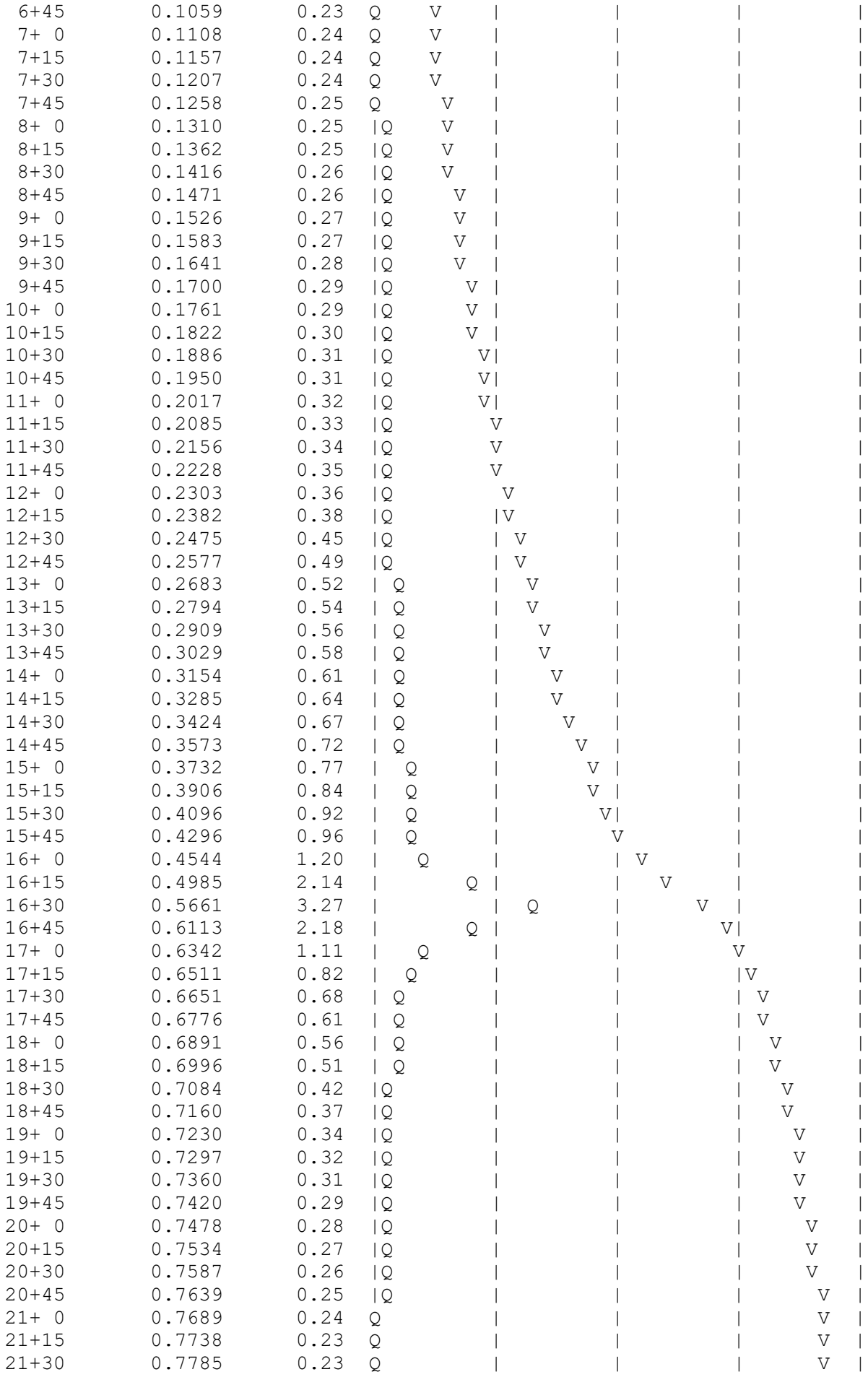
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0004	0.02	Q				
0+30	0.0026	0.11	Q				
0+45	0.0060	0.16	Q				
1+ 0	0.0097	0.18	Q				
1+15	0.0134	0.18	Q				
1+30	0.0171	0.18	Q				
1+45	0.0209	0.18	QV				
2+ 0	0.0247	0.18	QV				
2+15	0.0285	0.19	QV				
2+30	0.0324	0.19	QV				
2+45	0.0364	0.19	QV				
3+ 0	0.0403	0.19	QV				
3+15	0.0443	0.19	Q V				
3+30	0.0484	0.20	Q V				
3+45	0.0525	0.20	Q V				
4+ 0	0.0567	0.20	Q V				
4+15	0.0609	0.20	Q V				
4+30	0.0651	0.21	Q V				
4+45	0.0694	0.21	Q V				
5+ 0	0.0738	0.21	Q V				
5+15	0.0782	0.21	Q V				
5+30	0.0826	0.22	Q V				
5+45	0.0872	0.22	Q V				
6+ 0	0.0917	0.22	Q V				
6+15	0.0964	0.23	Q V				
6+30	0.1011	0.23	Q V				



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  21+45       0.7831      0.22  Q          |          |          |       V  |
  22+ 0       0.7875      0.22  Q          |          |          |        V |
  22+15       0.7919      0.21  Q          |          |          |        V |
  22+30       0.7961      0.21  Q          |          |          |        V |
  22+45       0.8003      0.20  Q          |          |          |        V |
  23+ 0       0.8043      0.20  Q          |          |          |         V|
  23+15       0.8083      0.19  Q          |          |          |         V|
  23+30       0.8122      0.19  Q          |          |          |         V|
  23+45       0.8160      0.18  Q          |          |          |         V|
  24+ 0       0.8197      0.18  Q          |          |          |         V|
  24+15       0.8230      0.16  Q          |          |          |         V|
  24+30       0.8244      0.07  Q          |          |          |         V|
  24+45       0.8246      0.01  Q          |          |          |         V|
  25+ 0       0.8247      0.00  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 10/06/21

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - EXISTING CONDITION
DRAINAGE AREA 3

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.17	1	0.71
Rainfall data for year 2		
1.17	6	1.14
Rainfall data for year 2		
1.17	24	2.06
Rainfall data for year 100		
1.17	1	1.10
Rainfall data for year 100		
1.17	6	2.68
Rainfall data for year 100		
1.17	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	1.17	1.000	0.734	0.050	0.037

Area-averaged adjusted loss rate Fm (In/Hr) = 0.037

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.06	0.050	56.0	56.0	7.86	0.014
1.11	0.950	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.846
Area-averaged low loss fraction, Yb = 0.154
User entry of time of concentration = 0.173 (hours)
++
Watershed area = 1.17(Ac.)
Catchment Lag time = 0.138 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 180.8449
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.037(In/Hr)
Average low loss rate fraction (Yb) = 0.154 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 1.17(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.161(In)
30-minute factor = 1.000 Adjusted rainfall = 0.330(In)
1-hour factor = 1.000 Adjusted rainfall = 0.436(In)
3-hour factor = 1.000 Adjusted rainfall = 0.786(In)
6-hour factor = 1.000 Adjusted rainfall = 1.140(In)
24-hour factor = 1.000 Adjusted rainfall = 2.060(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 4.72 (CFS))		
1	43.515	2.052
2	100.000	1.026

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2502	0.0375

2	0.3302	0.0232
3	0.3883	0.0179
4	0.4357	0.0149
5	0.4911	0.0179
6	0.5416	0.0164
7	0.5884	0.0152
8	0.6321	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9769	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3060	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4622	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5049	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6115	0.0043
55	1.6241	0.0042
56	1.6367	0.0042
57	1.6491	0.0041
58	1.6614	0.0041
59	1.6735	0.0040
60	1.6856	0.0040
61	1.6975	0.0040

62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7556	0.0038
67	1.7669	0.0038
68	1.7781	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9360	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0014	0.0078
2	0.0093	0.0014	0.0078
3	0.0094	0.0014	0.0079
4	0.0094	0.0015	0.0080
5	0.0095	0.0015	0.0081
6	0.0096	0.0015	0.0082
7	0.0097	0.0015	0.0082
8	0.0098	0.0015	0.0083
9	0.0099	0.0015	0.0084
10	0.0100	0.0015	0.0085
11	0.0101	0.0016	0.0086
12	0.0102	0.0016	0.0087
13	0.0104	0.0016	0.0088
14	0.0105	0.0016	0.0089
15	0.0106	0.0016	0.0090
16	0.0107	0.0016	0.0091
17	0.0109	0.0017	0.0092
18	0.0110	0.0017	0.0093
19	0.0111	0.0017	0.0094
20	0.0113	0.0017	0.0095

21	0.0114	0.0018	0.0097
22	0.0116	0.0018	0.0098
23	0.0117	0.0018	0.0099
24	0.0119	0.0018	0.0101
25	0.0121	0.0019	0.0102
26	0.0122	0.0019	0.0104
27	0.0124	0.0019	0.0105
28	0.0126	0.0019	0.0107
29	0.0128	0.0020	0.0109
30	0.0130	0.0020	0.0110
31	0.0133	0.0020	0.0112
32	0.0135	0.0021	0.0114
33	0.0137	0.0021	0.0116
34	0.0140	0.0021	0.0118
35	0.0143	0.0022	0.0121
36	0.0145	0.0022	0.0123
37	0.0148	0.0023	0.0126
38	0.0151	0.0023	0.0128
39	0.0155	0.0024	0.0131
40	0.0158	0.0024	0.0134
41	0.0162	0.0025	0.0137
42	0.0166	0.0026	0.0141
43	0.0171	0.0026	0.0145
44	0.0175	0.0027	0.0148
45	0.0181	0.0028	0.0153
46	0.0186	0.0029	0.0157
47	0.0192	0.0029	0.0163
48	0.0198	0.0030	0.0168
49	0.0258	0.0040	0.0218
50	0.0266	0.0041	0.0225
51	0.0275	0.0042	0.0233
52	0.0285	0.0044	0.0241
53	0.0296	0.0045	0.0251
54	0.0308	0.0047	0.0261
55	0.0323	0.0050	0.0274
56	0.0340	0.0052	0.0287
57	0.0360	0.0055	0.0305
58	0.0384	0.0059	0.0325
59	0.0415	0.0064	0.0352
60	0.0453	0.0070	0.0384
61	0.0510	0.0078	0.0432
62	0.0491	0.0075	0.0416
63	0.0604	0.0092	0.0512
64	0.1152	0.0092	0.1060
65	0.2128	0.0092	0.2036
66	0.0532	0.0082	0.0450
67	0.0448	0.0069	0.0379
68	0.0380	0.0058	0.0322
69	0.0337	0.0052	0.0285
70	0.0306	0.0047	0.0259
71	0.0283	0.0043	0.0240
72	0.0265	0.0041	0.0224
73	0.0197	0.0030	0.0167
74	0.0185	0.0028	0.0157
75	0.0175	0.0027	0.0148
76	0.0166	0.0025	0.0140
77	0.0158	0.0024	0.0134
78	0.0151	0.0023	0.0128
79	0.0145	0.0022	0.0123
80	0.0139	0.0021	0.0118

81	0.0134	0.0021	0.0114
82	0.0130	0.0020	0.0110
83	0.0126	0.0019	0.0107
84	0.0122	0.0019	0.0103
85	0.0119	0.0018	0.0100
86	0.0115	0.0018	0.0098
87	0.0112	0.0017	0.0095
88	0.0110	0.0017	0.0093
89	0.0107	0.0016	0.0091
90	0.0105	0.0016	0.0089
91	0.0102	0.0016	0.0087
92	0.0100	0.0015	0.0085
93	0.0098	0.0015	0.0083
94	0.0096	0.0015	0.0081
95	0.0094	0.0014	0.0080
96	0.0093	0.0014	0.0078

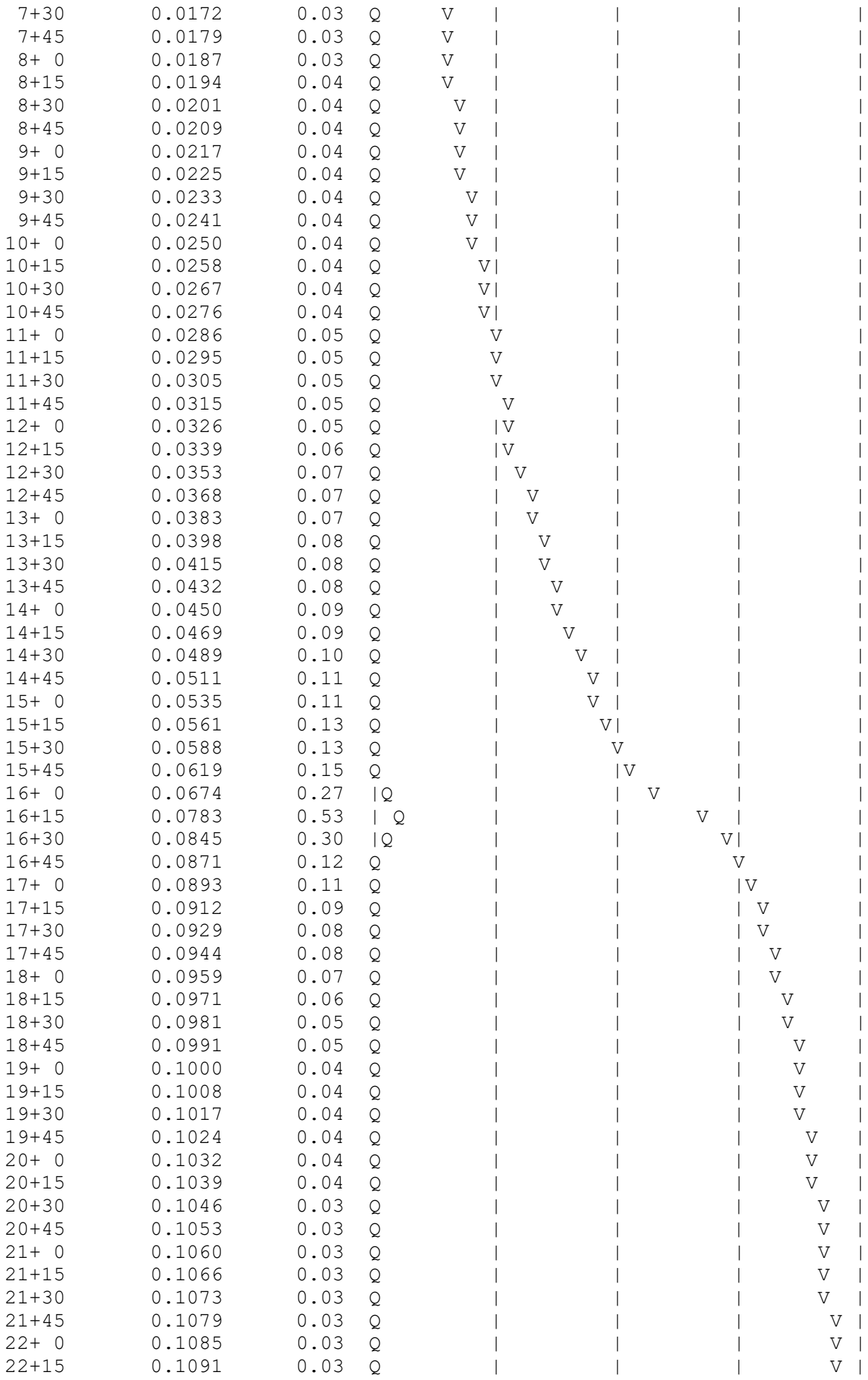
Total soil rain loss = 0.28(In)
Total effective rainfall = 1.78(In)
Peak flow rate in flood hydrograph = 0.53(CFS)

++

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 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0003	0.02	Q	|	|	|	|
0+30	0.0008	0.02	Q	|	|	|	|
0+45	0.0013	0.02	Q	|	|	|	|
1+ 0	0.0018	0.02	Q	|	|	|	|
1+15	0.0023	0.02	Q	|	|	|	|
1+30	0.0029	0.03	QV	|	|	|	|
1+45	0.0034	0.03	QV	|	|	|	|
2+ 0	0.0039	0.03	QV	|	|	|	|
2+15	0.0044	0.03	QV	|	|	|	|
2+30	0.0050	0.03	QV	|	|	|	|
2+45	0.0055	0.03	QV	|	|	|	|
3+ 0	0.0061	0.03	Q V	|	|	|	|
3+15	0.0066	0.03	Q V	|	|	|	|
3+30	0.0072	0.03	Q V	|	|	|	|
3+45	0.0078	0.03	Q V	|	|	|	|
4+ 0	0.0083	0.03	Q V	|	|	|	|
4+15	0.0089	0.03	Q V	|	|	|	|
4+30	0.0095	0.03	Q V	|	|	|	|
4+45	0.0101	0.03	Q V	|	|	|	|
5+ 0	0.0107	0.03	Q V	|	|	|	|
5+15	0.0113	0.03	Q V	|	|	|	|
5+30	0.0119	0.03	Q V	|	|	|	|
5+45	0.0126	0.03	Q V	|	|	|	|
6+ 0	0.0132	0.03	Q V	|	|	|	|
6+15	0.0139	0.03	Q V	|	|	|	|
6+30	0.0145	0.03	Q V	|	|	|	|
6+45	0.0152	0.03	Q V	|	|	|	|
7+ 0	0.0159	0.03	Q V	|	|	|	|
7+15	0.0165	0.03	Q V	|	|	|	|



```
   22+30       0.1096      0.03  Q          |          |          |        V |
   22+45       0.1102      0.03  Q          |          |          |         V|
   23+ 0       0.1107      0.03  Q          |          |          |         V|
   23+15       0.1112      0.03  Q          |          |          |         V|
   23+30       0.1118      0.03  Q          |          |          |         V|
   23+45       0.1123      0.02  Q          |          |          |         V|
   24+ 0       0.1128      0.02  Q          |          |          |         V|
   24+15       0.1129      0.01  Q          |          |          |         V|
-------------------------------------------------------------------------------
```

Proposed Condition

```
____________________________________________________________________________
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2015 Advanced Engineering Software (aes)
             Ver. 22.0  Release Date: 07/01/2015  License ID 1673

                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* STATE STREET VILLAGE                                                     *
* RATIONAL METHOD - PROPOSED                                               *
* 2 YEAR STORM - PROPOSED CONDITION                                        *
 **************************************************************************

  FILE NAME: 10086PO.DAT
  TIME/DATE OF STUDY: 09:29 10/08/2021
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.01
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.4640

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

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

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE      1.10 TO NODE      1.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   168.00
  ELEVATION DATA: UPSTREAM(FEET) =   1356.90  DOWNSTREAM(FEET) =   1355.50
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.149
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.820
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.31      0.75     0.100    56    6.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.31   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE      1.20 TO NODE      1.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1354.50  DOWNSTREAM(FEET) =  1342.10
  FLOW LENGTH(FEET) =   336.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.03
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.49
  PIPE TRAVEL TIME(MIN.) =   5.41    Tc(MIN.) =   11.56
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.30 =     504.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.30 TO NODE      1.30 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.56
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.246
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.28      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.28      SUBAREA RUNOFF(CFS) =    0.30
  EFFECTIVE AREA(ACRES) =      0.59   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       0.62

****************************************************************************
  FLOW PROCESS FROM NODE      1.30 TO NODE      1.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1342.10  DOWNSTREAM(FEET) =  1341.20
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.03
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.62
```

```
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   12.05
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.40 =     534.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.40 TO NODE      1.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.05
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.216
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.08      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.08      SUBAREA RUNOFF(CFS) =    3.16
  EFFECTIVE AREA(ACRES) =      3.67   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.7       PEAK FLOW RATE(CFS) =       3.77

****************************************************************************
  FLOW PROCESS FROM NODE      1.40 TO NODE      1.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1341.20  DOWNSTREAM(FEET) =  1334.00
  FLOW LENGTH(FEET) =   247.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.58
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.77
  PIPE TRAVEL TIME(MIN.) =   2.61    Tc(MIN.) =   14.66
  LONGEST FLOWPATH FROM NODE      1.10 TO NODE      1.50 =     781.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.50 TO NODE      1.50 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.66
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.081
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.17      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.17      SUBAREA RUNOFF(CFS) =    1.06
  EFFECTIVE AREA(ACRES) =      4.84   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.8       PEAK FLOW RATE(CFS) =       4.38

+--------------------------------------------------------------------------+
| END OF DRAINAGE AREA 1                                                   |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      2.10 TO NODE      2.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   163.00
  ELEVATION DATA: UPSTREAM(FEET) =   1356.60  DOWNSTREAM(FEET) =   1355.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.337
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.788
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        0.35      0.75     0.100    56    6.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.35   PEAK FLOW RATE(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE      2.20 TO NODE      2.30 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1355.50  DOWNSTREAM(FEET) =  1353.00
  FLOW LENGTH(FEET) =   336.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   0.38
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =   8.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.54
  PIPE TRAVEL TIME(MIN.) =  14.92    Tc(MIN.) =   21.26
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      2.30 =     499.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.30 TO NODE      2.30 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.865
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                B        3.27      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.27      SUBAREA RUNOFF(CFS) =    2.32
  EFFECTIVE AREA(ACRES) =      3.62   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.6       PEAK FLOW RATE(CFS) =       2.57

****************************************************************************
  FLOW PROCESS FROM NODE      2.30 TO NODE      2.40 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1349.90  DOWNSTREAM(FEET) =  1342.90
  FLOW LENGTH(FEET) =   249.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.41
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.57
  PIPE TRAVEL TIME(MIN.) =   2.93    Tc(MIN.) =   24.20
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      2.40 =     748.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.40 TO NODE      2.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   24.20
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.800
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.47      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.47      SUBAREA RUNOFF(CFS) =    1.61
  EFFECTIVE AREA(ACRES) =      6.09   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.1       PEAK FLOW RATE(CFS) =       3.98

****************************************************************************
  FLOW PROCESS FROM NODE      2.40 TO NODE      2.50 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1342.90  DOWNSTREAM(FEET) =  1339.50
  FLOW LENGTH(FEET) =    91.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.76
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.98
  PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   25.06
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      2.50 =     839.00 FEET.

+----------------------------------------------------------------------------+
| END OF DRAINAGE AREA 2                                                     |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.10 TO NODE      4.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    77.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.50  DOWNSTREAM(FEET) =   1353.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.40      0.75     0.100    56    5.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.71
 TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      0.71

****************************************************************************
 FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1345.50  DOWNSTREAM(FEET) =  1339.50
 FLOW LENGTH(FEET) =   276.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   0.94
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.71
 PIPE TRAVEL TIME(MIN.) =   4.88    Tc(MIN.) =    9.88
 LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =     353.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      4.30 TO NODE      4.30 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    9.88
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.369
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.80      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.80      SUBAREA RUNOFF(CFS) =    0.93
 EFFECTIVE AREA(ACRES) =      1.20   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       1.40
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =      9.88
 EFFECTIVE AREA(ACRES) =      1.20  AREA-AVERAGED Fm(INCH/HR)=  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       1.40
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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 10/06/21

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - DEVELOPED CONDITION
DRAINAGE AREA 1

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
4.85	1	0.71
Rainfall data for year 2		
4.85	6	1.14
Rainfall data for year 2		
4.85	24	2.06
Rainfall data for year 100		
4.85	1	1.10
Rainfall data for year 100		
4.85	6	2.68
Rainfall data for year 100		
4.85	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.85	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.48	0.100	56.0	56.0	7.86	0.014
4.37	0.900	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.803
Area-averaged low loss fraction, Yb = 0.197
User entry of time of concentration = 0.239 (hours)
++
Watershed area = 4.85(Ac.)
Catchment Lag time = 0.191 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 130.8626
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.197 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 4.85(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.161(In)
30-minute factor = 1.000 Adjusted rainfall = 0.330(In)
1-hour factor = 1.000 Adjusted rainfall = 0.436(In)
3-hour factor = 1.000 Adjusted rainfall = 0.786(In)
6-hour factor = 1.000 Adjusted rainfall = 1.140(In)
24-hour factor = 1.000 Adjusted rainfall = 2.060(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 19.55 (CFS))		
1	27.988	5.472
2	91.679	12.452
3	100.000	1.627

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)

1	0.2502	0.0375
2	0.3301	0.0232
3	0.3883	0.0179
4	0.4356	0.0149
5	0.4911	0.0179
6	0.5416	0.0164
7	0.5883	0.0152
8	0.6320	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9769	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3060	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4621	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5048	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6114	0.0043
55	1.6241	0.0042
56	1.6366	0.0042
57	1.6491	0.0041
58	1.6613	0.0041
59	1.6735	0.0040
60	1.6856	0.0040

61	1.6975	0.0040
62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7555	0.0038
67	1.7668	0.0038
68	1.7781	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9359	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0018	0.0074
2	0.0093	0.0018	0.0074
3	0.0094	0.0018	0.0075
4	0.0094	0.0019	0.0076
5	0.0095	0.0019	0.0077
6	0.0096	0.0019	0.0077
7	0.0097	0.0019	0.0078
8	0.0098	0.0019	0.0079
9	0.0099	0.0020	0.0080
10	0.0100	0.0020	0.0080
11	0.0101	0.0020	0.0081
12	0.0102	0.0020	0.0082
13	0.0104	0.0020	0.0083
14	0.0105	0.0021	0.0084
15	0.0106	0.0021	0.0085
16	0.0107	0.0021	0.0086
17	0.0109	0.0021	0.0087
18	0.0110	0.0022	0.0088
19	0.0111	0.0022	0.0089

20	0.0113	0.0022	0.0090
21	0.0114	0.0023	0.0092
22	0.0116	0.0023	0.0093
23	0.0117	0.0023	0.0094
24	0.0119	0.0023	0.0095
25	0.0121	0.0024	0.0097
26	0.0122	0.0024	0.0098
27	0.0124	0.0025	0.0100
28	0.0126	0.0025	0.0101
29	0.0128	0.0025	0.0103
30	0.0130	0.0026	0.0105
31	0.0133	0.0026	0.0106
32	0.0135	0.0027	0.0108
33	0.0137	0.0027	0.0110
34	0.0140	0.0028	0.0112
35	0.0143	0.0028	0.0114
36	0.0145	0.0029	0.0117
37	0.0148	0.0029	0.0119
38	0.0151	0.0030	0.0122
39	0.0155	0.0031	0.0124
40	0.0158	0.0031	0.0127
41	0.0162	0.0032	0.0130
42	0.0166	0.0033	0.0133
43	0.0171	0.0034	0.0137
44	0.0175	0.0035	0.0141
45	0.0181	0.0036	0.0145
46	0.0186	0.0037	0.0149
47	0.0192	0.0038	0.0154
48	0.0198	0.0039	0.0159
49	0.0258	0.0051	0.0207
50	0.0266	0.0052	0.0213
51	0.0275	0.0054	0.0221
52	0.0285	0.0056	0.0228
53	0.0296	0.0058	0.0238
54	0.0308	0.0061	0.0247
55	0.0323	0.0064	0.0259
56	0.0340	0.0067	0.0272
57	0.0360	0.0071	0.0289
58	0.0384	0.0076	0.0308
59	0.0415	0.0082	0.0333
60	0.0454	0.0090	0.0364
61	0.0511	0.0101	0.0410
62	0.0491	0.0097	0.0394
63	0.0604	0.0119	0.0484
64	0.1152	0.0183	0.0968
65	0.2127	0.0183	0.1944
66	0.0532	0.0105	0.0427
67	0.0448	0.0089	0.0360
68	0.0381	0.0075	0.0305
69	0.0337	0.0067	0.0271
70	0.0306	0.0061	0.0246
71	0.0283	0.0056	0.0227
72	0.0265	0.0052	0.0212
73	0.0197	0.0039	0.0158
74	0.0185	0.0037	0.0149
75	0.0175	0.0034	0.0140
76	0.0166	0.0033	0.0133
77	0.0158	0.0031	0.0127
78	0.0151	0.0030	0.0121
79	0.0145	0.0029	0.0116

80	0.0139	0.0028	0.0112
81	0.0134	0.0027	0.0108
82	0.0130	0.0026	0.0104
83	0.0126	0.0025	0.0101
84	0.0122	0.0024	0.0098
85	0.0119	0.0023	0.0095
86	0.0115	0.0023	0.0093
87	0.0112	0.0022	0.0090
88	0.0110	0.0022	0.0088
89	0.0107	0.0021	0.0086
90	0.0105	0.0021	0.0084
91	0.0102	0.0020	0.0082
92	0.0100	0.0020	0.0080
93	0.0098	0.0019	0.0079
94	0.0096	0.0019	0.0077
95	0.0094	0.0019	0.0076
96	0.0093	0.0018	0.0074

Total soil rain loss = 0.38(In)
Total effective rainfall = 1.68(In)
Peak flow rate in flood hydrograph = 2.81(CFS)

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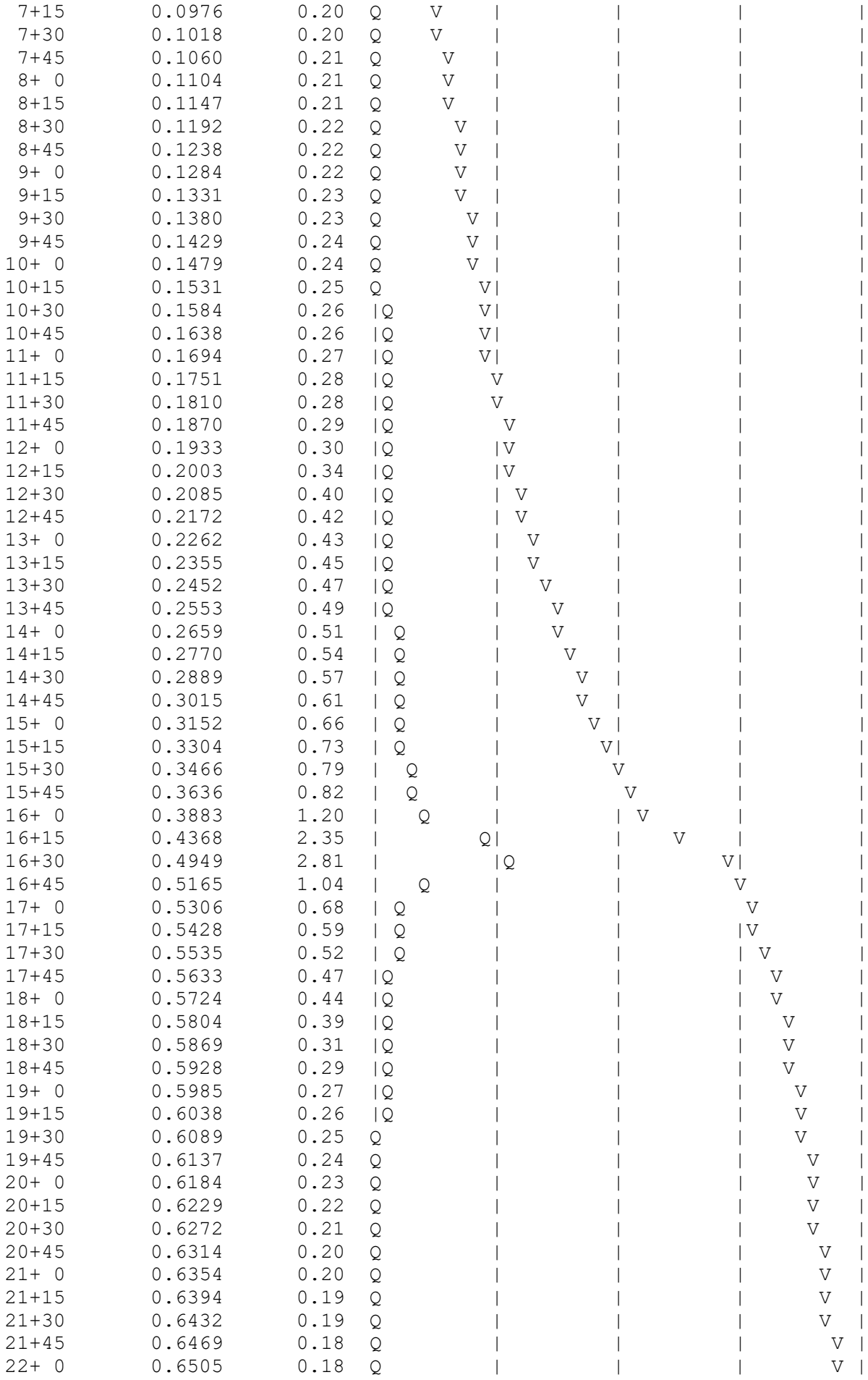
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0008	0.04	Q				
0+30	0.0036	0.13	Q				
0+45	0.0066	0.15	Q				
1+ 0	0.0096	0.15	Q				
1+15	0.0127	0.15	Q				
1+30	0.0158	0.15	Q				
1+45	0.0189	0.15	QV				
2+ 0	0.0221	0.15	QV				
2+15	0.0253	0.15	QV				
2+30	0.0285	0.16	QV				
2+45	0.0318	0.16	QV				
3+ 0	0.0351	0.16	Q V				
3+15	0.0384	0.16	Q V				
3+30	0.0417	0.16	Q V				
3+45	0.0452	0.16	Q V				
4+ 0	0.0486	0.17	Q V				
4+15	0.0521	0.17	Q V				
4+30	0.0556	0.17	Q V				
4+45	0.0592	0.17	Q V				
5+ 0	0.0628	0.17	Q V				
5+15	0.0665	0.18	Q V				
5+30	0.0702	0.18	Q V				
5+45	0.0739	0.18	Q V				
6+ 0	0.0777	0.18	Q V				
6+15	0.0816	0.19	Q V				
6+30	0.0855	0.19	Q V				
6+45	0.0895	0.19	Q V				
7+ 0	0.0935	0.20	Q V				



```
  22+15       0.6541      0.17  Q          |          |          |        V |
  22+30       0.6575      0.17  Q          |          |          |        V |
  22+45       0.6609      0.16  Q          |          |          |        V |
  23+ 0       0.6642      0.16  Q          |          |          |         V|
  23+15       0.6675      0.16  Q          |          |          |         V|
  23+30       0.6706      0.15  Q          |          |          |         V|
  23+45       0.6737      0.15  Q          |          |          |         V|
  24+ 0       0.6768      0.15  Q          |          |          |         V|
  24+15       0.6789      0.10  Q          |          |          |         V|
  24+30       0.6792      0.01  Q          |          |          |         V|
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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 10/08/21

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - DEVELOPED CONDITION
DRAINAGE AREA 2

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
6.21	1	0.71
Rainfall data for year 2		
6.21	6	1.14
Rainfall data for year 2		
6.21	24	2.06
Rainfall data for year 100		
6.21	1	1.10
Rainfall data for year 100		
6.21	6	2.68
Rainfall data for year 100		
6.21	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	6.21	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.62	0.100	56.0	56.0	7.86	0.014
5.59	0.900	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.803
Area-averaged low loss fraction, Yb = 0.197
User entry of time of concentration = 0.418 (hours)
++
Watershed area = 6.21(Ac.)
Catchment Lag time = 0.334 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 74.8145
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.197 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 6.21(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.161(In)
30-minute factor = 1.000 Adjusted rainfall = 0.330(In)
1-hour factor = 1.000 Adjusted rainfall = 0.436(In)
3-hour factor = 1.000 Adjusted rainfall = 0.786(In)
6-hour factor = 1.000 Adjusted rainfall = 1.140(In)
24-hour factor = 1.000 Adjusted rainfall = 2.060(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 25.03 (CFS))		
1	9.960	2.494
2	58.587	12.173
3	91.910	8.342
4	98.450	1.637
5	100.000	0.388

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2502	0.0375
2	0.3301	0.0232
3	0.3882	0.0179
4	0.4356	0.0149
5	0.4910	0.0179
6	0.5415	0.0164
7	0.5883	0.0152
8	0.6320	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9768	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3059	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4621	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5048	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6114	0.0043
55	1.6241	0.0042
56	1.6366	0.0042
57	1.6491	0.0041
58	1.6613	0.0041

59	1.6735	0.0040
60	1.6856	0.0040
61	1.6975	0.0040
62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7555	0.0038
67	1.7668	0.0038
68	1.7780	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9359	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0018	0.0074
2	0.0093	0.0018	0.0074
3	0.0094	0.0018	0.0075
4	0.0094	0.0019	0.0076
5	0.0095	0.0019	0.0077
6	0.0096	0.0019	0.0077
7	0.0097	0.0019	0.0078
8	0.0098	0.0019	0.0079
9	0.0099	0.0020	0.0080
10	0.0100	0.0020	0.0080
11	0.0101	0.0020	0.0081
12	0.0102	0.0020	0.0082
13	0.0104	0.0020	0.0083
14	0.0105	0.0021	0.0084
15	0.0106	0.0021	0.0085
16	0.0107	0.0021	0.0086
17	0.0109	0.0021	0.0087

18	0.0110	0.0022	0.0088
19	0.0111	0.0022	0.0089
20	0.0113	0.0022	0.0090
21	0.0114	0.0023	0.0092
22	0.0116	0.0023	0.0093
23	0.0117	0.0023	0.0094
24	0.0119	0.0023	0.0095
25	0.0121	0.0024	0.0097
26	0.0122	0.0024	0.0098
27	0.0124	0.0025	0.0100
28	0.0126	0.0025	0.0101
29	0.0128	0.0025	0.0103
30	0.0130	0.0026	0.0105
31	0.0133	0.0026	0.0106
32	0.0135	0.0027	0.0108
33	0.0137	0.0027	0.0110
34	0.0140	0.0028	0.0112
35	0.0143	0.0028	0.0114
36	0.0145	0.0029	0.0117
37	0.0148	0.0029	0.0119
38	0.0151	0.0030	0.0122
39	0.0155	0.0031	0.0124
40	0.0158	0.0031	0.0127
41	0.0162	0.0032	0.0130
42	0.0166	0.0033	0.0133
43	0.0171	0.0034	0.0137
44	0.0175	0.0035	0.0141
45	0.0181	0.0036	0.0145
46	0.0186	0.0037	0.0149
47	0.0192	0.0038	0.0154
48	0.0198	0.0039	0.0159
49	0.0258	0.0051	0.0207
50	0.0266	0.0052	0.0213
51	0.0275	0.0054	0.0221
52	0.0285	0.0056	0.0228
53	0.0296	0.0058	0.0238
54	0.0308	0.0061	0.0247
55	0.0323	0.0064	0.0259
56	0.0340	0.0067	0.0272
57	0.0360	0.0071	0.0289
58	0.0384	0.0076	0.0308
59	0.0415	0.0082	0.0333
60	0.0454	0.0090	0.0364
61	0.0511	0.0101	0.0410
62	0.0491	0.0097	0.0394
63	0.0603	0.0119	0.0484
64	0.1152	0.0183	0.0968
65	0.2127	0.0183	0.1944
66	0.0532	0.0105	0.0427
67	0.0448	0.0089	0.0360
68	0.0381	0.0075	0.0305
69	0.0337	0.0067	0.0271
70	0.0306	0.0061	0.0246
71	0.0283	0.0056	0.0227
72	0.0265	0.0052	0.0212
73	0.0197	0.0039	0.0158
74	0.0185	0.0037	0.0149
75	0.0175	0.0034	0.0140
76	0.0166	0.0033	0.0133
77	0.0158	0.0031	0.0127

78	0.0151	0.0030	0.0121
79	0.0145	0.0029	0.0116
80	0.0139	0.0028	0.0112
81	0.0134	0.0027	0.0108
82	0.0130	0.0026	0.0104
83	0.0126	0.0025	0.0101
84	0.0122	0.0024	0.0098
85	0.0119	0.0023	0.0095
86	0.0115	0.0023	0.0093
87	0.0112	0.0022	0.0090
88	0.0110	0.0022	0.0088
89	0.0107	0.0021	0.0086
90	0.0105	0.0021	0.0084
91	0.0102	0.0020	0.0082
92	0.0100	0.0020	0.0080
93	0.0098	0.0019	0.0079
94	0.0096	0.0019	0.0077
95	0.0094	0.0019	0.0076
96	0.0093	0.0018	0.0074

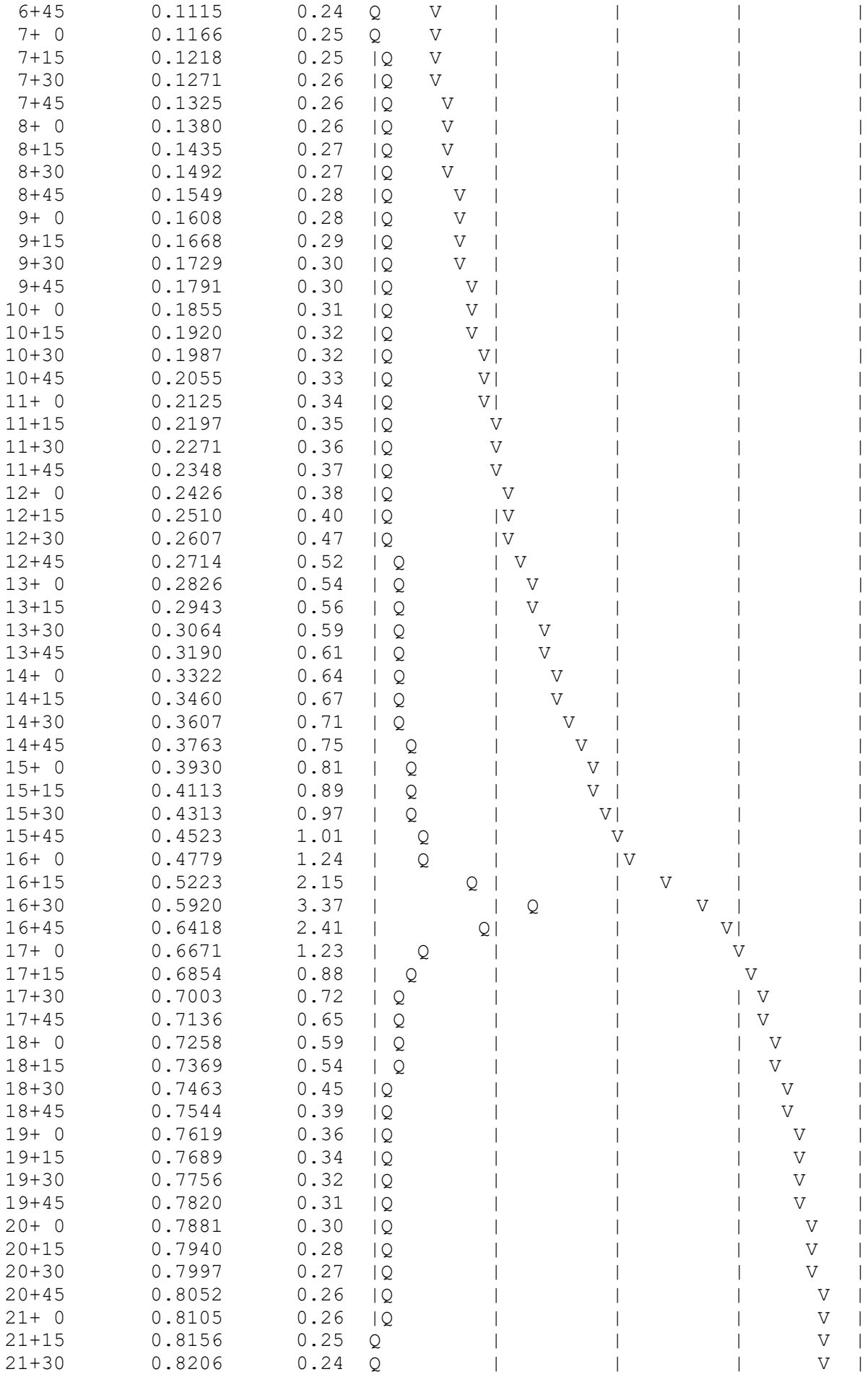
Total soil rain loss = 0.38(In)
Total effective rainfall = 1.68(In)
Peak flow rate in flood hydrograph = 3.37(CFS)

++

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 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0004	0.02	Q				
0+30	0.0026	0.11	Q				
0+45	0.0061	0.17	Q				
1+ 0	0.0100	0.18	Q				
1+15	0.0139	0.19	Q				
1+30	0.0178	0.19	Q				
1+45	0.0218	0.19	QV				
2+ 0	0.0258	0.19	QV				
2+15	0.0299	0.20	QV				
2+30	0.0340	0.20	QV				
2+45	0.0381	0.20	QV				
3+ 0	0.0423	0.20	QV				
3+15	0.0466	0.20	Q V				
3+30	0.0508	0.21	Q V				
3+45	0.0552	0.21	Q V				
4+ 0	0.0595	0.21	Q V				
4+15	0.0640	0.21	Q V				
4+30	0.0685	0.22	Q V				
4+45	0.0730	0.22	Q V				
5+ 0	0.0776	0.22	Q V				
5+15	0.0822	0.23	Q V				
5+30	0.0870	0.23	Q V				
5+45	0.0917	0.23	Q V				
6+ 0	0.0966	0.23	Q V				
6+15	0.1015	0.24	Q V				
6+30	0.1065	0.24	Q V				



```
   21+45       0.8254      0.23  Q          |          |          |       V  |
   22+ 0       0.8301      0.23  Q          |          |          |        V |
   22+15       0.8347      0.22  Q          |          |          |        V |
   22+30       0.8392      0.22  Q          |          |          |        V |
   22+45       0.8436      0.21  Q          |          |          |        V |
   23+ 0       0.8479      0.21  Q          |          |          |        V |
   23+15       0.8521      0.20  Q          |          |          |         V|
   23+30       0.8562      0.20  Q          |          |          |         V|
   23+45       0.8602      0.19  Q          |          |          |         V|
   24+ 0       0.8642      0.19  Q          |          |          |         V|
   24+15       0.8677      0.17  Q          |          |          |         V|
   24+30       0.8693      0.08  Q          |          |          |         V|
   24+45       0.8696      0.02  Q          |          |          |         V|
   25+ 0       0.8696      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 10/08/21

++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6094

STATE STREET VILLAGE
UNIT HYDROGRAPH
2 YEAR - DEVELOPED CONDITION
DRAINAGE AREA 3

Storm Event Year = 2

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.20	1	0.71
Rainfall data for year 2		
1.20	6	1.14
Rainfall data for year 2		
1.20	24	2.06
Rainfall data for year 100		
1.20	1	1.10
Rainfall data for year 100		
1.20	6	2.68
Rainfall data for year 100		
1.20	24	4.82

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	1.20	1.000	0.734	0.180	0.132

Area-averaged adjusted loss rate Fm (In/Hr) = 0.132

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.22	0.180	56.0	56.0	7.86	0.014
0.98	0.820	98.0	98.0	0.20	0.890

Area-averaged catchment yield fraction, Y = 0.732
Area-averaged low loss fraction, Yb = 0.268
User entry of time of concentration = 0.164 (hours)
++
Watershed area = 1.20(Ac.)
Catchment Lag time = 0.131 hours
Unit interval = 15.000 minutes
Unit interval percentage of lag time = 190.3167
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.132(In/Hr)
Average low loss rate fraction (Yb) = 0.268 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.161(In)
Computed peak 30-minute rainfall = 0.330(In)
Specified peak 1-hour rainfall = 0.436(In)
Computed peak 3-hour rainfall = 0.786(In)
Specified peak 6-hour rainfall = 1.140(In)
Specified peak 24-hour rainfall = 2.060(In)

Rainfall depth area reduction factors:
Using a total area of 1.20(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.161(In)
30-minute factor = 1.000 Adjusted rainfall = 0.330(In)
1-hour factor = 1.000 Adjusted rainfall = 0.436(In)
3-hour factor = 1.000 Adjusted rainfall = 0.786(In)
6-hour factor = 1.000 Adjusted rainfall = 1.140(In)
24-hour factor = 1.000 Adjusted rainfall = 2.060(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 4.84 (CFS))		
1	45.948	2.223
2	100.000	1.111

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2502	0.0375

2	0.3302	0.0232
3	0.3883	0.0179
4	0.4357	0.0149
5	0.4911	0.0179
6	0.5416	0.0164
7	0.5884	0.0152
8	0.6321	0.0143
9	0.6733	0.0135
10	0.7125	0.0129
11	0.7499	0.0123
12	0.7858	0.0118
13	0.8203	0.0114
14	0.8536	0.0110
15	0.8858	0.0106
16	0.9170	0.0103
17	0.9473	0.0100
18	0.9769	0.0098
19	1.0056	0.0095
20	1.0337	0.0093
21	1.0611	0.0091
22	1.0880	0.0089
23	1.1142	0.0087
24	1.1400	0.0085
25	1.1600	0.0066
26	1.1796	0.0065
27	1.1988	0.0063
28	1.2175	0.0062
29	1.2359	0.0061
30	1.2539	0.0060
31	1.2716	0.0059
32	1.2889	0.0057
33	1.3060	0.0056
34	1.3227	0.0056
35	1.3392	0.0055
36	1.3554	0.0054
37	1.3713	0.0053
38	1.3870	0.0052
39	1.4025	0.0051
40	1.4177	0.0051
41	1.4327	0.0050
42	1.4475	0.0049
43	1.4622	0.0048
44	1.4766	0.0048
45	1.4908	0.0047
46	1.5049	0.0047
47	1.5187	0.0046
48	1.5324	0.0046
49	1.5460	0.0045
50	1.5594	0.0044
51	1.5726	0.0044
52	1.5857	0.0043
53	1.5986	0.0043
54	1.6115	0.0043
55	1.6241	0.0042
56	1.6367	0.0042
57	1.6491	0.0041
58	1.6614	0.0041
59	1.6735	0.0040
60	1.6856	0.0040
61	1.6975	0.0040

62	1.7093	0.0039
63	1.7210	0.0039
64	1.7326	0.0039
65	1.7441	0.0038
66	1.7556	0.0038
67	1.7669	0.0038
68	1.7781	0.0037
69	1.7892	0.0037
70	1.8002	0.0037
71	1.8111	0.0036
72	1.8220	0.0036
73	1.8327	0.0036
74	1.8434	0.0035
75	1.8540	0.0035
76	1.8645	0.0035
77	1.8749	0.0035
78	1.8853	0.0034
79	1.8956	0.0034
80	1.9058	0.0034
81	1.9159	0.0034
82	1.9260	0.0033
83	1.9360	0.0033
84	1.9459	0.0033
85	1.9557	0.0033
86	1.9655	0.0033
87	1.9752	0.0032
88	1.9849	0.0032
89	1.9945	0.0032
90	2.0040	0.0032
91	2.0135	0.0032
92	2.0229	0.0031
93	2.0323	0.0031
94	2.0416	0.0031
95	2.0508	0.0031
96	2.0600	0.0031

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0092	0.0025	0.0067
2	0.0093	0.0025	0.0068
3	0.0094	0.0025	0.0069
4	0.0094	0.0025	0.0069
5	0.0095	0.0026	0.0070
6	0.0096	0.0026	0.0071
7	0.0097	0.0026	0.0071
8	0.0098	0.0026	0.0072
9	0.0099	0.0027	0.0073
10	0.0100	0.0027	0.0073
11	0.0101	0.0027	0.0074
12	0.0102	0.0027	0.0075
13	0.0104	0.0028	0.0076
14	0.0105	0.0028	0.0077
15	0.0106	0.0028	0.0078
16	0.0107	0.0029	0.0079
17	0.0109	0.0029	0.0079
18	0.0110	0.0029	0.0080
19	0.0111	0.0030	0.0081
20	0.0113	0.0030	0.0082

21	0.0114	0.0031	0.0084
22	0.0116	0.0031	0.0085
23	0.0117	0.0031	0.0086
24	0.0119	0.0032	0.0087
25	0.0121	0.0032	0.0088
26	0.0122	0.0033	0.0090
27	0.0124	0.0033	0.0091
28	0.0126	0.0034	0.0092
29	0.0128	0.0034	0.0094
30	0.0130	0.0035	0.0095
31	0.0133	0.0035	0.0097
32	0.0135	0.0036	0.0099
33	0.0137	0.0037	0.0101
34	0.0140	0.0037	0.0102
35	0.0143	0.0038	0.0104
36	0.0145	0.0039	0.0106
37	0.0148	0.0040	0.0109
38	0.0151	0.0041	0.0111
39	0.0155	0.0041	0.0113
40	0.0158	0.0042	0.0116
41	0.0162	0.0043	0.0119
42	0.0166	0.0044	0.0122
43	0.0171	0.0046	0.0125
44	0.0175	0.0047	0.0128
45	0.0181	0.0048	0.0132
46	0.0186	0.0050	0.0136
47	0.0192	0.0051	0.0141
48	0.0198	0.0053	0.0145
49	0.0258	0.0069	0.0189
50	0.0266	0.0071	0.0195
51	0.0275	0.0074	0.0201
52	0.0285	0.0076	0.0208
53	0.0296	0.0079	0.0217
54	0.0308	0.0082	0.0226
55	0.0323	0.0086	0.0237
56	0.0340	0.0091	0.0249
57	0.0360	0.0096	0.0264
58	0.0384	0.0103	0.0281
59	0.0415	0.0111	0.0304
60	0.0453	0.0121	0.0332
61	0.0510	0.0137	0.0374
62	0.0491	0.0131	0.0360
63	0.0604	0.0161	0.0442
64	0.1152	0.0308	0.0844
65	0.2128	0.0330	0.1797
66	0.0532	0.0142	0.0389
67	0.0448	0.0120	0.0328
68	0.0380	0.0102	0.0279
69	0.0337	0.0090	0.0247
70	0.0306	0.0082	0.0224
71	0.0283	0.0076	0.0207
72	0.0265	0.0071	0.0194
73	0.0197	0.0053	0.0145
74	0.0185	0.0050	0.0136
75	0.0175	0.0047	0.0128
76	0.0166	0.0044	0.0121
77	0.0158	0.0042	0.0116
78	0.0151	0.0040	0.0111
79	0.0145	0.0039	0.0106
80	0.0139	0.0037	0.0102

81	0.0134	0.0036	0.0098
82	0.0130	0.0035	0.0095
83	0.0126	0.0034	0.0092
84	0.0122	0.0033	0.0089
85	0.0119	0.0032	0.0087
86	0.0115	0.0031	0.0085
87	0.0112	0.0030	0.0082
88	0.0110	0.0029	0.0080
89	0.0107	0.0029	0.0078
90	0.0105	0.0028	0.0077
91	0.0102	0.0027	0.0075
92	0.0100	0.0027	0.0073
93	0.0098	0.0026	0.0072
94	0.0096	0.0026	0.0070
95	0.0094	0.0025	0.0069
96	0.0093	0.0025	0.0068

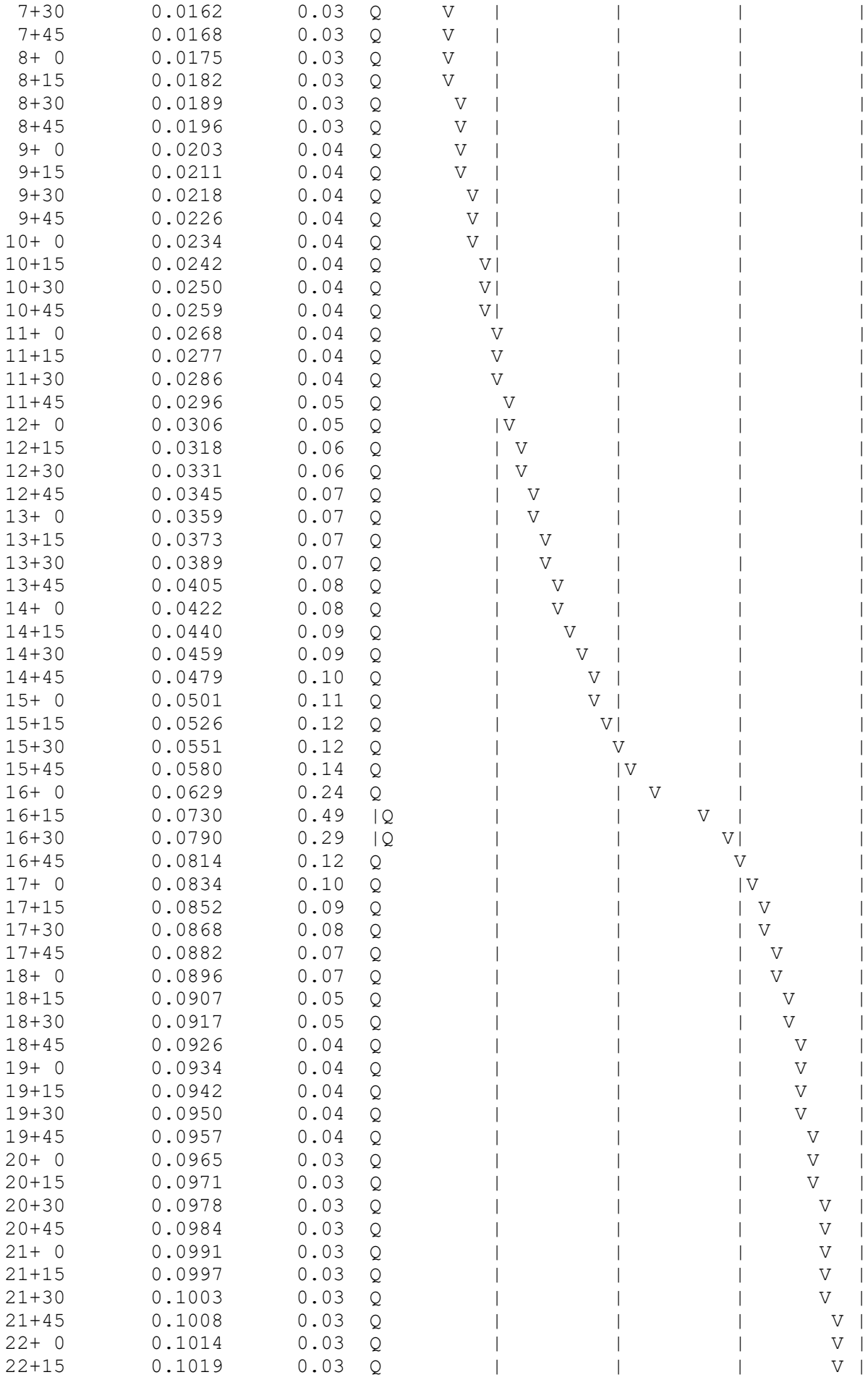
Total soil rain loss = 0.53(In)
Total effective rainfall = 1.53(In)
Peak flow rate in flood hydrograph = 0.49(CFS)

++

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 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0003	0.01	Q	|	|	|	|
0+30	0.0008	0.02	Q	|	|	|	|
0+45	0.0012	0.02	Q	|	|	|	|
1+ 0	0.0017	0.02	Q	|	|	|	|
1+15	0.0022	0.02	Q	|	|	|	|
1+30	0.0027	0.02	QV	|	|	|	|
1+45	0.0032	0.02	QV	|	|	|	|
2+ 0	0.0037	0.02	QV	|	|	|	|
2+15	0.0042	0.02	QV	|	|	|	|
2+30	0.0047	0.02	QV	|	|	|	|
2+45	0.0052	0.02	QV	|	|	|	|
3+ 0	0.0057	0.02	Q V	|	|	|	|
3+15	0.0062	0.03	Q V	|	|	|	|
3+30	0.0067	0.03	Q V	|	|	|	|
3+45	0.0073	0.03	Q V	|	|	|	|
4+ 0	0.0078	0.03	Q V	|	|	|	|
4+15	0.0084	0.03	Q V	|	|	|	|
4+30	0.0089	0.03	Q V	|	|	|	|
4+45	0.0095	0.03	Q V	|	|	|	|
5+ 0	0.0100	0.03	Q V	|	|	|	|
5+15	0.0106	0.03	Q V	|	|	|	|
5+30	0.0112	0.03	Q V	|	|	|	|
5+45	0.0118	0.03	Q V	|	|	|	|
6+ 0	0.0124	0.03	Q V	|	|	|	|
6+15	0.0130	0.03	Q V	|	|	|	|
6+30	0.0136	0.03	Q V	|	|	|	|
6+45	0.0142	0.03	Q V	|	|	|	|
7+ 0	0.0149	0.03	Q V	|	|	|	|
7+15	0.0155	0.03	Q V	|	|	|	|



```
   22+30       0.1025      0.03  Q          |          |          |        V |
   22+45       0.1030      0.03  Q          |          |          |         V|
   23+ 0       0.1035      0.02  Q          |          |          |         V|
   23+15       0.1040      0.02  Q          |          |          |         V|
   23+30       0.1045      0.02  Q          |          |          |         V|
   23+45       0.1050      0.02  Q          |          |          |         V|
   24+ 0       0.1054      0.02  Q          |          |          |         V|
   24+15       0.1056      0.01  Q          |          |          |         V|
-------------------------------------------------------------------------------
```

Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Trash Storage Areas SD-32

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- 0 Contain Pollutants
- Collect and Convey

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.

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.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- 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.

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.

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STORMWATER Pollution Prevention

LANDSCAPE MAINTENANCE

San Bernardino County Stormwater Program
825 East Third Street • Room 127
San Bernardino, CA 94215-0835

SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

Commercial landscape maintenance:

Yard waste, sediments and toxic lawn and garden chemicals used in commercial landscape maintenance often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates local waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution, protect public health and avoid fines or legal action.

- **Recycle Yard Waste:** Recycle leaves, grass clippings and other yard waste. Do not blow, sweep, rake or hose yard waste into the street. Let your customers know about grass cycling --the natural recycling of grass by leaving clippings on the lawn when mowing instead of using a grass catcher. Grass clippings will quickly decompose, returning valuable nutrients to the soil. You can get more information at www.ciwmb.ca.gov/Organics.
- **Use Fertilizers, Herbicides & Pesticides Safely:** Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use natural, non-toxic alternatives to traditional garden chemicals. If you must use chemical fertilizers, herbicides, or pesticides spot apply rather than blanketing entire areas, avoid applying near curbs and driveways and never apply before a rain.
- **Recycle Hazardous Waste:** Pesticides, fertilizers, herbicides and motor oil contaminate landfills and should be disposed of through a Hazardous Waste Facility. For information on proper disposal, call (909) 386-8401.
- **Use Water Wisely:** Conserve water and prevent runoff by controlling the amount of water and direction of sprinklers. Sprinklers should be on long enough to allow water to soak into the ground but not so long as to cause runoff. Periodically inspect, fix leaks and realign sprinkler heads.

- **Planting:** Plant native vegetation to reduce the need of water, fertilizers, herbicides and pesticides.
- **Prevent Erosion:** Erosion washes sediments, debris and toxic runoff into the storm drain system, polluting waterways. Prevent erosion and sediment runoff by using ground cover, berms and vegetation down-slope to capture runoff. Avoid excavation or grading during wet weather.

- **Store Materials Safely:** Keep landscaping materials and debris away from the street, gutter and storm drains. On-site stockpiles of materials should be covered with plastic sheeting to protect from rain, wind and runoff.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

NOTICE

! DISCHARGE INTO OUR WATERWAYS, ACCIDENTAL OR NOT, CAN LEAD TO ENFORCEMENT ACTIONS, WHICH CAN **INCLUDE FINES.**

WHEN WORKING WITH CONCRETE
USE THE 3Cs

CONTROL

Locate the nearest storm drain and ensure nothing can enter or be discharged into it. Use plastic covers and sandbags when working within 50' of a storm drain or catch basin.

CONTAIN

Isolate area and secure bags of cement after they are open. Keep cement, sand and aggregate (wet/dry) and slurries from saw cutting, from flowing into the streets, gutter and storm drains or being blown away. Cover bags of cement in case of rain.

CAPTURE

Sweep dry residue or vacuum wet concrete residue and dispose of properly. Create a designated washout area for equipment and tools and place away from driveways and storm drains. Dispose of concrete/plaster waste and rinsewater by hauling off to an approved disposal site.

To report illegal dumping, call **(877) WASTE18** or visit **sbcountystormwater.org**

SAN BERNARDINO COUNTY STORMWATER POLLUTION PREVENTION

Big Bear • Chino • Chino Hills • Colton • Fontana • Grand Terrace • Highland • Loma Linda • Montclair • Ontario • Rancho Cucamonga
Redlands • Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

Construction & development:

Soil, cement wash, asphalt, oil and other hazardous debris from construction sites often make their way into the San Bernardino County storm drain system, and flow untreated into local waterways. Follow these best management practices to prevent pollution, protect public health and avoid fines or legal action.

- **Store Materials Safely:** Keep construction materials and debris away from the street, gutter and storm drains. Cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.
- **Preventing Erosion:** Avoid excavation or grading during wet weather. Plant temporary vegetation or add hydro mulch on slopes where construction is not immediately planned, and permanent vegetation once excavation and grading are complete. Construct diversion dikes to channel runoff to a detention basin and around the construction site. Use gravel approaches where truck traffic is frequent to reduce soil compaction and limit the tracking of sediment into the streets. For more information on erosion control, call (909) 799-7407.

- **Cleaning & Preventing Spills:** Use a drip pan and funnel when draining or pouring fluids. Sweep up dry spills, instead of hosing. Be ready for spills by preparing and using spill containment and cleanup kits that include safety equipment and dry cleanup materials such as kitty litter or sawdust. To report serious spills, call 911.
- **Maintaining Vehicles & Equipment:** Maintain and refuel vehicles and equipment at a single location on-site, away from the street, gutter and storm drains. Perform major equipment repairs and washings off-site. Inspect vehicles and equipment frequently for leaks, and prevent leaks from stored vehicles by draining gas, hydraulic oil, transmission, and brake and radiator fluids.
- **Ordering Materials & Recycling Waste:** Reduce waste by ordering only the amounts of materials needed for the job. Use recycled or recyclable materials whenever possible. You can recycle broken asphalt, concrete, wood, and cleared vegetation. Dispose of hazardous materials through a hazardous waste hauler or other means in accordance with the construction permit. Non-recyclable materials should be taken to a landfill or disposed of as hazardous waste. For recycling and disposal information, call (909) 386-8401.
- **Concrete and mortar application:** Never dispose of cement washout into driveways, streets, gutters or drainage ditches. Wash concrete mixers and equipment only in specified washout areas, where the water flows into lined containment ponds. Cement wash water can be recycled by pumping it back into cement mixers for reuse.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

GOT COOKING OIL?

RECYCLE IT!

Recycle your leftover liquid cooking oil to avoid the hassle of dealing with clogged pipes and other sewer problems.

Step 1 Cool oil to a safe temperature & filter to remove food particles.

Step 2 Pour oil into a jar or plastic container with a tight fitting lid.

Step 3 Take the oil to your nearest toxic waste collection center.

For a list of collection centers near you, visit **TooToxicToTrash.com**

**No business waste accepted. Must be a San Bernardino County resident.*

SAN BERNARDINO COUNTY STORMWATER PROGRAM

WHERE WATER MEETS COMMUNITY

STORMWATER Pollution Prevention

FRESH CONCRETE & MORTAR APPLICATION

Cement wash, sediment, vehicle fluids, dust and hazardous debris from construction sites often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Storing Materials

Keep construction materials and debris away from the street, gutter and storm drains. Secure open bags of cement and cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.

Ordering Materials & Recycling Waste

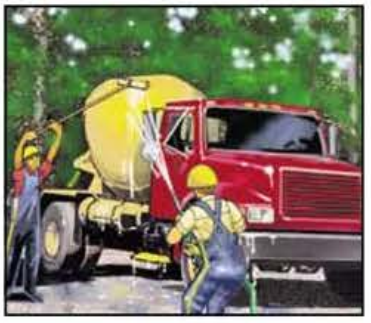
Reduce waste by ordering only the amounts of materials needed for the job. Use recycled or recyclable materials whenever possible. When breaking up paving, recycle the pieces at a crushing company. You can also recycle broken asphalt, concrete, wood, and cleared vegetation. Non-recyclable materials should be taken to a landfill or disposed of as hazardous waste. Call (909) 386-8401 for recycling and disposal information.

During Construction

Schedule excavation and grading during dry weather. Prevent mortar and cement from entering the street and storm drains by placing erosion controls. Setup small mixers on tarps or drop cloths, for easy cleanup of debris. Never bury waste material. Recycle or dispose of it as hazardous waste.

Cleaning Up

Wash concrete dust onto designated dirt areas, not down driveways or into the street or storm drains. Wash out concrete mixers and equipment in specified washout areas, where water can flow into a containment pond. Cement washwater can be recycled by pumping it back into cement mixers for reuse. Never dispose of cement washout into driveways, streets, gutters, storm drains or drainage ditches.



To report illegal dumping call

(877) WASTE18

sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

STORMWATER Pollution Prevention

CONSTRUCTION

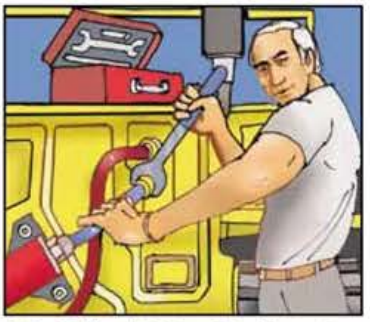
Cement wash, sediment, vehicle fluids, dust and hazardous debris from construction sites often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Store Materials Safely
Keep construction materials and debris away from the street, gutter and storm drains. Cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.

Ordering Materials & Recycling Waste
Reduce waste by ordering only the amounts of materials needed for the job. Use recycled or recyclable materials whenever possible. You can recycle broken asphalt, concrete, wood, and cleared vegetation. Non-recyclable materials should be taken to a landfill or disposed of as hazardous waste. For recycling and disposal information, call (909) 386-8401.

Cleaning & Preventing Spills
Use a drip pan and funnel when draining or pouring fluids. Sweep up dry spills, instead of hosing. Be ready for spills by preparing and using spill containment and cleanup kits that include safety equipment and dry cleanup materials such as kitty litter or sawdust. To report serious spills, call 911.

Preventing Erosion
Avoid excavation or grading during wet weather. Plant temporary vegetation or add hydromulch on slopes where construction is not immediately planned, and permanent vegetation once excavation and grading are complete. Construct diversion dikes to channel runoff to a detention basin and around the construction site. Channels can be lined with grass or roughened pavement to reduce runoff velocity.



Maintaining Vehicles & Equipment
Maintain and refuel vehicles and equipment at a single location on-site, away from the street, gutter and storm drains. Perform major equipment repairs and washings off-site. Inspect vehicles and equipment frequently for leaks, and prevent leaks from stored vehicles by draining gas, hydraulic oil, transmission, brake and radiator fluids.

To report illegal dumping call
(877) WASTE18
sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

STORMWATER Pollution Prevention

EXCAVATION AND GRADING

Sediment, cement wash, asphalt and vehicle fluids from soil excavation and grading often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Recycling Waste

Recycle broken asphalt, concrete, wood, and cleared vegetation whenever possible. Non-recyclable materials should be taken to a landfill or disposed of as hazardous waste. For recycling and disposal information, call (909) 386-8401.

Maintaining Vehicles & Equipment

Maintain and refuel vehicles and equipment at a single location on-site, away from the street, gutters and storm drains. Perform major equipment repairs and washings off-site. Inspect vehicles and equipment frequently for leaks. Use gravel approaches where truck traffic is heavy to reduce soil compaction and limit the tracking of sediment into the street.

Cleaning & Preventing Spills

Use a drip pan and funnel when draining or pouring fluids. Sweep up dry spills, instead of hosing. Be ready for spills by preparing and using spill containment and cleanup kits that include safety equipment and dry cleanup materials such as kitty litter or sawdust. Prevent leaks from stored vehicles by draining gas, hydraulic oil, transmission, brake and radiator fluids. To report serious spills, call 911.

Storing Materials

Keep construction materials and debris away from the street, gutter and storm drains. Cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.

Preventing Erosion

Avoid excavation or grading during wet weather. Plant temporary vegetation on slopes where construction is not immediately planned, and permanent vegetation once excavation and grading are complete. Construct diversion dikes to channel runoff. Channels can be lined with grass or roughened pavement to reduce runoff velocity.

To report illegal dumping call

(877) WASTE18

sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

STORMWATER Pollution Prevention

HOME & GARDEN

Yard waste and household toxics like paints and pesticides often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these simple tips to prevent pollution and protect your health.

Recycle Household Hazardous Waste
Household products like paint, pesticides, solvents and cleaners are too dangerous to dump and too toxic to trash. Take them to be recycled at a convenient household hazardous waste collection facility. Call (800) CLEANUP for the facility in your area.

Disposing of Yard Waste
Recycle leaves, grass clippings and other yard waste, instead of blowing, sweeping or hosing into the street. Try grasscycling, leaving grass clippings on your lawn instead of using a grass catcher. The clippings act as a natural fertilizer, and because grass is mostly water, it also irrigates your lawn, conserving water.

Use Fertilizers & Pesticides Safely
Fertilizers and pesticides are often carried into the storm drain system by sprinkler runoff. Try using organic or non-toxic alternatives. If you use chemical fertilizers or pesticides, avoid applying near curbs and driveways and never apply before a rain.

Planting in the Yard
Produce less yard waste and save water by planting low maintenance, drought-tolerant trees and shrubs. Using drip irrigation, soaker hoses or micro-spray systems for flower beds and vegetation can also help reduce your water bill and prevent runoff.

Use Water Wisely
Cut your water costs and prevent runoff by controlling the amount of water and direction of sprinklers. The average lawn needs about an inch of water a week, including rainfall, or 10 to 20 minutes of watering. A half-inch per week is enough for fall and spring. Sprinklers should be on long enough to allow water to soak into the ground but not so long as to cause runoff.

To report illegal dumping call
(877) WASTE18
sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

STORMWATER Pollution Prevention

FOOD AND RESTAURANT

Food waste, grease, cleaning fluids, mop water and trash from restaurant operations often make their way into the San Bernardino County storm drain system, and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Recycle Oil & Grease

Oil and grease wastes can be recycled. Look in the yellow pages for rendering companies, or call (909) 386-8401 for disposal information. Don't pour oil or grease into sinks, floor drains or onto a parking lot or street. Keep grease bins covered and contained. Keep your grease interceptor maintained to prevent sewer overflows or backups and keep records of grease waste hauling.

Dumpster Areas

Keep dumpster lids closed and the areas around them clean. Do not fill with liquid waste or hose them out. Call your trash hauler to replace any dumpsters that are damaged or leak.

Cleaning & Maintenance

Clean equipment, floor mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to the sewer through a grease trap. Don't wash them or pour wash water in a parking lot, alley, sidewalk or street. Sweep outside areas and put the debris in the garbage, instead of sweeping or hosing it into the parking lot or street.

Managing Spills

Clean food spills in loading and trash areas by using absorbent materials and sweeping then mopping, and discharge mop water into the sewer through a grease interceptor. Have spill containment and cleanup kits available. To report serious toxic spills, call 911.

Handling Toxic Chemicals

Dispose of all unwanted toxics materials like cleaners, solvents and detergents through a hazardous waste hauler. These items are not trash. For information on hazardous waste pickup, call (909) 386-8401. Use non-toxic cleaning products whenever possible.

To report illegal dumping call

(877) WASTE18

sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

STORMWATER Pollution Prevention

ROADWORK AND PAVING

Asphalt, saw-cut slurry and excavated materials from road paving, surfacing and pavement removal often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Preventing Erosion
Schedule excavation and grading work during dry weather. Develop and implement erosion and sediment control plans for excavated embankments. Cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.

During Construction
Cover catch basins and maintenance holes when applying seal coat, slurry seal or fog seal. Use check dams, ditches or berms around excavations, and avoid over applying water for dust control. Never wash excess materials from exposed aggregate or concrete into the street, gutter or a storm drain.

Maintaining Vehicles & Equipment
Maintain and refuel vehicles and equipment at a single location on-site, away from the street, gutter and storm drains. Perform major equipment repairs and washings off-site. Inspect vehicles and equipment frequently for leaks, and prevent leaks from stored vehicles by draining gas, hydraulic oil, transmission, brake and radiator fluids.

Asphalt & Concrete Removal
Barricade storm drain openings during saw-cutting, and recycle broken up pavement at a crushing company. For recycling information, call (909) 386-8401.

Cleaning & Preventing Spills
Be ready for spills by preparing and using spill containment and cleanup kits that include safety equipment and dry cleanup materials such as kitty litter or sawdust. Sweep up dry spills, instead of hosing. Prevent spills from paver machines by using drip pans, or by placing absorbent materials like cloths or rags under the machines when not in use. To report serious spills, call 911.

To report illegal dumping call

(877) WASTE18

sbcountystormwater.org

San Bernardino County STORMWATER PROGRAM

SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

Food & Restaurants:

Food waste, grease, cleaning fluids, mop water and trash from restaurant operations often make their way into the San Bernardino County storm drain system, and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution, protect public health and avoid fines or legal action.

- **Cleaning & Maintenance:** Clean equipment, floor mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to the sewer through a grease trap. Don't wash them or pour wash water in a parking lot, alley, sidewalk or street. Sweep outside areas and put the debris in the garbage, instead of sweeping or hosing it into the parking lot or street.
- **Recycle oil & grease:** Oil and grease wastes can be recycled. Look in the yellow pages for rendering companies, or call (909) 386-8401 for disposal information. Don't pour oil or grease into sinks, floor drains or onto a parking lot or street. Keep grease bins covered and contained.
- **Dumpster areas:** Keep dumpster lids closed and the areas around them clean. Do not fill with liquid waste or hose them out. Call your trash hauler to replace any dumpsters that are damaged or leak. Do not wash down or steam clean trash enclosure area or trash bin unless you collect the water and dispose of it into the sanitary sewer. Hire a mobile pressure wash business that is familiar with the storm water regulations to clean these areas and make sure they provide you with a record of proper wastewater disposal.

- **Managing spills:** Use dry methods for spill cleanup, sweeping and using cat litter instead of hosing. Have spill containment and cleanup kits available for possible spills on your property. To report serious toxic spills, call (800) 33-TOXIC.

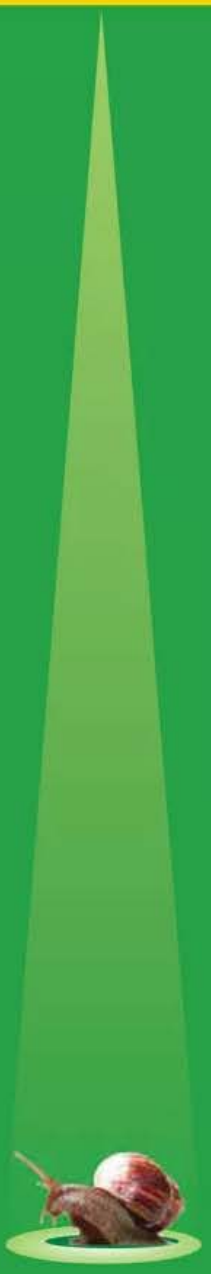
- **Handling toxic chemicals:** Dispose of all unwanted toxics materials like cleaners, solvents and detergents through a hazardous waste hauler. These items are not trash. Use non-toxic cleaning products whenever possible. For information on hazardous waste pickup, call (909) 386-8401.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

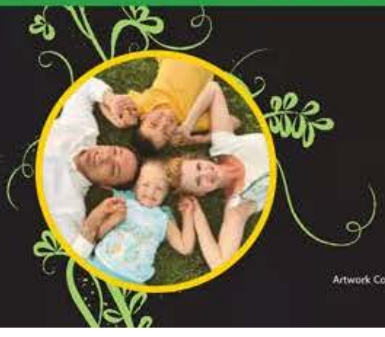
SPOT-APPLY

pesticides directly on the problem rather than blanketing the whole area.



sbcountystormwater.org

A SAFE GARDEN:
A LOT DEPENDS ON IT.



San Bernardino County STORMWATER PROGRAM

(877) WASTE18

Artwork Courtesy of the City of Los Angeles Stormwater Program. Printed on recycled paper.

SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

General industrial & manufacturing businesses:

If you own, manage or help operate a business, especially an industrial or manufacturing company, you can help reduce storm water pollution. From environmentally friendly cleaning and maintenance activities, to recycling hazardous waste materials, businesses can do a lot to prevent storm water pollution.

- Review your cleaning and maintenance activities to look for ways to reduce runoff into the storm drain system, especially in outdoor areas like parking lots, loading docks and maintenance yards. Keep trash enclosure swept and trash bin lids closed.
- Train employees to wash vehicles and equipment indoors in a wash rack that is connected to the sanitary sewer or off-site at a commercial wash facility. Train janitorial staff to dispose of floor cleaning water in the sewer and not into the parking lot. Make sure that cooling towers, boilers, compressors, water softeners and other process equipment are connected to the sanitary sewer and do not discharge wastewater into the parking lot.
- If you use hazardous materials in your everyday business, like ink and solvents for commercial printing, or polishes and chemicals for car detailing or manufacturing after-market accessories, do not put these hazardous materials in the trash or pour them into the gutter. Take them to be recycled safely. Store chemicals, wastes, raw materials and contaminated equipment indoors or in a covered, spill contained area, to prevent exposure of these materials to storm water. For information on proper hazardous waste disposal, call (909)386-8401.
- Take advantage of less-toxic alternatives to dangerous chemicals. From detergents to drain openers, there are a lot of ways to get the same or better result without having to rely toxic substances.
- Looking for raw materials? San Bernardino County Materials Exchange Program, or SBCoMax is a partnership between the County and the California Integrated Waste Management Board, for businesses to provide used but usable materials to those interested in obtaining them. The program helps divert used materials from landfills, saves resources and can save you money.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

BRING US YOUR TOXIC WASTE

Take toxic household products to your local household hazardous waste collection center.

IT'S EASY!

1 Make sure products are **properly sealed**, **labeled**, and **spill-proof**.*

2 Take them to a **FREE** collection center in:

Big Bear Lake
Chino
Fontana
Ontario
Rancho Cucamonga
Redlands
Rialto
San Bernardino
Upland

TOXIC HOUSEHOLD PRODUCTS INCLUDE:

Automotive Fluids
Batteries
Cooking Oil
Fertilizers & Pesticides
Fluorescent Bulbs
Household Cleaners
Medicine
Motor Oil & Filters
Paint Products
Pool Chemicals

WHY CAN'T I THROW THESE ITEMS IN THE TRASH?

It is illegal and poses health risks to humans, pets, the environment, and our waterways.

For more information, locations and a full list of items, visit

tootoxictotrash.com

** You can bring 15 gallons or 125 pounds in containers no larger than 5 gallons per visit. No business waste accepted. Must be a San Bernardino County resident.*

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

Stormwater Pollution Prevention

Best Management Practices for Homeowner's Associations, Property Managers and Property Owners

Your Guide To Maintaining Water Friendly Standards In Your Community

sbcountystormwater.org

Big Bear · Chino · Chino Hills · Colton · Fontana · Grand Terrace · Highland · Loma Linda · Montclair · Ontario · Rancho Cucamonga
Redlands · Rialto · San Bernardino · San Bernardino County · San Bernardino County Flood Control District · Upland · Yucaipa

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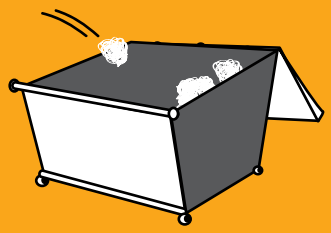
COMMERCIAL TRASH ENCLOSURES

FOLLOW THESE **REQUIREMENTS** TO **KEEP OUR WATERWAYS CLEAN**

Trash enclosures, such as those found in commercial and apartment complexes, typically contain materials that are intended to find their way to a landfill or a recycling facility. **These materials are NOT meant to go into our local lakes and rivers.**

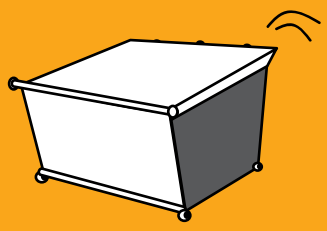
PROTECT WATER QUALITY BY FOLLOWING THESE SIMPLE STEPS

PUT TRASH INSIDE



Place trash inside the bin (preferably in sealed bags)

CLOSE THE LID



Prevent rain from entering the bin in order to avoid leakage of polluted water runoff

KEEP TOXICS OUT

- Paint
- Grease, fats and used oils
- Batteries, electronics and fluorescent lights

SOME ADDITIONAL GUIDELINES, INCLUDE

✓ SWEEP FREQUENTLY
Sweep trash enclosure areas frequently, instead of hosing them down, to prevent polluted water from flowing into the streets and storm drains.

✓ FIX LEAKS
Address trash bin leaks immediately by using dry clean up methods and report to your waste hauler to receive a replacement.

✓ CONSTRUCT ROOF
Construct a solid cover roof over the existing trash enclosure structure to prevent rainwater from coming into contact with trash and garbage. Check with your local City/County for Building Codes.

In San Bernardino County, stormwater pollution is caused by food waste, landscape waste, chemicals and other debris that are washed into storm drains and end up in our waterways - untreated! You can be part of the solution by maintaining a water-friendly trash enclosure.

THANK YOU FOR HELPING TO KEEP SAN BERNARDINO COUNTY CLEAN AND HEALTHY!

San Bernardino County STORMWATER PROGRAM

In the event of a spill or discharge to a storm drain or waterway, contact San Bernardino County Stormwater immediately: (877) WASTE18 | sbcountystormwater.org/report

sbcountystormwater.org

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CESQG PROGRAM

Conditionally Exempt Small Quantity Generator

WHAT IS A CESQG?

Businesses that generate 27 gallons or 220 lbs. of hazardous waste, or 2.2 lbs. of extremely hazardous waste per month are called "Conditionally Exempt Small Quantity Generators," or CESQGs. San Bernardino County Household Hazardous Program provides waste management services to CESQG businesses. The most common CESQGs in San Bernardino County are painters, print shops, auto shops, builders, agricultural operators and property managers, but there are many others. When you call, be ready to describe the types and amounts of waste your business generates in a typical month. If you generate hazardous waste on a regular basis, you must:

- Register with San Bernardino County Fire Department (909) 386-8400 as a hazardous waste generator.
- To obtain an EPA ID# and application form from the State visit www.dtsc.ca.gov.
- Manage hazardous waste in accordance with all applicable local, state and federal laws and regulations.

HOW DO I GET SERVICE?

To arrange an appointment for the CESQG Program, call 1-800-OILY CAT or 909-382-5401. Be ready to describe the type and amount of hazardous waste your business is ready to dispose of, and the types and size(s) of containers that the waste is in.

Waste Type and Cost

There is a small handling fee involved in the collection of hazardous waste from your business. Disposal costs depend on the type of waste.

Aerosols	$1.29/lb.
Automobile motor oil	$.73/gal.
Anti-freeze	$1.57/gal.
Contaminated oil	$4.48/gal.
Car batteries	$.62/ea.
Corrosive liquids, solids	$2.80/lb.
Flammable solids, liquids	$1.57/lb.
Latex Paint	$.73/lb.
Mercury	$10.08/lb.
NiCad/Alkaline Batteries	$2.13/lb.
Oil Base Paints	$1.00/lb.
Oil Filters	$.56/ea.
Oxidizers	$9.63/lb.
PCB Ballasts	$5.94/lb.
Pesticides (most)	$2.91/lb.
Photofixer, developer	$4.31/gal.
Television & Monitors	$11.20/ea.
Additional Handling	$138.00/hr.

Rates subject to change without notice

WE CANNOT ACCEPT

- Radioactives
- Water reactives
- Explosives
- Compressed gas cylinders
- Medical or biohazardous waste
- Asbestos
- Remediation wastes

HAZARDOUS WASTE

WHY IS THE FIRE DEPARTMENT COLLECTING HAZARDOUS WASTE?

Small Quantity Generators often have difficulty disposing of small quantities of hazardous waste. Hazardous waste companies usually have a minimum amount of waste that they will pick up, or charge a minimum fee for service. Typically, the minimum fee exceeds the cost of disposal for the hazardous waste. This leaves the small quantity generator in a difficult situation. Some respond by storing hazardous waste until it becomes economical for the hazardous waste transporter to pick it up, putting the business out of compliance by exceeding regulatory accumulation time limits. Other businesses simply store their hazardous wastes indefinitely, creating an unsafe work environment and exceeding accumulation time limits. Yet other businesses attempt to illegally dispose of their waste at household hazardous waste collection facilities. These facilities are not legally permitted to accept commercial wastes, nor are prepared to provide legal documentation for commercial hazardous waste disposal. In answer to the problems identified above, the San Bernardino County Fire Department Household Hazardous Program instituted the Conditionally Exempt Small Quantity Generator Program.

PAYMENT FOR SERVICES

The CESQG Program will prepare an invoice for your business at the time of service. You can pay at the time of service with cash or a check, or you can mail your payment to the Fire Department within 30 days. Please note that we do not accept credit card payments. The preferred method of payment is to handle payment at time of service. Additional charges may apply for accounts not paid within 30 days.

ARE THERE ANY OTHER WAYS THAT I CAN SAVE MONEY ON HAZARDOUS WASTE DISPOSAL?

Yes! First, start by reducing the amount of waste that you produce by changing processes or process chemicals, at your business. Next, examine if there is a way that you can recycle your waste back into your processes. Network with similar businesses or trade associations for waste minimization and pollution prevention solutions.

WHAT IF YOUR BUSINESS DOES NOT QUALIFY?

Call the San Bernardino County Fire Department Field Services Division for assistance with hazardous waste management at 909-386-8400.

If you reduce the amount of waste you generate each month to 27 gallons or less, you may qualify in the future.

WHAT HAPPENS TO YOUR HAZARDOUS WASTE?

Hazardous waste collected by the CESQG Program is transported to a state permitted processing facility in San Bernardino. The waste is further processed at this point and packaged for off-site recycling (oil filters, oil, latex paint, antifreeze, and batteries) or destructive incineration (pesticides, corrosives, flammables, oil based paint).

San Bernardino County Fire Department
CESQG Program
2824 East "W" Street
San Bernardino, CA 92415-0799
Phone: 909-382-5401
Fax: 909-382-5413
www.sbcfire.org/ofm/hhw/HouseholdHazardousWaste.aspx
Email: mvangese@sbcfire.org

WHEN WORKING OUTDOORS USE THE 3Cs

CUANDO TRABAJE AL AIRE LIBRE UTILICE LAS 3Cs

CONTROL | CONTROL

Locate the nearest storm drain and ensure nothing can enter or be discharged into it.
Ubique el desagüe de aguas pluviales más cercano y asegúrese de que nada pueda ingresar a éste ni descargarse en él.

CONTAIN | CONTENER

Isolate your area to prevent material from potentially flowing or being blown away.
Aísle su área para evitar que el material pueda discurrirse o ser llevado por el viento.

CAPTURE | CAPTURAR

Sweep up debris and place it in the trash. Clean up spills with an absorbent material (e.g. kitty litter) or vacuum with a Wet-Vac and dispose of properly.
Recoja los restos y colóquelos en la basura. Limpie los derrames con un material absorbente (como la arena para gatos) o aspírelos con una Wet-Vac (aspiradora de humedad) y deséchelos correctamente.

COMMERCIAL LANDSCAPE

DISCHARGE TO THE STORM DRAIN, **ACCIDENTAL OR NOT**, COULD LEAD TO ENFORCEMENT ACTIONS, WHICH COULD INCLUDE FINES.

Follow the best practices below to **prevent water pollution from landscaping activities.**

RECYCLE YARD WASTE

- Recycle leaves, grass clippings and other yard waste.
- Do not blow, sweep, rake or hose yard waste into the street or catch basin.
- **Try grasscycling:** the natural recycling of grass by leaving clippings on the lawn when mowing.

  For more information, please visit: **www.calrecycle.ca.gov/organics/grasscycling**

USE FERTILIZERS, HERBICIDES AND PESTICIDES SAFELY

- Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use natural and non-toxic alternatives as often as possible.
- If you must use chemical fertilizers, herbicides or pesticides:
  - Spot apply, rather than blanketing entire areas.
  - Avoid applying near curbs and driveways, and **never** before a rain.
  - Apply fertilizers as needed: when plants could best use it and when the potential runoff would be low.
  - Follow the manufacturer's instructions carefully—this will not only give the best results, but will save money.

USE WATER WISELY

- Control the amount of water and direction of sprinklers. Sprinklers should only be on long enough to allow water to soak into the ground, but not so long as to cause runoff.
- Periodically inspect, fix leaks and realign sprinkler heads.
- Plant native vegetation to reduce the need of water, fertilizers, herbicides and pesticides.

HOMEOWNERS

KEEP THESE TIPS IN MIND WHEN HIRING PROFESSIONAL LANDSCAPERS AND REMIND AS NECESSARY.

Leftover pesticides, fertilizers, and herbicides contaminate landfills and should be disposed of through a Hazardous Waste Facility.

For more information on proper disposal call,

(909) 382-5401 or 1-800-OILY CAT.

In the event of a spill or discharge to a storm drain or waterway, contact San Bernardino County Stormwater immediately: (877) WASTE18 | sbcountystormwater.org/report

sbcountystormwater.org

Big Bear • Chino • Chino Hills • Colton • Fontana • Grand Terrace • Highland • Loma Linda • Montclair • Ontario • Rancho Cucamonga
Redlands • Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. Fountain water containing chlorine and copperbased algaecides is toxic to aquatic life. Proper inspection, cleaning, and repair of pedestrian areas and HOA owned surfaces and structures can reduce pollutant runoff from these areas. Maintaining these areas may involve one or more of the following activities:

1. **Surface Cleaning**
2. **Graffiti Cleaning**
3. **Sidewalk Repair**
4. **Controlling Litter**
5. **Fountain Maintenance**

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for sidewalk, plaza, and fountain maintenance and cleaning include:

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).
- Once per year, educate HOA staff and tenants on pollution prevention measures.

MODEL PROCEDURES:

1. Surface Cleaning

Discharges of wash water to the storm water drainage system from cleaning or hosing of impervious surfaces is prohibited.

Sidewalks, Plazas

✓ Use dry methods (e.g. sweeping, backpack blowers, vacuuming) whenever practical to clean sidewalks and plazas rather than hosing, pressure washing, or steam cleaning. DO NOT sweep or blow material into curb; use devices that contain the materials.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

Parking Areas, Driveways, Drive-thru

✓ Parking facilities should be swept/vacuumed on a regular basis. Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

✓ Sweep all parking lots at least once before the onset of the wet season.

✓ Use absorbents to pick up oil; then dry sweep.

✓ Appropriately dispose of spilled materials and absorbents.

OPTIONAL:

- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc.

Building Surfaces, Decks, etc., without loose paint

✓ Use high-pressure water, no soap.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

Unpainted Building Surfaces, Wood Decks, etc.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

✓ If using a biodegradable or other cleaning agent to remove deposits contain and dispose of properly.

2. Graffiti Cleaning

Graffiti Removal

✓ Avoid graffiti abatement activities during rain events.

✓ When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal in the Roads, Streets, and Highway Operation and Maintenance procedure sheet.

✓ Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

✓ Note that care should be taken when disposing of waste since it may need to be disposed of as hazardous waste.

OPTIONAL:

• Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

3. Sidewalk Repair

Surface Removal and Repair

✓ Schedule surface removal activities for dry weather if possible.

✓ Avoid creating excess dust when breaking asphalt or concrete.

✓ Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up material.

✓ Designate an area for clean up and proper disposal of excess materials.

✓ Remove and recycle as much of the broken pavement as possible.

✓ When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains shovel or vacuum the slurry, remove from site and dispose of properly.

✓ Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Discharge wash water to landscaping, pump to the sanitary sewer if permitted to do so or contain and dispose of properly.

Concrete Installation and Repair

✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site. Only mix what is needed for the job.

✓ Wash concrete trucks off-site or in designated areas on-site, such that there is no discharge of concrete wash water into storm drain inlets, open ditches, streets, or other storm water conveyance structures. (See Concrete Waste Management BMP WM – 8)

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

✓ Store dry and wet concrete materials under cover, protected from rainfall and runoff and away from drainage areas. After job is complete remove temporary stockpiles (asphalt materials, sand, etc.) and other materials as soon as possible.

✓ Return leftover materials to the transit mixer. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

✓ When washing concrete to remove fine particles and expose the aggregate, contain the wash water for proper disposal.

✓ Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stock pile, or dispose in the trash.

✓ Protect applications of fresh concrete from rainfall and runoff until the material has hardened.

4. Litter Control

✓ Enforce anti-litter laws.

✓ Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.

✓ Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.

OPTIONAL:

• Post "No Littering" signs.

5. Fountain Maintenance

✓ Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.

✓ Allow chlorine to dissipate for a few days and then recycle/reuse water by draining it gradually onto a landscaped area. Water must be tested prior to discharge to ensure that chlorine is not present (concentration must be less than 0.1 ppm).

✓ Contact local agency for approval to drain into sewer or storm drain.

✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site. Only mix what is needed for the job.

EQUIPMENT MAINTENANCE & REPAIR

Vehicle or equipment maintenance has the potential to be a significant source of stormwater pollution. Engine repair and service (parts cleaning, spilled fuel, oil, etc.), replacement of fluids, and outdoor equipment storage and parking (dripping engines) can all contaminate stormwater. Conducting the following activities in a controlled manner will reduce the potential for stormwater contamination:

1. **General Maintenance and Repair**
2. **Vehicle and Machine Repair**
3. **Waste Handling/Disposal**

Related vehicle maintenance activities are covered under the following program headings in this manual: "Vehicle and Equipment Cleaning", "Vehicle and Equipment Storage", and "Vehicle Fueling".

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for equipment maintenance and repair include:

- Review maintenance activities to verify that they minimize the amount of pollutants discharged to receiving waters. Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible. Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- Once per year, educate HOA staff and tenants on pollution prevention measures.

EQUIPMENT MAINTENANCE & REPAIR

MODEL PROCEDURES:

1. General Maintenance and Repair

General Guidelines

➔ *Note: Permission must be obtained for any discharge of wash water to the sanitary sewer from the local sewering agency.*

- ✓ Review maintenance activities to verify that they minimize the amount of pollutants discharged to receiving waters. Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ✓ Regularly inspect vehicles and equipment for leaks.
- ✓ Move activity indoors or cover repair area with a permanent roof if feasible.
- ✓ Minimize contact of stormwater with outside operations through berming the local sewering and drainage routing.
- ✓ Place curbs around the immediate boundaries of the process equipment.
- ✓ Clean yard storm drain inlets regularly and stencil them.

Good Housekeeping

- ✓ Avoid hosing down work areas. If work areas are washed and if discharge to the sanitary sewer is allowed, treat water with an appropriate treatment device (e.g. clarifier) before discharging. If discharge to the sanitary sewer is not permitted, pump water to a tank and dispose of properly.
- ✓ Collect leaking or dripping fluids in drip pans or container. Fluids are easier to recycle or dispose of properly if kept separate.
- ✓ Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, any discharge of or remove other parts. Place a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
- ✓ Educate employees on proper handling and disposal of engine fluids.
- ✓ Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- ✓ Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ✓ Post signs at sinks and stencil outdoor storm drain inlets.

2. Vehicle Repair

General Guidelines

- ✓ Perform vehicle fluid removal or changing inside of a building or in a contained covered area, where feasible, to prevent the run-on of stormwater and the runoff of spills.
- ✓ Regularly inspect vehicles and equipment for leaks, and repair as needed.

EQUIPMENT MAINTENANCE & REPAIR

- ✓ 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. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- ✓ Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- ✓ Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- ✓ Oil filters disposed of in trash cans or dumpsters can leak oil. 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 and dispose of properly at recycling facilities or at County hazardous waste disposal site.

Vehicle Leak and Spill Control

- ✓ Use absorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- ✓ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ✓ Sweep floor using dry absorbent material.

3. Machine Repair

- ✓ Keep equipment clean; don't allow excessive build-up of oil or grease.
- ✓ Minimize use of solvents.
- ✓ Use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- ✓ Perform major equipment repairs at the corporation yard, when practical.
- ✓ Following good housekeeping measures in Vehicle Repair section.

4. Waste Handling/Disposal

Waste Reduction

- ✓ Prevent spills and drips of solvents and cleansers to the shop floor.
- ✓ Do liquid cleaning at a centralized station so the solvents and residues stay in one area. Recycle liquid cleaners when feasible.

✓ Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

OPTIONAL:

- If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

  -Use non-caustic detergents instead of caustic cleaning for parts cleaning.

  -Use a water-based cleaning service and have tank cleaned. Use detergent-based or water-based cleaning systems in place of organic solvent degreasers.

  -Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.

  -Choose cleaning agents that can be recycled.

Recycling

OPTIONAL:

- Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.

- Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).

- Purchase recycled products to support the market for recycled materials.

LIMITATIONS:

Space and time limitations may preclude all work being conducted indoors. It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours. Dry floor cleaning methods may not be sufficient for some spills – see spill prevention and control procedures sheet. Identification of engine leaks may require some use of solvents.

POOL MAINTENANCE

Pool chemicals and filter solids, when discharged to the City streets, gutters or storm drans, DO NOT GET TREATED before reaching the Santa Ana River. Chlorine, acid cleaning chemicals and metal-based algaecides used in pools can kill beneficial organisms in the food chain and pollute our drinking water.

When emptying your swimming pool, spa or fountain, please use one of the following best management practices to prevent water pollution:

- Reuse the water as landscape irrigation
- Empty the water into the sewer between midnight and 6:00 am
- Remove solids and floating debris and dispose of in the trash, de-chlorinate the water to a chlorine residual = 0, wait 24 hours, then discharge the water to the street or storm drain
- Try not to use metal-based algaecides (i.e. copper sulfate) in your pool or spa. If you have, empty your pool or spa into the sewer. *Prior to discharging pool water into the sanitary sewer system, contact your local agency.*
- If the pool contains algae and mosquito larvae, discharge the water to the sewer

When acid cleaning or other chemical cleaning:

- Neutralize the pool water to pH of 6.5 to 8.5, then discharge to the sewer

For swimming pool and spa filter backwash:

- Dispose of solids into trash bag, then wash filter into a landscape area
- Settle, dispose of solids in trash and discharge water to the sewer, never to the storm drain

» For Residents

The following is a preview of the information we have available to residents. For more fact sheets, visit ***sbcountystormwater.org***

Household Hazardous Waste Center Locations

DO YOU HAVE THE FOLLOWING ITEMS IN YOUR HOME?

Automotive Fluids
Batteries
Cooking Oil
Fertilizers & Pesticides
Fluorescent Bulbs
Household Cleaners
Medicine
Motor Oil & Filters
Paint Products
Pool Chemicals

PROTECT YOUR COMMUNITY!
Take your toxic products to a local waste collection center:

Big Bear Lake
Chino
Fontana
Ontario
Rancho Cucamonga
Redlands
Rialto
San Bernardino
Upland

**No business waste accepted. Must be a San Bernardino County resident.*

Find locations and a full list of items, visit
tootoxictotrash.com

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

WE DID IT OURSELVES AND WE DID IT RIGHT

When painting your home, protect your family and community.

- **PAINTS** that are water-based are less toxic and should be used whenever possible.
- **BRUSHES** with water-based paint should be washed in the sink. Those with oil-based paint should be cleaned with paint thinner.
- **SAFELY** dispose of unwanted paint and paint thinner.

The County of San Bernardino offers 9 HHW Centers that accept paint and other household hazardous waste from residents FREE of charge. For a list of acceptable materials, location information, and hours of operation visit TooToxicToTrash.com.

VEHICLE MAINTENANCE

Oil, grease, anti-freeze and other toxic automotive fluids often make their way into the San Bernardino County storm drain system, and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Cleaning Auto Parts
Scrape parts with a wire brush or use a bake oven rather than liquid cleaners. Arrange drip pans, drying racks and drain boards so that fluids are directed back into the parts washer or the fluid holding tank. Do not wash parts or equipment in a sink, parking lot, driveway or street.

Storing Hazardous Waste
Keep your liquid waste segregated. Many fluids can be recycled via hazardous waste disposal companies if they are not mixed. Store all materials under cover with spill containment or inside to prevent contamination of rainwater runoff.

Preventing Leaks and Spills
Conduct all vehicle maintenance inside of a garage. Place drip pans underneath vehicle to capture fluids. Use absorbent materials instead of water to clean work areas.

Cleaning Spills
Use dry methods for spill cleanup (sweeping, absorbent materials). To report accidental spills into the street or storm drain call (877) WASTE18 or 911.

Proper Disposal of Hazardous Waste
Dispose of household hazardous waste by taking it to your nearest household hazardous waste center. For more information, call 1-800-OILY CAT or check out TooToxicToTrash.com.

PET WASTE DISPOSAL

» Get In Touch With Us Online!

» Website
sbcountystormwater.org

» eUpdates
sbcountystormwater.org/newsletter

» Facebook
facebook.com/sbcountystormwater

» YouTube
youtube.com/sbcountystormwater

» Report Pollution Violations
sbcountystormwater.org/report

» Email
info@sbcountystormwater.org

STORMWATER Pollution Prevention

Important Phone Numbers

San Bernardino County Flood Control
(909) 387-8112

County of San Bernardino
(909) 387-8109

City of Big Bear Lake
(909) 866-5831

City of Chino (909) 591-9850

City of Chino Hills (909) 364-2722

City of Colton (909) 370-6128

City of Fontana (909) 350-6772

City of Grand Terrace
(909) 824-6671 x 226

City of Highland (909) 864-8732 x 230

City of Loma Linda (909) 799-4405

City of Montclair (909) 625-9470

City of Ontario (909) 395-2025

City of Rancho Cucamonga
(909) 477-2740 x 4063

City of Redlands (909) 798-7655

City of Rialto (909) 421-4921

City of San Bernardino (909) 384-5154

City of Upland (909) 931-4370

City of Yucaipa (909) 797-2489 x 243

San Bernardino County
Stormwater Program
825 East Third Street • Room 201
San Bernardino, CA 94215-0835

STORMWATER

Pollution Prevention

INDUSTRIAL AND COMMERCIAL FACILITIES

LANDSCAPE MAINTENANCE

DISCHARGE TO THE STORM DRAIN, ACCIDENTAL OR NOT, COULD LEAD TO ENFORCEMENT ACTIONS, WHICH COULD INCLUDE FINES.

Follow the best practices below to **prevent water pollution from landscaping activities.**

RECYCLE YARD WASTE

- Recycle leaves, grass clippings and other yard waste.
- Do not blow, sweep, rake or hose yard waste into the street or catch basin.
- **Try grasscycling:** the natural recycling of grass by leaving clippings on the lawn when mowing.

  For more information, please visit: **www.calrecycle.ca.gov/organics/grasscycling**

USE FERTILIZERS, HERBICIDES AND PESTICIDES SAFELY

- Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use natural and non-toxic alternatives as often as possible.
- If you must use chemical fertilizers, herbicides or pesticides:
  - Spot apply, rather than blanketing entire areas.
  - Avoid applying near curbs and driveways, and **never** before a rain.
  - Apply fertilizers as needed: when plants could best use it and when the potential runoff would be low.
  - Follow the manufacturer's instructions carefully—this will not only give the best results, but will save money.

USE WATER WISELY

- Control the amount of water and direction of sprinklers. Sprinklers should only be on long enough to allow water to soak into the ground, but not so long as to cause runoff.
- Periodically inspect, fix leaks and realign sprinkler heads.
- Plant native vegetation to reduce the need of water, fertilizers, herbicides and pesticides.

HOMEOWNERS

KEEP THESE TIPS IN MIND WHEN HIRING PROFESSIONAL LANDSCAPERS AND REMIND AS NECESSARY.

Leftover pesticides, fertilizers, and herbicides contaminate landfills and should be disposed of through a Hazardous Waste Facility.

For more information on proper disposal call,

(909) 382-5401 or 1-800-OILY CAT.

*FREE for San Bernardino County residents only. Businesses can call for cost inquiries and to schedule an appointment.

To report illegal dumping, call (877) WASTE18 or visit sbcountystormwater.org
To report toxic spills, call 1(800) 33 TOXIC
To dispose of hazardous waste, call 1(800) OILY CAT

sbcountystormwater.org

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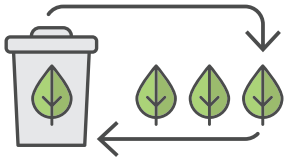
Redlands • Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

DISCHARGE TO THE STORM DRAIN, ACCIDENTAL OR NOT, COULD LEAD TO ENFORCEMENT ACTIONS AND FINES

Sustainable Practices for Landscape Maintenance

Your contributions make a difference in the way you maintain your yard. Learn how to truly be a "green" thumb and prevent stormwater pollution.

Recycle Yard Waste



Yard waste, like grass and leaves, can block the storm drain or carry harmful chemicals into it.

- Recycle yard waste by placing them into your greenwaste container.
- Do not blow, sweep, rake, or hose yard waste into the street or catch basin.
- Try grasscycling by leaving clippings on the lawn when mowing.

For more information, visit www.calrecycle.ca.gov/organics/grasscycling.

Use Safe Products

Fertilizers, herbicides, and pesticides are often carried into the storm drain by sprinkler runoff.

- Use natural and non-toxic alternatives as often as possible.
- Spot-apply, rather than blanketing entire areas.

Apply chemicals directly to the area that needs treatment.

- Read the product label and use only as directed.
- Never apply before a rain.

Use Water Wisely

Conserving water minimizes the amount of urban runoff going into the street.

- Control the amount of water and direction of sprinklers.

The average lawn only needs about an inch of water a week or 10 to 20 minutes of watering.

- Periodically inspect and fix sprinklers for leaks.

Realign sprinkler heads to make sure water is distributed onto the lawn and not onto the sidewalk.

- Plant native vegetation to reduce the need of water.

HOMEOWNERS

Keep these tips in mind when hiring professional landscapers and remind them as necessary.

Leftover pesticides, fertilizers, and herbicides contaminate landfills and should be disposed of through a Household Hazardous Waste Center*.

For more information on proper disposal, call 1 (800) OILYCAT or visit tootoxictotrash.com.

**FREE for San Bernardino County residents.*
Businesses can call for cost inquiries and to schedule an appointment.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **tootoxictotrash.com**

To dispose of hazardous waste, call **1 (800) OILYCAT**

sbcountystormwater.org

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

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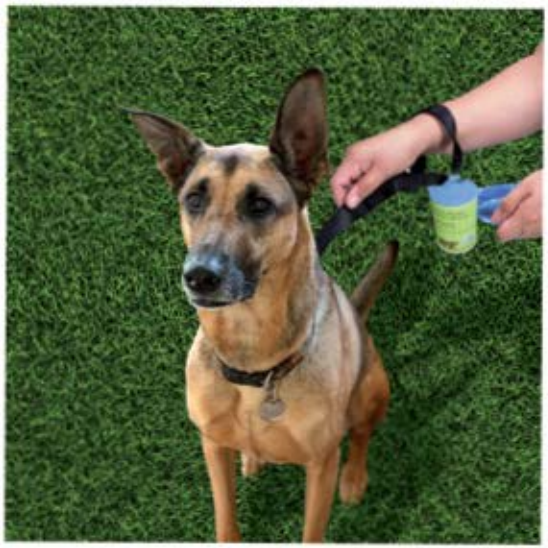
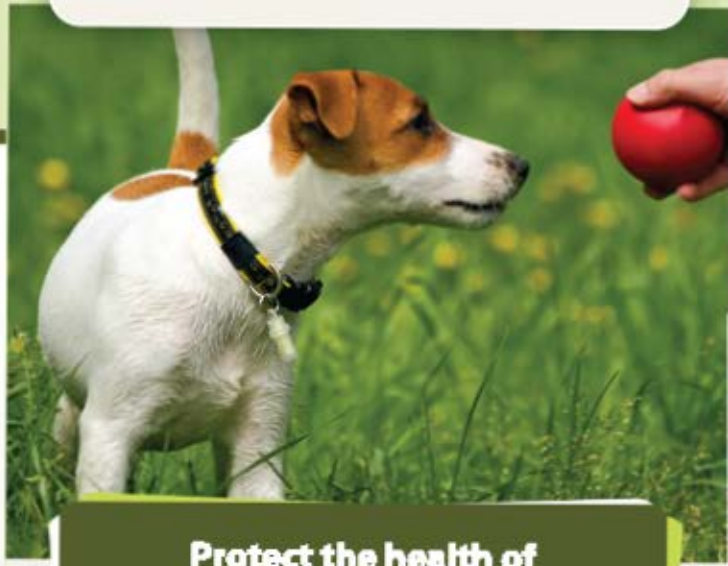
Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

PICK UP
After Your Pet!





Protect the health of your pet and the environment

For more information about current campaigns visit **sbcountystormwater.org/dog**

facebook.com/sbcountystormwater

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SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

WHY IT MATTERS

PROTECT YOUR FAMILY AND YOUR PET

- Dog waste can infect children and adults with disease-causing bacteria and parasites.
- Your dog can get infected from the waste of other dogs.

PROTECT OUR ENVIRONMENT

Leaving dog waste on the streets or on your property can have a negative impact on water quality. Pet waste that's not disposed of properly flows untreated through the storm drain system and directly into our local water bodies. Pet waste is a pollutant that contains nutrients, parasites and bacteria that can affect the quality of our rivers and the ocean and make the water unsafe for swimming, drinking or fishing.

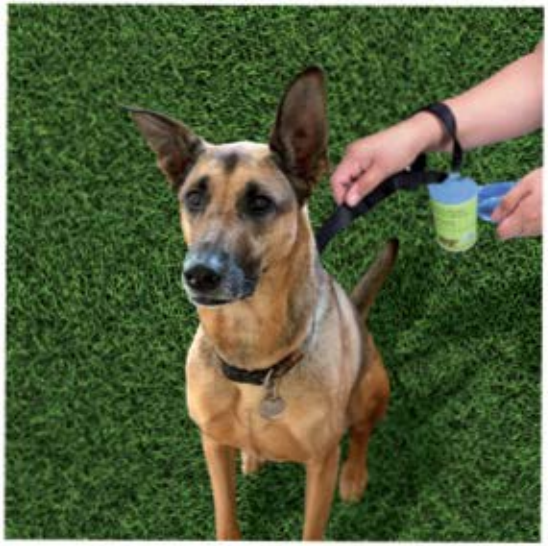
BAG IT AND TRASH IT

It's that simple to protect our health and the environment!

- Keep a supply of bags near your dog leash or tie them to the leash
- Use a poop scooper
- Bring several plastic bags with you
- Reuse plastic grocery bags or purchase special doggie waste bags at pet supplies stores
- Make sure your pet's waste gets into a trash can

Encourage your neighbors and other pet owners to do the right thing and pick up after their pets.

¡RECOJA los desechos de sus mascotas!



Proteja la salud de su mascota y el medio ambiente

Si desea más información, visite
sbcountystormwater.org/dog

facebook.com/sbcountystormwater

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SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

POR QUÉ ES IMPORTANTE

PROTEJA
A SU FAMILIA Y A SU MASCOTA

- Los desechos de los perros pueden infectar a niños y adultos con enfermedades causadas por bacterias y parásitos.
- Su perro puede contraer una infección de los desechos de otros perros.

PROTEJA
EL MEDIO AMBIENTE

Dejar desechos de perros en la calle o en su propiedad puede tener un impacto negativo en la calidad del agua. Los desechos de mascotas que no se eliminan de la propiedad fluyen sin tratamiento por el sistema de drenaje de tormentas y llegan directamente a las masas de agua locales. Los desechos de mascotas son agentes contaminantes que contienen nutrientes, parásitos y bacterias que pueden afectar la calidad de nuestros ríos y océanos, y hacer que el agua no sea segura para nadar, beber o pescar.

COLÓQUELA EN UNA BOLSA Y TÍRELA EN LA BASURA

Así de simple es proteger nuestra salud y el medio ambiente.

- Guarde algunas bolsas cerca de la correa de su perro o átelas a la correa;
- Use una cuchara para recojer el desecho;
- Lleve varias bolsas plásticas;
- Reutilice bolsas plásticas de comestibles o compre bolsas especiales para desechos de perros en las tiendas para mascotas;
- Asegúrese de tirar los desechos de su perro en un cesto de basura.

Aliente a sus vecinos y otros dueños de mascotas a hacer lo correcto y levantar los desechos de sus mascotas.

Pool Discharge Tips

Maintain your pool properly and help protect the environment

DID YOU KNOW?

Routine swimming pool maintenance generates a variety of wastes such as cleaning wastewater, filter back-wash residues, biocides and acid washes that can contribute to stormwater pollution. Chlorine and other pool chemicals can harm our waterways when they are discharged improperly.

Share these good housekeeping practices with your pool service personnel to keep pollutants out of our waterways:

HOLD IT BEFORE YOU DRAIN IT.

- De-chlorinate the water before draining the pool to the storm drain.
- Consult with your pool contractor before de-chlorinating the pool to learn about your options.

IMPORTANT:

- Dispose of filter backwash solids in the trash or landscape area.
- Neutralize acid washes before discharging to the sewer. Do not discharge to the storm drain.

SHUT: Shut off the chlorination system or stop adding chlorine.

HOLD: Hold the water in the pool for at least 5 days or add a de-chlorinating agent.

TEST: Use a pool testing kit to ensure the level of chlorine is at 0.1ppm before discharging the water.

- Make sure all debris is removed and chemicals are dissipated.
- pH of pool water should be between 6.5 and 8.5 before discharging.
- Make sure the water is free of any discoloration, mosquitoes, dirt or algae.

DRAIN: Check with your city for local requirements before discharging your pool to the storm drain or sewer.

- **Alternative 1:** Sanitary Sewer — Some cities allow pools to be drained to the sanitary sewer during non-peak hours.
- **Alternative 2:** Lawn or Garden — Discharge the pool water through the lawn or garden. The flow should be controlled to prevent erosion problems or the water entering a neighbor's property.
- **For Saltwater Pools:** Saltwater pools should only be drained to the sewer or hauled away.

To report illegal dumping, call (877) WASTE18 or visit sbcountystormwater.org

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WASH YOUR CAR THE ECO-FRIENDLY WAY!

When possible, wash in a professional car wash.

1. **Locate** the nearest storm drain and ensure that wash water does not flow into it.

2. **Wash** in a contained area or on grass*, gravel or other permeable surface. Dispose of excess soapy water into the sanitary sewer *(ie. sink or toilet)* or onto grass.

3. **Use** eco-friendly cleaning products (*non-toxic, phosphate free or biodegradable*). Use as little soap as possible and wipe brake dust off tires with a rag before washing.

4. **Conserve** water by using a high pressure hose and turn off the water when not in use.

**Some local ordinances may not allow a car to be parked on the front lawn. Check with your City's Building and Code department if you are unsure.*

How Does Eco Car Washing Help Local Waterways?

When excess wash water travels through the street it has the potential to pick up oil, grease and other chemicals along the way before it ends up in the curb, gutter and the storm drain system. **This contaminated water then travels to our creeks and the Santa Ana River making it unsafe for people and wildlife.**

To report illegal dumping, call **(877) WASTE18** or visit **sbcountystormwater.org**
To find a Hazardous Waste Facility, call **(800) OILY CAT**

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COMMERCIAL TRASH ENCLOSURES

FOLLOW THESE **REQUIREMENTS** TO **KEEP OUR WATERWAYS CLEAN**

Trash enclosures, such as those found in commercial and apartment complexes, typically contain materials that are intended to find their way to a landfill or a recycling facility. **These materials are NOT meant to go into our local lakes and rivers.**

PROTECT WATER QUALITY BY FOLLOWING THESE SIMPLE STEPS

PUT TRASH INSIDE

Place trash inside the bin (preferably in sealed bags)

CLOSE THE LID

Prevent rain from entering the bin in order to avoid leakage of polluted water runoff

KEEP TOXICS OUT

- Paint
- Grease, fats and used oils
- Batteries, electronics and fluorescent lights

SOME ADDITIONAL GUIDELINES, INCLUDE

✓ **SWEEP FREQUENTLY**
Sweep trash enclosure areas frequently, instead of hosing them down, to prevent polluted water from flowing into the streets and storm drains.

✓ **FIX LEAKS**
Address trash bin leaks immediately by using dry clean up methods and report to your waste hauler to receive a replacement.

✓ **CONSTRUCT ROOF**
Construct a solid cover roof over the existing trash enclosure structure to prevent rainwater from coming into contact with trash and garbage. Check with your local City/County for Building Codes.

In San Bernardino County, stormwater pollution is caused by food waste, landscape waste, chemicals and other debris that are washed into storm drains and end up in our waterways - untreated! You can be part of the solution by maintaining a water-friendly trash enclosure.

THANK YOU FOR HELPING TO KEEP SAN BERNARDINO COUNTY CLEAN AND HEALTHY!

San Bernardino County STORMWATER PROGRAM

To report illegal dumping **(877-WASTE18)** or
to find a household hazardous waste facility (800-OILY CAT): **sbcountystormwater.org**
To dispose of hazardous waste call the San Bernardino County Fire Dept. - CUPA Program **(909) 386-8401**

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