

Water Quality Management Plan

For:

Fire Station No. 227

ASSESSOR'S MAP BOOK 0154 PAGE 28, SAN BERNARDINO COUNTY, LOT 281,
APN 0154-281-01

Prepared for:

San Bernardino County Project & Facilities Management Department

385 N. Arrowhead Ave.,
San Bernardino, CA, 92415
(909) 387-5000

Prepared by:

Engineering Resources of Southern California

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Submittal Date: December 20th, 2025

Revision Date: May 13th, 2025

Approval Date: _____

**County of San Bernardino
NPDES**

THE PLANS & DETAILS HAVE BEEN

REVIEWED
FOR COMPLIANCE

THE APPROVAL OF THESE PLANS SHALL NOT
BE CONSTRUED TO BE A PERMIT FOR ANY
VIOLATION OF ANY CODE OR ORDINANCE OF
THIS COUNTY

By _____

Date _____

Jonathan Dillon
05/30/2025

THESE PLANS SHALL BE ON THE JOB FOR
ALL REQUESTED INSPECTIONS

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for San Bernardino County by Engineering Resources of Southern California. 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."

Project Data			
Permit/Application Number(s):	WQMP-2025-00005	Grading Permit Number(s):	GRAD-2025-000008
Tract/Parcel Map Number(s):	Assessor's Map Book 0154 Page 28, San Bernardino County, Lot 281	Building Permit Number(s):	NEWNR-2025-00002
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 0154-281-01
Owner's Signature			
Owner Name: Donald Day			
Title	Project and Facilities Management Department		
Company	San Bernardino County		
Address	385 N. Arrowhead Avenue, San Bernardino, CA, 92415		
Email	Donald.day@pfm.sbcounty.gov		
Telephone #	(909) 387-3072		
Signature	Date		

Preparer's Certification

Project Data			
Permit/Application Number(s):	WQMP-2025-00005	Grading Permit Number(s):	GRAD-2025-000008
Tract/Parcel Map Number(s):	Assessor's Map Book 0154 Page 28, San Bernardino County, Lot 281	Building Permit Number(s):	NEWNR-2025-00002
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"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: Stephania Hernandez		PE Stamp Below 
Title	Principal Engineer	
Company	Engineering Resources of Southern California, Inc.	
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Email	shernandez@erscinc.com	
Telephone #	(909) 890-1255	
Signature		
Date	5/13/2025	

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Section 1 Discretionary Permit(s)

Form 1-1 Project Information					
Project Name		Fire Station No. 227			
Project Owner Contact Name:		Donald Day			
Mailing Address:	385 N. Arrowhead Avenue, San Bernardino, CA, 92415	E-mail Address:	Donald.day@pfm.sbcounty.gov	Telephone:	(909) 387-3072
Permit/Application Number(s):		WQMP-2025-00005	Tract/Parcel Map Number(s):	Assessor's Map Book 0154 Page 28, San Bernardino County, Lot 281 (APN 0154-281-01)	
Additional Information/Comments:		None			
Description of Project:		The project is a new site development for a fire station facility located at the northwest corner of West 38th Street and Genevieve Street North in the City of San Bernardino. The new facility will occupy the southerly end of the play fields at Arrowhead Elementary School by lease agreement between the County and the School District. The site is mostly vacant with scattered weeds and native grass. The site currently slopes 1.20% at approximately 218 feet from north to south, having about 2.6 feet of fall. The proposed structure will be approximately 10,764 square feet (SF) and will include sleeping quarters for eight crew members, and four single use toilet/sink/shower combos. The station shall include 3-bay apparatus building and other site improvements typical of County fire stations. All on-site runoff will be collected by catch basins with trash capture devices and treated by underground chambers with an isolator. Treatment will occur on the south side below the proposed landscape area in front of the new fire station. The underground chambers are sized to treat approximately 4,917.45 cubic feet. The emergency overflow from the proposed project site will ultimately be discharged to 38th street where it flows via curb and gutter to finally be intercepted by the existing storm drain pipe and to the Santa Ana River, Prado Basin, and the Pacific Ocean. See WQMP site map in Attachment A for drainage areas and facility locations.			
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.		N/A			

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

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 ft ² or more of impervious surface on an already developed site	☒ New development involving the creation of 10,000 ft ² 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 ft ² or more		
☐ Hillside developments of 5,000 ft ² 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 ft ² 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 ft ² or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft ² or more, or have a projected average daily traffic of 100 or more vehicles per day		
☐ Non-Priority / Non-Category Project <i>May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements.</i>					
2 Project Area (ft ²):	51,586 SF	3 Number of Dwelling Units:	1	4 SIC Code:	9224
5 Is Project going to be phased? Yes ☐ No ☒ <i>If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.</i>					
6 Does Project include roads? Yes ☐ No ☒ <i>If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)</i>					

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

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

This property is being developed by and owned by San Bernardino County, who will be the entity responsible for the long-term maintenance of WQMP Storm Drain Water Facilities throughout the site.

Contact Information:

Owner Name/Developer Name: Donald Day/San Bernardino County

Title: Project and Facilities Management

Company: San Bernardino County Project & Facilities Management Department

Address: 385 N. Arrowhead Avenue, San Bernardino, CA, 92415

Email: Donald.day@pfm.sbcounty.gov

Phone: (909) 387-3072

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern			
Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Resulting from vehicles; "Bacterial indicators are routinely detected in pavement runoff." Table 3-3 TDG
Nutrients - Phosphorous	E ☒	N ☐	Resulting from landscaping; "Expected pollutant if landscaping exists on-site." Table 3-3 TDG
Nutrients - Nitrogen	E ☒	N ☐	Resulting from landscaping; "Expected pollutant if landscaping exists on-site." Table 3-3 TDG
Noxious Aquatic Plants	E ☒	N ☐	Resulting from landscaping; "Expected pollutant if landscaping exists on-site." Table 3-3 TDG
Sediment	E ☒	N ☐	Resulting from landscaping; "Expected pollutant if landscaping exists on-site." Table 3-3 TDG
Metals	E ☒	N ☐	Resulting from vehicles in the parking lots and commercial/industrial development, Table 3-3 TDG
Oil and Grease	E ☒	N ☐	Resulting from vehicles in the parking lots and commercial/industrial development, Table 3-3 TDG
Trash/Debris	E ☒	N ☐	Resulting from vehicles in the parking lots and commercial/industrial development, Table 3-3 TDG
Pesticides / Herbicides	E ☒	N ☐	Resulting from vehicles in the parking lots and commercial/industrial development, Table 3-3 TDG
Organic Compounds	E ☒	N ☐	Resulting from pavement runoff and petroleum hydrocarbons; "Bacterial indicators are routinely detected in pavement runoff. Including petroleum hydrocarbons." Table 3-3 TDG
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits			
1 Project Types that Qualify for Water Quality Credits: <i>N/A</i>			
☐ 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 % <i>N/A</i> (Total all credit percentages up to a maximum allowable credit of 50 percent)			
Description of Water Quality Credit Eligibility (if applicable)	<i>N/A</i>		

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 34.160432 Longitude -117.286782 Thomas Bros Map page 546
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	
<pre> graph TD DA1DMAA[DA 1 DMA A] --> BMP1[BMP-1 Underground Chambers] DA1DMAB[DA 1 DMA B] --> BMP1 DA1DMAC[DA 1 DMA C] --> BMP1 BMP1 --> Outlet1[Outlet 1] </pre>	
Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA1 DMA A flows to BMP-1 to Outlet 1	Runoff from the area DA 1, DMA A will sheet flow south into ribbon gutters and eventually into a proposed catch basin and storm drain pipe that connect to proposed underground chambers on the south side of the project site. The proposed catch basin inlets will include inlet filters to remove and capture some of the pollutants of concern. Additionally, the proposed chambers feature an isolator row designed to capture the "first flush" runoff, allowing for settlement time before the water flows into the infiltration chambers. Storm flow exceeding the design capacity of the chambers will be directed through a proposed pipe, which will ultimately discharge to 38 th Street. See the WQMP site map in Attachment A for details.
DA1 DMA B flows to BMP-1 to Outlet 1	Runoff from the area DA 1, DMA B will sheet flow south off the roof of the proposed building and eventually into a proposed catch basin and storm drain pipe that connect to proposed underground chambers on the south side of the project site. The proposed catch basin inlets will include inlet filters to remove and capture some of the pollutants of concern. Additionally, the proposed chambers feature an isolator row designed to capture the "first flush" runoff, allowing for settlement time before the water flows into the infiltration chambers. Storm flow exceeding the design capacity of the chambers will be directed through a proposed pipe, which will ultimately discharge to 38 th Street. See the WQMP site map in Attachment A for details.
DA1 DMA C flows to BMP-1 to Outlet 1	Runoff from the area DA 1, DMA C will sheet flow east off the roof of the proposed building and eventually into a proposed catch basin and storm drain pipe that connect to proposed underground chambers on the south side of the project site. The proposed catch basin inlets will include inlet filters

	to remove and capture some of the pollutants of concern. Additionally, the proposed chambers feature an isolator row designed to capture the “first flush” runoff, allowing for settlement time before the water flows into the infiltration chambers. Storm flow exceeding the design capacity of the chambers will be directed through a proposed pipe, which will ultimately discharge to 38 th Street. See the WQMP site map in Attachment A for details.
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Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft ²)	32,444	8,224	10,918	-
2 Existing site impervious area (ft ²)	0	0	0	-
3 Antecedent moisture condition <i>For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf</i>	AMC II	AMC II	AMC II	-
4 Hydrologic soil group <i>Refer to Watershed Mapping Tool – http://permittrack.sbcounty.gov/wap/</i>	B	B	B	-
5 Longest flowpath length (ft)	340	150	362	-
6 Longest flowpath slope (ft/ft)	0.42	1.03	0.43	-
7 Current land cover type(s) <i>Select from Fig C-3 of Hydrology Manual</i>	Residential or Commercial Landscaping (grass, shrubs, etc.)	Residential or Commercial Landscaping (grass, shrubs, etc.)	Residential or Commercial Landscaping (grass, shrubs, etc.)	-
8 Pre-developed pervious area condition: <i>Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating</i>	Fair	Fair	Fair	-

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1 (use only as needed for additional DMA w/in DA 1)				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA E	DMA F	DMA G	DMA H
1 DMA drainage area (ft ²)	-	-	-	-
2 Existing site impervious area (ft ²)	-	-	-	-
3 Antecedent moisture condition <i>For desert areas, use</i> http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf	-	-	-	-
4 Hydrologic soil group <i>Refer to Watershed Mapping Tool –</i> http://permittrack.sbcounty.gov/wap/	-	-	-	-
5 Longest flowpath length (ft)	-	-	-	-
6 Longest flowpath slope (ft/ft)	-	-	-	-
7 Current land cover type(s) <i>Select from Fig C-3 of Hydrology Manual</i>	-	-	-	-
8 Pre-developed pervious area condition: <i>Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating</i>	-	-	-	-

Form 3-3 Watershed Description for Drainage Area	
Receiving waters <i>Refer to Watershed Mapping Tool - http://permitrack.sbcounty.gov/wap/</i> <i>See "Drainage Facilities" link at this website</i>	Mt. View Storm Drain → Twin Creek Channel → Warm Creek Channel → San Ana River, Reach 4 → Santa Ana River, Reach 3 → Prado Dam → Santa Ana River, Reach 2 → Santa Ana River, Reach 1 → Pacific Ocean
Applicable TMDLs <i>Refer to Local Implementation Plan</i>	Santa Ana River, Reach 3: Pathogens
303(d) listed impairments <i>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</i>	Warm Creek Channel: Pathogens Santa Ana River, Reach 4: Ddt (Dichlorodiphenyltrichloroethane), Oil and Grease, Pathogens Santa Ana River, Reach 3: Pathogens, Bifenthrin, Copper, Lead, Pyrethroids, Toxicity Prado Dam: pH
Environmentally Sensitive Areas (ESA) <i>Refer to Watershed Mapping Tool - http://permitrack.sbcounty.gov/wap/</i>	None
Unlined Downstream Water Bodies <i>Refer to Watershed Mapping Tool - http://permitrack.sbcounty.gov/wap/</i>	Twin Creek Channel Warm Creek Channel Santa Ana River, Reach 4, 3, 2, and 1
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 Property Owner shall familiarize themselves with the WQMP document contents, including BMP educational materials in Section 6D of the Technical Guidance Document and shall ensure that all other occupants are also educated on stormwater BMPs.
N2	Activity Restrictions	☐	☒	The County of San Bernardino will own and operate a single property. No POA or CCRs are a part of this WQMP.
N3	Landscape Management BMPs	☒	☐	The Property Owner will ensure landscaping and irrigation is properly maintained. The Property Owner and their landscape contractor will regularly inspect the irrigation system and storage/infiltration for signs of erosion or sediment and debris buildup and clean and/or repair as needed.
N4	BMP Maintenance	☒	☐	The Property Owner will provide the applicable BMP maintenance information to those who will be maintaining the non-structural and structural BMPs. See Section 5, Form 5.1.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	No hazardous waste expected on site.
N6	Local Water Quality Ordinances	☒	☐	The project site must comply with any applicable local water quality ordinances set by the local jurisdiction through implementation of this WQMP.
N7	Spill Contingency Plan	☒	☐	Fire stations often deal with hazardous materials such as firefighting chemicals, fuel, maintenance products, and cleaning agents. These materials can spill during storage, handling, or use; therefore, the Property Owner shall be required to prepare a spill contingency plan. The plan shall be implemented in accordance with Section 6.5 of the California Health and Safety Code. The spill contingency plan shall identify responsible persons in the event of a spill, an action item list identifying how the spill should be contained, cleaned up, and who should be contacted in the event of a spill. Documentation of any spill event and cleanup process shall be kept on site in perpetuity.
N8	Underground Storage Tank Compliance	☒	☐	The Fire Station will utilize the use of an underground grease interceptor tank. The tank will be in compliance with State regulations and enforced by the County Environmental Health Services on behalf of the State.

Form 4.1-1 Non-Structural Source Control BMPs				
N9	Hazardous Materials Disclosure Compliance	☒	☐	The Fire Station includes a proposed fueling station for the fire trucks. The Property Owner is to abide by the respective Fire Protection Agency Regulations for the Management of Hazardous Materials.

NOT FOR BIDDING

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	☒	☐	The property site will comply with Article 80 of the Uniform Fire Code enforced by the Fire Protection Agency.
N11	Litter/Debris Control Program	☒	☐	Litter/Debris shall be regularly swept from the property site and dumped into a city dumpster with lids. The Property Owner shall contract with the City to ensure that the dumpster is emptied on a weekly basis.
N12	Employee Training	☒	☐	The Property Owner will provide proper employee training.
N13	Housekeeping of Loading Docks	☐	☒	No proposed loading docks on site.
N14	Catch Basin Inspection Program	☒	☐	The Property Owner will have at least 80 percent of the drainage facilities inspected, cleaned, and maintained on an annual basis with 100 percent of the facilities included in a two-year period. Debris will be removed from the inlets of the catch basins at least once a week.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	At a minimum, all paved areas on the property site shall be swept utilizing a vacuum assisted sweeper, quarterly. The collected waste shall be properly disposed of at an approved dumpsite.
N16	Other Non-structural Measures for Public Agency Projects	☒	☐	This is a public agency project; no additional non-structural measures are required.
N17	Comply with all other applicable NPDES permits	☒	☐	The Property Owner must ensure that all regulatory requirements are met at the Municipal, State, and Federal levels as related to NPDES programs and permitting. The State Construction General Permit will be adhered to through implementation of a SWPPP uploaded to the SMARTs waterboard system.

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 stencils contain a brief statement that prohibits dumping of improper materials into the MS4 typically placed directly to storm drain inlets. Provide stencilling or labeling within the project areas with prohibitive language (such as: "No Dumping – Flows to Creek") and/or graphical icons to discourage illegal dumping. Pretreatment filter inserts to be installed.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	There is no outdoor material storage area but there is a proposed storage building that will be placed on impervious area with proper grading to prevent the infiltration of pollutants into the soil and runoff directly away from the area. The storage building is positioned away from the stormwater drainage path to minimize exposure to stormwater. The proposed storage building shall have a solid roof.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Site dumpsters will be covered with a solid roof or awning. This will prevent site drainage from entry into site dumpsters. The trash and waste storage shall be inspected and maintained on a weekly basis. Collection of trash from the trash storage areas shall occur on a regular basis to ensure trash receptacles are not overflowing. Documentation of such inspection/maintenance and trash collection shall be kept by the owner in perpetuity. See the WQMP site map in Attachment A for anticipated location of trash storage areas.
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)	☒	☐	The landscape architect will follow the plans for the on-site irrigation system. The irrigation system shall be inspected monthly to ensure proper operation. Any broken sprinkler heads shall be repaired immediately to ensure that the system continues to operate efficiently. Documentation of such inspection/maintenance and trash collection shall be kept by the owner in perpetuity.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	The landscape architect will provide design plans for the on-site landscaping irrigation system. The design shall incorporate that finish grade of landscaped areas at a minimum of 1-2 inches below the top of curb, sidewalk, or pavement throughout the project site.
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	The proposed site will convey runoff safely from the tops of slopes, stabilize disturbed slopes as quickly as possible, control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems. Design landscaping grounds to optimize surface infiltration where appropriate.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	No proposed dock on site.

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S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	No proposed maintenance on site.
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☒	☐	The proposed Fire Station will be equipped with a clarifier or other pretreatment facilities. It will also have a proper connection to a sanitary sewer.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	No proposed outdoor processing on site.

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)	☒	☐	The proposed Fire Station will be equipped with a clarifier or other pretreatment facilities. It will also have a proper connection to a sanitary sewer.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☒	☐	The Fire Station has a proposed fuel tank and dispensing equipment. Design requirements for fueling areas are governed by Building and Fire Codes and by current local agency ordinances and zoning requirements. Fueling areas, per the MS4 permit require roofing that extends 6.5 feet from dispenser, Portland Cement Concrete dispensing area, secondary containment in a dead-end sump.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	No proposed hillside landscaping on site.
S14	Wash water control for food preparation areas	☐	☒	No proposed food preparation on site.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	No proposed community car wash.

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist
Site Design Practices <i>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</i>
Minimize impervious areas: Yes ☐ No ☒ Explanation: The proposed site plan and intended use of the site offer limited opportunities to reduce impervious surfaces. As a result, the underground chamber system has been sized to meet the BMP requirements, with landscaping incorporated where space allows. The site remains 23% pervious.
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: The proposed BMP to treat storm runoff is an underground chamber system, where run-off is captured via catch basin inlets and travels through storm drains to the underground chambers. Underground chambers will store the runoff water temporarily, allowing it to infiltrate into the surrounding soil gradually.
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: Existing drainage flows from north to south and discharges to West 38th Street. The proposed runoff will be collected and conveyed to on-site underground chamber, and the overflow will discharge to the Mt. View Storm Drain and ultimately to the Santa Ana River and Pacific Ocean. Time of concentration won't be affected.
Disconnect impervious areas: Yes ☒ No ☐ Explanation: Impervious areas will drain to landscaping and to the proposed underground chambers.
Protect existing vegetation and sensitive areas: Yes ☐ No ☒ Explanation: Existing site has Residential or Commercial Landscaping (grass, shrubs, etc.).
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: Disturbed areas will be landscaped according to the landscaping plan of the project site.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: Care will be taken to minimize the traffic of heavy equipment over the infiltration areas and soil at the bottom of the proposed underground chambers will be leveled, compaction shall be per the manufacturer's specifications.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation: The north drainage pattern runs through concrete ribbon gutters, collected by catch basins with trash capture devices, and travels through a storm drain system to the proposed underground chambers with an isolator row.
Stake off areas that will be used for landscaping to minimize compaction during construction: Yes ☒ No ☐ Explanation: Landscape areas will be staked off during the grading to avoid/minimize compaction in the designated landscape areas.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P₆ 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 mi²), 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): 51,586 SF	2 Imperviousness after applying preventative site design practices (Imp%): 0.77	3 Runoff Coefficient (Rc): 0.57 $R_c = 0.858(Imp\%)^{0.3} - 0.78(Imp\%)^{0.2} + 0.774(Imp\%) + 0.04$
4 Determine 1-hour rainfall depth for a 2-year return period P _{2yr-1hr} (in): 0.660 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P ₆ , Mean 6-hr Precipitation (inches): 0.98 $P_6 = \text{Item 4} * C_1$, 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): 4,714 CF $DCV = 1/12 * [\text{Item 1} * \text{Item 3} * \text{Item 5} * C_2]$, 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://permittrack.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 N/A <i>Form 4.2-3 Item 12</i>	2 N/A <i>Form 4.2-4 Item 13</i>	3 N/A <i>Form 4.2-5 Item 10</i>
Post-developed	4 N/A <i>Form 4.2-3 Item 13</i>	5 N/A <i>Form 4.2-4 Item 14</i>	6 N/A <i>Form 4.2-5 Item 14</i>
Difference	7 N/A <i>Item 4 – Item 1</i>	8 N/A <i>Item 2 – Item 5</i>	9 N/A <i>Item 6 – Item 3</i>
Difference (as % of pre-developed)	10 N/A % <i>Item 7 / Item 1</i>	11 N/A % <i>Item 8 / Item 2</i>	12 N/A % <i>Item 9 / Item 3</i>

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

Weighted Curve Number Determination for: <u>Pre-developed DA</u>	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H								
1a Land Cover type	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
2a Hydrologic Soil Group (HSG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
3a DMA Area, ft ² sum of areas of DMA should equal area of DA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
4a Curve Number (CN) use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Weighted Curve Number Determination for: <u>Post-developed DA</u>	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H								
1b Land Cover type	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
2b Hydrologic Soil Group (HSG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
3b DMA Area, ft ² sum of areas of DMA should equal area of DA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
4b Curve Number (CN) use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
5 Pre-Developed area-weighted CN: N/A	7 Pre-developed soil storage capacity, S (in): N/A $S = (1000 / \text{Item 5}) - 10$					9 Initial abstraction, I _a (in): N/A $I_a = 0.2 * \text{Item 7}$										
6 Post-Developed area-weighted CN: N/A	8 Post-developed soil storage capacity, S (in): N/A $S = (1000 / \text{Item 6}) - 10$					10 Initial abstraction, I _a (in): N/A $I_a = 0.2 * \text{Item 8}$										
11 Precipitation for 2 yr, 24 hr storm (in): N/A Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html																
12 Pre-developed Volume (ft ³): N/A $V_{pre} = (1 / 12) * (\text{Item sum of Item 3}) * [(\text{Item 11} - \text{Item 9})^2 / ((\text{Item 11} - \text{Item 9} + \text{Item 7}))]$																
13 Post-developed Volume (ft ³): N/A $V_{pre} = (1 / 12) * (\text{Item sum of Item 3}) * [(\text{Item 11} - \text{Item 10})^2 / ((\text{Item 11} - \text{Item 10} + \text{Item 8}))]$																
14 Volume Reduction needed to meet HCOC Requirement, (ft ³): N/A $V_{HCOC} = (\text{Item 13} * 0.95) - \text{Item 12}$																

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

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 <i>Use additional forms if there are more than 4 DMA</i>				Post-developed DA1 <i>Use additional forms if there are more than 4 DMA</i>			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) <i>Use Form 3-2 Item 5 for pre-developed condition</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2 Change in elevation (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 Slope (ft/ft), $S_o = \text{Item 2} / \text{Item 1}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4 Land cover	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5 Initial DMA Time of Concentration (min) <i>Appendix C-1 of the TGD for WQMP</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6 Length of conveyance from DMA outlet to project site outlet (ft) <i>May be zero if DMA outlet is at project site outlet</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7 Cross-sectional area of channel (ft ²)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8 Wetted perimeter of channel (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9 Manning's roughness of channel (n)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10 Channel flow velocity (ft/sec) $V_{fps} = (1.49 / \text{Item 9}) * (\text{Item 7}/\text{Item 8})^{0.67} * (\text{Item 3})^{0.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11 Travel time to outlet (min) $T_t = \text{Item 6} / (\text{Item 10} * 60)$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 Total time of concentration (min) $T_c = \text{Item 5} + \text{Item 11}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13 Pre-developed time of concentration (min): N/A <i>Minimum of Item 12 pre-developed DMA</i>								
14 Post-developed time of concentration (min): N/A <i>Minimum of Item 12 post-developed DMA</i>								
15 Additional time of concentration needed to meet HCOC requirement (min): N/A $T_{C-HCOC} = (\text{Item 13} * 0.95) - \text{Item 14}$								

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

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 $I_{peak} = 10^{(LOG \text{ Form 4.2-1 Item 4} - 0.6 \text{ LOG Form 4.2-4 Item 5} / 60)}$	N/A	N/A	N/A	N/A	N/A	N/A						
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)	N/A	N/A	N/A	N/A	N/A	N/A						
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)	N/A	N/A	N/A	N/A	N/A	N/A						
4 Pervious area infiltration rate (in/hr) Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP	N/A	N/A	N/A	N/A	N/A	N/A						
5 Maximum loss rate (in/hr) $F_m = \text{Item 3} * \text{Item 4}$ 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)	N/A	N/A	N/A	N/A	N/A	N/A						
6 Peak Flow from DMA (cfs) $Q_p = \text{Item 2} * 0.9 * (\text{Item 1} - \text{Item 5})$	N/A	N/A	N/A	N/A	N/A	N/A						
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	n/a	N/A	N/A						
	DMA B	N/A	n/a	N/A	n/a	N/A						
	DMA C	N/A	N/A	n/a	N/A	n/a						
8 Pre-developed Q_p at T_c for DMA A: N/A $Q_p = \text{Item 6}_{DMAA} + [\text{Item 6}_{DMAB} * (\text{Item 1}_{DMAA} - \text{Item 5}_{DMAB}) / (\text{Item 1}_{DMAB} - \text{Item 5}_{DMAB}) * \text{Item 7}_{DMAA/2}] + [\text{Item 6}_{DMAC} * (\text{Item 1}_{DMAA} - \text{Item 5}_{DMAC}) / (\text{Item 1}_{DMAC} - \text{Item 5}_{DMAC}) * \text{Item 7}_{DMAA/3}]$	9 Pre-developed Q_p at T_c for DMA B: N/A $Q_p = \text{Item 6}_{DMAB} + [\text{Item 6}_{DMAA} * (\text{Item 1}_{DMAB} - \text{Item 5}_{DMAA}) / (\text{Item 1}_{DMAA} - \text{Item 5}_{DMAA}) * \text{Item 7}_{DMAB/1}] + [\text{Item 6}_{DMAC} * (\text{Item 1}_{DMAB} - \text{Item 5}_{DMAC}) / (\text{Item 1}_{DMAC} - \text{Item 5}_{DMAC}) * \text{Item 7}_{DMAB/3}]$			10 Pre-developed Q_p at T_c for DMA C: N/A $Q_p = \text{Item 6}_{DMAC} + [\text{Item 6}_{DMAA} * (\text{Item 1}_{DMAC} - \text{Item 5}_{DMAA}) / (\text{Item 1}_{DMAA} - \text{Item 5}_{DMAA}) * \text{Item 7}_{DMAC/1}] + [\text{Item 6}_{DMAB} * (\text{Item 1}_{DMAC} - \text{Item 5}_{DMAB}) / (\text{Item 1}_{DMAB} - \text{Item 5}_{DMAB}) * \text{Item 7}_{DMAC/2}]$								
10 Peak runoff from pre-developed condition confluence analysis (cfs): N/A Maximum of Item 8, 9, and 10 (including additional forms as needed)												
11 Post-developed Q_p at T_c for DMA A: N/A Same as Item 8 for post-developed values	12 Post-developed Q_p at T_c for DMA B: N/A Same as Item 9 for post-developed values			13 Post-developed Q_p at T_c for DMA C: N/A Same as Item 10 for post-developed values								
14 Peak runoff from post-developed condition confluence analysis (cfs): N/A Maximum of Item 11, 12, and 13 (including additional forms as needed)												
15 Peak runoff reduction needed to meet HCOC Requirement (cfs): N/A $Q_{p-HCOC} = (\text{Item 14} * 0.95) - \text{Item 10}$												

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).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3 to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is “Yes,” provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2).

Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment.

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)

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

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1) (N/A)			
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 N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
2 Total impervious area draining to pervious area (ft ²)	N/A	N/A	N/A
3 Ratio of pervious area receiving runoff to impervious area	N/A	N/A	N/A
4 Retention volume achieved from impervious area dispersion (ft ³) $V = \text{Item 2} * \text{Item 3} * (0.5/12)$, assuming retention of 0.5 inches of runoff	N/A	N/A	N/A
5 Sum of retention volume achieved from impervious area dispersion (ft ³): N/A $V_{\text{retention}} = \text{Sum of Item 4 for all BMPs}$			
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 N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
7 Ponding surface area (ft ²)	N/A	N/A	N/A
8 Ponding depth (ft)	N/A	N/A	N/A
9 Surface area of amended soil/gravel (ft ²)	N/A	N/A	N/A
10 Average depth of amended soil/gravel (ft)	N/A	N/A	N/A
11 Average porosity of amended soil/gravel	N/A	N/A	N/A
12 Retention volume achieved from on-lot infiltration (ft ³) $V_{\text{retention}} = (\text{Item 7} * \text{Item 8}) + (\text{Item 9} * \text{Item 10} * \text{Item 11})$	N/A	N/A	N/A
13 Runoff volume retention from on-lot infiltration (ft ³): N/A $V_{\text{retention}} = \text{Sum of Item 12 for all BMPs}$			

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1) (N/A)**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 ☒ <i>If yes, complete Items 15-20. If no, proceed to Item 21</i>	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
15 Rooftop area planned for ET BMP (ft ²)	N/A	N/A	N/A
16 Average wet season ET demand (in/day) <i>Use local values, typical ~ 0.1</i>	N/A	N/A	N/A
17 Daily ET demand (ft ³ /day) <i>Item 15 * (Item 16 / 12)</i>	N/A	N/A	N/A
18 Drawdown time (hrs) <i>Copy Item 6 in Form 4.2-1</i>	N/A	N/A	N/A
19 Retention Volume (ft ³) <i>$V_{\text{retention}} = \text{Item 17} * (\text{Item 18} / 24)$</i>	N/A	N/A	N/A
20 Runoff volume retention from evapotranspiration BMPs (ft ³): N/A <i>$V_{\text{retention}} = \text{Sum of Item 19 for all BMPs}$</i>			
21 Implementation of Street Trees: Yes ☐ No ☒ <i>If yes, complete Items 22-25. If no, proceed to Item 26</i>	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
22 Number of Street Trees	N/A	N/A	N/A
23 Average canopy cover over impervious area (ft ²)	N/A	N/A	N/A
24 Runoff volume retention from street trees (ft ³) <i>$V_{\text{retention}} = \text{Item 22} * \text{Item 23} * (0.05/12)$ assume runoff retention of 0.05 inches</i>	N/A	N/A	N/A
25 Runoff volume retention from street tree BMPs (ft ³): N/A <i>$V_{\text{retention}} = \text{Sum of Item 24 for all BMPs}$</i>			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ <i>If yes, complete Items 27-29; If no, proceed to Item 30</i>	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
27 Number of rain barrels/cisterns	N/A	N/A	N/A
28 Runoff volume retention from rain barrels/cisterns (ft ³) <i>$V_{\text{retention}} = \text{Item 27} * 3$</i>	N/A	N/A	N/A
29 Runoff volume retention from residential rain barrels/Cisterns (ft ³): N/A <i>$V_{\text{retention}} = \text{Sum of Item 28 for all BMPs}$</i>			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: N/A <i>Sum of Items 5, 13, 20, 25 and 29</i>			

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).

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): 4,714 CF $V_{unmet} = \text{Form 4.2-1 Item 7} - \text{Form 4.3-2 Item 30}$			
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 1, DMA 2, DMA 3 BMP-1 Underground Chambers	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (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	5.7	-	-
3 Infiltration safety factor See TGD Section 5.4.2 and Appendix D	3	-	-
4 Design percolation rate (in/hr) $P_{design} = \text{Item 2} / \text{Item 3}$	1.9	-	-
5 Pondered 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	5.5	-	-
7 Ponding Depth (ft) $d_{BMP} = \text{Minimum of } (1/12 * \text{Item 4} * \text{Item 5}) \text{ or Item 6}$	3.75	-	-
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	1,491.07	-	-
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	1.75	-	-
12 Gravel porosity	0.40	-	-
13 Duration of storm as basin is filling (hrs) Typical ~ 3hrs	3	-	-
14 Above Ground Retention Volume (ft ³) $V_{retention} = \text{Item 8} * [\text{Item 7} + (\text{Item 9} * \text{Item 10}) + (\text{Item 11} * \text{Item 12}) + (\text{Item 13} * (\text{Item 4} / 12))]$	N/A	-	-
15 Underground Retention Volume (ft ³) Volume determined using manufacturer's specifications and calculations	4,917.45	-	-
16 Total Retention Volume from LID Infiltration BMPs: 4,917.45 CF (Sum of Items 14 and 15 for all infiltration BMP included in plan)			
17 Fraction of DCV achieved with infiltration BMP: 104.32% $\text{Retention\%} = \text{Item 16} / \text{Form 4.2-1 Item 7}$			
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 BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs. Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs (DA 1) (N/A)			
1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft ³): N/A <i>V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 - Form 4.3-3 Item 16</i>			
BMP Type(s) <i>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</i>	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
2 Describe cistern or runoff detention facility	N/A	N/A	N/A
3 Storage volume for proposed detention type (ft ³) <i>Volume of cistern</i>	N/A	N/A	N/A
4 Landscaped area planned for use of harvested stormwater (ft ²)	N/A	N/A	N/A
5 Average wet season daily irrigation demand (in/day) <i>Use local values, typical ~ 0.1 in/day</i>	N/A	N/A	N/A
6 Daily water demand (ft ³ /day) <i>Item 4 * (Item 5 / 12)</i>	N/A	N/A	N/A
7 Drawdown time (hrs) <i>Copy Item 6 from Form 4.2-1</i>	N/A	N/A	N/A
8 Retention Volume (ft ³) <i>V_{retention} = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))</i>	N/A	N/A	N/A
9 Total Retention Volume (ft ³) from Harvest and Use BMP N/A <i>Sum of Item 8 for all harvest and use BMP included in plan</i>			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☐ No ☐ <i>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.</i>			

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).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1) (N/A)		
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 <i>(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)</i>	Volume-based biotreatment <i>Use Forms 4.3-6 and 4.3-7 to compute treated volume</i>	Flow-based biotreatment <i>Use Form 4.3-8 to compute treated volume</i>
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft ³): N/A 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): N/A Item 1 – Item 3	5 Remaining fraction of LID DCV for sizing flow based biotreatment BMP: N/A% Item 4 / Item 1
6 Flow-based biotreatment BMP capacity provided (cfs): N/A 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 (N/A)

Biotreatment BMP Type (Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A	DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)
1 Pollutants addressed with BMP <i>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</i>	N/A	N/A	N/A
2 Amended soil infiltration rate <i>Typical ~ 5.0</i>	N/A	N/A	N/A
3 Amended soil infiltration safety factor <i>Typical ~ 2.0</i>	N/A	N/A	N/A
4 Amended soil design percolation rate (in/hr) $P_{design} = \text{Item 2} / \text{Item 3}$	N/A	N/A	N/A
5 Ponded water drawdown time (hr) <i>Copy Item 6 from Form 4.2-1</i>	N/A	N/A	N/A
6 Maximum ponding depth (ft) <i>see Table 5-6 of the TGD for WQMP for reference to BMP design details</i>	N/A	N/A	N/A
7 Ponding Depth (ft) $d_{BMP} = \text{Minimum of } (1/12 * \text{Item 4} * \text{Item 5}) \text{ or Item 6}$	N/A	N/A	N/A
8 Amended soil surface area (ft ²)	N/A	N/A	N/A
9 Amended soil depth (ft) <i>see Table 5-6 of the TGD for WQMP for reference to BMP design details</i>	N/A	N/A	N/A
10 Amended soil porosity, n	N/A	N/A	N/A
11 Gravel depth (ft) <i>see Table 5-6 of the TGD for WQMP for reference to BMP design details</i>	N/A	N/A	N/A
12 Gravel porosity, n	N/A	N/A	N/A
13 Duration of storm as basin is filling (hrs) <i>Typical ~ 3hrs</i>	N/A	N/A	N/A
14 Biotreated Volume (ft ³) $V_{biotreated} = \text{Item 8} * [(\text{Item 7} / 2) + (\text{Item 9} * \text{Item 10}) + (\text{Item 11} * \text{Item 12}) + (\text{Item 13} * (\text{Item 4} / 12))]$	N/A	N/A	N/A
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: N/A <i>Sum of Item 14 for all volume-based BMPs included in this form</i>			

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

Biotreatment BMP Type <i>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.</i>	DA N/A DMA N/A BMP Type N/A		DA N/A DMA N/A BMP Type N/A (Use additional forms for more BMPs)	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin <i>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</i>	N/A	N/A	N/A	N/A
2 Bottom width (ft)	N/A	N/A	N/A	N/A
3 Bottom length (ft)	N/A	N/A	N/A	N/A
4 Bottom area (ft ²) $A_{bottom} = \text{Item 2} * \text{Item 3}$	N/A	N/A	N/A	N/A
5 Side slope (ft/ft)	N/A	N/A	N/A	N/A
6 Depth of storage (ft)	N/A	N/A	N/A	N/A
7 Water surface area (ft ²) $A_{surface} = (\text{Item 2} + (2 * \text{Item 5} * \text{Item 6})) * (\text{Item 3} + (2 * \text{Item 5} * \text{Item 6}))$	N/A	N/A	N/A	N/A
8 Storage volume (ft ³) <i>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</i> $V = \text{Item 6} / 3 * [\text{Item 4} + \text{Item 7} + (\text{Item 4} * \text{Item 7})^{0.5}]$	N/A	N/A	N/A	N/A
9 Drawdown Time (hrs) <i>Copy Item 6 from Form 2.1</i>	N/A		N/A	
10 Outflow rate (cfs) $Q_{BMP} = (\text{Item 8}_{forebay} + \text{Item 8}_{basin}) / (\text{Item 9} * 3600)$	N/A		N/A	
11 Duration of design storm event (hrs)	N/A		N/A	
12 Biotreated Volume (ft ³) $V_{biotreated} = (\text{Item 8}_{forebay} + \text{Item 8}_{basin}) + (\text{Item 10} * \text{Item 11} * 3600)$	N/A		N/A	
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : N/A <i>(Sum of Item 12 for all BMP included in plan)</i>				

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

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1) (N/A)	
1	Total LID DCV for the Project DA-1 (ft ³): 4,714 CF <i>Copy Item 7 in Form 4.2-1</i>
2	On-site retention with site design hydrologic source control LID BMP (ft ³): N/A <i>Copy Item 30 in Form 4.3-2</i>
3	On-site retention with LID infiltration BMP (ft ³): 4,917.45 CF <i>Copy Item 16 in Form 4.3-3</i>
4	On-site retention with LID harvest and use BMP (ft ³): N/A <i>Copy Item 9 in Form 4.3-4</i>
5	On-site biotreatment with volume based biotreatment BMP (ft ³): N/A <i>Copy Item 3 in Form 4.3-5</i>
6	Flow capacity provided by flow based biotreatment BMP (cfs): N/A <i>Copy Item 6 in Form 4.3-5</i>
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 ☐ <i>If yes, sum of Items 2, 3, and 4 is greater than Item 1</i> - 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 ☒ <i>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</i> - 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 ☒ <i>If yes, Form 4.3-1 Items 7 and 8 were both checked yes</i>
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: ☐ <i>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, $V_{alt} = (Item\ 1 - Item\ 2 - Item\ 3 - Item\ 4 - Item\ 5) * (100 - Form\ 2.4-1\ Item\ 2)\%$</i> - 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: ☐ <i>Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed</i>

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) (N/A)	
1 Volume reduction needed for HCOC performance criteria (ft ³): N/A <i>(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1</i>	2 On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft ³): N/A <i>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</i>
3 Remaining volume for HCOC volume capture (ft ³): N/A <i>Item 1 – Item 2</i>	4 Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft ³): N/A <i>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)</i>
5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ <i>Attach in-stream control BMP selection and evaluation to this WQMP</i>	
6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☐ <i>If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:</i> - Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐ <i>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)</i> - 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 ☐ <i>If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:</i> - Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐ <i>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)</i> - 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 ☐	

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
Landscape Maintenance	Owner	Mowing and clipping cleaning to maintain landscape areas and remove and replace landscape as necessary.	Weekly
Littering Control	Owner	Maintain waste collection areas and sweeping parking areas.	Daily/Weekly
Catch Basin	Owner	Visual inspection and debris removal.	Monthly
Fueling Area	Owner	Clean fuel pad and spill areas with absorbent spill cleaning materials as needed. Dispose of properly.	Daily
Irrigation	Owner	Provide high-efficient sprinklers system with rain sensors into the onsite sprinkler system. Sprinklers and sensors will be inspected for damage or defects and will be replaced immediately. Employ rain-triggered shutoff devices to prevent irrigation after precipitation, and design irrigation systems to each landscape area's specific water requirements, include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	Monthly
Parking Areas	Owner	Vacuum and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff. Clean out oil/sand separators regularly, especially after heavy storms.	Quarterly
Stenciling	Owner	Inspect stenciling and/or signs and perform necessary maintenance as required. Signs that are broken or damaged will be replaced by the owner immediately.	Annually
Storm Drain Piping	Building Owner	Inspection and sediment removal	Monthly

Water Quality Management Plan (WQMP)

Infiltration Chambers	Owner	Visual inspection of water ponding for more than 48 hours and debris removal.	Twice a year at the beginning and end of rainy season
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NOT FOR BID

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

Attachment A
WQMP Site Plan

NOT FOR BID

N MOUNTAIN VIEW AVENUE

38TH STREET

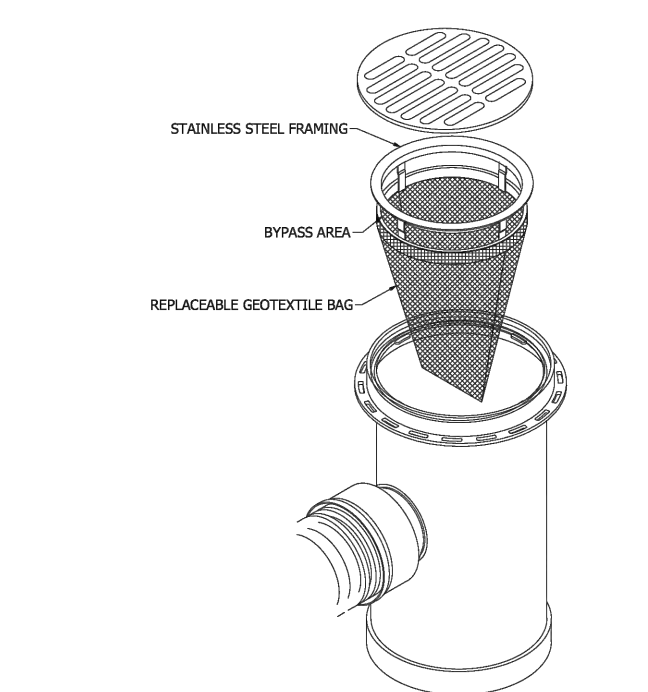
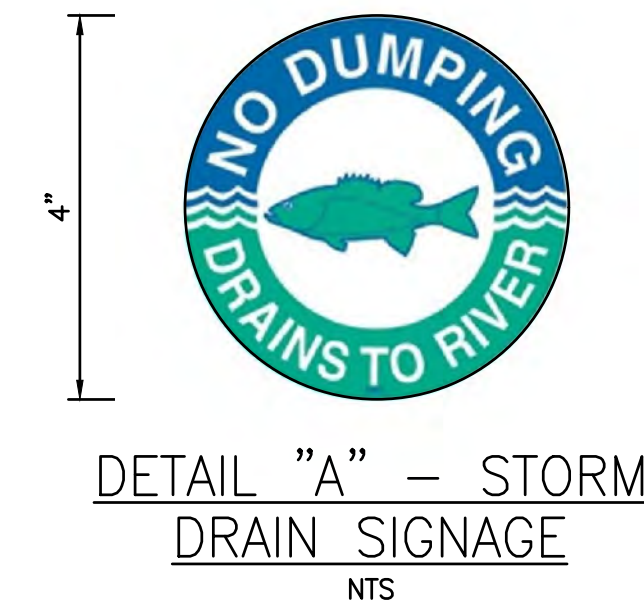
GENEVIEVE STREET

LEGEND

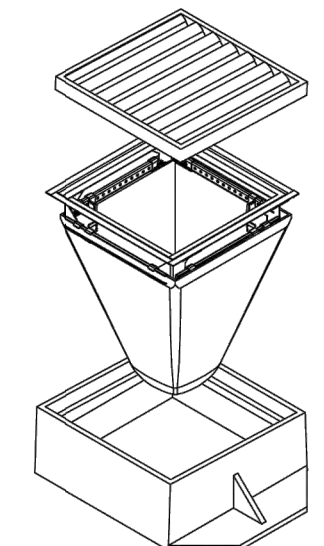
- DA1 DRAINAGE AREA (DA)
DMA-A DRAINAGE MANAGEMENT AREA (DMA)
1.00 ACRES NET AREA IN ACRES
DIRECTION OF SURFACE FLOW
DRAINAGE AREA
DMA BOUNDARY
PROPOSED PERVIOUS AREA (LANDSCAPE)
PROPOSED IMPERVIOUS AREA
BUILDING ROOF AREA
PROPOSED INFILTRATION CHAMBERS (BMP)
PROPOSED STORM DRAIN INLET/OUTLET
DISCHARGE LOCATION

STRUCTURAL BMP NOTES

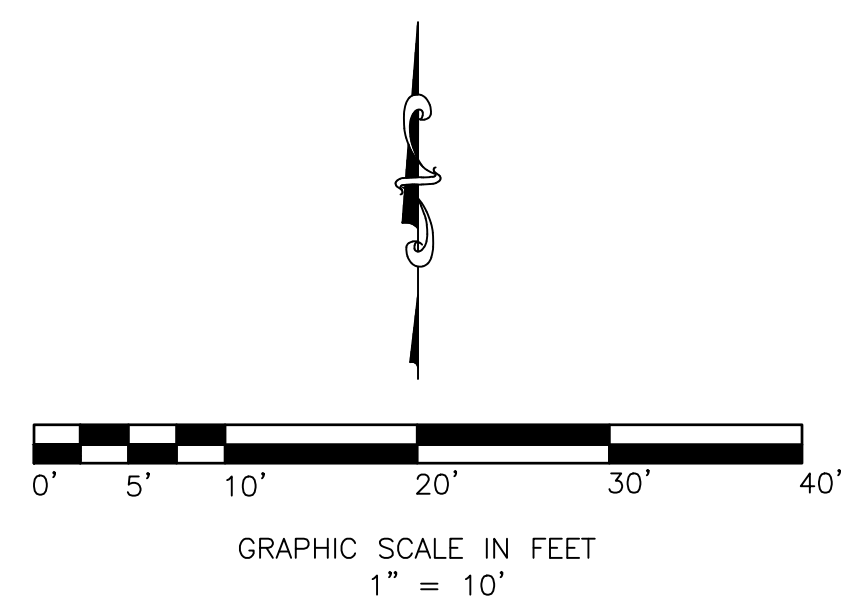
- 1 TREATMENT CONTROL BMP - UNDERGROUND CHAMBER SYSTEM
2 STORAGE BUILDING PER DETAIL ON SHEET A1.3 OF ARCHITECTURAL PLANS
3 TRASH STORAGE AREA PER DETAIL ON SHEET A1.3 OF ARCHITECTURAL PLANS
4 LANDSCAPE AND IRRIGATION SYSTEM DESIGN
5 FUELING AREA PER DETAIL ON SHEET A1.2 OF ARCHITECTURAL PLANS
6 STORM DRAIN SYSTEM STENCILING/SIGNAGE PER DETAIL "A"
7 INSTALL ADS FLEXSTORM PURE INLET FOR NYLOPLAST INLET, OR APPROVED EQUAL PER DETAIL "B"
8 INSTALL ADS FLEXSTORM PURE INLET FOR PRECAST CATCH BASIN, OR APPROVED EQUAL PER DETAIL "C"



DETAIL "B" - ADS FLEXSTORM
PURE INLET FILTER DETAIL FOR
NYLOPLAST INLET
NTS



DETAIL "C" - ADS FLEXSTORM
PURE INLET FILTER DETAIL FOR
PRECAST CATCH BASIN
NTS



DA ID	AREA (ACRES)	EXISTING IMPERVIOUS AREA	PROPOSED IMPERVIOUS AREA	REQUIRED VOLUME	DESIGN VOLUME	BMP (SIZE AND TYPE)
DA 1	1.18	0%	77%	4,714 CF	4,917.45 CF	BMP 1: UNDERGROUND CHAMBERS



PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY
PROJECT & FACILITIES
MANAGEMENT DEPARTMENT

385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:
SAN BERNARDINO
COUNTY FIRE
DEPARTMENT:
FIRE STATION 227

PROJECT # 10.10.1202

CIP #22-105

APN: 0154-281-01

180 W. 38TH STREET
SAN BERNARDINO,
CA 92405

ISSUE INFORMATION:

DATE:	INFORMATION:
03-14-25	Plan Check 1
05-13-25	Plan Check 2

SHEET INFORMATION:

STK PROJECT NO.: 374-193-24
SCALE: AS NOTED
DATE: DECEMBER 2024
PLOT DATE: -
DRAWING NAME: -

SEAL:



SHEET TITLE:

WQMP MAP

SHEET NO.:

1 OF 1

Attachment B
Construction Plans

NOT FOR BID

SAN BERNARDINO COUNTY

FIRE STATION NO.227

GRADING NOTES:

- ALL GRADING SHALL CONFORM TO THE LATEST CALIFORNIA BUILDING CODE (CBC) CHAPTERS 17, 18, APPENDIX-J AND ALL APPLICABLE SECTIONS.
- A GRADING PERMIT SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF ANY WORK ON THE SITE.
- ISSUANCE OF A GRADING PERMIT DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER REGULATORY AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED IN THIS PLAN.
- ALL WORK UNDER THIS PERMIT SHALL BE LIMITED TO WORK WITHIN THE PROPERTY LINES. A SEPARATE CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS MAY BE REQUIRED FOR ANY WORK WITHIN THE COUNTY RIGHT-OF-WAY.
- APPROVAL OF THESE PLANS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE EFFECTIVE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND VALID GRADING PERMIT HAS BEEN ISSUED.
- THIS PLAN IS FOR GRADING PURPOSES ONLY AND IS NOT TO BE USED FOR THE PURPOSE OF CONSTRUCTING ONSITE OR OFFSITE IMPROVEMENTS. ISSUANCE OF A PERMIT BASED ON THIS PLAN DOES NOT CONSTITUTE APPROVAL OF DRIVEWAY LOCATIONS OR SIZES, PARKING LOT STRUCTURAL SECTIONS OR LAYOUT, ADA-RELATED REQUIREMENTS, BUILDING LOCATIONS OR FOUNDATIONS, WALLS, CURBING, OFFSITE DRAINAGE FACILITIES OR OTHER ITEMS NOT RELATED DIRECTLY TO THE BASIC GRADING OPERATION. ONSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE APPROVED BUILDING PERMIT PLANS. OFFSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TO PLANS APPROVED FOR THIS PURPOSE BY THE PUBLIC WORKS DEPARTMENT.
- MAXIMUM CUT AND FILL SLOPE = 2:1 (HORIZONTAL TO VERTICAL) AND MAXIMUM VERTICAL HEIGHT = 30 FEET, UNLESS AN APPROVED GEOTECHNICAL REPORT CAN JUSTIFY A STEEPER AND TALLER SLOPE.
- NO FILL SHALL BE PLACED ON EXISTING GROUND UNTIL THE GROUND HAS BEEN CLEARED OF WEEDS, DEBRIS, TOPSOIL AND OTHER DELETERIOUS MATERIAL.
- FILL SLOPES SHALL NOT HAVE LESS THAN 90% RELATIVE COMPACTION, OR AS RECOMMENDED ON THE APPROVED GEOTECHNICAL REPORT.
- IT IS THE GRADING CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ADEQUATE COMPACTION HAS BEEN ATTAINED ON THE ENTIRE GRADING SITE, INCLUDING FILL AREAS OUTSIDE THE BUILDING PADS AND ON ALL FILL SLOPES.
- UNLESS OTHERWISE RECOMMENDED IN AN APPROVED GEOTECHNICAL REPORT, OVER-EXCAVATION SHALL BE AT LEAST 60" (5') MINIMUM BELOW THE BOTTOM OF FOOTINGS OR TO COMPETENT NATIVE SOIL OR BEDROCK MATERIALS, WHICHEVER IS DEEPER, AS APPROVED BY THE PROJECT'S GEOTECHNICAL ENGINEER OR GEOLOGIST.
- EARTHWORK VOLUMES:
CUT 1,311 (CY), FILL 129 (CY), TOTAL DISTURBED AREA 50,966 (SF)
- EARTHWORK QUANTITIES ARE SHOWN FOR GRADING PERMIT PURPOSES ONLY, AND SAN BERNARDINO COUNTY IS NOT RESPONSIBLE FOR THEIR ACCURACY.
- A COPY OF THE GRADING PERMIT AND APPROVED GRADING PLANS MUST BE IN THE POSSESSION OF A RESPONSIBLE PERSON AND AVAILABLE AT THE SITE AT ALL TIMES.
- ANY ONSITE RETAINING WALLS SHOWN ON THE GRADING PLANS THAT ARE OVER 4' IN HEIGHT, MEASURED FROM TOP OF WALL TO BOTTOM OF FOOTING, ARE FOR REFERENCE ONLY. RETAINING WALLS OVER 4' IN HEIGHT ARE NOT CHECKED, PERMITTED, OR INSPECTED PER THE GRADING PERMIT. A SEPARATE RETAINING WALL PERMIT IS REQUIRED FOR ALL RETAINING WALLS OVER 4' IN HEIGHT.
- ANY WALLS, FENCES, STRUCTURES AND/OR APPURTENANCES ADJACENT TO THIS PROJECT ARE TO BE PROTECTED IN PLACE. IF GRADING OPERATIONS DAMAGE OR ADVERSELY AFFECT SAID ITEMS IN ANY WAY, THE CONTRACTOR AND/OR DEVELOPER IS RESPONSIBLE FOR WORKING OUT AN ACCEPTABLE SOLUTION TO THE SATISFACTION OF THE AFFECTED PROPERTY OWNER(S).
- FOR SITES WITH PROTECTED SPECIES OR TREES, THE PROPOSED GRADING MAY BE SUBJECT TO A SEPARATE PERMIT.
- ADEQUATE FIRE ACCESS AROUND BUILDINGS (INCLUDING GARAGES) SHOULD BE PROVIDED AS APPROVED BY COUNTY FIRE.
- EXISTING DRAINAGE COURSES SHALL NOT BE OBSTRUCTED, ALTERED, OR DIVERTED WITHOUT PRIOR APPROVAL FROM THE COUNTY OF SAN BERNARDINO, LAND DEVELOPMENT DIVISION. A STREAMBED ALTERATION AGREEMENT MAY ALSO BE REQUIRED FROM THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE.
- DRAINAGE EASEMENTS SHALL NOT BE OBSTRUCTED, ALTERED OR DIVERTED WITHOUT PRIOR APPROVAL OF THE COUNTY OF SAN BERNARDINO, LAND DEVELOPMENT DIVISION.
- SETBACKS AND BUILDING LOCATIONS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
- UTILITY AND SEPTIC IMPROVEMENTS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
- A NOTICE OF INTENT (NOI) HAS BEEN, OR WILL BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN OR WILL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF CALIFORNIA GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (PERMIT NO. CAS000002) FOR ALL OPERATIONS ASSOCIATED WITH THESE PLANS. THE PERMITTEE SHALL KEEP A COPY OF THE SWPPP ON SITE AND AVAILABLE FOR REVIEW BY COUNTY.
- IN CONJUNCTION WITH THE CALIFORNIA GENERAL PERMIT FOR PROPOSED DISTURBANCE OVER ONE ACRE, AN ACTIVE WASTEWATER DISCHARGE ID # (WQID) _____ MUST BE INCLUDED ON THE FINAL GRADING PLAN.
- A FINAL GRADING CERTIFICATION WILL BE COLLECTED BY THE BUILDING INSPECTOR AT THE FINAL BUILDING INSPECTION OR PRIOR A GRADING FINAL STATUS ON THE PERMIT. THE FINAL GRADING CERTIFICATION IS TO BE COMPLETED BY THE ENGINEER OF RECORD ON THE APPROVED GRADING PLANS.
- THE SOILS ENGINEER SHALL PROVIDE A FINAL SOIL GRADING REPORT INCLUDING LOCATIONS AND ELEVATIONS OF FIELD DENSITY TESTS, SUMMARIES OF FIELD AND LABORATORY TESTS AND OTHER SUBSTANTIATING DATA AND COMMENTS ON ANY CHANGES MADE DURING GRADING AND THEIR EFFECT ON THE RECOMMENDATIONS MADE IN THE SOIL ENGINEERING INVESTIGATION REPORT. IT SHALL ALSO PROVIDE INFORMATION AS TO LOCATION AND NATURE OF TESTS, STATEMENTS RELATIVE TO THE EXPANSIVE NATURE OF SOIL AND/OR ROCK MATERIAL, LIMITS OF COMPACTED FILL SHOWN ON THE AS-GRADED PLAN AND CERTIFICATION AS TO THE ADEQUACY AND STABILITY OF THE SITE FOR THE INTENDED USE.
- IF APPLICABLE, THE ENGINEERING GEOLOGIST SHALL PROVIDE A GEOLOGIC GRADING REPORT INCLUDING A FINAL DESCRIPTION OF THE GEOLOGY OF THE SITE INCLUDING ANY NEW INFORMATION DISCLOSED DURING THE GRADING AND THE EFFECT OF SAME ON RECOMMENDATIONS INCORPORATED IN THE APPROVED GRADING PLAN. THE ENGINEERING GEOLOGIST SHALL PROVIDE CERTIFICATION AS TO THE ADEQUACY OF THE SITE FOR THE INTENDED USE AS AFFECTED BY GEOLOGIC FACTORS. WHERE NECESSARY, A REVISED GEOLOGIC MAP AND CROSS-SECTIONS, AND ANY RECOMMENDATIONS REGARDING SPECIAL BUILDING RESTRICTIONS OR FOUNDATION SETBACKS SHALL BE INCLUDED.
- SHOULD THE EXCAVATION DISCLOSE SOIL AND/OR ROCK CONDITIONS WHERE CUT SLOPES ARE UNSTABLE, THE ENGINEERING GEOLOGIST AND/OR THE SOILS ENGINEER SHALL RECOMMEND NECESSARY TREATMENT TO THE BUILDING OFFICIAL FOR APPROVAL.
- GEOLOGICAL AND SOILS ENGINEERING REPORTS BY INLAND FOUNDATION ENGINEERING, INC. DATED 09/06/2024 AND ALL SOILS REPORT ADDENDUM(S) SHALL BE INCORPORATED HEREWITH AND MADE PART OF THIS GRADING PLAN.
- THE CONTRACTOR SHALL IMPLEMENT PREVENTIVE MEASURES TO ASSURE THAT NO ROCKS, SOIL, DUST, OR DEBRIS OF ANY FORM SHALL FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES OR PUBLIC WAYS. ALL VEHICLE LOADS SHALL BE TRIMMED AND WATERED OR OTHERWISE SECURED TO PREVENT SPILLAGE FROM THE EQUIPMENT.
- ALL EXPORT AND IMPORT OF MATERIAL OVER DEDICATED AND IMPROVED STREETS SHALL BE UNDERTAKEN OR CONDUCTED BY EQUIPMENT THAT COMPLIES IN ALL RESPECTS TO THE STATE VEHICLE CODE. REPAIR TO ANY DAMAGED DEDICATED OR IMPROVED STREETS SHALL BE MADE TO THE SATISFACTION OF THE BUILDING OFFICIAL AND IS THE RESPONSIBILITY OF THE OWNER, PERMITTEE, AND THE GRADING CONTRACTOR.
- ALL FLOOD ZONE REQUIREMENTS MUST BE REFLECTED OR ACCOUNTED FOR ON THE GRADING PLANS. ELEVATIONS OR CONSTRUCTION NOTES MUST BE INCLUDED IN THE PLANS TO ENSURE COMPLIANCE WITH ALL APPLICABLE FIRST FLOOR ELEVATION REQUIREMENTS PER FEMA AND SAN BERNARDINO COUNTY DEVELOPMENT CODE GUIDELINES.
- ALL GRADING SHALL COMPLY WITH SBC DEVELOPMENT CODE SECTION 82.14.050.C; IF FILL IS PLACED TO ELEVATE PADS ABOVE BASE ELEVATION, IT MUST BE DEMONSTRATED THAT FILL WILL NOT SETTLE AND IS PROTECTED FROM EROSION, SCOUR, OR DIFFERENTIAL SETTLEMENT, AS FOLLOWS:
 - THE PAD ELEVATION SHALL BE CERTIFIED TO MEET OR EXCEED THE ELEVATION REQUIRED BY THE APPLICABLE FLOODPLAIN SAFETY REVIEW AREA, AND IT MUST BE DEMONSTRATED THAT THE CUMULATIVE EFFECT OF THE PROPOSED DEVELOPMENT WHEN COMBINED WITH ALL OTHER EXISTING AND ANTICIPATED DEVELOPMENT WILL NOT INCREASE THE WATER SURFACE ELEVATION OF THE BASE FLOOD AT ANY POINT WITHIN THE COMMUNITY.
 - FILL SHALL BE COMPACTED TO 95 PERCENT PER ASTM (AMERICAN SOCIETY OF TESTING MATERIALS) STANDARD D-698.
 - FILL SLOPES SHALL BE NO STEEPER THAN TWO FEET HORIZONTAL TO ONE FOOT VERTICAL RATIO UNLESS SUBSTANTIATING DATA FOR STEEPER SLOPES IS PROVIDED, AND THE SLOPES ARE APPROVED BY THE COUNTY.
 - FILL SLOPES ADJACENT TO A WATER COURSE MAY BE REQUIRED TO BE ARMORED WITH STONE, ROCK OR APPROVED EQUAL PROTECTION.
- FOR NONRESIDENTIAL PROJECTS, PROVIDE FOLLOWING NOTE ON PLANS:
CALIFORNIA GREEN BUILDING STANDARDS CODE
5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS
100 PERCENT OF TREES, STUMPS, ROCKS AND ASSOCIATED VEGETATION AND SOILS RESULTING PRIMARILY FROM LAND CLEARING SHALL BE REUSED OR RECYCLED. FOR A PHASED PROJECT, SUCH MATERIAL MAY BE STOCKPILED ON SITE UNTIL THE STORAGE SITE IS DEVELOPED.
EXCEPTION: REUSE, EITHER ON-OR OFF-SITE, OF VEGETATION OR SOIL CONTAMINATED BY DISEASE OR PEST INFESTATION.
- CONTRACTOR SHALL ACQUIRE ENCROACHMENT PERMITS, CONSTRUCTION PERMITS OR ACCEPTANCE CORRESPONDENCE IN KIND PRIOR TO EXCAVATION ON THE STREET FOR UTILITIES.
- CONTRACTOR SHALL FOLLOW MONUMENT PRESERVATION PER BUSINESS AND PROFESSIONS CODE § 8776

CIVIL ENGINEER'S STATEMENT:

I CERTIFY THAT I WILL BE RESPONSIBLE FOR THIS GRADING IN ACCORDANCE WITH SECTION 7014(C) OF THE BUILDING CODE TO INCLUDE INCORPORATING ALL RECOMMENDATIONS OF THE SOILS ENGINEER, REPORT AND BE RESPONSIBLE FOR PROFESSIONAL INSPECTION AND APPROVAL OF THE GRADING. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, INSPECTION AND APPROVAL AS TO THE ESTABLISHMENT OF LINE GRADE AND DRAINAGE OF DEVELOPMENT AREA. I WILL ALSO BE RESPONSIBLE FOR THE PREPARATION OF REVISED PLANS AND THE SUBMISSION OF 'AS GRADED' GRADING PLANS UPON THE COMPLETION OF THE WORK.

LEIDY STEPHANIA HERNANDEZ, P.E. 97548 05/12/2025
SUPERVISING CIVIL ENGINEER R.C.E. NUMBER SIGNATURE DATE

SOILS ENGINEER'S STATEMENT:

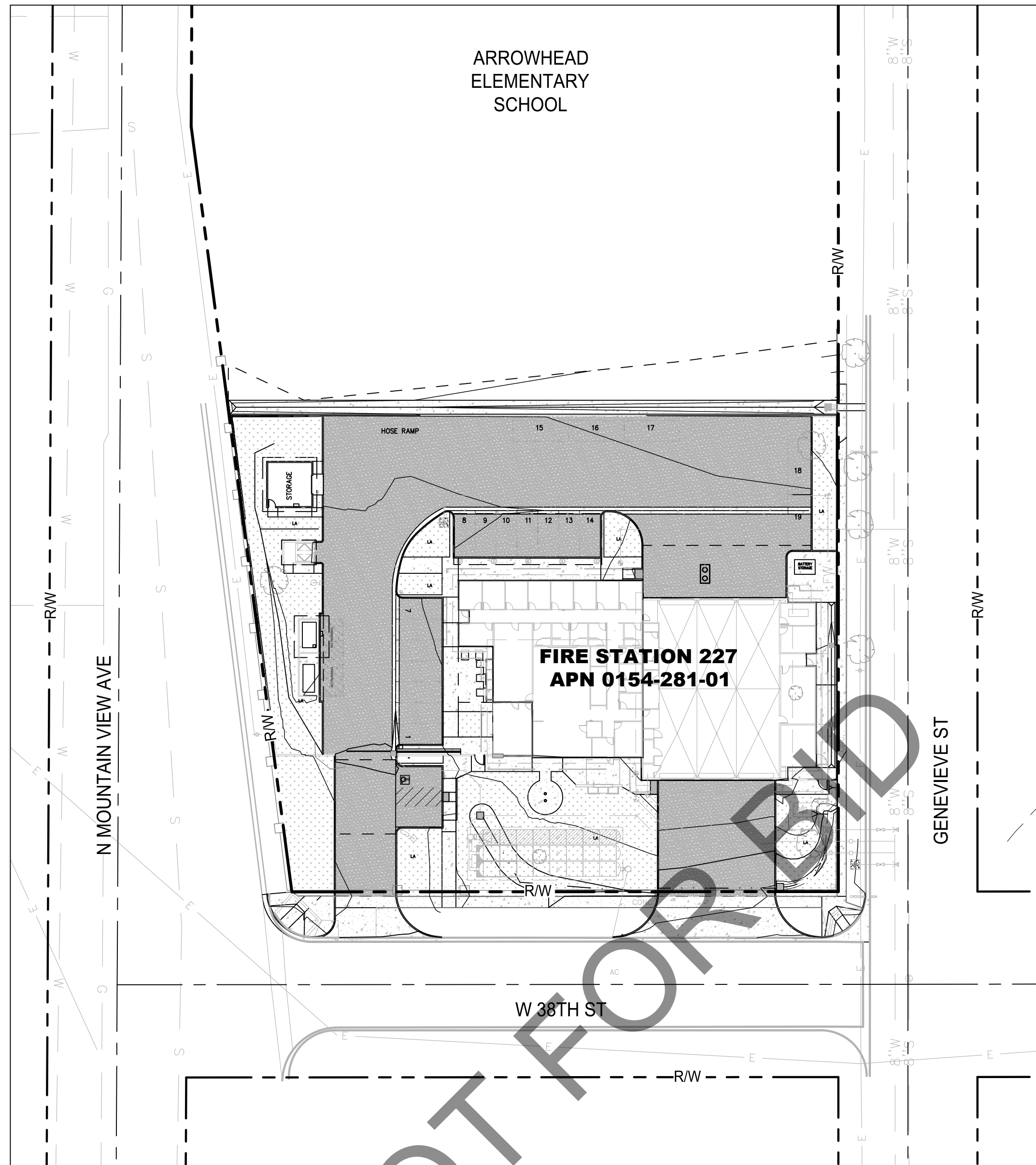
I SHALL PROVIDE PROFESSIONAL INSPECTION AND APPROVAL CONCERNING THE PREPARATION OF GROUND TO RECEIVE FILLS, TESTING FOR REQUIRED COMPACTION STABILITY OF ALL FILL SLOPES AND INCORPORATING THE DATE SUPPLIED BY THE ENGINEERING GEOLOGIST AND THE PREPARATION OF THE SOILS GRADING REPORT.

ALLEN D. EVANS, P.E., G.E. 2060
SUPERVISING CIVIL ENGINEER R.C.E. NUMBER SIGNATURE DATE

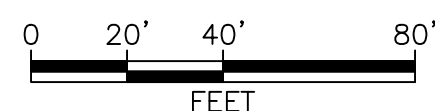
NO GRADING IN EXCESS OF 5000 CU. YDS. SHALL BE STARTED WITHOUT FIRST NOTIFYING THE ENGINEER. A PRE-GRADING MEETING AT THE SITE IS REQUIRED BEFORE START OF FILLING WITH THE FOLLOWING PEOPLE PRESENT: OWNER, GRADING CONTRACTOR, SUPERVISING CIVIL ENGINEER, SOILS ENGINEER AND/OR GEOLOGIST, CITY CONSTRUCTION INSPECTORS OR THEIR REPRESENTATIVES.

THE PERMITTEE OR HIS AGENT SHALL NOTIFY THE CITY OF SAN BERNARDINO WHEN THE GRADING OPERATION (EXCEEDING 5000 CU. YDS.) IS READY FOR REQUIRED INSPECTIONS AS SHOWN IN THE TESTING AND INSPECTION REQUIREMENTS OF DIVISION V.

WATER, SEWER AND PLUMBING ELEMENTS PER SEPARATE PERMIT.



LOCATION MAP
SCALE 1"=40'



LEGEND:

PROPOSED RIGHT OF WAY	--- R/W ---	POWER POLE	⚡
PROPOSED IMPROVEMENTS	---	STREET LIGHT	☀
PROPOSED DRAINAGE FLOW LINE	---	FIRE HYDRANT	⚡
EXISTING IMPROVEMENTS	---	UTILITY VALVE	⚡
EXISTING OVERHEAD LINE	--- OH/L ---	PALM TREE	🌴
EXISTING GAS LINE	--- G ---	TREE	🌳
EXISTING SEWER LINE	--- S ---	EXISTING SIGN	Ⓜ
EXISTING STORM DRAIN LINE	--- SD ---	UTILITY PULL BOX	Ⓜ
EXISTING TELECOMM.	--- FO ---	STORM DRAIN MANHOLE	Ⓜ
EXISTING WATER LINE	--- W ---	TELEPHONE MANHOLE	Ⓜ
℄/CENTER LINE	---	ELECTRICAL MANHOLE	Ⓜ
PROPOSED ELEVATION CONTOUR	--- 12XX.XX ---	SEWER MANHOLE	Ⓜ
EXISTING ELEVATION CONTOUR	--- (12XX.XX) ---	WATER MANHOLE	Ⓜ
SIDE SLOPE	---	WATER METER	Ⓜ
		ELECTRICAL PULLBOX	Ⓜ
		BENCH MARK	Ⓜ
		SPOT ELEVATION	Ⓜ
		FENCE	Ⓜ

HATCH LEGEND:

CONSTRUCT PCC SIDEWALK	---
CONSTRUCT PCC IMPROVEMENTS	---

SHEET NO.

C-1	TITLE SHEET
C-2	DETAILS SHEET
C-3	DETAILS SHEET
C-4	GRADING PLAN
C-5	ON-SITE UTILITIES
C-6	EROSION CONTROL

EARTHWORK QUANTITIES

CUT=	1,311 C.Y.
FILL=	129 C.Y.
TOTAL EXPORT =	1182 C.Y.

EARTHWORK NOTE:
EARTHWORK VOLUMES SHOWN HERE ARE FOR FEE PURPOSES ONLY NOT FOR BIDDING. CONTRACTOR SHALL PERFORM INDEPENDENT EARTHWORK CALCULATIONS AND BID A COMPLETE JOB.
THE SOURCE OF FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD AND THE BUILDING DEPARTMENT BEFORE IMPORT OF THE MATERIAL.

LEGEND

AC	ASPHALT CONCRETE
℄	CENTER LINE
C&G	CURB AND GUTTER
FF	FINISHED FLOOR
FL	FLOW LINE
FS	FINISHED SURFACE
GB	GRADE BREAK
NTS	NOT TO SCALE
PL	PROPERTY LINE
RL	RIDGE LINE
R/W	RIGHT OF WAY
SWR	SEWER
TC	TOP OF CURB
TD	TOP OF DITCH
TF	TOP OF FOOTING
TG	TOP OF GRATE
TW	TOP OF WALL
TYP.	TYPICAL

UTILITIES CONTACT

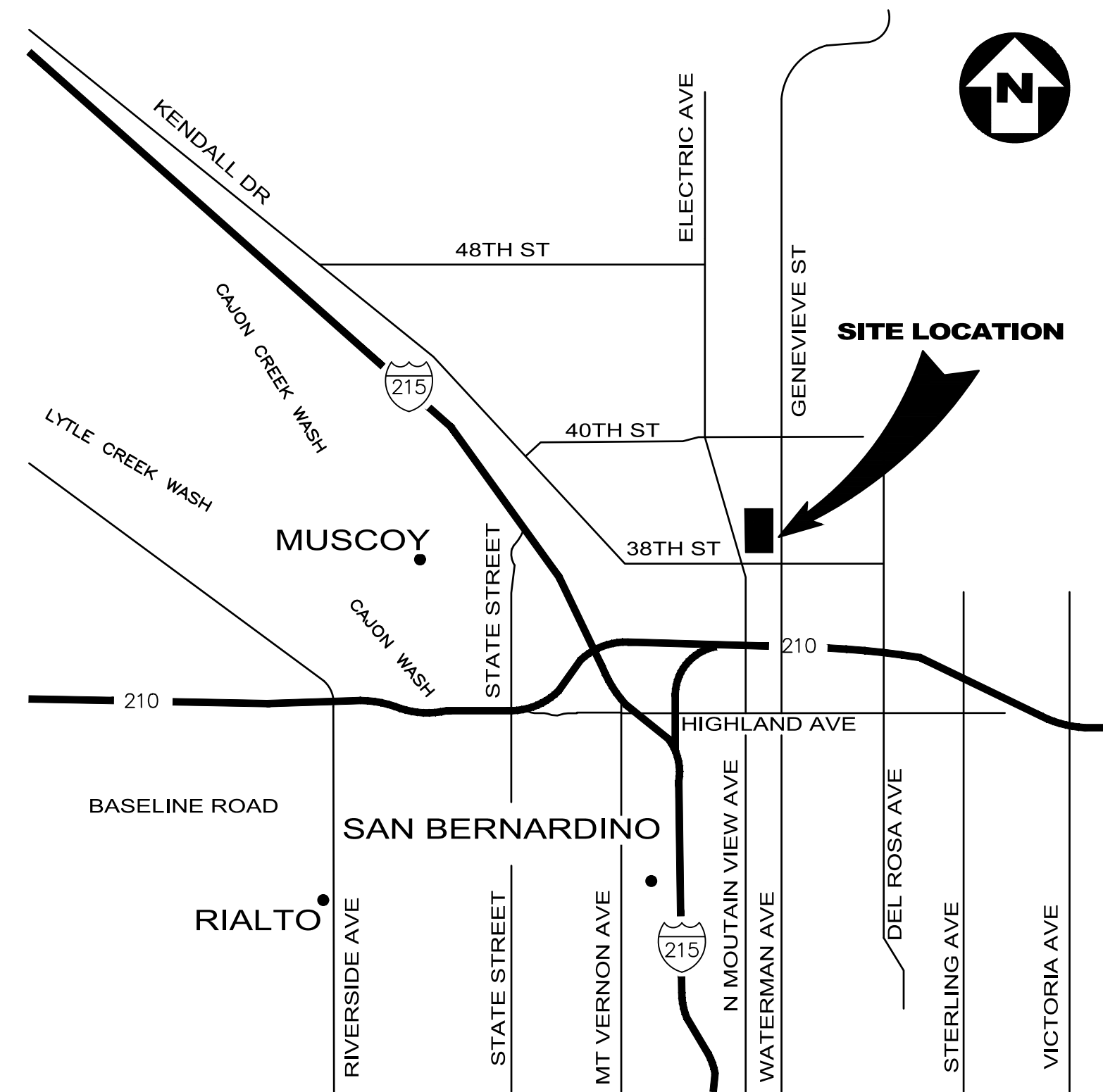
SOUTHERN CALIFORNIA EDISON
1-800-990-7788

SOUTHERN CALIFORNIA GAS
1-800-427-2000

FRONTIER
(877) 599-1870

SPECTRUM
(833) 267-6094

SAN BERNARDINO MUNICIPAL WATER DISTRICT
1350 SOUTH E STREET
SAN BERNARDINO, CA 92408
(909) 384-5141



VICINITY MAP
NTS

OWNER/APPLICANT
SAN BERNARDINO COUNTY PROJECT & FACILITIES MANAGMENT DEPARTMENT
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA, 92415
(909) 387-5000

TOPOGRAPHY SOURCE
ERSC INC., DATED 07/26/2024
1810 W. REDLANDS AVE., REDLANDS, CALIFORNIA 92373
(909) 890-1255

ROBERT OLLERTON 7731 05/13/25
SUPERVISING LAND SURVEYOR L.S. NUMBER SIGNATURE DATE

SITE ADDRESS
180 W. 38TH STREET, SAN BERNARDINO CA 92405

BENCH MARK
VERTICAL CONTROL FOR THIS SURVEY IS A NGS: BENCHMARK A-6-11

DESCRIPTION: "A-6-11" DESCRIBED BY METRO WATER DISTR SO. CALIFORNIA 1993
SAN BERNARDINO, AT THE NORTHWEST CORNER OF 48TH ST. AND H STREET (AKA 42ND ST AND E ST.),
42 FEET (12.8 M) NORTH OF 48TH ST AND 46 FEET (14.0 M) WEST OF H ST., IN TOP OF A CONCRETE
POST 0.4 FOOT (12.2CM) BELOW CONCRETE SIDEWALK AND 10 FEET NORTHWEST OF CURB FACE.

ELEVATION:1364.63' (NAVD88)

TOTAL DISTURBED AREA WDID GRADING PERMIT
1.18 ACRES TBA GRAD-2025-000008

ASSESSOR PARCEL NUMBER
0154-281-01

GEOTECHNICAL ENGINEER'S
GEOLOGIC HAZARDS EVALUATION/GEOTECHNICAL INVESTIGATION, DATED 09/06/2024
INLAND FOUNDATION ENGINEERING, INC. 1310 S. SANTA FE AVENUE, SAN JACINTO, CALIFORNIA 92581
(951) 654-1555

FEMA FLOOD ZONE INFORMATION

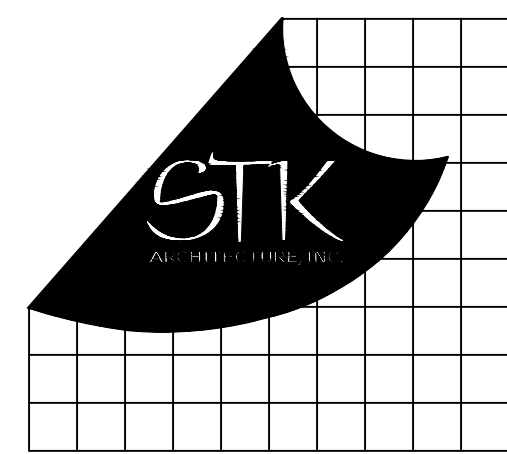
THIS PROJECT IS LOCATED IN FLOOD ZONE X, AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1%ANNUAL CHANCE FLOOD PER FEMA FLOOD INSURANCE RATE MAP NUMBER 06071C7945H EFFECTIVE AUGUST 28, 2008.

LEGAL DESCRIPTION

PTN W 1/2 NE 1/4 SEC 22 TP 1N 1R 4W COM ON E LI MT VIEW AVE S 00 DEG 17 1/2 MIN W 480 FT FROM SW COR LOT 15 TR 1948 TH S 00 DEG 17 1/2 MIN W 794.51 FT TH S 89 DEG 34 1/2 MIN E 274.13 FT TH N 00 DEG 17 1/2 MIN E 794.51 FT TH N 89 DEG 34 1/2 MIN W 274.13 FT TO BEG EX STREET

EROSION CONTROL NOTES:

- IN CASE OF EMERGENCY, CALL ERNESTO GONZALEZ AT 909 387-5000.
- POLLUTION AND EROSION PREVENTION MEASURES, ALSO KNOWN AS BEST MANAGEMENT PRACTICES (BMPs), MUST BE INSTALLED PRIOR TO GRADING. THESE MEASURES, INCLUDING THE PREVENTION OF SEDIMENTATION OR FLOOD DAMAGE, TO OFFSITE PROPERTY SHALL BE ADEQUATE WHETHER OR NOT AN EROSION CONTROL PERMIT IS REQUIRED.
- ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
- EROSION CONTROL DEVICES SHALL BE FUNCTIONING AT ALL TIMES. IN CASE OF FAILURE, RAPID CONSTRUCTION OF EMERGENCY DEVICES SHALL BE IMPLEMENTED.
- STOCKPILES OF EARTH AND OTHER CONSTRUCTION-RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
- FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOILS AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
- EXCESS OR WASTE CONCRETE MUST BE CONTAINED ONSITE. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ONSITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
- DEVELOPERS/CONTRACTORS ARE RESPONSIBLE TO ENSURE ALL EROSION CONTROL DEVICES AND BMPs ARE INSTALLED AND FUNCTIONING PROPERLY PER PLAN. PROPER PRECAUTION SHALL BE CONSIDERED WHEN 50% OR GREATER PROBABILITY OF PREDICTED PRECIPITATION, AND AFTER ACTUAL PRECIPITATION. A CONSTRUCTION SITE INSPECTION CHECKLIST AND INSPECTION LOG SHALL BE MAINTAINED AT THE PROJECT SITE AT ALL TIMES AND AVAILABLE FOR REVIEW BY THE BUILDING OFFICIAL.
- TRASH AND CONSTRUCTION-RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
- SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEEP UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
- ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.
- ALL SILT AND DEBRIS SHALL BE REMOVED FROM ALL DEVICES WITHIN 24 HOURS AFTER EACH RAINSTORM AND BE DISPOSED OF PROPERLY.
- ALL STORM WATER CAPTURE DEVICES SHALL BE PROTECTED AT ALL TIMES.
- EROSION AND SEDIMENT CONTROL PRACTICES SHOULD BE IN CONFORMANCE WITH STANDARD PRACTICE. THE MOST COMMON EROSION CONTROL MEASURES ARE:
 - SCHEDULING
 - PRESERVATION OF EXISTING VEGETATION
 - STOCKPILE MANAGEMENT
 - SILT FENCE
 - FIBER ROLLS
 - SANDBAG BARRIER
 - STRAW BALE BARRIER
 - STORM DRAIN INLET PROTECTION
 - CONCRETE WASTE MANAGEMENT
 - VEHICLE AND EQUIPMENT MAINTENANCE
 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
 - ENTRANCE/EXIT TIRE WASH
 - WIND EROSION CONTROL
 - DUST SHALL BE CONTROLLED BY WATERING.



CONSULTANT:



PROJECT ADMINISTERED BY:
SAN BERNARDINO COUNTY
PROJECT & FACILITIES
MANAGEMENT DEPARTMENT

385 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415

PROJECT NAME:

SAN BERNARDINO
COUNTY FIRE
DEPARTMENT:
FIRE STATION 227

PROJECT # 10.10.1202

CIP #22-105

APN: 0154-281-01

180 W. 38TH STREET
SAN BERNARDINO,
CA 92405

ISSUE INFORMATION:

DATE:	INFORMATION:
03-14-25	Plan Check, 1
05-13-25	Plan Check, 2

SHEET INFORMATION:

STK PROJECT NO.: 374-193-24
SCALE: AS NOTED
DATE: DECEMBER 2024
PLOT DATE: -
DRAWING NAME:

SEAL:



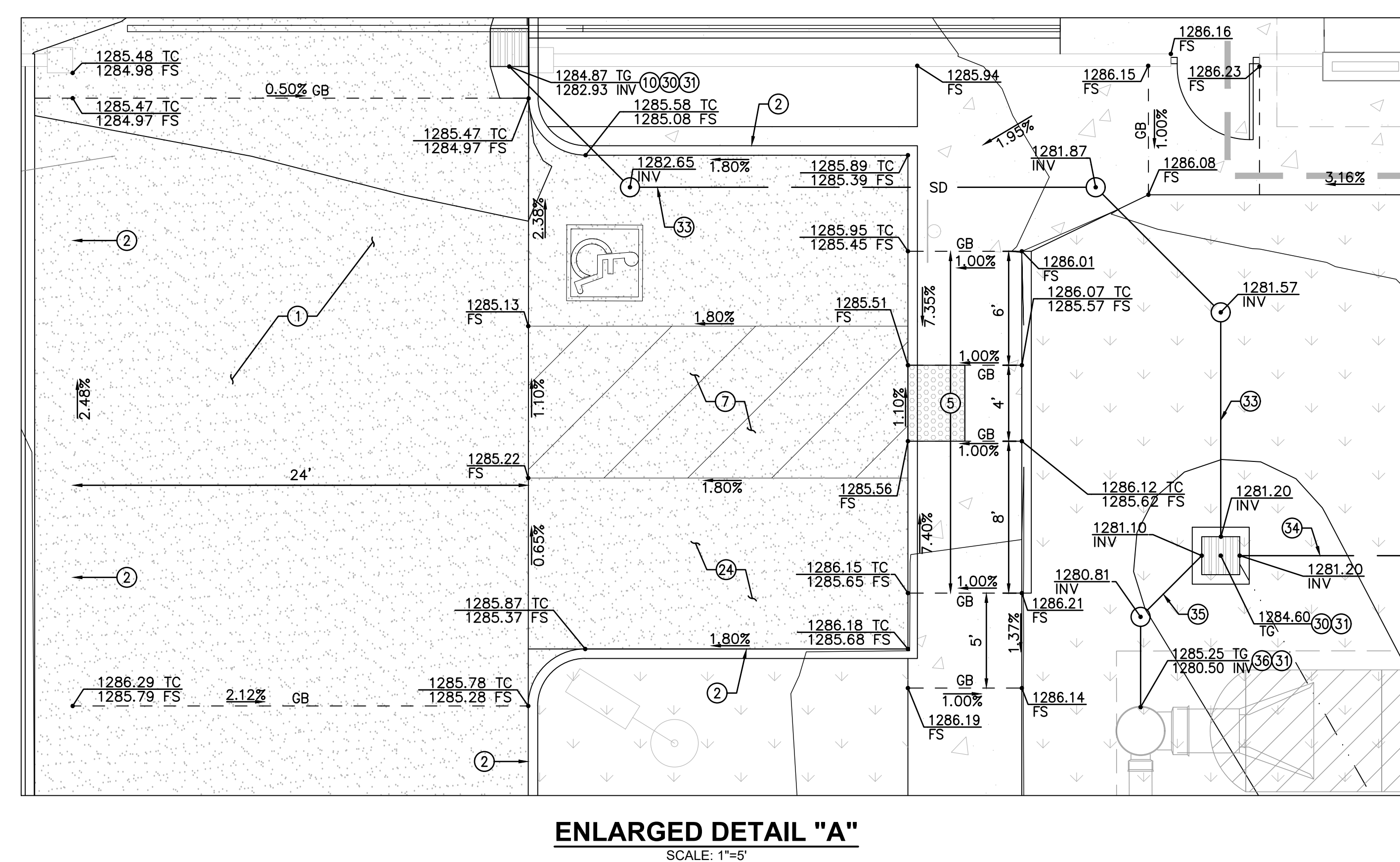
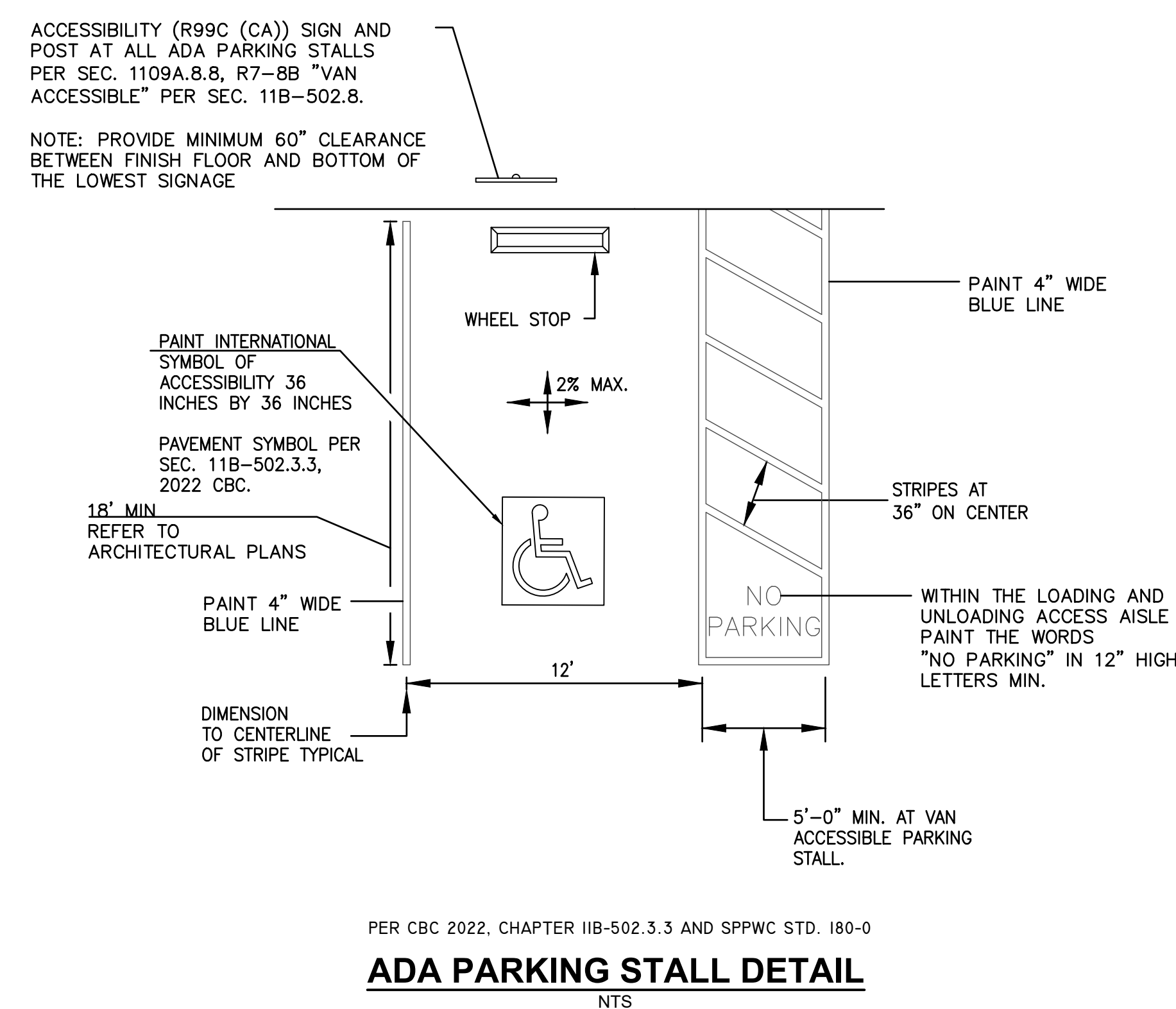
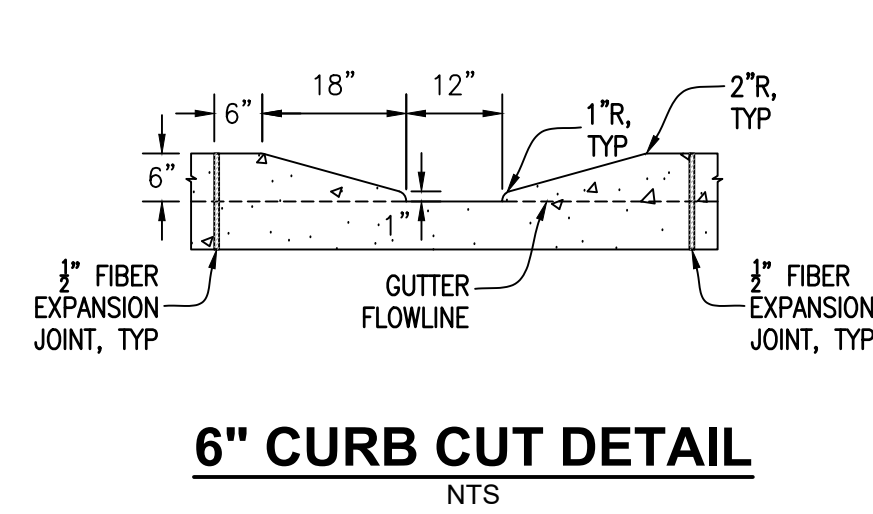
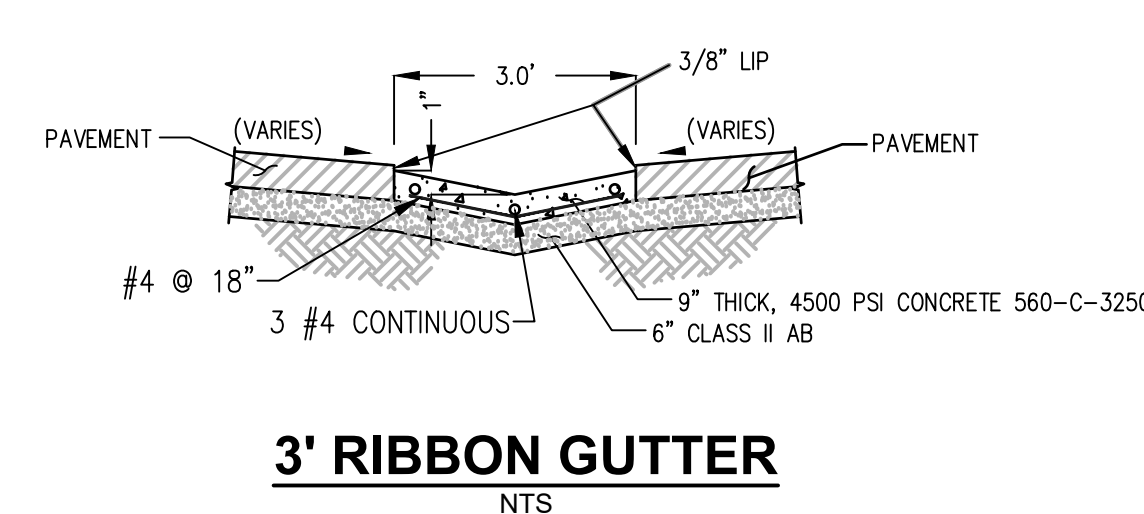
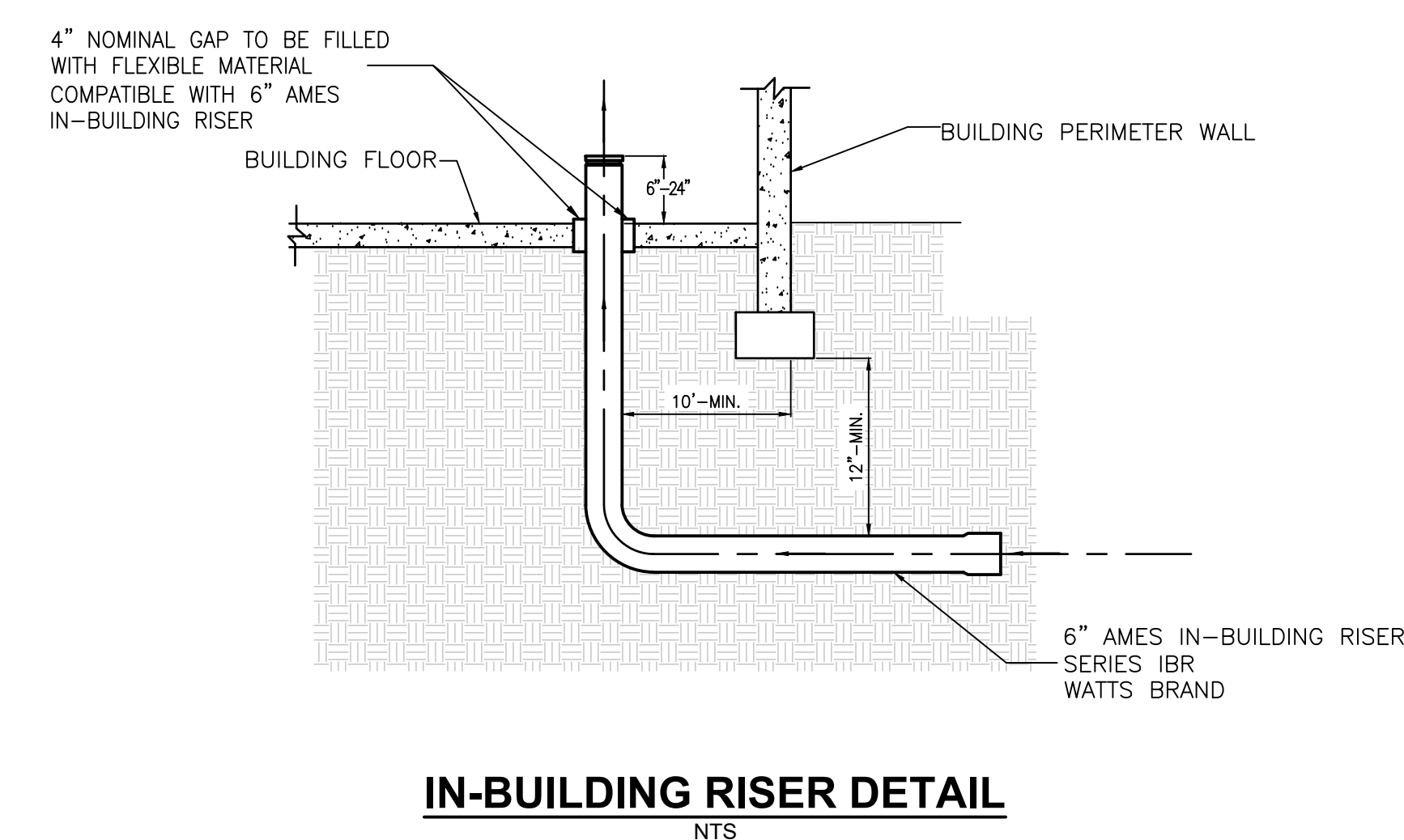
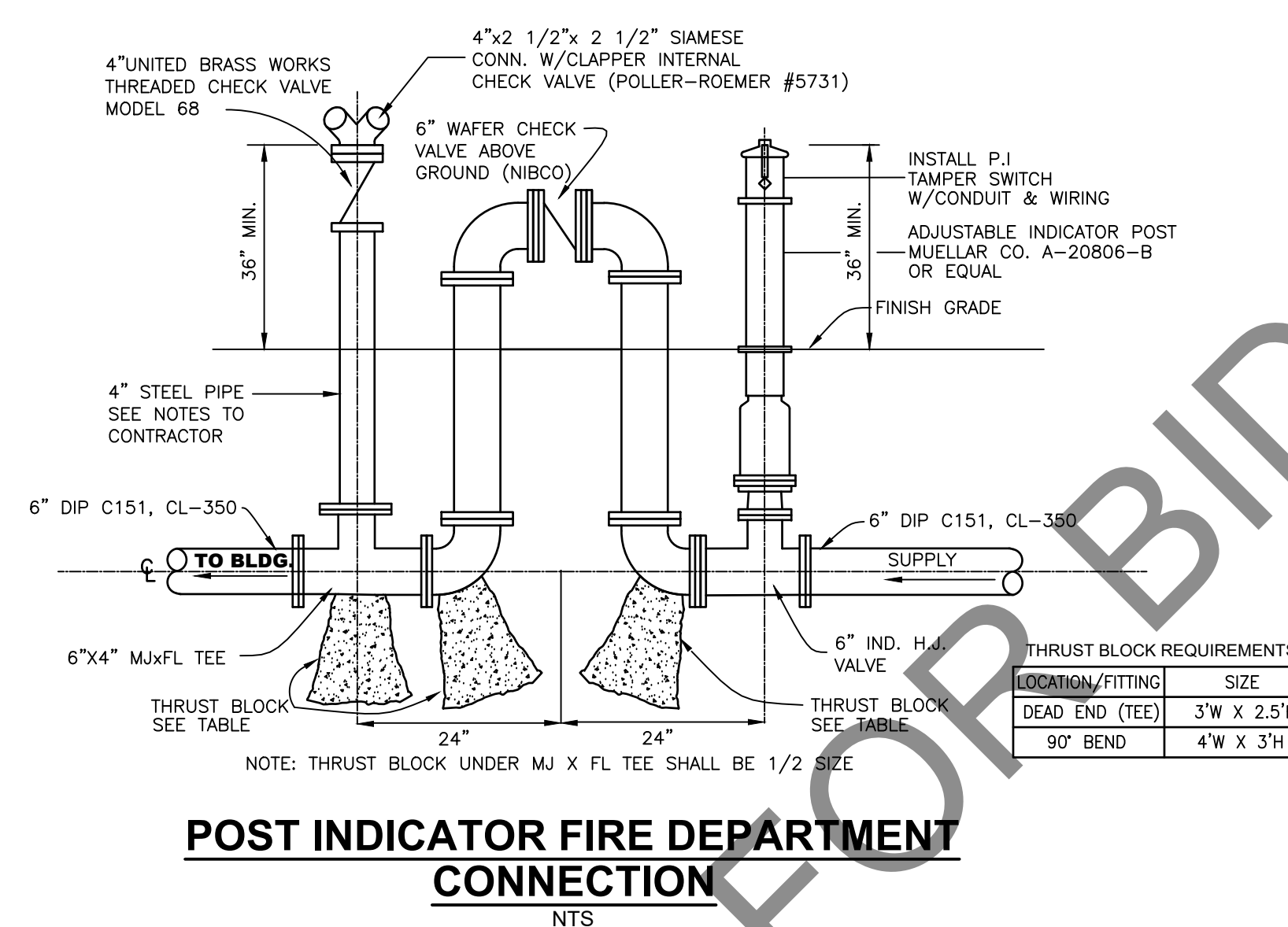
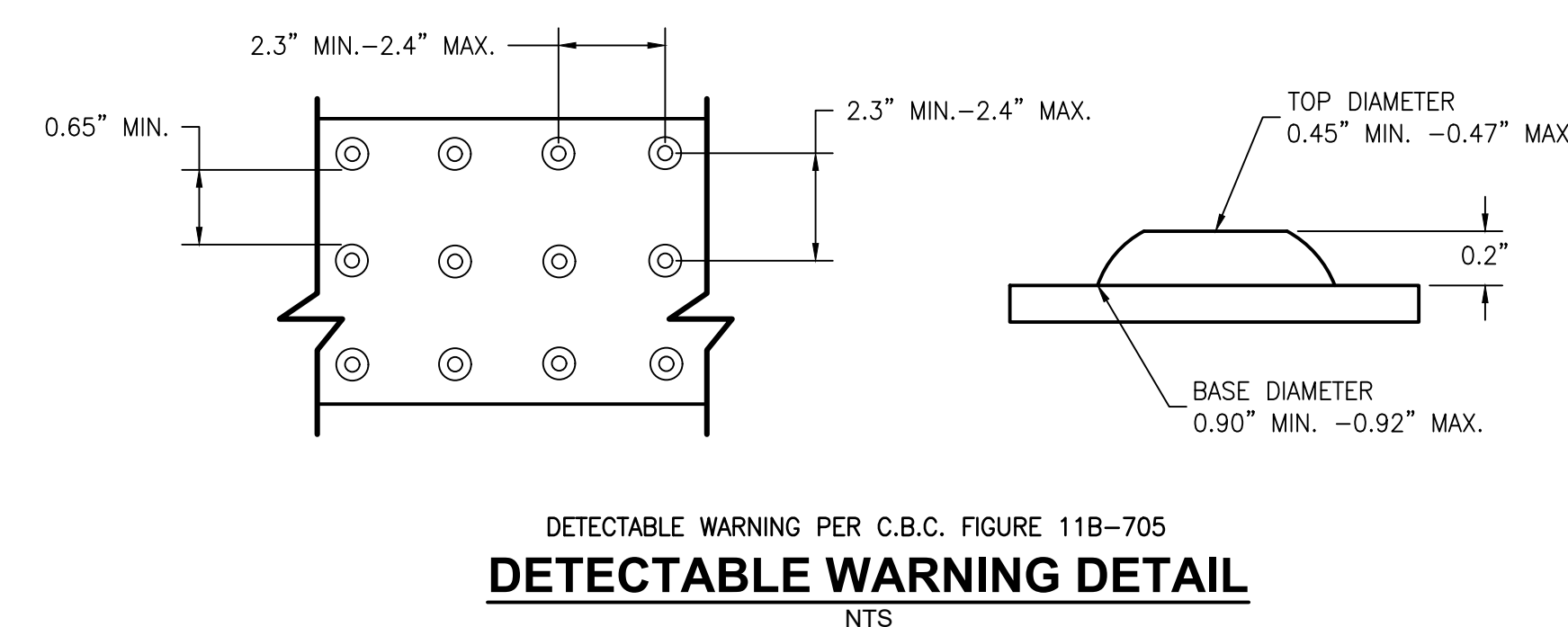
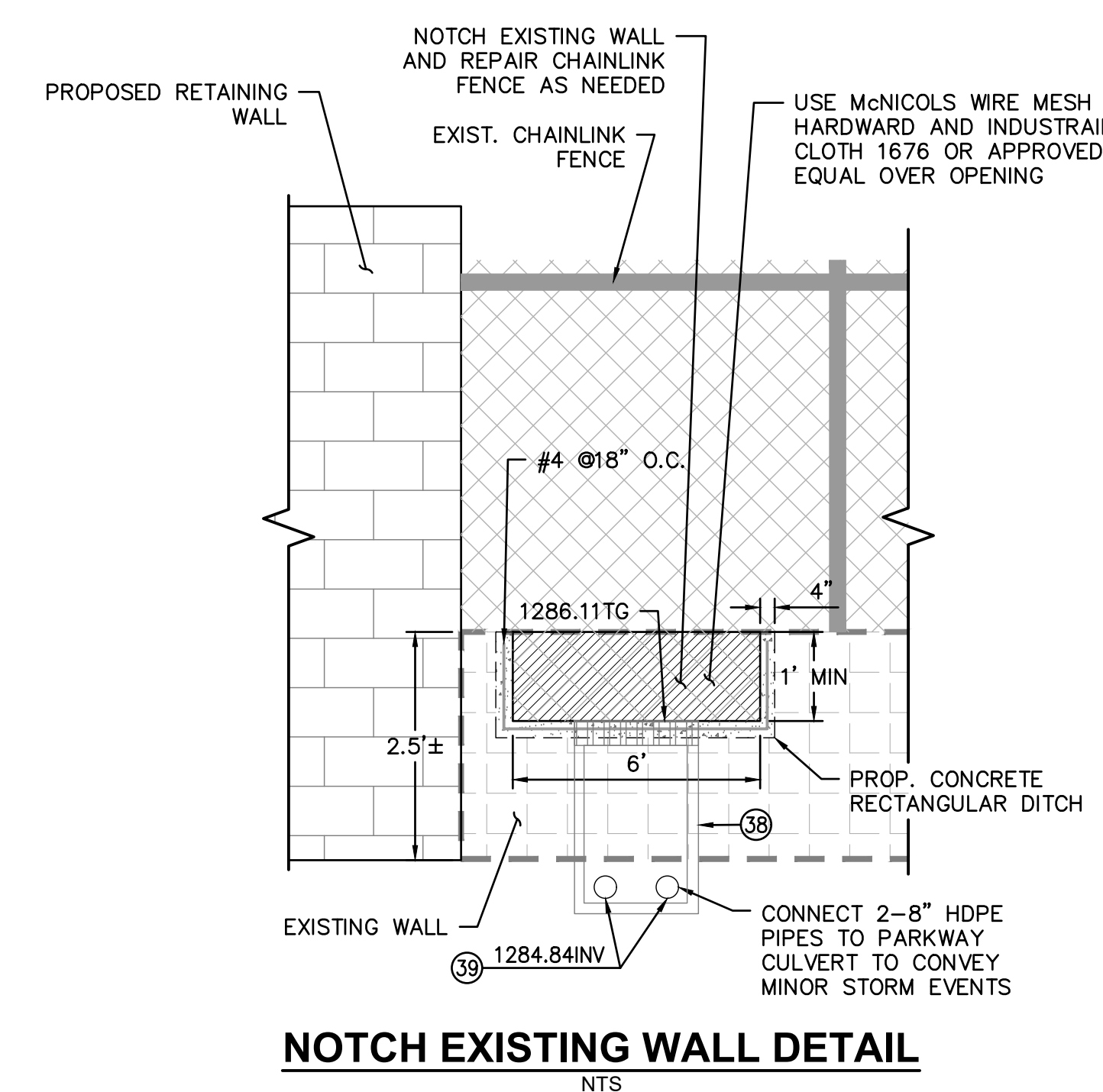
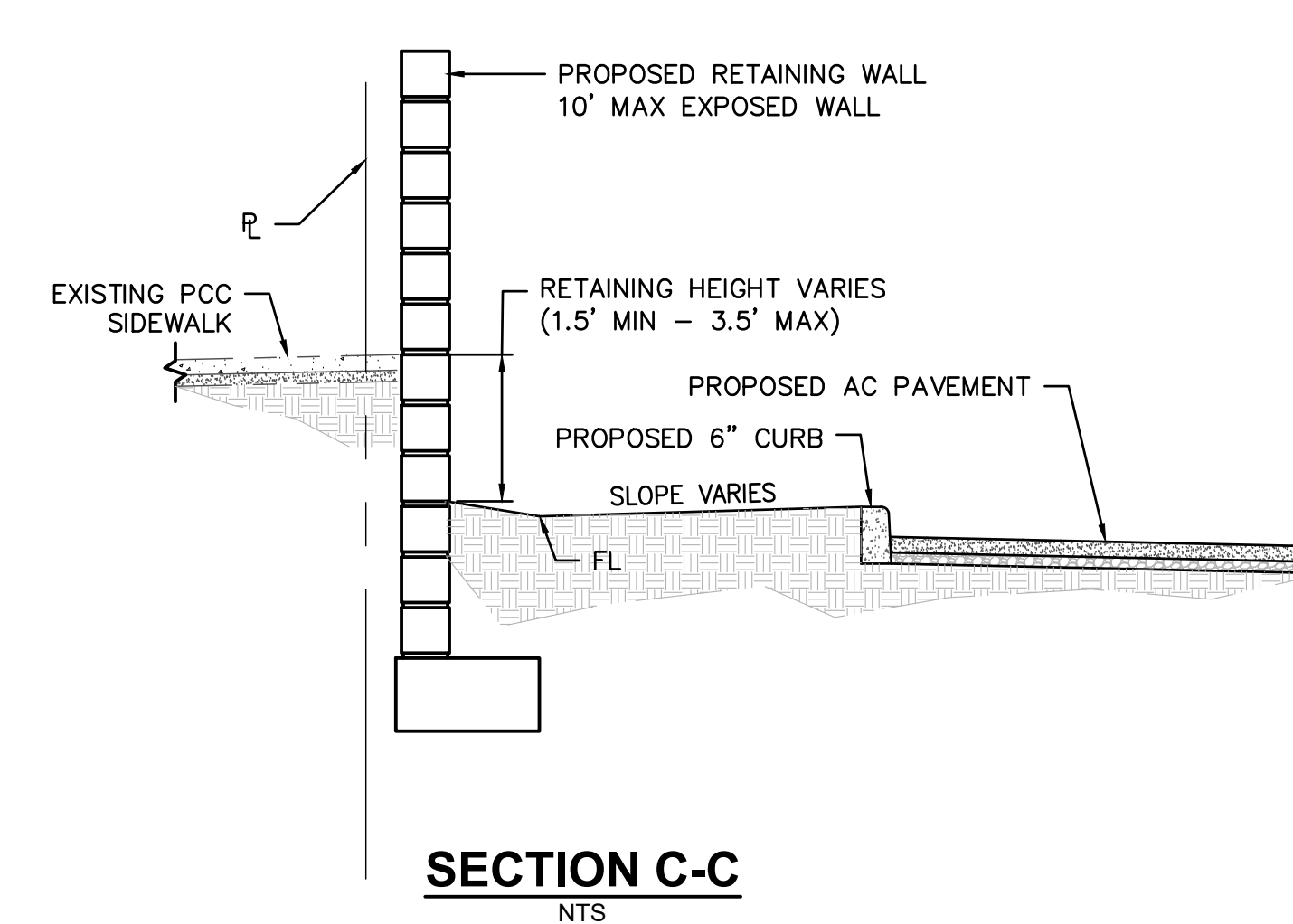
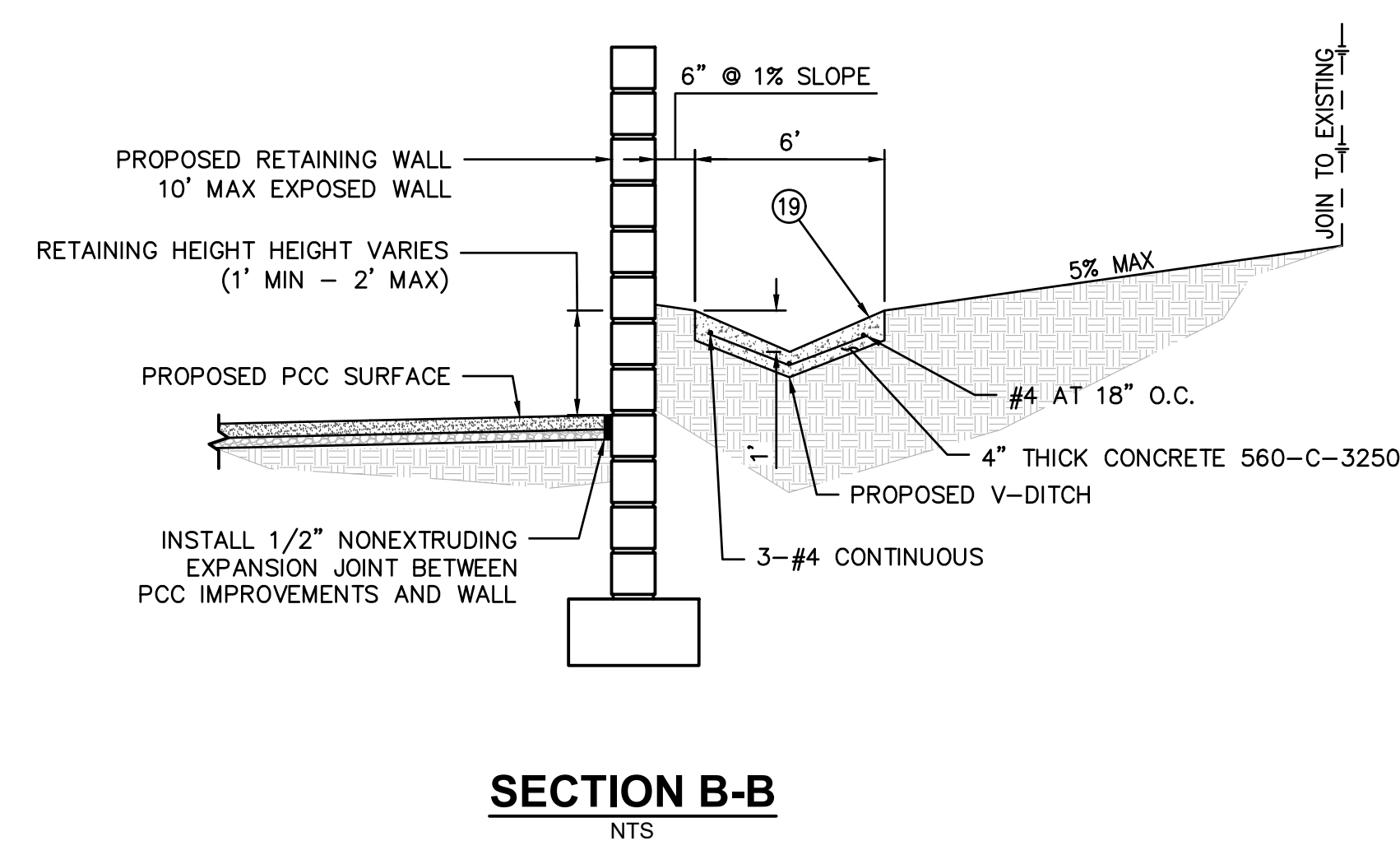
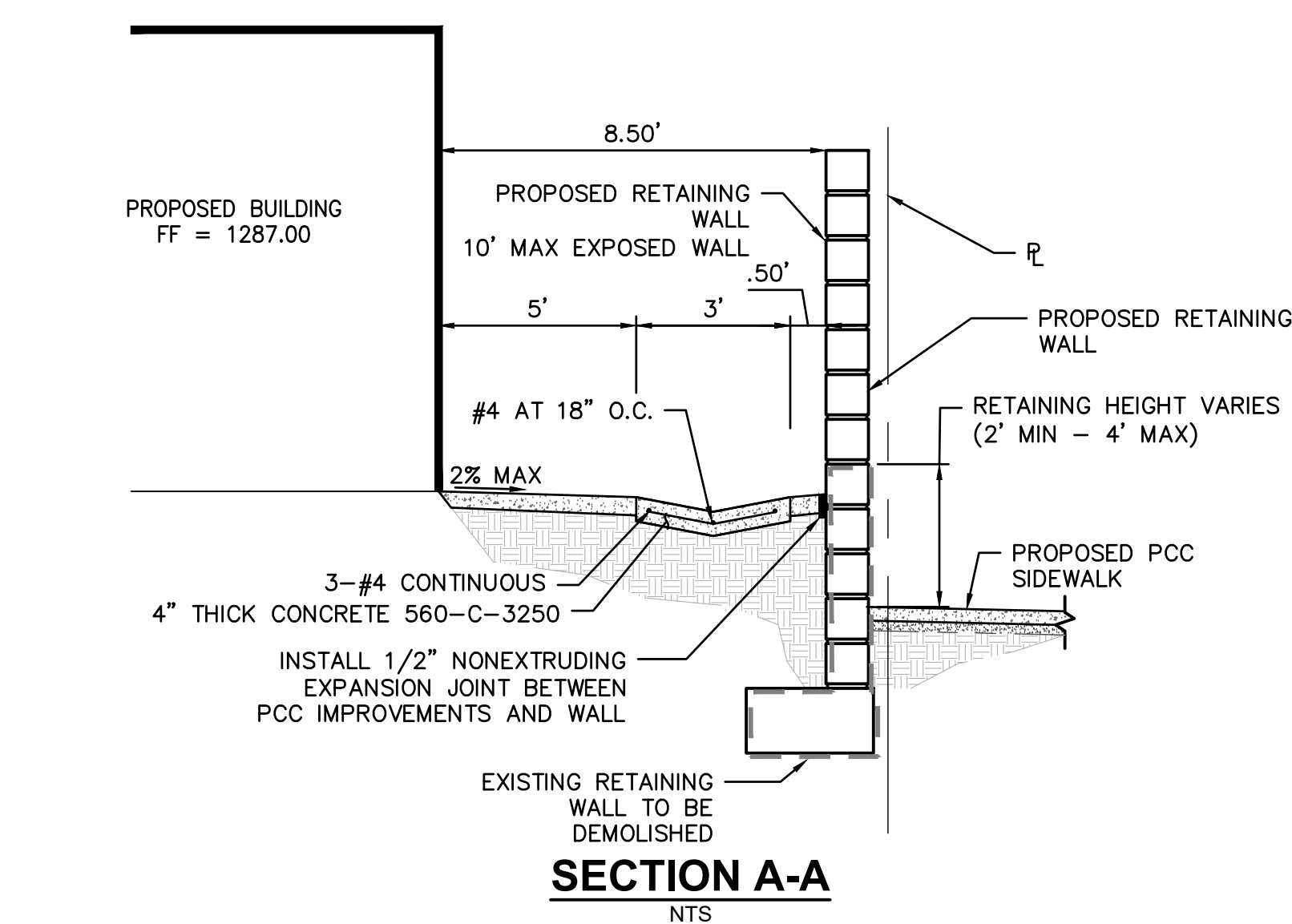
SHEET TITLE:

TITLE SHEET

SHEET NO.:

C-1

SHT 1 OF 6



- CONSTRUCTION NOTES

- ① CONSTRUCT 3" PCC WITH REBAR OVER 6" OF CLASS II AGGREGATE BASE MATERIAL.
- ② CONSTRUCT 6" PCC CURB PER PER CITY OF SAN BERNARDINO STD. DWG. 200
- ⑤ CONSTRUCT CURB RAMP CASE B, TYPE 1 PER SPWC STD. 111-5
- ⑦ CONSTRUCT HANDICAP STALL PER DETAIL ON SHEET C-2
- ⑩ CONSTRUCT MODIFIED PER PLAN LOCAL DEPRESSION TYPE F PER SPWC STD. DWG. 313-4
- ⑬ CONSTRUCT CONCRETE V-DITCH PER SECTION B-B ON SHEET C-2
- ⑭ CONSTRUCT 5" PCC OVER 4" CLASS II AGGREGATE BASE

- STORM DRAIN NOTES

- 36 INSTALL 24"x24" JENSEN PRECAST DROP INLET BASIN MODEL 2424 WITH GRATE, OR APPROVED EQUAL
- 37 INSTALL ADS FLOXTORM PURE INLET FILTER PER DETAIL ON SHEET C-3, OR APPROVED EQUAL
- 38 INSTALL 12" HDPE PIPE OR APPROVED EQUAL
- 39 INSTALL 15" HDPE PIPE OR APPROVED EQUAL
- 40 INSTALL 18" HDPE PIPE OR APPROVED EQUAL
- 41 INSTALL 30" DIAMETER NYLOPLAST INLINE DRAIN BASIN
- 42 INSTALL 12"x12" JENSEN PRECAST DROP INLET BASIN MODEL 1212 WITH GRATE, OR APPROVED EQUAL
- 43 INSTALL 36"x36" JENSEN PRECAST DROP INLET BASIN MODEL 3636 WITH GRATE, OR APPROVED EQUAL
- 44 INSTALL 8" HDPE PIPE OR APPROVED EQUAL



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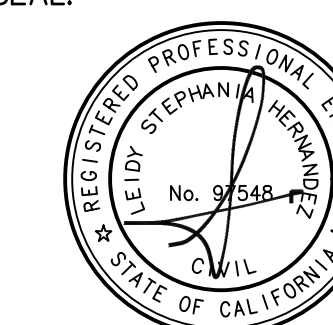
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SHEET TITLE:

DETAILS SHEET

SHEET NO.:

C-2

SHT 2 OF 6