SAFE, CLEAN WATER PROGRAM

FEASIBILITY STUDY REPORT

Regional Program Projects Module

PROJECT NAME	David M. Gonzales Recreation Center Stormwater Capture Project
PROJECT LEAD(S)	Los Angeles Department of Water and Power (LADWP)
SCW WATERSHED AREA	Upper Los Angeles River
PRELIMINARY SCORE	97
TOTAL SCW FUNDING REQUESTED	$ 19,363,000.00
YEAR 1 FUNDING REQUESTED	$ 388,000.00

Submitted On: Thursday, October 15, 2020

Created By: David Pettijohn, Director of Water Resources, Los Angeles Department of Water and Power (Los Angeles Department of Water and Power (LADWP))

OVERVIEW

The objective of the Regional Infrastructure Program under the Safe, Clean Water (SCW) Program is to plan, build, and maintain multi-benefit watershed-based projects that improve water quality and increase water supply and/or enhance communities. A Feasibility Study is required before a project can be submitted for consideration and scoring for funding through the Los Angeles Region Safe, Clean Water (SCW) Program's Regional Infrastructure Program. Each Feasibility Study should provide enough information about a potential project to allow the Watershed Area Steering Committee members to make an informed decision for as to which projects should move forward for consideration for funding. The Minimum Feasibility Study Requirements for the Scoring and Consideration of Regional Infrastructure Program Projects is available at: https://portal.safecleanwaterla.org/projects-module/.

This document is based upon an output from the web-based tool called the 'SCW Regional Projects Module' (https://portal.safecleanwaterla.org/projects-module/). This output summarizes the information and data provided to Regional Projects Module, and also provides an initial estimate of project scoring per the SCW Infrastructure Program Project Scoring Criteria.

IMPORTANT: *ALL SCORING ESTIMATES GENERATED BY THE PROJECTS MODULE ARE PRELIMINARY AND SUBJECT TO REVIEW AND REVISION BY THE SCORING COMMITTEE.*

ORGANIZATIONAL OVERVIEW:

1 GENERAL INFORMATION

This section provides general information on the project including location and project description.

1.1 Overview

The following table provides an overview of the project and the Project Developer(s):

Project Name:	David M. Gonzales Recreation Center Stormwater Capture Project
Project Description:	Will capture 342 AF per year, improve water quality, enhance the DAC, and mitigate flooding. 50% cost match with strong community support.
SCW Watershed Area:	Upper Los Angeles River
Call for Projects year:	FY21-22
Total SCW Funding Requested:	$ 19,363,000.00
Phase(s) this application is requesting SCW funding for:	Design, Construction
Project Weather Type:	Wet
Project Lead(s):	Los Angeles Department of Water and Power (LADWP)
Additional Project Collaborators:	Los Angeles Department of Public Works Bureau of Engineering (BOE)
Additional Project Collaborators:	Los Angeles Sanitation and Environment (LASAN)
Additional Project Collaborators:	Los Angeles Department of Recreation and Parks (RAP)
Anticipated IPPD:	Los Angeles Department of Water and Power (LADWP)
Is this a non-municipal project?	No
Primary Contact (if differs from submitter):	SCWP Implementation
Primary Contact Email (if differs from submitter):	scwp.implementation@ladwp.com
Secondary Contact (if differs from submitter):	Peter Tonthat, Project Manager, Los Angeles Department of Water and Power

Secondary Contact Email (if differs from submitter):	Peter.Tonthat@ladwp.com

1.2 Project Location

The following table summarizes the project location:

Latitude:	34.268616
Longitude:	-118.413235
Street Address:	10943 Herrick Ave
City:	Los Angeles
State:	CA
Zip Code:	91331
Municipality:	Los Angeles

Please see the following attachment(s) for a project location map.

Attachments for this Section	
Attachment Name	Description
1.2 - Location - David M. Gonzales.pdf	Location information on right-of-way, park needs, and the disadvantaged community.

Will the project provide benefit to a Disadvantaged Community (DAC)?

Yes

If Yes, Distance to nearest DAC.

0

If Yes, Describe how the project will provide benefits to a DAC.

According to data from the Safe, Clean Water Program (SCW Program) GIS Tool, the David M. Gonzales Recreation Center Stormwater Capture Project (Project) is located in a disadvantaged community (DAC), as shown in the Attachment for Section 1.2 (Location). The Project will improve recreational opportunities at the park while creating new local jobs for members of the community. Educational signage will provide opportunities for members of the community to learn about stormwater and water resources. In addition, the Project will provide water quality benefits by reducing pollutants in local runoff at the park and in runoff from the Project watershed, which is also largely a DAC. Significant water supply benefits will be achieved through groundwater recharge of the underground aquifer, which is used as a water supply source for the area.

The Project will include six of the seven SCW Program community investment benefits (improved flood mitigation, restoration of parks, enhanced recreational opportunities, increasing shade, carbon sequestration, and greening of schools). Beyond the features geared toward organized sports, such as a new natural turf soccer field, playground, basketball court, handball court, baseball fields, and LED lighting, the Project will also involve planting a series of trees and California-native/friendly vegetation. In addition to providing opportunities for active recreation, such as jogging, the additional green elements will provide health benefits to the community. Shade will reduce the heat island effect, and the additional plants will provide air quality benefits to a community that is often out of attainment for air quality goals according to the South Coast Air Quality Management District. Taken together, the Project will strengthen the community from the inside out.

Based on the Los Angeles Countywide Parks and Recreations Needs Assessment, the area surrounding the Project has high park needs, as shown in the Attachment for Section 1.2. The study, released in 2016, used a series of metrics (Park Land, Park Access, Park Pressure, Park Amenities and Park Condition) and population density data holistically to determine park needs in 188 study areas. By moving beyond a simple analysis of park acreage only, the study was able to take into account the quality of parks that currently exist and factor those qualities into the assessment along with anticipated demand based on population density.

The Project will prioritize local hire and create a significant number of new jobs through construction in addition to some permanent jobs related to operations and maintenance (O&M). During construction, multiplier benefits are expected to be large and benefit local businesses providing services to the prime contractor (specialty trades) and workers (food, PPE). In all cases there will be a preference for local hire, and existing City contracting guidelines will ensure a sizable portion of the construction contract will be subcontracted to qualified Minority-owned Business Enterprises, Woman-owned Business Enterprises, Small Business Enterprises, Emerging Business Enterprises, Disabled Veteran-Business Enterprises, and LGBT Business Enterprises, thereby supporting a wider range of local businesses.

If Yes, Describe how the project will provide water quality benefits to a DAC.

The majority of the drainage area for the Project is also a DAC, and the Project removes 97 percent of Zinc and 89 percent of E. coli from the runoff from those areas during a storm event. Additional trees and vegetation will also provide water quality benefits to on-site runoff at the park and in adjacent areas.

If Yes, Describe how the project will provide water supply benefits to a DAC.

The Project will capture and infiltrate 342 acre-feet (AF) per year of stormwater to benefit the aquifer directly underneath the park, which is located in a DAC. Water rights to the aquifer under the park belong to LADWP, which operates several wells throughout the San Fernando Valley. The DAC the Project is in, and the drainage area the Project captures, is served by LADWP. As a result, the additional water supply created by the Project will directly benefit the DAC areas it serves.

If Yes, Describe how the project will provide community investment benefits to a DAC.

The Project will provide six out of the seven community investment benefits defined in the SCW Program (improved flood mitigation, restoration of parks, new or enhanced recreational opportunities, increasing shade, carbon sequestration and greening at schools). Features related to recreation and vegetation (greening of the school, native vegetation, enhanced baseball fields and exercise equipment, a new natural soccer field, new basketball court, new handball court, new playground, and trees for carbon sequestration and reduction in heat island effect, etc.) will be located at or adjacent to the park, which is located in a DAC, meaning these benefits will accrue locally. Benefits from enhanced flood projection will be spread out over a larger area, and because the Project, the upstream drainage area, and the downstream watershed are located primarily in a DAC, the additional flood mitigation benefits will accrue to these DAC areas.

If Yes, Describe how the project engaged the benefitting DAC(s) to date.

Because face-to-face community meetings were not possible due to the COVID-19 pandemic, the team has held virtual community meetings and prepared informational materials to lead public participants to a survey about landscape renovation concepts and options. The materials included a printed informational mailer that contained the survey, outdoor banners with contacts so the public could find information and the survey online, and an online presentation that included the survey at the end. Section 5.2 (Local Support) provides more information on outreach efforts.

Does this project comply with the anti-displacement policies of the Feasibility Study Requirements?

Yes

If Yes, Describe how anti-displacement policies were considered.

In promoting a healthier environment and improving air quality, green space, and recreation while creating a significant number of local jobs and educational opportunities for the community, the Project will not displace any residents either directly or indirectly, and no affordable housing will be affected by the Project in any way. While the Project will provide community benefits through improved facilities and additional greening at the park, these improvements will be designed to serve the existing community and not spur gentrification. Outreach efforts will engage community members affected by the Project and authorities overseeing gentrification, displacement, and housing affordability, including local non-profit organizations and the City Council District office. The Project will comply with any County-wide displacement policies and any specific anti-displacement requirements associated with other funding sources.

1.3 Project Description

Attachments for this Section	
Attachment Name	Description
1.3 - Description - David M. Gonzales.pdf	Project fact sheet.

Which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):

The David M. Gonzales Recreation Center Stormwater Capture Project is included in the Upper Los Angeles River (ULAR) Enhanced Watershed Management Plan (EWMP) Implementation Plan for compliance, identified as subwatershed number 668649. It is also included in the ULAR Integrated Regional Water Management Plan (IRWMP). A support letter from the ULAR EWMP Watershed Management Group, included in the Attachment for Section 5.2 (Local Support), confirms that the Project is included in the ULAR EWMP Implementation Plan and that it offers benefits to the disadvantaged community in which it is located.

Provide a detailed description and historical background of the project. Please also state which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):

The David M. Gonzales Recreation Center Stormwater Capture Project (Project), included in the ULAR EWMP and IRWMP, is a proposed regional multi-benefit project led by the Los Angeles Department of Water and Power (LADWP) in collaboration with the Los Angeles Department of Public Works Bureau of Engineering (BOE), Los Angeles Sanitation and Environment (LASAN), and Los Angeles Department of Recreation and Parks (RAP). Located in City Council District 7 (CD7), this project is part of the Stormwater Capture Parks Program, which will capture and infiltrate stormwater throughout various parks within the northeastern region of the San Fernando Valley to improve the City of Los Angeles' (City's) water quality and water supply while also providing community enhancements for the park and the disadvantaged community (DAC).

The proposed multi-benefit Project will improve water quality in the Tujunga Wash watershed by implementing nature-based solutions and will increase local water supply by recharging the groundwater basin. The Project will alleviate localized flooding in this area of the San Fernando Valley, which is in high need of park improvements according to the Los Angeles Countywide Parks and Recreations Needs Assessment. New and improved park amenities, the addition of native vegetation, development of educational signage to promote sustainability awareness, and the creation of new, local jobs will also benefit the local community and are among many reasons why the Project has been able to secure the support of multiple community-based organizations. The Project will add a minimum of 40 trees where the park meets Pacoima Elementary School and proposes adding several new recreational features that do not currently exist at the park. This includes a new playground, basketball court, handball court, and a natural turf multipurpose soccer field. Other improvements include enhancing the existing athletic equipment and baseball fields with new turf, dugouts, back-stops, batting cages, benches, and bleachers with integral shade structures. A new LED sports lighting system, permeable pavement and native landscaping for the parking lot, and replacement and improvement of the irrigation system are expected to improve park safety, provide greater accessibility, and maintain greenery for the usage and enjoyment of residents in the community. Park improvements will be finalized with input from the community through outreach and engagement.

Stormwater from Tributary Area 1 (310 acres) will be conveyed through an existing storm drain system that converges to a 63-inch diameter reinforced concrete pipe (RCP) storm drain located on Pierce Street. The stormwater from Tributary Area 2 (449 acres) is conveyed through an existing storm drain system that converges to an 84-inch diameter RCP storm drain located on Van Nuys Boulevard. The proposed Project will divert, treat, and infiltrate approximately 342 AF of stormwater annually from the combined 759-acre drainage area while improving the water quality of the Los Angeles River. To accomplish this, the Project will utilize two diversion structures, hydrodynamic separators, desilting basins, and subsurface infiltration galleries. Please refer to the Attachment for Section 2.1 (Configuration) for more detail on the Project's recreational features and stormwater components. The Project will comply with any County-wide displacement policies as well as with any specific anti-displacement requirements associated with other funding sources. As currently envisioned, the Project will not displace individuals or buildings or spur gentrification in the Project area.

2 DESIGN ELEMENTS

This section provides an overview of the project design details.

2.1 Configuration

The following table is a summary of the project configuration:

Project Configuration Summary	
BMP Type:	Infiltration Facility
Infiltration Footprint Area:	2.62 ac
Ponding Depth:	14 ft
Media Layer Depth:	0.01 ft
Media Layer Porosity:	0.4 ft
Underdrain Layer Depth:	0 ft
Underdrain Layer Porosity:	0 ft

Calculated Storage Volume	
Module-generated Storage Volume:	36.6905 ac-ft

Please upload a description and detailed schematic of the project layout including its anticipated footprint and key components such as, but not limited to: inlets, outlets, diversion point, recreational components, nature-based components, pumps, treatment facilities, underdrains, conveyance, above ground improvements, and other project components.

Attachments for this Section	
Attachment Name	Description
2.1 - Configuration - David M. Gonzales.pdf	Overview of Project components.

2.2 Capture Area

The size and land uses of the capture area upstream of a project plays an important role in its water quality and water supply benefits. The capture area information here is used by the Module for scoring:

Capture Area Summary	
Capture Area:	759.3 ac
Impervious Area:	395.1 ac
Pervious Area:	364.19999999999993 ac

The following table is a summary of the land use breakdown for the area that drains to the project:

Breakdown of Impervious Acreage in Capture Area		
Land Use Type	Percent Impervious	Acres
Single Family Residential	43.3 %	171.0783
Multi Family Residential	16.9 %	66.7719
Commercial	3.9 %	15.408900000000001
Institutional	6.7 %	26.471700000000002
Industrial	6.7 %	26.471700000000002
Highways and Interstates	1.9 %	7.5069
Secondary Roads and Alleys	20.6 %	81.3906

The following table is a breakdown of the municipal jurisdictional areas within the project capture area:

Breakdown of the Municipal Jurisdictional Areas within the Project Capture Area		
Municipal	Tributary Percent	Acres
Los Angeles	98 %	744.1139999999999
Unincorporated (Los Angeles County)	2 %	15.186

Attachments for this Section	
Attachment Name	Description
2.2 - Capture Area - David M. Gonzales.pdf	Overview of Project capture area, including jurisdictional and land use breakdown.

Has a shapefile of the project capture area has been uploaded to the project?
Yes

2.3 Diversion

Diversion Structures generally apply to 'off-line' regional projects where stormwater is diverted from a major water conveyance (e.g., gravity main) and directed to the project at a predetermined maximum rate. Smaller distributed projects, like bioretention, do not normally utilize these devices.

Does the project have a diversion structure?

Yes

The following table provides details on the diversion type and maximum diversion rate:

Diversion Details	
Type of Diversion	Typical Max Diversion Rate (cfs)
Gravity Flow	66 cfs

Estimated Average Inflow Captured by Project:

0.15 cfs

Description of Diversion:

The Project will contain two gravity diversion structures to divert flow from the 84-inch and 63-inch diameter storm water pipes near the park. The diversions are anticipated to have a typical maximum combined diversion rate of 66 cfs and an estimated average inflow capture of 42 cfs and an average dry weather inflow of 0.15 cfs. The dry weather inflow was inputted as the "Estimated Average Inflow Captured by Project" based on the SCW Projects Module requirement included in a tooltip for this section. The diversions will consist of a precast concrete maintenance hole with either a diversion weir or a significant depression in the diversion outlet pipe. Diversion is anticipated to occur during all dry-weather periods for the nuisance flows while for wet-weather events, it will flow at a continuous combined rate of 66 cfs until the storage is full. More detail on the diversions, BMPs, conveyance, and pretreatment systems can be found in the Attachment for Section 2.1 (Configuration).

2.4 Site Conditions & Constraints

Please provide an upload for each of the attachments below that describes the methods, outcomes and how the information will be incorporated into the project design.:

A geotechnical investigation was completed from March to May of 2020 to evaluate the soil and geologic conditions at the Project site and to provide preliminary geotechnical recommendations for pre-design of the proposed BMPs at the site for stormwater infiltration. Exploratory borings at the site have reached up to 51 feet of depth with no signs of groundwater. Historical data suggests the groundwater depth to be somewhere between 100 to 120 feet below the ground surface, thus suggesting infiltration will not impact the proposed structures. Percolation tests were conducted at five locations at depths ranging from approximately 28 to 51 feet. Percolation rates were found to range from approximately 0.3 to 4.1 inches per hour, and the preliminary effective drawdown rate was assumed to be 2.5 in/hr. Recommendations and guidelines provided in the report shall be adhered to during Project implementation. The draft Geotechnical Evaluation is included in the Attachment for Section 2.4.1 (Geotechnical Evaluation).

For this Project, Hydrocalc v1.03 was used to determine the peak flow and volume for the 85th percentile design storm event. The model uses the Modified Rational Method to generate the 24-hour hydrographs and the peak flow rate and storm volumes. The results of the analysis are summarized in the Attachment for Section 2.4.2 (Hydrology & Hydraulics). For the hydraulic calculations, the PCSWMM model was used to determine the flow depths and hydraulic grade line. The model used the output hydrograph from the Hydrocalc model to generate the inflows. Initial model results indicate that both a drop structure and weir structure are functional diversion techniques for the locations. LADWP acknowledges that there are differences between the SCW Projects Module outputs and the modeling results in the Hydrologic and Hydraulic Analysis Technical Memorandum, which are attributed to different objectives and models used. The full Hydrologic and Hydraulic Analysis Technical Memorandum can be found in the Attachment for Section 2.4.2.

The Project will divert from a Los Angeles County Flood Control District (LACFCD) storm drain. Confirmation of conceptual approval by LACFCD is included in the Attachment for Section 2.4.3 (ROW & LACFCD Approval).

A preliminary utility investigation, conducted during the preliminary design phase, is included in the Attachment for Section 2.4.4 (Utility Investigation). A detailed utility investigation is recommended to take place during the design phase in order to physically locate all utilities that may not have been identified in the preliminary design phase.

Does the project involve LACFCD infrastructure, facilities, or right-of-way?

Yes

Please see the following attachments for additional details on geotechnical, hydrology, right-of-way and/or LACFCD, and utility conditions.

Attachments for this Section	
Attachment Name	**Description**
2.4.1 - Geotechnical Evaluation - David M. Gonzales.pdf	Geotechnical Evaluation conducted for the Project.

Attachments for this Section	
Attachment Name	**Description**
2.4.2 - Hydrology & Hydraulics - David M. Gonzales.pdf	Preliminary Hydrology & Hydraulics Technical Memorandum.

Attachments for this Section	
Attachment Name	**Description**
2.4.3 - ROW & LACFCD Approval - David M. Gonzales.pdf	Overview of Project right-of-way and confirmation of LACFCD conceptual approval.

Attachments for this Section	
Attachment Name	**Description**
2.4.4 - Utility Investigation - David M. Gonzales.pdf	Preliminary utility investigation conducted for the Project.

2.5 Monitoring

This section provides an overview of monitoring data related to the project.

Has any monitoring data been compiled related to the project?

No

Please provide an overview of the monitoring performed to date:

N/A

Please upload a monitoring plan to measure the effectiveness of the proposed project once completed, including metrics specific to the identified benefits. Also attach supplemental information on monitoring conducted to date, if applicable.

Attachments for this Section	
Attachment Name	Description
2.5 - Monitoring - David M. Gonzales.pdf	Monitoring information and example Monitoring Plan.

2.6 O & M

Provide an overview of the plan for how operations and maintenance of the Project will be carried out. Identify the responsible party and describe any technical expertise required for O&M.

As required in the Los Angeles Charter Section 580, the Project's operations and maintenance commitments are the responsibility of the Los Angeles Department of Public Works, with the Bureau of Sanitation and Environment (LASAN) as the responsible agency. Please refer to the Attachment for Section 2.6 (O&M). An overview of the Project's O&M requirements can also be found in the Attachment for Section 2.6.

Attachments for this Section	
Attachment Name	Description
2.6 - O&M - David M. Gonzales.pdf	O&M information and confirmation of responsible agency.

3 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of SCW Project Scoring Criteria.

3.1 MS4 Compliance

Please describe in detail how the project will support achievement of compliance with MS4 Permit including applicable TMDLs, role with Watershed Management Program, etc. Please clearly specify if this project is being developed as part of a Time Schedule Order for the MS4 Permit. SCW funds may be used for projects implemented pursuant to a TSO issued by the LA Regional Water Quality Control Board provided that, at the time the TSO is issued, the project is included in an approved watershed management program developed pursuant to the MS4 Permit:

The Los Angeles County Municipal Separate Storm Sewer System (MS4) permit outlines the process for developing watershed management programs to achieve compliance, such as the ULAR EWMP and IRWMP. The Upper Los Angeles River is subject to the following TMDLs:

- Los Angeles River Nitrogen Compounds and Related Effects.
- Legg Lake Trash.
- Los Angeles River Trash.
- Los Angeles River Metals.
- Los Angeles River Bacteria.
- Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants.
- Los Angeles Area Lakes TMDLs for Lake Calabasas, Echo Park Lake, and Legg Lake.

The David M. Gonzales Recreation Center is part of the Tujunga Wash watershed within the San Fernando Groundwater Basin. The David M. Gonzales Recreation Center and its vicinity is identified in the ULAR EWMP as part of the Implementation Plan for compliance and is identified as subwatershed number 668649. Please refer to the Attachment for Section 5.2 (Local Support) for a confirmation letter from the ULAR EWMP Watershed Management Group. This Project is also included in the ULAR IRWMP, and it will support the region in meeting compliance goals as established by the MS4 Permit and as issued by the Los Angeles Regional Water Quality Control Board.

3.2 24-hour Storm Capacity

Please enter information below regarding key parameters of the project's capacity. The Module will use those values to estimate the 24-hour capacity:

24-hour Storm Capacity Breakdown	
Effective Draw Down Rate:	2.5 in/hr
Stormwater Use During 24-hr Design Event:	0 gal

Calculated 24-hour Storm Capacity	
Module-generated 24-hr Capacity:	49.7905 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate 24-hour capacity, and attach supplemental information with details of the methodology, assumptions and calculations.	N/A

3.3 Event-based Design Details

n this section, details regarding the project inlets and outlets are provided, along with estimates generated for the project design event. The event-based information is envisioned as basic estimates that would be generated during the project design, and will support review of the project details.

Estimated Total Inflow Volume during Design Event:

42.32 ac-ft

Describe the event used for project design. Describe the portion of the peak inflow that would be retained by the project through infiltration, capture, diversion, use, or other means. Tooltip for 'Treatment Description' under outlets:

Because the Project was sized to fully capture the 85th percentile, 24-hour storm event, no outflows are expected during the design storm event. The peak flow rates will be retained by the Project and the full volumes infiltrated thus capturing 100% of the design storm.

Describe whether and how the 85th percentile is being captured/diverted. If not, is there opportunity to do so? If feasible but not incorporated, explain why. If not feasible, explain why.

The Project is designed to capture the 85th percentile storm for a 24-hour event (42.32 AF). The full volume of the 85th percentile storm is being captured and infiltrated to contribute to water quality and water recharge goals. This capture is made possible by the inclusion of two diversions with drop inlets and pipes designed to convey the peak flow rates of the 85th percentile, 24-hour storm event. The storage volume and the favorable infiltration rates provide for full capture and infiltration of the design storm event.

The following tables detail inflow and outflow from the project during the design event:

Inlets	
Estimated Max Inflow Rate (cfs)	Total Inflow (ac-ft)
28.87 cfs	16.35 ac-ft
36.87 cfs	25.97 ac-ft

Outlets			
Estimated Max Outflow Rate (cfs)	Treated?	Treatment Description	Percent of Volume Treated (%)
None provided	N/A	N/A	N/A

Describe the methods used to generate estimates:

Hydrocalc v1.03 was used to perform the hydrologic modeling of the Project for the 85th percentile, 24-hour storm. Hydrocalc v1.03 provides a hydrograph resulting from the specified catchment for peak discharge and volume to a specific diversion point, along with the overall hydrograph shape. Hydrocalc also calculates peak intensity, undeveloped and developed runoff coefficients, time of concentration, peak flow rate, and 24-hr runoff volume.

3.4 Long-term Performance

This section present details of the calculation of long term (10-year) water quality benefit for Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria. These estimates were either generated by the Module using a 10-year hourly simulation with the Watershed Management Modeling System (WMMS), or generated by the Project Developer.

The following tables present selected primary and secondary pollutants and calculated reductions for water quality benefit per Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.

Note: these estimates are based on the hourly 10-year WMMS simulation performed by the Module, or as estimated by the Project Developer.

Primary Pollutant	
Primary Pollutant	Total Zinc
Reduction Method used for Scoring	Method 2 (% Load Reduction)
Justification for selecting Primary Pollutant	Based on the Project's location in the ULAR Watershed and the water quality pollutant combinations described in the ULAR EWMP, the primary pollutant evaluated for the Project was total zinc as identified as the limiting pollutant in the ULAR EWMP (LA River Metals TMDL; 75% by 2020 and 100% by 2024).
Calculated 10-year Pollutant Reduction	96.6
Use Project Developer estimate instead?	No
Own Value	N/A
Justification for using own value	N/A
Secondary Pollutant	
Secondary Pollutant	Bacteria
Reduction Method used for Scoring	Method 2 (% Load Reduction)

Justification for selecting Secondary Pollutant	Based on the Project's location in the ULAR Watershed and the water quality pollutant combinations described in the ULAR EWMP, the secondary pollutant evaluated for the Project was bacteria (LA River Bacteria TMDL; 100% dry-weather by 2030).
Calculated 10-year Pollutant Reduction	88.5
Use Project Developer estimate instead?	No
Own Value	N/A
Justification for using own value	N/A

The following table presents calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes all pollutants and methods, including those not selected as Primary or Secondary for scoring.

Pollutant Name	Method 1 (% Concentration Reduction)	Method 2 (% Load Reduction)	Method 3 (% Exceedance Reduction)
Total Zinc	65.5 %	96.6 %	N/A
Total Copper	52.2 %	95.3 %	N/A
Total Lead	55.5 %	95.6 %	N/A
Total Nitrogen	30.9 %	93.2 %	N/A
Total Phosphorous	18.4 %	91.9 %	N/A
E.coli	-16.1 %	88.5 %	N/A
Toxics	N/A	N/A	N/A
Chloride	N/A	N/A	N/A
Trash	N/A	N/A	N/A
N/A = Modeling results not available from Projects Module, must be manually generated by user			

The following table presents inflow and outflow details for calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes pollutants not selected as Primary or Secondary for scoring, and reduction methods not selected for scoring.

Metric	Runoff from Capture Area	Minimally Treated Outflow from Project	Inflow into Project Inlet	Outflow from Project Outlet	Reduction by Project	% Reduction by Project
Runoff Volume (ac-ft)	411.000	37.656	380.076	37.656	342.419	90.092 %
Total Zinc (ug/L)	204.800	68.720	199.070	68.720	130.350	65.479 %
Total Zinc (lbs)	228.891	7.037	205.752	7.037	198.714	96.580 %
Total Copper (ug/L)	60.090	27.390	57.300	27.390	29.910	52.199 %
Total Copper (lbs)	67.160	2.805	59.218	2.805	56.413	95.264 %
Total Lead (ug/L)	38.450	16.240	36.510	16.240	20.270	55.519 %
Total Lead (lbs)	42.978	1.663	37.735	1.663	36.072	95.593 %
Total Nitrogen (mg/L)	3.887	2.728	3.950	2.728	1.223	30.949 %
Total Nitrogen (lbs)	4344.572	279.322	4082.880	279.322	3803.559	93.159 %
Total Phosphorous (mg/L)	0.521	0.427	0.523	0.427	0.096	18.422 %
Total Phosphorous (lbs)	582.145	43.710	540.801	43.710	497.091	91.918 %
E.coli (#/100mL)	8.268E+004	9.334E+004	8.040E+004	9.334E+004	-1.294E+004	-16.090 %
E.coli (#)	4.191E+014	4.335E+013	3.769E+014	4.335E+013	3.335E+014	88.498 %
Toxics	N/A	N/A	N/A	N/A	N/A	N/A
Chloride	N/A	N/A	N/A	N/A	N/A	N/A
Trash	N/A	N/A	N/A	N/A	N/A	N/A
N/A Modeling results not available from Projects Module, must be manually generated by user						

4 WATER SUPPLY BENEFITS

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

4.1 Water Supply Nexus

Please describe and clearly justify the nexus between water supply and the stormwater and/or urban runoff that is captured/infiltrated/diverted by the Project:

Because this Project uses infiltration to treat and store captured stormwater, its operation is at the nexus of stormwater management and water supply. The Project is located above the San Fernando Groundwater Basin, which is managed by the Upper Los Angeles River Area Watermaster (ULARA Watermaster). The water supply benefit realized by this Project results from an increase in the usable groundwater supply, as opposed to offsetting potable water demand. Refer to the Attachment for Section 4.1 (Nexus) for a visual representation of the anticipated flow regime and how the water supply benefit is realized. LADWP and the ULARA Watermaster have acknowledged that the Project provides a groundwater augmentation benefit. A copy of this confirmation is included in the Attachment for Section 4.1 (Nexus).

Does this project capture water for onsite irrigation use?

No

Description of onsite use by the project:

N/A

Does this project capture water used for water recycling by a wastewater treatment facility?

No

Description of water recycling by the project:

N/A

Is the project connected to a managed water supply aquifer?

Yes

If Yes, managed Aquifer Name:

San Fernando Groundwater Basin

If this project is augmenting groundwater supply, please provide confirmation that the agency managing the groundwater basin concurs with the added benefit.

Attachments for this Section	
Attachment Name	Description
4.1 - Nexus - David M. Gonzales.pdf	Confirmation of added supply benefit.

4.2 Benefit Magnitude

Project Scoring Criteria Section B is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

Average dry weather inflow to project:

0.15 cfs

Describe the methods used to estimate average dry weather inflow to the project:

The average dry weather inflow was estimated using information from projects submitted to the SCW Projects Module for Fiscal Year 2019-2020 and information provided in the Hydrologic and Hydraulic Analysis Technical Memorandum, included in the Attachment for Section 2.4.2 (Hydrology & Hydraulics). A linear regression between reported dry weather flows for these SCW Program projects and the Project drainage area was developed and applied to the drainage area for this Project.

The following tables present calculated annual inflow the project.

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average inflow to project:	380.076 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate water supply inflow values	N/A
Supporting PDF	See attached PDF if applicable.

The following tables present calculated annual average capture by the project, which is used for the Section B2 scoring calculation (Benefit Magnitude of SCW Scoring Criteria).

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average capture for water supply:	342.419 ac-ft
Use Project Developer estimate instead?	No

Custom Value specified by User:	N/A
Please provide a description of methods used to calculate water supply benefit	N/A
Supporting PDF	See attached PDF if applicable.

4.3 Cost Effectiveness

Project Scoring Criteria Section B2 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B2 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

Module-generated water supply cost-effectiveness:	$ 6,337.33 per ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	$ N/A
Justification	N/A
Supporting PDF	See attached PDF if applicable.

5 COMMUNITY INVESTMENT & LOCAL SUPPORT BENEFITS

5.1 Community Investment

This section provides an overview of project elements related to community investment benefits, which are used in calculations for Section C (Community Investment Benefits) of SCW Project Scoring Criteria.

The following table details the project's community investment benefits:

Community Investment		
Investment Type	Applicable?	Detailed Description
Does this project improve flood management, flood conveyance, or flood risk mitigation?	Yes	Flood management, mitigation, and conveyance are regional issues in the Los Angeles area, with Los Angeles County and the City of Los Angeles both maintaining regional flood control and mitigation networks. As large as these networks may be, their capacity is limited and can become overwhelmed in larger storm events. As shown in Figure 1 of the Attachment for Section 5.1 (Community Benefits, Local Support, & Nature-Based Solutions), the Project will address a significant number of flooding complaints that have been reported within a two-mile radius of the drainage area and continue to persist under existing conditions. This portion of the San Fernando Valley has a well-documented history of flooding issues that are especially severe during large storm events. This multi-benefit Project will capture 342 AF of water annually, meaning that 342 AF of water is being diverted from the flood control system. Said another way, this Project will add 342 AF of capacity to the system downstream of the Project. In lowering the pressure on the system by removing a significant amount of flow, businesses and residents downstream of the Project should see significantly increased effectiveness of the flood mitigation systems, especially during heavier storm events.

Does this project create, enhance, or restore park space, habitat, or wetland space?	Yes	The Project will include an almost complete renovation of existing facilities at the David M. Gonzales Recreation Center. From a park space perspective, the Project will renovate an existing multipurpose field, providing improved open space. Additional shade trees will provide improved habitat for birds and other species. As shown in Figure 2 of the Attachment for Section 5.1, at certain times during the year the existing field becomes barren due to a lack of sufficient irrigation to keep existing vegetation alive. These conditions inhibit recreation and robust use of the park. These dry conditions also adversely impact species that depend on live grass such as communities of insects, birds, and tree dwelling animals. The Project will include new grass throughout the park and a new irrigation system that will facilitate the upkeep of the turf areas and allow park maintenance staff to more easily avoid dry conditions. The Project will also add a minimum of 40 California-native trees mostly clustered in a grove where the park and Pacoima Elementary School come together. The school has a gate that effectively makes the park an extension of the school playgrounds, which will allow the students to experience the revamped park on an almost daily basis. Clustering trees in a grove like configuration will further enhance ecosystem benefits, including wind blocking and noise reduction, which will create a more pleasant environment for students and park goers. The trees will harbor wildlife ranging from birds and squirrels to insects, which with time will create a harmonious ecosystem wherein trees that are in close proximity to each other will enable outputs from one species to serve as inputs for others. The grove of trees will also provide a

		collectively higher cooling benefit than scattered trees, providing a refuge for species during the hot summer months. Many of these California-native trees will especially provide habitat for native species that are stressed in the urban environment. Where deemed acceptable after careful study, new types of tree species may be introduced. The Project will also lay out new grass throughout the park and a new irrigation system that will facilitate the upkeep and maintenance of greenery to allow continuous active use of the site across the seasons. The Project also offers a number of new recreational opportunities for the surrounding disadvantaged communities, as described below and in the Attachment for Section 5.1.
Does this project improve public access to waterways?	No	N/A

Does this project create or enhance new recreational opportunities?	Yes	Recreational opportunities at the park will be expanded by adding a new basketball court, handball court, and playground near the school gate that opens up to the park. The Project will also upgrade two ball fields and install a new natural turf multipurpose soccer field, which does not currently exist at the park. All ball fields will be outfitted with bleachers, dugouts, and backstops with new integral shade to enhance the experience for those watching games. There will also be an overflow lawn area for teams to gather and a new LED sports lighting system that will improve park safety and enhance nighttime activities for park users. The existing athletic equipment will be replaced and upgraded with community feedback. The parking lot will be replaced with permeable pavement with native landscaping throughout, and ADA compliant access will be provided to the park facilities. Figure 3 and Figure 5 of the Attachment for Section 5.1 illustrate these proposed improvements. As is the case with the other LA park projects that are included in the Stormwater Capture Parks Program, LADWP may supply the parking lot with EV charging stations in an effort to encourage a reduction in local carbon emissions. Park improvements will be finalized with input from the community through outreach and engagement.

Does this project create or enhance green spaces at school?	Yes	The Project will also add a minimum of 40 California-native trees, many of which will be clustered in a grove where the park and Pacoima Elementary School come together. The school has a gate that effectively makes the park an extension of the school playgrounds, which will allow the students to experience the ecosystem benefits of the trees on a daily basis. These trees will provide greening at the school and benefit students through increased shade and improved air quality. Figure 3 in the Attachment for Section 5.1 illustrates the location of the school and the tree placement.
Does this project reduce heat local island effect and increase shade?	Yes	In addition to replacing any trees impacted by construction, the Project will add at least 40 trees (and up to 95 trees) to provide shade and help reduce the heat island effect. Upon maturity, each of the 40 trees will provide approximately 500 square feet of canopy for a total of approximately 20,000 square feet of new canopy. Added trees, vegetation, and natural turf will also provide carbon sequestration benefits.
Does this project increase shade or the number of trees or other vegetation at the site location?	Yes	Because the Project is located near major highways of a densely populated area, adding trees and vegetation will greatly benefit the air quality in the disadvantaged community. According to the US Forest Service Center for Urban Forest Research Tree Carbon Calculator, each tree will sequester approximately 34 pounds of carbon annually. This equates to at least 1,360 pounds annually for the minimum of 40 trees to be added by the Project. Additional sod and added native vegetation will provide additional air quality and carbon sequestration benefits.

5.2 Local Support

Please describe any prior outreach and engagement conducted for this project:

The Project was able to garner support from several organizations because it provides crucial benefits to the disadvantaged community, ranging from improved recreational opportunities to an enhanced local ecosystem with air quality benefits. The Project benefits a broad swath of the community including students, seniors, and families of all socioeconomic backgrounds. This community is considered a disadvantaged community and is in an area underserved by parks. These benefits will be most significant for residents in the community served by the park. Please refer to the Attachment for Section 5.2 for community support letters.

Public outreach has been initiated for the Project. Because face-to-face community meetings are not possible due to the COVID-19 pandemic, the team held virtual community meetings and prepared informational materials to lead public participants to a survey about park renovation landscape concepts and options. The materials include a printed informational mailer that contains the survey, outdoor banners that provide contacts so the public can find information and the survey online, and an online presentation that concludes with the survey. Throughout the planning process, virtual meetings with key stakeholders were held, and coordination for community meetings began either virtually or in traditional face-to-face formats. Please refer to the Attachment for Section 5.1 for a summary table of outreach conducted and sample photos of outreach banners at the park.

Please describe the Outreach Plan for this project moving forward:

The outreach strategy for the David M. Gonzales Recreation Center Stormwater Capture Project was centered on identifying appropriate stakeholders and engaging them in the Project's development. LADWP and BOE will reach out to the adjacent neighborhoods, schools, organizations, park users, and community leaders.

The public will actively engage and collaborate with the Project team, learning about the possibilities and offering local knowledge and ideas. Public involvement strengthens the stormwater capture projects and influences design improvements to the park and flood control improvements in nearby neighborhoods.

Below is a list of anticipated events for the Project.
- Early 2021 Councilmember Update Briefings.
- Early 2021 Outreach to Neighborhood Council and Key Stakeholders.
- Spring-Summer 2021 Outreach to Park Neighbors and Users.
- Ongoing 2021 Presentations to Groups/Organizations.
- Ongoing 2021 Project Information Online and Other Means.

The Outreach Plan will be in keeping with the watershed planning goals for engagement in DAC areas. Objectives will include:
- Work collaboratively to involve DACs, community-based organizations, and stakeholders in planning efforts to ensure balanced access and opportunity for participation in the planning process.
- Increase the understanding and, where necessary, identify the water management needs of DACs.
- Develop strategies and long-term solutions that appropriately address the identified DAC water management needs.

Amidst the current COVID-19 pandemic, community outreach and engagement plans will require adapting to a safe process for receiving community input from residents and stakeholders. This Project's outreach objectives include encouraging stakeholders and community members to participate, build support for LADWP's Stormwater Capture Parks Program, create new meaningful opportunities for participation, and utilize a hybrid of traditional and innovative outreach methods that meet current COVID-19 pandemic requirements while maximizing community input. To meet the objectives, the outreach program plans on creating an interface with LADWP to develop and manage a community database (including residents and stakeholders) to maintain communication on project progress, disseminate new information, and invite community members to virtual meetings.

Does this demonstrate strong local, community-based support?

Yes

The following table details the support by local, community-based organizations for the project (also see attachments)**:**

Local Support		
Organization Name	Description	PDF
Pacoima Beautiful	Pacoima Beautiful is a grassroots environmental justice organization that provides education, impacts local policy, and supports local arts and culture to promote a healthy and sustainable San Fernando Valley.	Pacoima Beautiful Support Letter
Council for Watershed Health	The council's mission is to advance the health and sustainability of our region's watersheds, rivers, streams and habitats - both in natural areas and urban neighborhoods.	Council for Watershed Health Support Letter
Mountains Recreation and Conservation Authority	The MRCA is dedicated to the preservation and management of local open space and parkland, wildlife habitat, watershed lands, and trails in both wilderness and urban settings, and to ensuring public access to public parkland.	MRCA Support Letter

ULAR EWMP Watershed Management Group	The ULAR EWMP Watershed Management Group consists of 19 agencies (including 17 Cities) covering 485 square miles of watershed. Electing to work collaboratively with each other, these agencies are developing a comprehensive approach to stormwater management by maximizing capture and use of urban runoff for groundwater recharge while creating green spaces for the community.	ULAR EWMP WMG.pdf
Council District 7	Council Member Monica Rodriguez, representative for City of Los Angeles Council District 7, has expressed support for the Project.	Council District 7 Support Letter.pdf

6 NATURE-BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in calculations for Section D (Nature-Based Solutions) of SCW Project Scoring Criteria.

Does this project implement natural processes?

Yes

Natural Processes Description:

The Project is focused on using natural processes to achieve its multi-benefit objectives, using infiltration to convey a large amount of water to the underground aquifer. As it is percolating into the ground, the captured water will undergo a measure of soil-aquifer treatment that will improve water quality. Upon extraction, the water will undergo additional treatment to meet drinking water standards. Adding new grasses, trees, and other vegetation will also enable natural processes to filter surface water flows, uptake atmospheric carbon, and generate oxygen. As the trees grow, they will provide shade to the area, further reducing heat island effect. These elements are all built around a project that enhances park space through new or upgraded facilities, enhances habitat through additional native vegetation, and improves usable open space through natural turf improvements in the park.

Does this project utilize natural materials?

Yes

Natural Materials Description:

Natural materials will be used for the ball fields and the new natural turf multi-purpose soccer field. For the new trees and additional vegetation, California natives and California-tolerant plants are preferred, understanding that sports fields may require non-native turf grasses. Direction will be given to the landscape architect during detailed design to evaluate whether a native grass species, such as California Native Bentgrass (Agrostis pallens), could be used in lieu of more conventional bluegrass for the ball fields.

Native landscaping will be added around the parking lot area. Refer to Figure 5 of the Attachment for Section 5.1 (Community Investment Benefits, Local Support, & Nature-Based Solutions) for an illustration of landscaping components that will be added to the parking lot area. All other vegetation added is expected to be California-native and California-friendly. Table 2 in the Attachment for Section 5.1 is an example initial tree list, but specific species of trees and other plants will be confirmed during the detailed design phase of the Project.

Description of how nature-based solutions are utilized to the maximum extent feasible. If nature-based solutions are not used, include a description of what options where considered and why they were not included.

The Project aims to maximize nature based solutions by incorporating vegetation, trees, and green space to the maximum extent feasible.

Permeable pavement enhances water-capture benefits and helps reduce surface runoff. Since the only impervious area in the Project footprint is the parking lot, which will be replaced with pervious pavement, the Project is removing 100% of the impervious area in the Project footprint. The Project footprint consists of areas where the infiltration galleries will be installed, as these are the only areas that will experience ground-disturbing activities. Refer to Figure 5 of the Attachment for Section 5.1 for before and after illustrations of the changes to the parking lot at David M. Gonzales Recreation Center.

The following table details the impermeable area removed by the project:

Removed Impermeable Area by Project	
Pre-Project Impervious Area:	Post-Project Impervious Area:
0.3 ac	0 ac

7 COST & SCHEDULE

This section provides an overview of the project's funding and community support, which are used in calculations for Section E (Leverage Funds and Community Support) of SCW Project Scoring Criteria.

7.1 Cost & Schedule

Attachments for this Section	
Attachment Name	Description
7.1 - Cost & Schedule - David M. Gonzales.pdf	Estimates of capital cost, annual O&M cost, and Project schedule.

The following tables provide details on the project's phase and annualized costs:

Phase Costs			
Phase	Description	Cost	Completion Date
Design	Design, pre-design, geotechnical, environmental, outreach, permitting, grant applications, grant reporting.	$ 6,168,000.00	11/2021
Construction	Bid & award, construction, construction management, outreach, grant reporting.	$ 32,951,000.00	08/2023
Total Funding:		$ 39,119,000.00	

Annual Cost Breakdown	
Annual Maintenance Cost:	$ 177,950.00
Annual Operation Cost:	$ 0.00
Annual Monitoring Cost:	$ 195,595.00
Project Life Span:	40 years

The following table provide details on calculated life-cycle costs for the project (either calculated the Module, or estimated by the Project Developer)**.**

Note: these life-cycle costs are used in Section 4.3 of this output for Water Supply Benefit scoring.

Module-generated Life-Cycle Cost for Project*	$ 47,253,080.13
Module-generated Annualized Cost for Project*	$ 2,170,024.33
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate Life Cycle costs, and attach supplemental information with details of the methodology, assumptions and calculations:	N/A
Supporting PDF	See attachment if applicable.

*Applies an annual discount rate as a static rate equal to 3.375%. The only costs not included in total life-cycle cost are the dismantling and replacement costs at the end of life.

7.2 Cost Share

Is additional funding being provided as a Cost Share for this project?

Yes

The following is a summary of what other sources of funding were explored and/or why funding could not be secured through these other sources:

LADWP has committed to matching 50 percent of the total capital cost of the Project. The dollar-to-dollar funding match, which will rely on LADWP's general fund, will support the Project as it moves through the construction phase and create a significant number of new jobs while prioritizing local hire. Documentation of leveraged funds is included in the Attachment for Section 7.2 (Cost Share).

LADWP is committed to improving public health and the environment and will continue to seek additional funding sources, such as grants and leveraging internal resources to support this and other stormwater projects in the City. Some alternative funding sources include the Clean Water State Revolving Fund, the Infrastructure State Revolving Fund, the 2014 California State Water Bond (Prop 1), the Integrated Regional Water Management Grant Program, the Title XVI Water Reclamation and Reuse Program, and the Water Infrastructure Finance and Innovation Act. While alternative sources of funding have not been secured as of the date of this report, LADWP is continuing to explore a variety of funding options.

LADWP acknowledges that the only eligible expenditures for this Project are those incurred after November 7, 2018.

The following table details the additional funding attained for the project:

Additional Funding				
Type of Cost Share	Sub-Phase Description	Funding Amount	Funding Status	PDF
Other	LADWP has committed to matching 50 percent of the total capital cost of the Project conditional upon approval of the SCW Program funding request corresponding to the Project.	$ 19,756,000.00	Commitment Received	7.2 - Cost Share - David M. Gonzales.pdf
Total Funding:		$ 19,756,000.00		

7.3 Funding Request

Total funding requested

$ 19,363,000.00

The following table shows the requested schedule of funding (by Year and Phase) to create a summary table. A breakdown for the first five years must be provided. The schedule of funding must also match the Requested Funding. In most cases, the entries will not add up to the estimated Life-Cycle cost, as Applicants are discouraged from including long-term O&M costs beyond five years in the funding request.

Funding Requested by Year & Phase			
Year	SCW Funding Requested	Phase	Efforts during Phase and Year
Year 1	$ 388,000.00	Design	Pre-design, design, geotechnical, environmental, outreach, permitting, grant applications, grant reporting.
Total Year 1	$ 388,000.00		
Year 2	$ 581,000.00	Design	Design, geotechnical, environmental, outreach, permitting, grant applications, grant reporting.
Total Year 2	$ 581,000.00		
Year 3	$ 1,229,000.00	Design	Design, environmental, outreach, permitting, grant applications, grant reporting.
Year 3	$ 321,000.00	Construction	Bid & award, construction.
Total Year 3	$ 1,550,000.00		
Year 4	$ 2,130,000.00	Construction	Construction, construction management.
Total Year 4	$ 2,130,000.00		
Year 5	$ 3,099,000.00	Construction	Construction, construction management.
Total Year 5	$ 3,099,000.00		

Funding requested beyond 5 years	$ 11,615,000.00	Construction	Construction, construction management, post-construction management, grant reporting.
Total Funding requested beyond 5 years	$ 11,615,000.00		
Total Funding:	$ 19,363,000.00		

The Life-cycle costs do not match Total Funding Requested + Cost Share. For many projects this is acceptable because funding requests for O&M and monitoring funding are typically included for first 5-years only (rather than entire life cycle).

8 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

8.1 Environmental Documents and Permits

Environmental Documentation:

1. **Identify the lead agency for the Project per CEQA.**
2. **Identify environmental documentation (e.g. EIR, MND, ND, Exemption) that has been completed or will be prepared for the Project.**
3. **Discuss the current status and schedule for preparation and notification of environmental documentation.**
4. **State if NEPA is required and identify the lead agency under NEPA, and environmental document (e.g. EIS, FONSI, Categorical Exclusion) that has been completed or will be prepared for the Project.**

As the lead agency per CEQA, LADWP is developing an MND for the Stormwater Capture Parks Program projects. The MND will outline any environmental issues and define any necessary mitigation. The current status is that the Draft MND is under development by LADWP and is expected to be available for public review in October 2020. It is not anticipated that NEPA would apply, though if any federally derived funding were to be identified for the Project, that funding could trigger a need to complete NEPA documentation. Please refer to the Attachment for Section 8.1 (Environmental Documents & Permits) for more detail.

Permitting:

- **Describe all permit requirements including for the Flood Control permit. Discuss anticipated challenges associated with obtaining permits ie. time and cost. A Flood Control Permit (obtained through epicla.lacounty.gov) is required for any project affecting LACFCD right-of-way and/or facility.**
- **If a Flood Control Permit is required:**
  - **Describe how the project will affect LACFCD right-of-way and/or facility.**
  - **Provide a planning-level schedule showing the time allotted for permit review and issuance in the context of the overall project planning and delivery process**.

The Project is not expected to affect LACFCD right of way but will involve diverting stormwater from the LACFCD system. LADWP has been coordinating with LACFCD staff for all necessary LACFCD permits and will continue to do so during the design phase. Please refer to the Attachment for Section 8.1 (Environmental Documents & Permits) for more detail.

Attachments for this Section	
Attachment Name	Description
8.1 - Environmental Docs & Permits - David M. Gonzales.pdf	Supplemental information on environmental work and permitting requirements.

8.2 Vector Minimization

This following provides details on vector minimization strategies.

Does the project have vector minimization plan?

Yes

Provide a description of the vector minimization plan.

Please refer to the Attachment for Section 8.2 (Vector Minimization).

Please see an attachment with proposed vector minimization plan.

Attachments for this Section	
Attachment Name	Description
8.2 - Vector Minimization - David M. Gonzales.pdf	Vector minimization guidance.

8.3 Alternatives Studied

Describe alternatives that were considered and evaluated as part of the Project development:

While the Project was being conceptualized, several alternatives were evaluated. In the preliminary concept report, spreading basins were evaluated but ultimately discarded because they would have resulted in the loss of park features, something likely unacceptable to the community.

During the pre-design phase, three alternatives were evaluated. Alternative 1 was the selected alternative and is the subject of this report. Alternative 2 assumed much of the park could not be altered due to the possibility of a Prop 68-funded project being implemented prior to the stormwater Project. Alternative 2 would have resulted in much less stormwater capture (only 50 percent of the 85th percentile, 24-hour storm). Because the Prop 68 project ultimately did not come to fruition, Alternative 2 was discarded because it did not maximize the potential of the site for stormwater capture.

Alternative 3 combined a different configuration of the underground infiltration gallery with 12 drywells along Norris Avenue. While requiring less excavation due to a shallower infiltration gallery, Alternative 3 would have had higher operation costs because stormwater needed to be pumped into the infiltration gallery and because the drywells needed to be maintained. Alternative 3 would have captured a comparable amount of water as Alternative 1. However, Alternative 3 was discarded because the lower initial capital costs were ultimately more than offset by the higher cost of O&M.

8.4 Effectiveness

Describe the effectiveness of similar types of projects already constructed if applicable:

Examples of successful projects in the City of LA that utilized underground infiltration galleries are Sun Valley Park Drain and Infiltration System Project, Garvanza Park Best Management Practices Project, and Broadway Neighborhood Greenway Project.

8.5 Legal Requirements and Obligations

Describe any legal requirements or obligations that may arise as a result of constructing the Project and how these requirements will be satisfied:

LADWP is committed to fulfilling any obligations that arise from constructing the Project as a result of being awarded funds from the Safe, Clean Water Program.

8.6 Technical Reports

Please upload additional technical reports related to this project not provided above.

8.7 Other

Provide any additional information related to the Project as necessary:

N/A

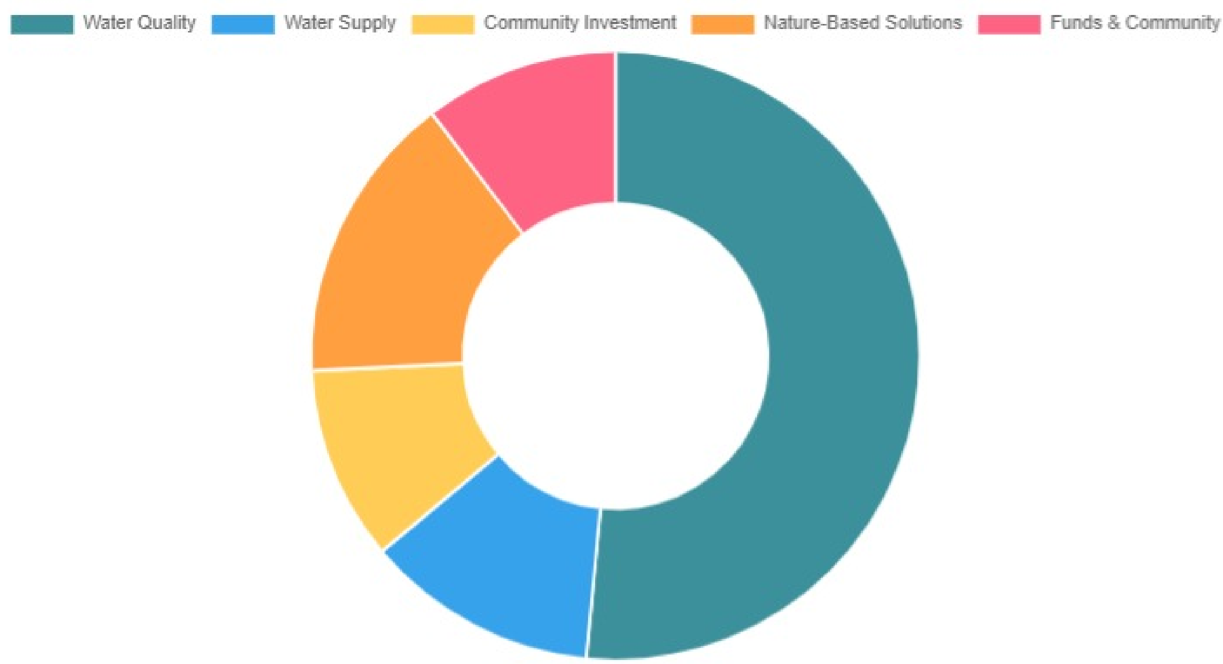
9 SCORING

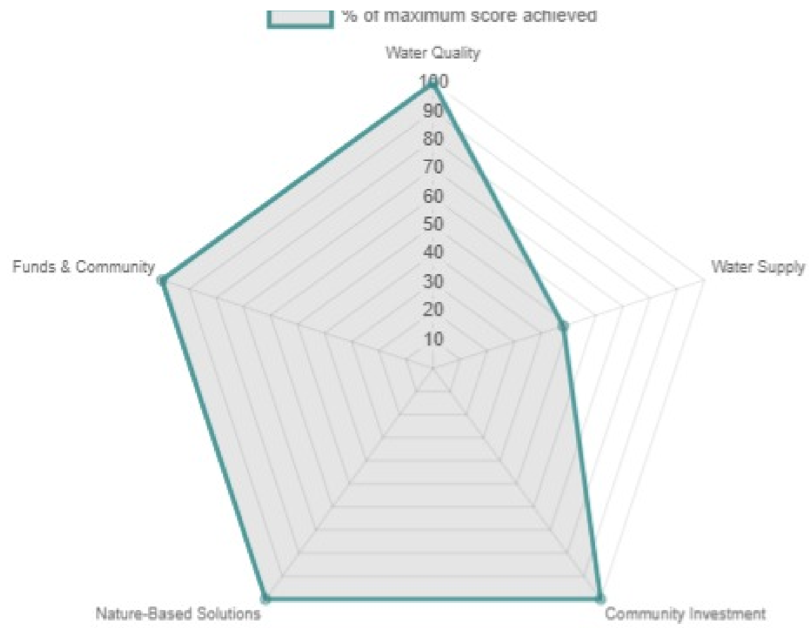
This section summarizes scoring calculations generated by the Module. All Regional Program Projects must meet the Threshold Score of 60 points or more using the following Project Scoring Criteria to be eligible for consideration.

Note: all scoring estimates are considered preliminary and subject to review and revision by the Scoring Committee.

Preliminary Estimated Project Score:
97 points

The following graphics summarize the project scoring. The first graphic shows the components of the project score, based on the different scoring sections. The second graphic shows the percent of maximum score achieved by the project within each scoring section.




% of maximum score achieved
Water Quality
100
90
80
70
60
50
40
30
20
10
Water Supply
Funds & Community
Nature-Based Solutions
Community Investment

The following table details the scoring calculated for the project, along with the scoring thresholds from the SCW Project Scoring Criteria:

Scoring Section	Project Score	Max Score	Scoring Criteria Thresholds
Water Quality Wet + Dry Weather **Part 1**	20	20	Cost Effectiveness = (24-hour BMP Capacity) / (Construction Cost in $Millions) • <0.4 = 0 points • 0.4-0.6 = 7 points • 0.6-0.8) = 11 points • 0.8-1.0 = 14 points • >1.0 = 20 points
Water Quality Wet + Dry Weather **Part 2**	30	30	Primary Pollutant Reduction: • >50% = 15 points • >80% = 20 points Secondary Pollutant Reduction: • >50% = 5 points • >80% = 10 points
Water Quality Dry Weather Only **Part 1**	N/A	20	For dry weather BMPs only, Projects must be designed to capture, infiltrate, or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows.
Water Quality Dry Weather Only **Part 2**	N/A	20	For Dry Weather BMPs Only. Tributary Size of the Dry Weather BMP: • <200 Acres = 10 points • >200 Acres = 20 points
Water Supply Part 1	0	13	• >$2500/ac-ft = 0 points • $2,000–2,500/ac-ft = 3 points • $1500-2,000/ac-ft = 6 points • $1000–1500/ac-ft = 10 points • <$1000/ac-ft = 13 points
Water Supply Part 2	12	12	• <25 ac-ft/year = 0 points • 25 - 100 ac-ft/year = 2 points • 100 - 200 ac-ft/year = 5 points • 200 - 300 ac-ft/year = 9 points • >300 ac-ft/year = 12 points
Community Investment	10	10	• One Benefit = 2 points • Three Benefits = 5 points • Six Benefits = 10 points

Nature Based Solutions	15	15	• Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space = 5 points • Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points • Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points
Leveraging Funds Part 1	6	6	• >25% Funding Matched = 3 points • >50% Funding Matched = 6 points
Leveraging Funds Part 2	4	4	The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.
Total	**97**	110 / 100	

10 ATTACHMENTS

Attachments are bundled and organized in the following pages, with cover pages between each subsection.

Please note – at a minimum, a feasibility study must attach the following:

- A Location Map
- A Schematic with Proposed Footprint and Key Components
- A Map of the Capture Area (Tributary Map)
- Technical Reports (e.g. soil report, hydrology report, hydraulic study, utility search, survey, PEIR, EIR, monitoring data, etc.)

ATTACHMENTS FOR SECTION 1.3:

PROJECT SUMMARY

FACT SHEET

DAVID M. GONZALES RECREATION CENTER STORMWATER CAPTURE PROJECT

The David M. Gonzales Recreation Center Stormwater Capture Project is a proposed regional project led by the the Los Angeles Department of Water and Power in collaboration with the Los Angeles Department of Public Works Bureau of Engineering, Bureau of Sanitation, and the Los Angeles Department of Recreation and Parks. The goal of this project is to improve the City of Los Angeles's water quality and water supply by pre-treatment and infiltration of stormwater while also providing community enhancements and flood mitigation for the park and the disadvantaged community.

97 POINTS

COUNTY SCORE
Safe Clean Water (SCW) Program

WET WEATHER WATER QUALITY BENEFITS

50/50

49.78 AF/DAY
Capacity

97 % Zn
Zinc Removal

89%
E. coli Removal

SIGNIFICANT WATER SUPPLY BENEFITS

12/25

342 AF/YR
Captured

NATURE BASED SOLUTIONS

15/15

Removes **100%** of impermeable area, adds native vegetation including **> 40** trees and native plants

COMMUNITY BENEFITS

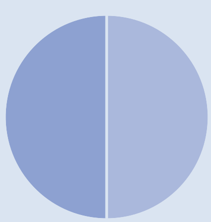
10/10

- ✓ Flood Management
- ✓ Park Enhancements
- ✓ New Recreational Opportunities
- ✓ Greening of School
- ✓ Increased Trees and Shade
- ✓ Carbon Reduction

LEVERAGING FUNDS AND COMMUNITY SUPPORT

10/10

50 % LADWP Funding



50 % SCW Funding

Total Project Cost ~ $39M

Community Support

Council for Watershed Health
ULAR
Mountains Recreation & Conservation Authority
Pacoima Beautiful
MONICA RODRIGUEZ L.A. CITY COUNCILWOMAN

ATTACHMENTS FOR SECTION 1.1:

OVERVIEW

ATTACHMENTS FOR SECTION 1.2:

PROJECT LOCATION

1.2 Location

The park was established on June 1, 1950 and was originally named Pacoima Recreation Center. In 1990, it was renamed David M. Gonzales Recreation Center in honor of the Medal of Honor recipient from the community for his actions during World War II.

The park is located at 10943 Herrick Ave, Pacoima, California 91331 in the San Fernando Valley and is bounded by Herrick Avenue on the north, Norris Avenue on the south, Pierce Street on the east, and the school located on Van Nuys Boulevard on the west, as depicted on Figure 1. The park is adjacent to Pacoima Elementary Charter School and near Guardian Angel Catholic Church and School, Pacoima Hills Apartments, Whiteman Airport, and a commercial complex. The park is owned and managed by RAP.

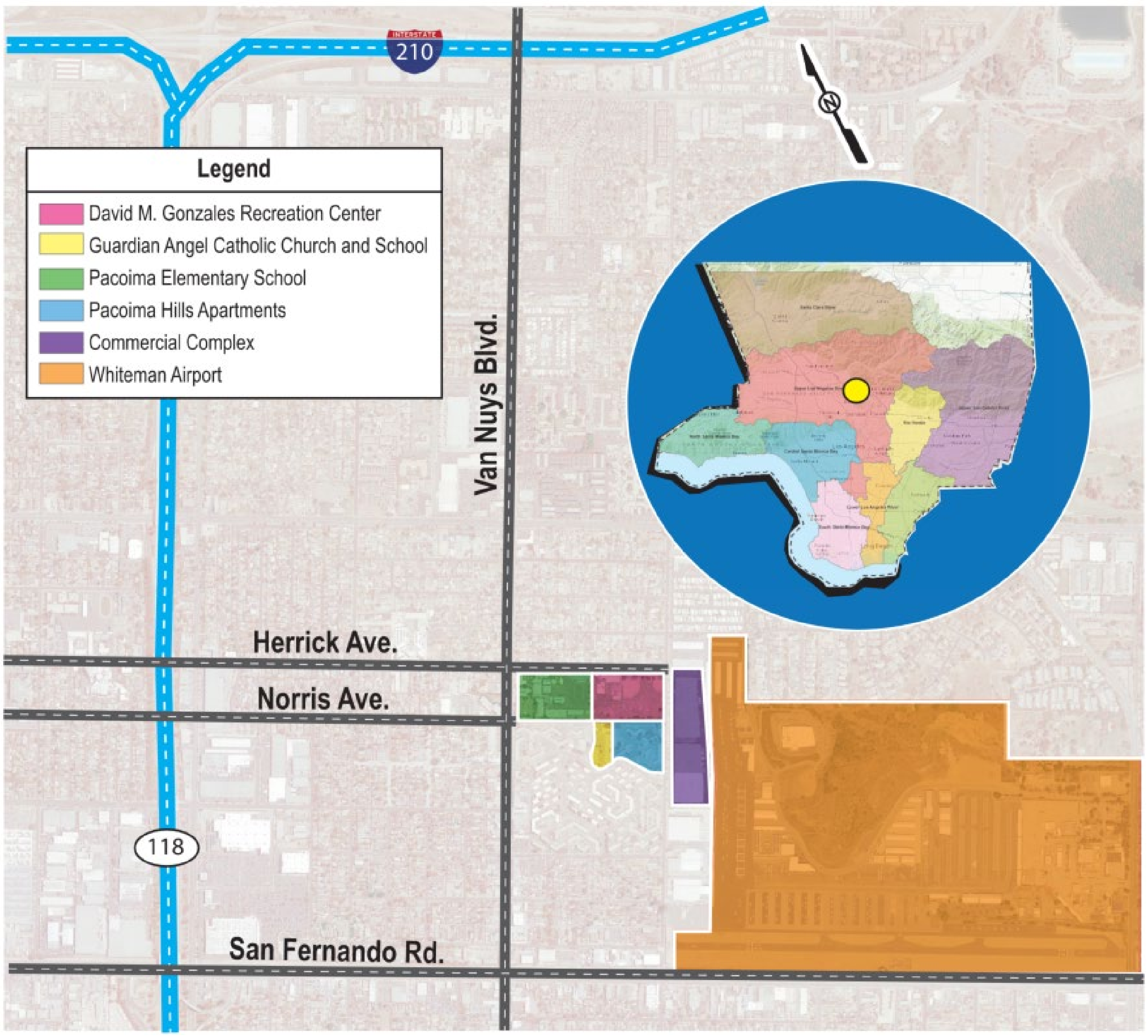


Figure 1 Location Map

Based on the Los Angeles Countywide Parks and Recreations Needs Assessment, the area surrounding the Project has high park needs as shown in Figure 2. The study, released in 2016, used a series of metrics (Park Land, Park Access, Park Pressure, Park Amenities and Park Condition) to perform a holistic analysis using population density data to determine park needs in 188 study areas. By moving beyond a simple analysis of park acreage only, the study was able to take into account the quality of parks that currently exist and factor those qualities into the assessment along with anticipated demand based on population density.

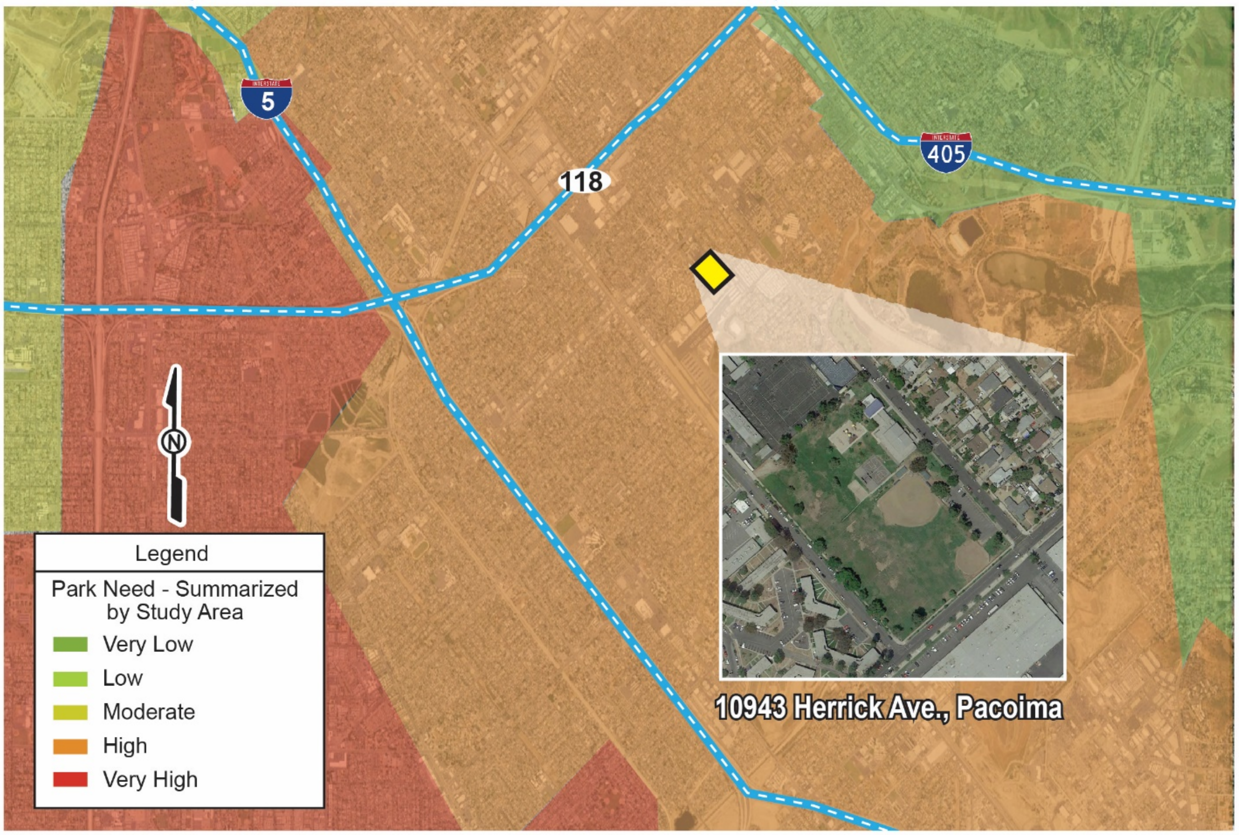


Figure 2 Map of Park Needs Surrounding David M. Gonzales Recreation Center

1.2.1 The Project in the Context of the Community it Serves (DAC)

The history of the Los Angeles area is a story of challenges, successes, achievements, and failures. It is a story of a glimmering City on the Hill, but also of uneven access to the City's riches. Such is the case in many of the neighborhoods surrounding David M. Gonzales Recreation Center and park. The park is located in a disadvantaged community (DAC) according to data from the Safe, Clean Water Program (SCW Program) GIS Tool, and much of the area surrounding the park is also a DAC. Figure 3 shows the Project site and surrounding DAC areas.

DACs are a census block group with an annual median household income of less than 80 percent of the statewide annual median household income. Across the region and the state, DACs tend to suffer from a combination of economic, health, and environmental burdens. These burdens include poverty, high unemployment, air and water pollution, the presence of hazardous wastes, and a high incidence of asthma and heart disease.

Project upgrades could be a new beginning for the surrounding community. In addition to the jobs created by construction, improvements to the park will allow the park to be a community focal point—a place for families to gather, play, and discuss the issues of the day. Strong, well-used community centers can be a base for building stronger communities in their areas.

Improvements to the lighting will enhance the experience of nighttime athletic events, providing much-needed after-hours activities for students and their families. Improvements to the various ballfields will make the site more desirable, bringing people together to strengthen the community. These improvements will also enable the community to gather more frequently for diverse recreational opportunities.

Figure 3 Disadvantaged Communities (Pink) in the Vicinity of David M. Gonzales Recreation Center

ATTACHMENTS FOR SECTION 2.1:

CONFIGURATION

2.1 Configuration

The proposed best management practices (BMPs) consist of the following elements, shown on Figure 1:

- Two diversion structures – one located on the 84-inch diameter storm water pipe located at the intersection of Van Nuys Boulevard and Norris Ave and the other located on the 63-inch diameter stormwater pipe at the intersection of Pierce Street and Herrick Avenue.
- Approximately 935 linear feet (lf) of 36-inch diameter RCP storm drain system with maintenance holes every 300 feet and at changes in the alignment.
- Two hydrodynamic separators within the park area and upstream of the infiltration galleries.
- Two subsurface infiltration galleries – one located underneath the open field and baseball diamond with an approximate area of 68,000 square-feet (sf). The second infiltration gallery would be located within the open field, adjacent to Pierce Street, and would span approximately 46,000 sf. The depth below ground to the top of the infiltration galleries is approximately 7 feet and 11 feet, respectively.
- Two desilting basins immediately upstream of each infiltration gallery.
- Two valves shall be provided upstream of the infiltration galleries to isolate the infiltration galleries from the stormwater stream.

The following are landscape and park improvements that will be further evaluated during design:

- Replacement of the two existing baseball fields to include the following features: new turf, dugouts, back-stops, batting cages, benches, and bleachers with trees that provide shade, and integral shade structures.
- Natural turf multi-purpose soccer field with bleachers.
- Replacement of park irrigation system.
- An additional 40 trees, at minimum, to be added where the park meets the school (with 95 added trees likely).
- Replacement and enhancement of existing exercise equipment in the exercise area.
- Addition of educational signage that will engage the community and promote sustainability awareness.
- ADA access from new parking lot to existing facilities.
- Overflow lawn area for team gatherings.
- High and low fencing for clear demarcation.
- Permeable pavement and native landscaping for the parking lot.

The following are the electrical and instrumentation components for the Project:

- Replace the existing lighting control panel and enclosure with a 3-phase 480V panel to power the new stormwater capture facilities. Replace the existing electrical switchboard in the Recreation Center Building.
- Replace sports field lighting for the two baseball fields and for the new multi-purpose soccer field with LED lighting.
- Provide flow monitoring instrumentation for the diversion pipe. Provide level indication for the infiltration galleries.
- Provide Honeywell Programmable Logic Controller (PLC) with Human-Machine Interface (HMI) connected to LASAN's SCADA network.
- Add an uninterruptible power supply for the control system.

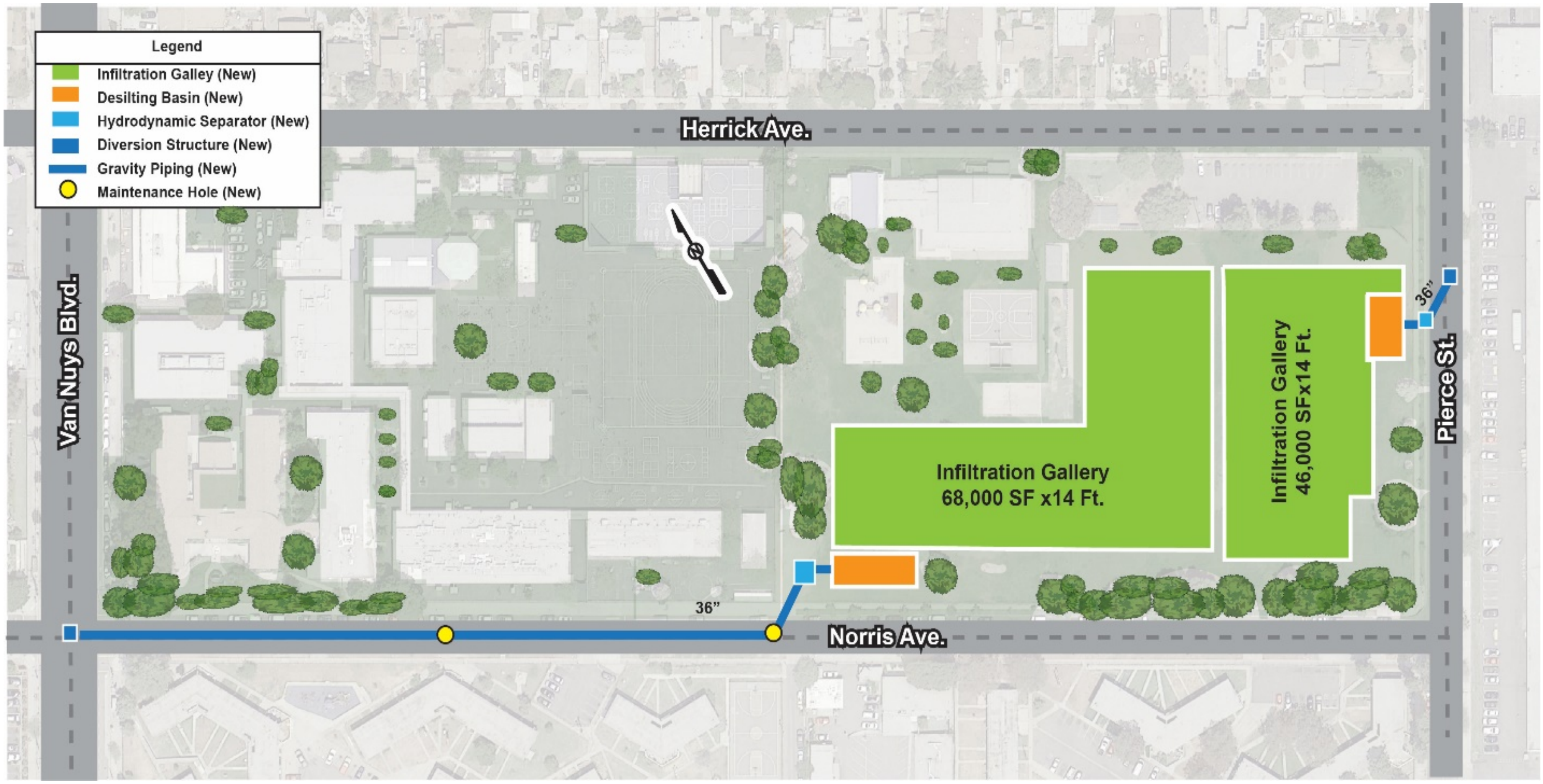


Figure 1 Stormwater Capture Project Features

Figure 2 provides an overview of the above-ground improvements at the park, and Figure 3 illustrates some of these park improvements.

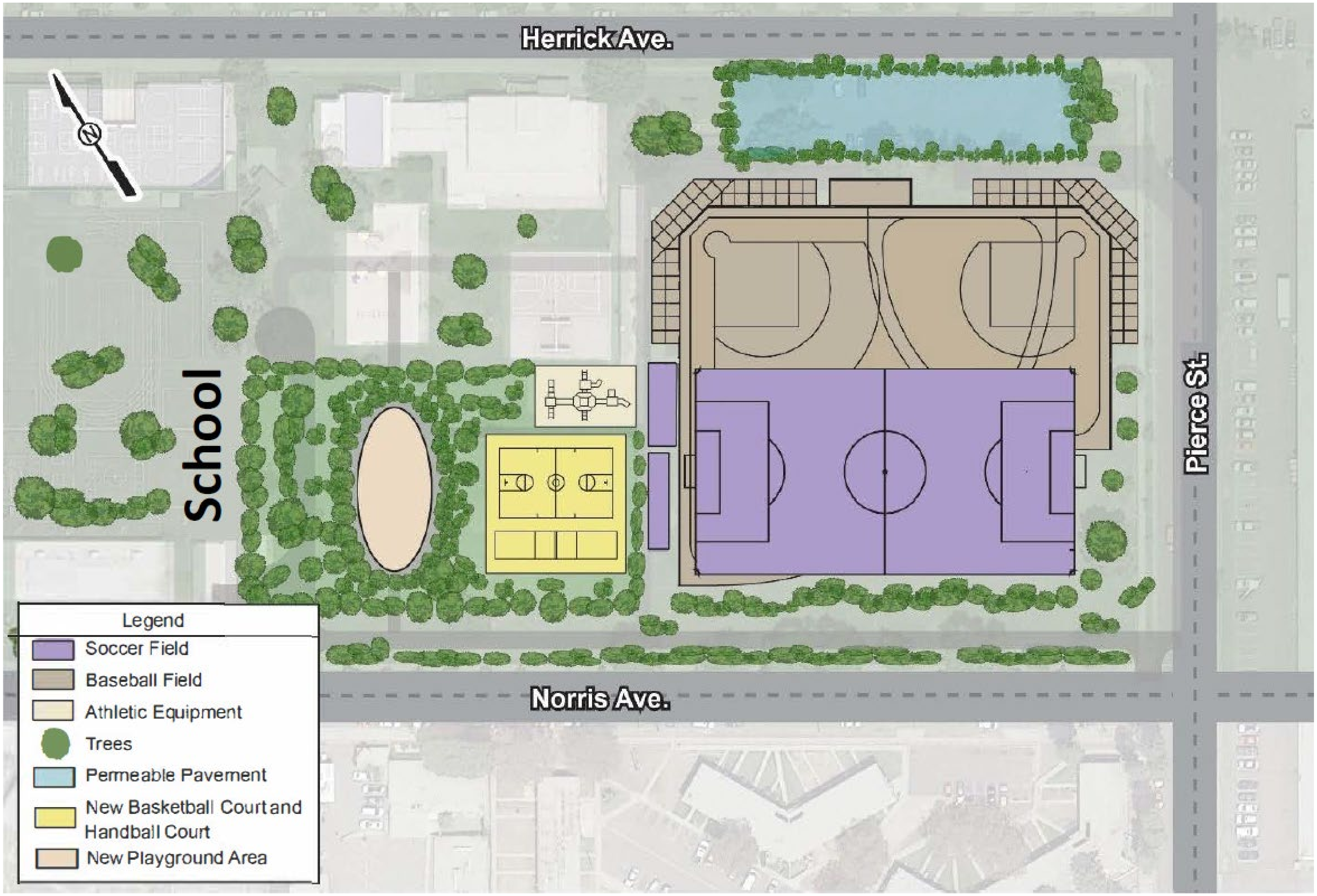


Figure 2 Overview of Above-Ground Project Improvements

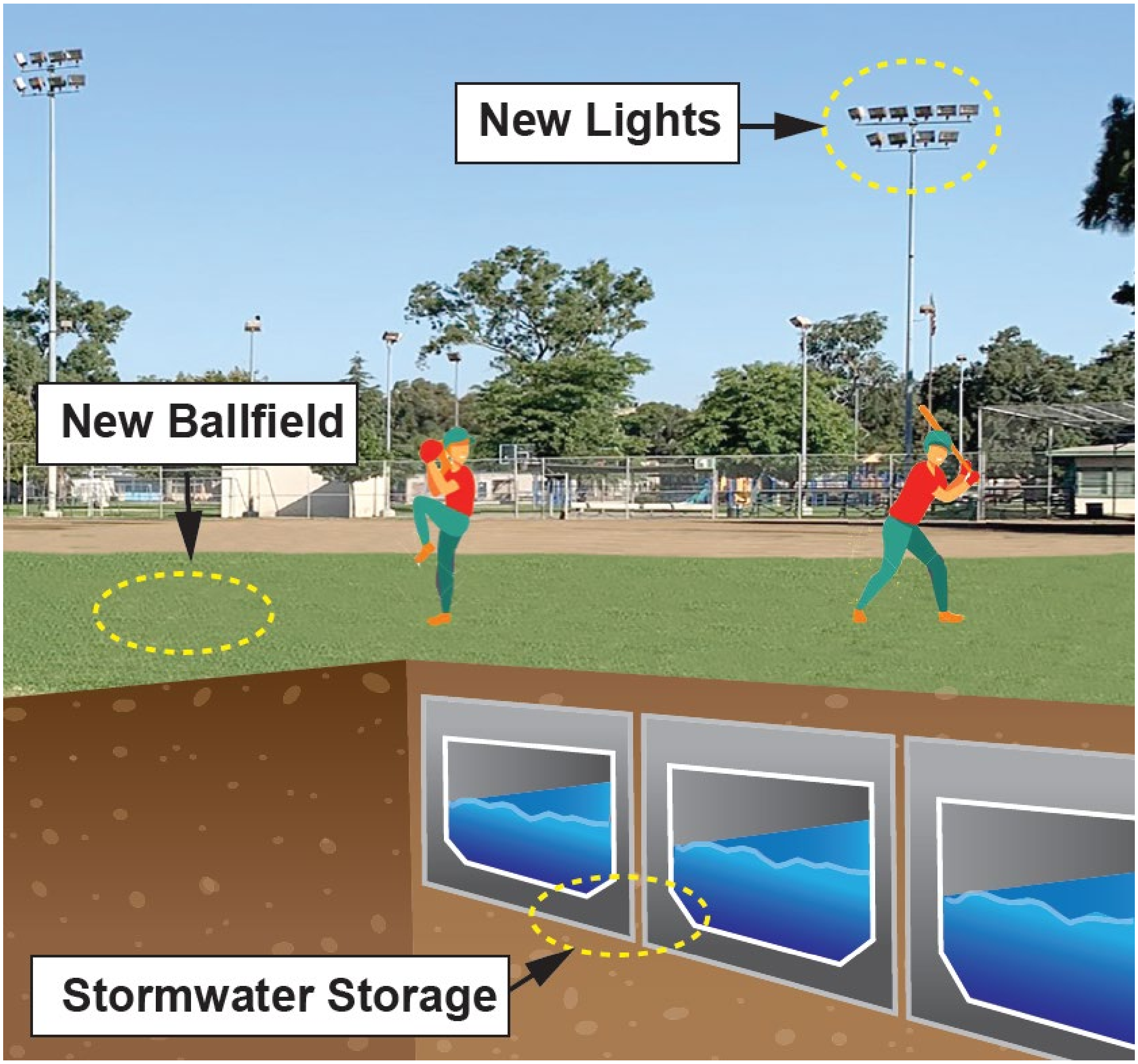


Figure 3 Illustration of Project Improvements

The Project consists of two unique infiltration galleries for the two proposed diversions. For the purposes of the SCW Projects Module, these two systems are modeled individually, and the inputs and results are merged in the SCW Projects Module. The module is not capable of performing calculations on two diversions and two storage units within a project and this aggregated method shown herein can be used to represent the infiltration gallery. The storage depth is the same across the two galleries and the footprint areas have been aggregated for ease of entry into the SCW Projects Module. Table 1 provide module inputs for the Project.

Table 1 Configuration Summary

Component	Dimension
Ponding Depth (ft)	14
Infiltration Footprint Area (ac)	2.62
Media Layer Depth (ft)	0.01(1)
Media Layer Porosity	0.4
Underdrain Layer Depth (ft)	N/A(2)
Underdrain Layer Porosity	N/A(2)
Additional Components	N/A(2)

Notes:
(1) Media layer is not included within the storage calculation, but the module does not accept zero values. This is used to represent a close to zero value.
(2) Characteristics described do not apply for infiltration galleries.

2.1.1 Process Description

Dry weather runoff and stormwater from the drainage area will be diverted from the 63-inch and 84-inch RCP storm water pipes located on Pierce Street and Van Nuys Boulevard. Both stormwater pipes are owned by the County of Los Angeles.

Once intercepted by the diversion structure, the captured runoff would be routed via a hydrodynamic separator and then a desilting basin, ultimately reaching the infiltration gallery where the stormwater will be infiltrated. Lastly, the captured runoff will percolate and help replenish the groundwater basin.

A process flow diagram for the Project proposal is shown in Figure 4. Refer to Figure 1 for location and layout of all process elements proposed for this Project.

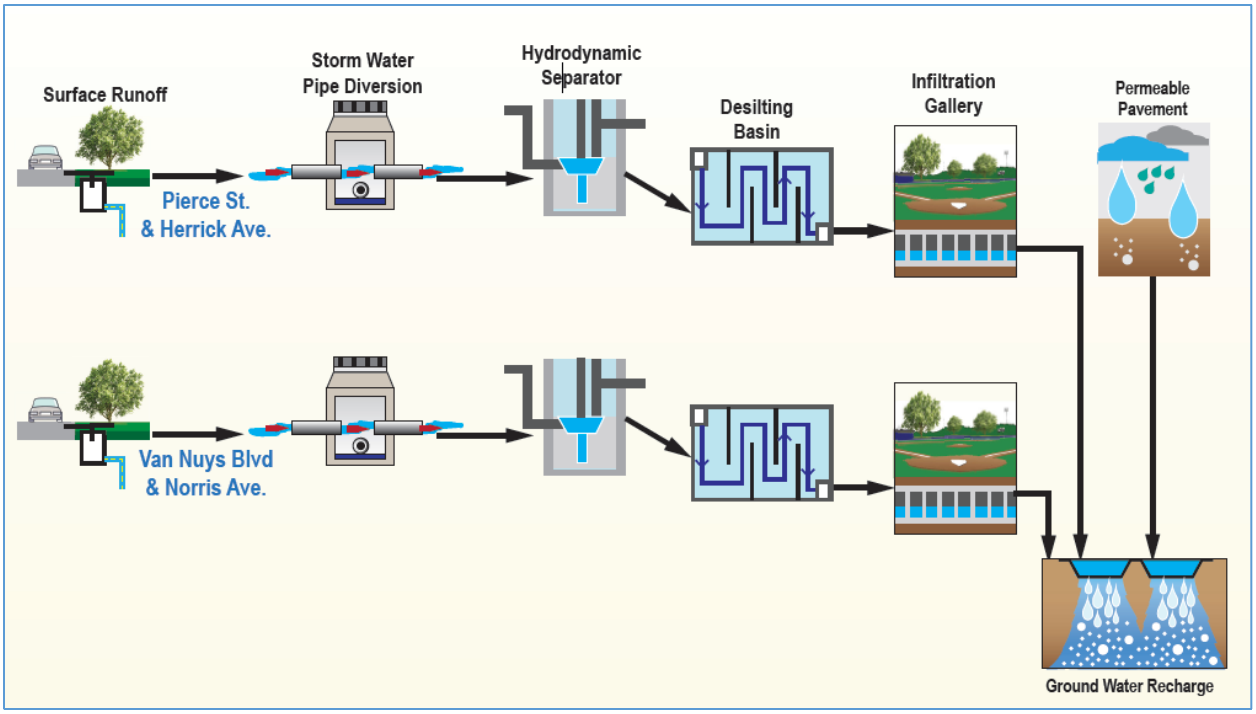


Figure 4 Process Flow Diagram

2.1.2 Intercept Project Component: Diversion Structure

A diversion structure will be required to intercept and divert the 85th percentile storm event flows from each of the 63-inch and 84-inch storm water pipes. Diversion structures typically consist of precast maintenance holes with either a diversion weir or significant depression in the diversion outlet pipe. The proposed diversion structure includes a weir plate and a manually operated steel slide gate at the diversion outlet location. A manually operated slide gate is proposed over a motorized slide for the following reasons:

- A motorized slide gate requires electrical and instrumentation components that are more difficult to construct.
- A manual slide gate is more cost effective.
- A slide gate would normally remain open; thus, a motorized slide gate is less useful.

The location of stormwater pipes should be carefully considered since operating a manual slide gate may require temporary traffic control measures if the slide gate is installed in the street. It is recommended that designing the slide gate to be located within the park or parkway area to avoid temporary traffic control scenarios while BMPs are being maintained. The exact location of the pipeline will determine the feasibility of a manually operated slide gate.

Figure 5 shows the configuration of a typical diversion structure.

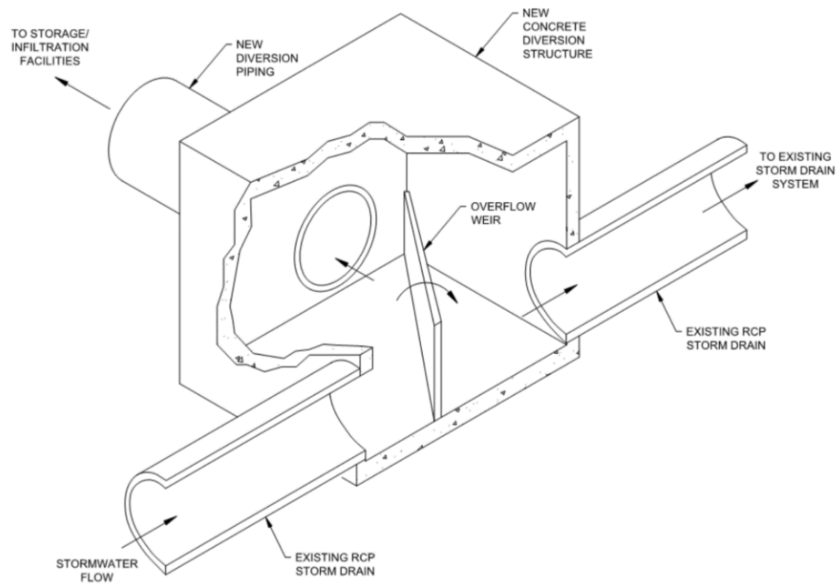


Figure 5 Typical Diversion Structure

2.1.3 Treatment Project Component: Hydrodynamic Separator & Desilting Basin

Stormwater BMPs proposed include hydrodynamic separators prior to infiltration for the removal of suspended solids, oil and grease, trash, and other debris from stormwater runoff. For this Project, the Nutrient Separating Baffle Box NSBB-1020 with the SkimBoss Max Floating Skimmer (or approved equivalent) is proposed due to the model's high treatment flow capacity (up to 37.5 cubic feet per second [cfs]) and inline configuration.

The SkimBoss Max Floating Skimmer is required in order to achieve the desired treatment capacity and optimal sediment and hydrocarbon removal. A hydrodynamic separator would help reduce infiltration gallery operations and maintenance (O&M) and help protect the infiltration design capacity of the infiltration gallery. Refer to Figure 6 for an illustration of this unit.

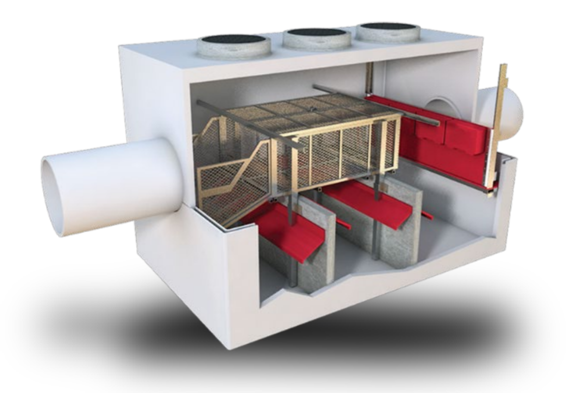


Figure 6 NSBB Hydrodynamic Separator

A desilting basin is proposed downstream of each hydrodynamic separator and upstream of each infiltration gallery. The main purpose of the desilting basin is to remove silt and fine sediment that cannot be treated by the upstream hydrodynamic separator. Adding the desilting basin would in turn reduce maintenance issues and preserve the long-term design performance of the infiltration galleries.

The preliminary sizing for Desilting Basin No. 1 is 40'W x 80'L x 7'H and Desilting Basin No. 2 is 40'W x 64'L x 7'H. The preliminary desilting basin design assumes 100 percent capture of the 75-micron particle size. Refer to Figure 7 for an example of a desilting basin.

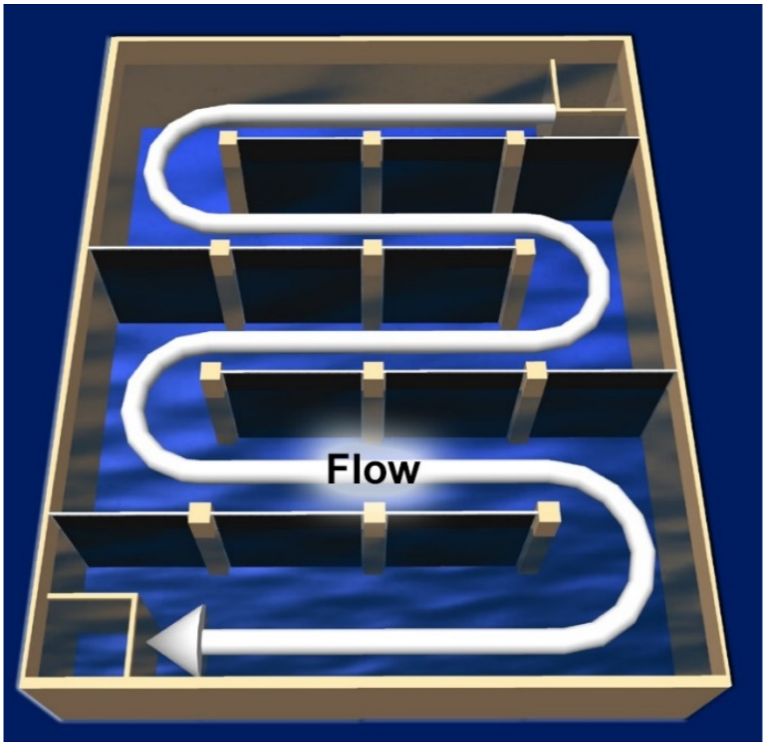


Figure 7 Example of a Baffled Desilting Basin with Serpentine Flow

2.1.4 Infiltration Project Component: Infiltration Gallery

This Project will use infiltration galleries as the primary means of infiltrating treated stormwater into the underlying soils. Infiltration gallery systems are underground storage facilities built from modular precast concrete vaults that can be customized in various configurations to meet site-specific constraints.

These systems are built with hollowed-out precast concrete bases sitting on top of permeable aggregates to facilitate infiltration and allow for installation at various depths below the ground surface, allowing park space to be used above. This makes the system nearly invisible from above ground once construction is complete. Refer to Figure 8 for an illustration of an infiltration gallery.

Two infiltration galleries are proposed for this Project. To maximize the infiltration capacity, infiltration galleries will span 68,000 sf and 46,000 sf, as shown in Figure 1. A suggestion by the Project team is hydraulically interconnecting the infiltration galleries with an equalization pipe so the galleries can function together.

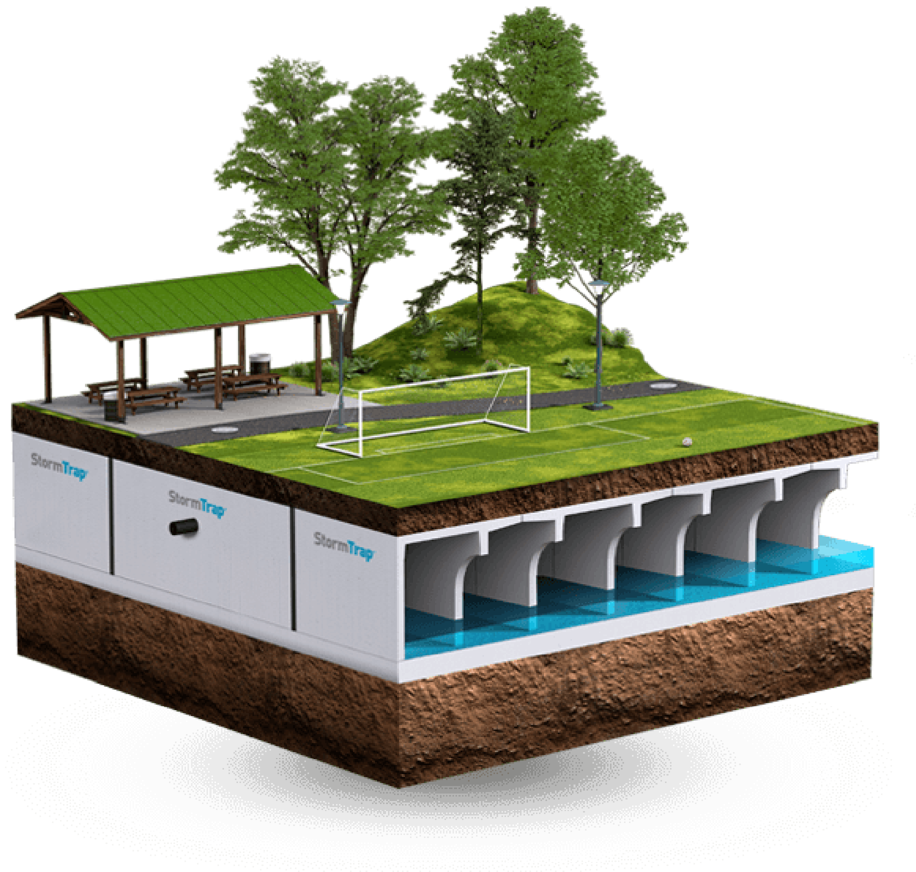


Figure 8 Example of an Infiltration Gallery: DoubleTrap Unit by StormTrap

2.1.5 Recreation and Park Improvements

The Project will replace the existing parking lot with a new one in the same configuration, except it will be paved with permeable pavement and accented with California-native vegetation. The Project will also add a minimum of an additional 40 trees throughout the park and adjacent to the elementary school. LADWP is coordinating with the Trust for Public Land which could result in an increase of up to an additional 55 trees for a total of 95. Additional recreation and park improvements are described in Section 2.1 of this attachment and Section 5.1 (Community Investment Benefits) of the feasibility study.

ATTACHMENTS FOR SECTION 2.2:

CAPTURE AREA

2.2 Capture Area

The Project will capture stormwater from two drainage areas, Tributary Area 1 (310 acres) and Tributary Area 2 (449 acres). The combined drainage area for the Project is 759 acres. The drainage area is predominantly in the City of Los Angeles, with a small portion in unincorporated Los Angeles County. This includes surface drainage areas based on ground elevations and the storm drain network. Table 1 provides a summary of the municipal jurisdictional area breakdown for the Project drainage area. Figure 1 shows a map of the drainage area breakdown and municipal contributions.

Table 1 Jurisdictional Drainage Area

Agency	Tributary Percent	Land Area (acres)
City of Los Angeles	98.0%	744
County of Los Angeles (Unincorporated)	2.0%	15
Total Watershed Area		759

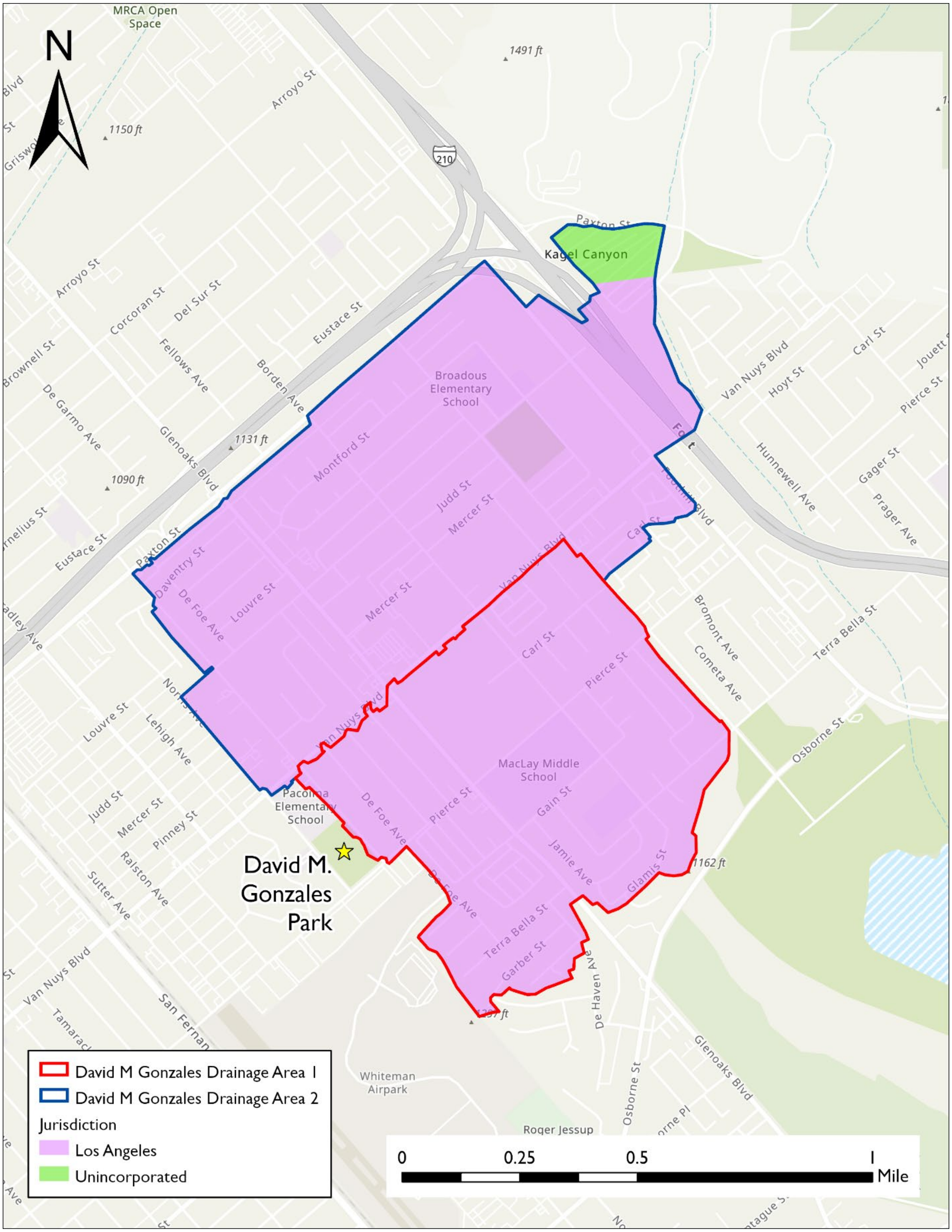


Figure 1 Jurisdictional Drainage Area Map

Table 2 and Figure 2 show the land uses, area, and percent of total impervious acreage within the drainage area used in the development of the preliminary design report. The 2005 land use designations were used to categorize the various land use types within the drainage area; thus, some land uses may have changed designations, redeveloped, and/or new construction completed. Based on the breakdown of land uses, the drainage area has a weighted average of 52 percent imperviousness. The percent of total impervious acreage is the breakdown of the impervious area by land use and adds up to 100% of the impervious area (395.1 acres).

Table 2 Land Use, Area, and Percent of Total Impervious Acreage Summary

Land Use Classification	Area (acres)	Impervious Area (acres)	% of Total Impervious Acreage
Single-Family Residential	345.4	170.9	43.3%
Multi-Family Residential	114.0	66.6	16.9%
Commercial	23.2	15.6	3.9%
Institutional	45.8	26.5	6.7%
Industrial	34.9	26.3	6.7%
Transportation	18.3	7.7	1.9%
Secondary Roads	147.8	81.5	20.6%
Agriculture	10.4	0.0	0.0%
Vacant	19.4	0.0	0.0%
TOTAL	**759.3**	**395.1**	**100%**

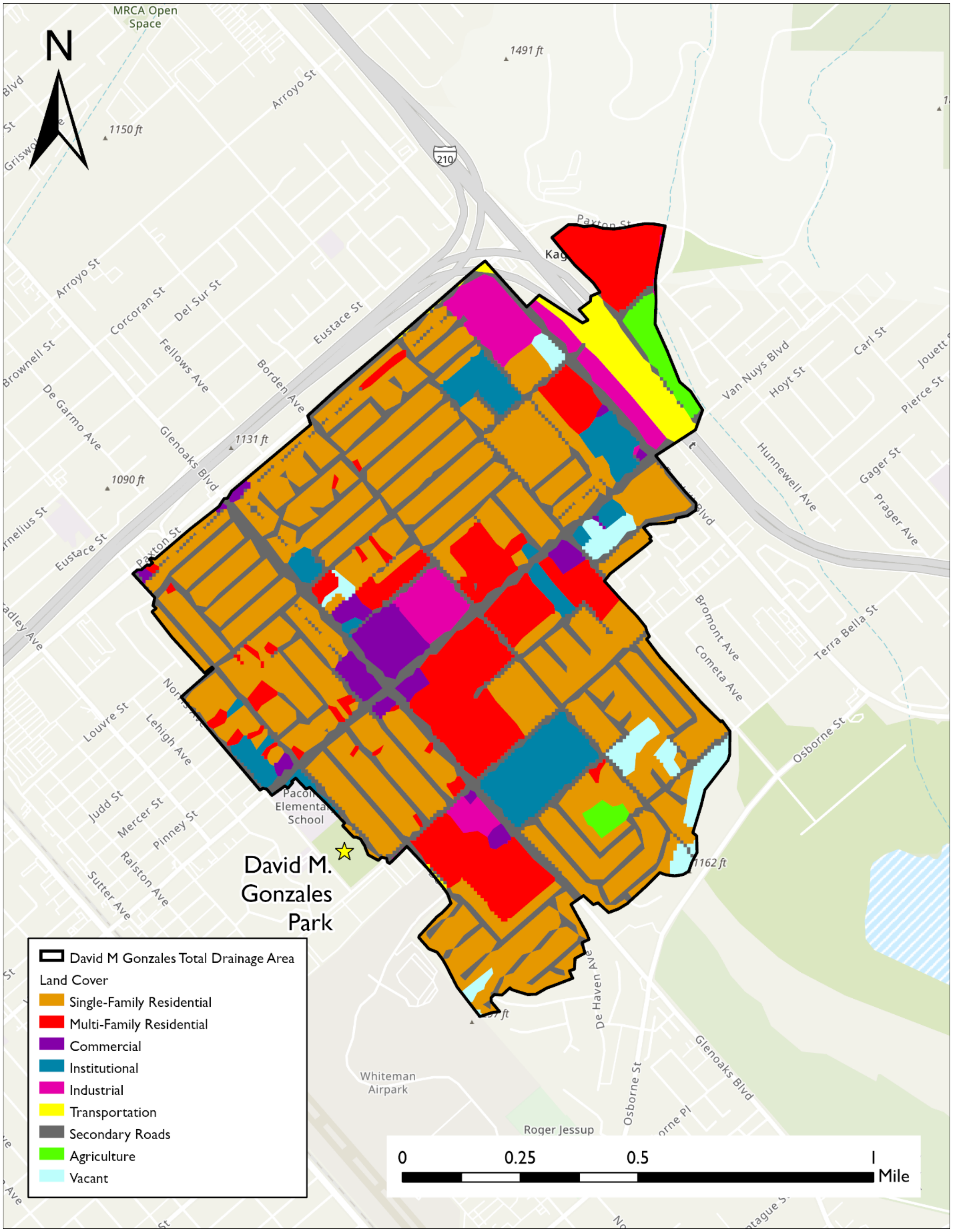


Figure 2 Drainage Area Land Uses

ATTACHMENTS FOR SECTION 2.4:

SITE CONDITIONS & CONSTRAINTS

2.4.1 Geotechnical Evaluation

A geotechnical investigation was completed from March to May of 2020 to evaluate the soil and geologic conditions at the Project site and to provide preliminary geotechnical recommendations for pre-design of the proposed stormwater BMPs. The draft Geotechnical Evaluation is included in the following pages.

Geotechnical Evaluation

LABOE TOS No. 25
Stormwater Capture Parks Program
David M. Gonzales Recreation Center
10943 Herrick Avenue
Pacoima, California

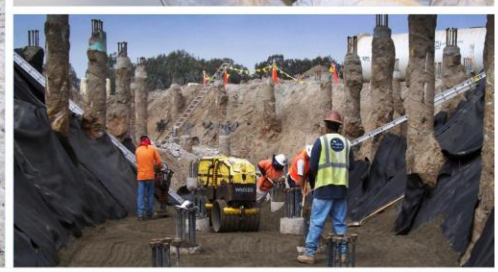
CDM Smith

600 Wilshire Boulevard, Suite 750 | Los Angeles, California 90017

July 2, 2020 | Project No. 211294003







Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Geotechnical Evaluation

LABOE TOS No. 25
Stormwater Capture Parks Program
David M. Gonzales Recreation Center
10943 Herrick Avenue
Pacoima, California

Mr. Scott Dellinger
CDM Smith
600 Wilshire Boulevard, Suite 750 | Los Angeles, California 90071

July 7, 2020 | Project No. 211294003

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Principal Geologist

Daniel Chu, PhD, PE, GE
Principal Engineer

KMB/SCM/GMC/mlc

Distribution: (1) Addressee (via e-mail)

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FIGURES

APPENDICES

1 INTRODUCTION

In accordance with your request and authorization, we have performed a geotechnical evaluation at David M Gonzales Recreation Center located at 10943 Herrick Avenue in Pacoima, California as part of the Los Angeles Bureau of Engineering (LABOE) Stormwater Capture Parks Program (Figure 1). The purpose of our study was to evaluate the soil and geologic conditions at the site and to provide preliminary geotechnical recommendations for pre-design of proposed Best Management Practices (BMPs) at the site for stormwater infiltration. Our evaluation was performed in general accordance with Task Order Solicitation (TOS) No. 25 (LABOE, 2019) and our referenced proposal dated May 18, 2020 (Ninyo & Moore, 2020a). This report presents our findings, conclusions, and recommendations for the David M. Gonzales Recreation Center project.

The intent of the Stormwater Capture Parks Program is to capture up to 2,912 acre-feet of stormwater and urban runoff per year that drain from 5,868 acres within a portion of the San Fernando Valley in order to reduce the potential for flooding, improve stormwater quality, increase water supplies through stormwater capture, and provide recreational, social, and economic benefits (LABOE, 2019). The stormwater runoff will be diverted into proposed stormwater capture and infiltration BMPs within nine City of Los Angeles parks generally located along the SR-170 corridor, including the subject David M. Gonzales Recreation Center, for replenishment of the San Fernando Groundwater Basin. According to the Conceptual Study Report (CSR) (Los Angeles Department of Water & Power [LADWP], 2018), the project at David M. Gonzales Recreation Center is anticipated to capture and infiltrate stormwater runoff from a tributary area of approximately 575 acres.

2 SCOPE OF SERVICES

Our scope of services was prepared based on our review and the conceptual design provided in the CSR (LADWP, 2018), an anticipated infiltration invert depth of 29 feet, and discussions with the client, CDM Smith, and included the following:

- Project coordination and planning with subcontractor, CDM Smith, LABOE, and Los Angeles Department of Recreations and Parks (RAP) personnel, and attendance at a project kick-off meeting.
- Review of readily available background materials, including published topographic maps, geologic maps, fault and seismic hazard maps, groundwater data, stereoscopic aerial photographs, project related plans, and in-house geotechnical information.
- Acquisition of a Los Angeles County Environmental Health Department (LACEHD) permit.
- Acquisition of a City of Los Angeles Encroachment permit for drilling within the City right-of-way on Norris Avenue.

- Field reconnaissance to observe and document the site conditions, mark-out proposed hollow-stem-auger (HSA) boring and cone penetration test (CPT) sounding locations for underground utility clearance by Underground Service Alert, meet with RAP personnel regarding site access and constraints, and meet with the City of Los Angeles inspectors.

- Subsurface exploration consisting of the drilling, sampling, and logging of eight HSA borings, ranging in depths from approximately 16½ feet to 51 feet, and five CPTs to depths ranging from approximately 13 feet to 24 feet. The purpose of the borings and CPTs was to evaluate the subsurface soil conditions and percolation rates of the on-site soils.

- Field percolation testing in five of the borings in general accordance with the methods presented in the County of Los Angeles Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration (COLA, 2017).

- Geotechnical laboratory testing of representative soil samples to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve, consolidation, direct shear strength, and soil corrosivity.

- Data compilation and engineering analysis of the information obtained from our background review, subsurface evaluation, infiltration testing, and laboratory testing.

- Preparation of this geotechnical report presenting our findings, conclusions, and preliminary recommendations pertaining to the design and construction of the proposed improvements.

3 SITE DESCRIPTION

David M. Gonzales Recreation Center is a City of Los Angeles park located on the northeastern side of the San Fernando Valley, approximately 1¾ miles to the east of the intersection of California State Route (SR) 118 and Interstate 5 (I-5), approximately 1¼ miles southwest of the intersection of SR-118 and I-210, and ¾ mile west of Hansen Dam (Figure 1). The park consists of a relatively flat rectangular-shaped lot bounded by Herrick Avenue on the northeast, Pierce Street on the southeast, Norris Avenue on the southwest, and Pacoima Charter School on the northwest (Figure 2). Residential and multi-family properties are located to the north, east, and west of the park and Whiteman Airport is located to the south of the park. The southeast approximate half of the park consist of two baseball diamonds with dirt infields and grass-covered outfields lined by trees. The northwest approximate half of the park includes a grass field area, recreation center building, picnic area, and playground area. An asphalt concrete (AC) parking lot is located along Herrick Avenue on the northeast side of the park. The project area also consists an approximately 760-foot-long section of Norris Avenue between the park and Van Nuys Boulevard to the northwest. Norris Avenue is paved with AC and bounded by residential properties on the southwest and Pacoima Charter School on the northeast.

Based on our review of topographic maps (NavigateLA, 2020), the park slopes gently downward toward the south with site elevations ranging from approximately 1,042 feet above mean sea level (MSL) at the north corner of the park to approximately 1,031 feet (MSL) at the south corner of the park. Norris Avenue slopes gently downward toward the southeast with site elevations ranging from approximately 1,044 feet above MSL at Van Nuys Boulevard to the and approximately 1,040 feet (MSL) adjacent to the east side of the park.

4 PROJECT DESCRIPTION AND PROPOSED CONSTRUCTION

Based on our review of TOS 25 (LABOE, 2019), the David M. Gonzales Recreation Center project would consist of the installation of new BMPs within the park to infiltrate stormwater diverted from an existing 84-inch-diameter reinforced concrete pipe (RCP) storm drain along Van Nuys Boulevard and an existing 63-inch-diameter RCP storm drain along Pierce Street (Figure 3). The new BMPs would consist of the installation of an underground infiltration gallery to store approximately 1,250,000 cubic feet of water, a diversion structure, hydrodynamic separator (HDS) units, flow measuring devices, supervisory control and data acquisition, educational signage, and park restoration/improvements. According to the CSR (LADPW, 2018), which was included as part of TOS 25, the conceptual infiltration gallery would have a footprint of approximately 130,800 square feet (sf) with an inner height of approximately 12 feet (11 feet of storage), and an invert depth of approximately 29 feet below the ground surface (bgs). As indicated our proposed scope of services (2020) was based on our review of the CSR (LADPW, 2018). We understand that the gallery will likely consist of prefabricated, modular concrete vaults with open bottoms underlain by drain rock over a layer of filter fabric. Based on our discussions with CDM Smith, it is our understanding that the gallery may be supported on concrete strip footings. Upon completion of the BMP installation, the BMPs will be buried with compacted fill and the ground surface returned to its existing condition for continued use and additional development as a park

Subsequent to performing our subsurface exploration, presented herein, we received conceptual plans from our client (CDM Smith, 2020), which include three BMP options (Alternatives 1 through 3) for the project. The improvements generally involve the construction of an underground infiltration gallery within the existing fields at the park. We understand that these proposed alternatives are subject to change as further design is performed. The three options are described below.

Alternative 1 – According to CDM Smith (2020), Alternative 1 consists of the installation of a subterranean infiltration gallery (94,300 sf) within the existing baseball fields that will have an interior height of 14 feet, invert depth ranging from approximately 19 to 24 feet, and fill cover of approximately 5 feet. The alternative will include the construction of new concrete structures, including two diversion structures (one on Pierce Street adjacent to the park and one in the intersection of Norris Avenue and Van Nuys Boulevard), hydrodynamic separators, and manhole vaults, and new 36-inch-diameter pipelines that connect the structures to the gallery. The invert depths of the structures and pipelines are anticipated to be on the order of 12 to 16 feet in depth. The proposed layout of Alternative 1 is presented on Figure 3.

Alternative 2 – Alternative 2 consists of the installation of a smaller subterranean infiltration gallery (9,800 sf) within the existing parking lot along the northeast side of the baseball diamonds along with nine approximately 50-foot-deep dry wells within and adjacent to Herrick Avenue. The gallery would have an interior height of 14 feet, invert depth of approximately 24 feet, and fill cover of approximately 10 feet. The alternative also includes the installation of concrete structures, including a diversion structure in Pierce Street and an HDS unit within the park, new 36-inch-diameter pipelines between the structures and gallery, and bioswales on both sides of Herrick Avenue. The invert depths of the structures and pipelines are anticipated to be on the order of 13 to 18 feet in depth Additional pipelines would connect the dry wells to the gallery.

Alternative 3 – Alternative 3 consists of the installation of a smaller subterranean infiltration gallery (20,000 sf) within the park, northwest of the existing baseball diamonds, along with twelve approximately 50-foot-deep dry wells within the park along Norris Avenue. The gallery would have an interior height of 14 feet, invert depth of approximately 19 feet, and fill cover of approximately 5 feet. The alternative also includes the installation of concrete structures, including a diversion structure at the intersection of Van Nuys Boulevard and Norris Avenue, an HDS unit within the park, and new manhole vaults, and new 36-inch-diameter pipelines between the structures and gallery. The invert depths of the structures and pipelines are anticipated to be on the order of 12 to 16 feet in depth. Additional pipelines would connect the dry wells to the gallery.

5 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our subsurface evaluation was conducted on March 25 through April 2, May 28, and May 29, 2020, and consisted of the drilling, logging, and sampling of eight HSA borings (B-1 through B-3 and P-1 through P-5) and five CPT soundings (CPT-1 through CPT-5). The borings were drilled using a truck-mounted drill rig with 8-inch diameter augers. The depths of the borings were based on the conceptual design depths for the infiltration basin presented in the CSR (LADWP, 2018) and on our discussions with CDM Smith regarding the possible use of deeper dry wells. Borings B-1, B-2, P-3, P-4, and P-5 were drilled to proposed depths of approximately 36, 16½, 51, 31½ and 31 feet, respectively. Drilling refusal was encountered in borings B-3, P-1, and P-2 at depths of approximately 35½, 28, and 37 feet (proposed depths of 80, 30, and 50 feet), respectively. The borings were logged in the field by a representative of Ninyo & Moore and representative bulk and relatively undisturbed soil samples were collected from the borings at selected depths for laboratory testing. Percolation testing was performed in borings P-1 through P-5 as further discussed in Section 8 of this report. The CPT soundings (CPT-1 through CPT-5) were performed using a 30-ton CPT rig with a 15 square centimeter cone to depths of approximately 23.3, 13.7, 22.0, 24.0, and 13.2 feet, respectively. Since the proposed depths of the CPT soundings were 60 feet, and relatively shallow refusal was encountered, CPT-2 and CPT-5 were repeated as CPT-2A and CPT-5A within approximately 5 feet of each previous CPT. The repeated CPTs also encountered refusal at depths of approximately 13.4 and 12.9 feet, respectively. Continuous soil profiles, including cone tip resistance and sleeve friction, were recorded during the sounding. A representative of Ninyo & Moore was on site to observe the CPT soundings. Logs of the exploratory borings and CPT soundings are provided in Appendices A and B, respectively. The approximate locations of the borings and CPTs are presented on Figures 2 and 3. The borings and CPTs were backfilled with cement-bentonite grout upon completion of the drilling and percolation testing in general accordance with the requirements of LACEHD.

Geotechnical laboratory testing of representative soil samples included tests to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve consolidation, direct shear strength, and soil corrosivity. Moisture and density test results are presented on the boring logs in Appendix A. The remaining test results are presented in Appendix C.

Soil cuttings from the borings and CPT were placed in 55-gallon drums, and composite soil samples of the drummed soil were collected in 8-ounce jars for waste characterization. The samples were stored in a chilled cooler and delivered to SunStar Laboratories, Inc. for analytical testing under chain-of-custody protocol. The samples were tested for total petroleum hydrocarbons (TPH) (gas and diesel range) per United Stated Environmental Protection Agency (EPA) Test Method 8015B, Title 22 metals per EPA Test Methods 6010B/7470/7471, and volatile organic compounds per EPA Test Method 8260B. Based on the characterization test results, the drums were disposed at an approved landfill (Soil Safe in Adelanto, California) by a licensed transportation subcontractor (Belshire) as non-hazardous. The test results and a copy of the transportation manifest are provided in Appendix D.

6 GEOLOGIC AND SUBSURFACE CONDITIONS

The project site is within the San Fernando Valley, which is generally bounded by the Santa Monica Mountains on the south, Verdugo Mountains on the east, Santa Susana Mountains on the north, and Chatsworth Hills on the west. The valley along with these bounding mountain ranges are part of the Transverse Ranges Geomorphic Province. The province encompasses an approximately 40- to 60-mile-wide area (north to south) that extends approximately 320 miles (west to east) from Point Arguello and San Miguel Island to the Eagle and Pinto Mountains of the Mojave Desert (Norris and Webb, 1990). The province generally consists of a region of east to west-trending mountain ranges considered atypical to the predominant northwest to southeast structural fabric of California. The atypical trend of the Province is the result of a restraining bend ("the Big Bend") on the San Andreas Fault that has rotated and compressed the region to its current configuration. The compression has resulted in folding and reverse/thrust faulting with similar east to west trends, and regional uplift. The Santa Monica Mountains are the southernmost of the east to west trending ranges of the province and the San Fernando Valley is a synclinal valley infilled with relatively thick deposits of sedimentary rock overlain by alluvial deposits (Norris and Webb, 1980).

Review of regional geologic maps indicate that the locations of the proposed project improvements, including the buried concrete structures, pipelines, and park BMPs, are underlain by Holocene to Pleistocene-age alluvial fan deposits consisting of unconsolidated gravel, sand, and silt of the Pacoima alluvial fan (Campbell et al., 2014) (Figure 4). The California Department of Mines and Geology (CDMG, 1997) has also mapped the site as being underlain by alluvial fan deposits consisting of loose to medium dense, silty sand and sand with minor clay.

Materials encountered during our subsurface exploration generally consisted of undocumented fill underlain by alluvium. AC pavement was encountered at the ground surface in borings B-1 and B-2 on Norris Avenue. The pavement sections consisted of approximately 5½ to 6 inches of AC underlain by approximately 4 inches of aggregate base (AB). The AB generally consisted of brown, dense, poorly graded gravel with sand. Undocumented fill was encountered in our borings to depths ranging from approximately 1 to 6 feet below the ground surface. The undocumented fill generally consisted of brown, moist, loose to very dense, silty sand, clayey sand, poorly graded sand with silt, and poorly graded sand with variable amounts of organic material, gravel, and cobbles. Documentation regarding the limits of fill or the placement and compaction of the fill soils was not available for our review. Alluvium was encountered beneath the undocumented fill to the total depth explored of up to approximately 51 feet. The alluvium generally consisted of interbedded granular deposits of light brown and brown, moist, medium dense to very dense, poorly graded sand, poorly graded sand with silt, well-graded sand, well-graded sand, silty sand, poorly graded gravel, and poorly graded gravel with silt with variable amounts of gravel and cobbles. Boulders may also be present. More detailed descriptions of the subsurface materials are presented on the boring logs and CPT soundings in Appendices A and B, respectively.

7 GROUNDWATER

Seepage and/or groundwater was not encountered in our borings or CPT to the total depth explored of up to approximately 51 feet. CDMG (1998) indicates that the historic high depth to groundwater at the project site is between 100 and 120 feet below the ground surface increasing in depth towards the southwest. Groundwater monitoring well data (Stratus Environmental, Inc., 2012) available on the State of California Water Resources Control Board's GeoTracker website (SWRCB, 2020) indicates that groundwater was reportedly encountered at a depth ranging from approximately 66 to 79 feet below the ground surface at a monitoring well located approximately 900 feet northwest of the park. The depth to groundwater in a Los Angeles County groundwater monitoring well (Well ID 4892A) located 0.9 mile northeast of the site was approximately 125 feet in 2009 (the latest posted measurement) (COLA, 2020). The depth to groundwater in this well ranged from approximately 107 and 199 feet between 1966 and 2009. Since the depths to groundwater measured in the adjacent wells are approximately consistent with the historic high groundwater depth at each well location, it is anticipated that the depth to groundwater at the site will be similar to the historic high depth to groundwater at the site of approximately 100 to 120 feet (CDMG, 1998). Fluctuations in the level of groundwater will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors that were not evident at the time of our field evaluation.

8 FIELD PERCOLATION TESTING

Percolation testing was performed in percolation borings P-1 through P-5 in general accordance with the County of Los Angeles Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration (COLA, 2017). The testing was performed to evaluate the infiltration rate of the on-site soils for use in design of the BMPs by CDM Smith. The approximate locations of the percolation test borings are shown on Figures 2 and 3.

Borings P-1 through P-5 were drilled to depths ranging from 28 to 50.7 feet. Preparation of each boring for percolation testing included the installation of a 2-inch-diameter polyvinyl chloride (PVC) pipe in the borings, the lowest 15 feet of which was slotted, and backfilling the bottom approximately 15 feet of annular space between the borehole wall and pipe with clean gravel. The infiltration zones were pre-soaked with water for at least one hour prior to performing percolation testing. After the borings were pre-soaked, constant-head percolation testing was performed in borings P-1, P-2, P-4, and P-5 and falling-head percolation testing was performed in boring P-3.

The constant-head testing was performed by placing clean water in the PVC pipe at a constant flow rate to establish a stabilized head. The flow rate was measured using a digital flow meter. Once a stabilized head was established in the borings, the flow was maintained for a period of approximately 2 hours. The field percolation rate was calculated by measuring the total volume of water infiltrated by the total duration of the test and dividing by the surface area of the tested zone of the boring.

A constant-head could not be established in boring P-3 since the flow rate was lower than the threshold of our equipment. Accordingly, the percolation rate at boring P-2 was evaluated using the falling-head test method. The falling-head test method involved placing clean water into the PVC pipe to establish a head of water and measuring the rate at which the water level dropped in the pipe at consecutive time intervals (approximately 10 minutes). The test was repeated until three consecutive tests provided similar results and a stabilized rate was obtained. The field percolation rate was calculated by measuring the total volume of water infiltrated during the time interval and dividing by the surface area of the tested zone of the boring.

The measured rates were adjusted to account for the reliability of the test method by applying a reduction factor per the County of Los Angeles guidelines (COLA, 2017). The results of our percolation testing are presented in Table 1.

Table 1 – Percolation Test Results

Test Boring	Test Type	Approximate Depth of Tested Zone (feet)	Field Percolation Rate (inches/hour)	Adjusted Percolation Rate (inches/hour)
P-1	Constant Head	17 – 28	5.8	1.9
P-2	Constant Head	22 – 37	6.5	2.2
P-3	Falling Head	40 – 51	0.6	0.3
P-4	Constant Head	19 – 31½	12.3	4.1
P-5	Constant Head	19 – 31	10.1	3.4

The BMP designer should apply additional adjustment factors to the percolation rates presented in Table 1 based on the manufacturer's requirements as discussed in the County of Los Angeles guidelines (COLA, 2017). These additional reduction factors account for site variability, number of tests, thoroughness of subsurface evaluation, long-term siltation, plugging, and maintenance. The rate of percolation will vary across the future infiltration systems and will be dependent on the soil type encountered and depth. In addition, we recommend that infiltration systems be set back approximately 15 feet or more from existing and/or future structures.

9 FLOOD HAZARDS

Based on our review of flood insurance rate maps for the project area (Federal Emergency Management Agency [FEMA], 2020), the project site is not located in the 100-year Flood Hazard Zone, A99. Zone A99 includes areas to be protected from a 100-year flood by the Federal Flood Protection System under construction at the time of publication of the FEMA map; no base flood elevations are given. The site is located within Other Flood Areas – Zone X, which includes areas of 500-year floods and areas of 100-year floods with average depths of less than one foot and areas protected by levees from 100-year floods.

10 FAULTING AND SEISMICITY

The site is in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered significant during the design life of the proposed project. Figure 5 shows the approximate site location relative to the major faults in the region. The site is not located within a State of California EFZ (formerly known as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 2018). The nearest mapped active fault to the site is the Verdugo fault located approximately 0.62 mile (1.0 kilometer) southwest of the site (United States Geological Survey [USGS], 2008) (Figure 4).

The principal seismic hazards evaluated at the subject site are surface fault rupture, ground motion, and liquefaction. A brief description of these principal seismic hazards are discussed in the following sections.

10.1 Surface Fault Rupture

Surface fault rupture is the offset or rupturing of the ground surface by relative displacement across a fault during an earthquake. Based on our review of referenced geologic and fault hazard data, the project site is not transected by known active faults. Therefore, the potential for surface rupture is relatively low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

10.2 Site-Specific Ground Motion

Considering the proximity of the site to active faults capable of producing a M_{max} of 6.0 or more, the project area has a high potential for experiencing strong ground motion. The 2019 CBC specifies that the risk-targeted maximum considered earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures.

In accordance with Chapter 20 of the American Society of Civil Engineers (ASCE) Publication 7-16 (2016) for the Minimum Design Loads and Associated Criteria for Building and Other Structures, the Site Class should be classified based on the average shear wave velocity (V_S) in the upper 100 feet (i.e., 30 meters) (V_{S30}), the average field standard penetration resistance in the upper 100 feet (blow counts, N), or the average undrained shear strength in the upper 100 feet (S_u). After reviewing the blow counts obtained from our borings and correlations from our CPTs, the field penetration blow counts in the upper 100 feet are within the range of 15 to 50 blows per foot. Additionally, we estimated that the V_{S30} at the site is 918 feet per second (ft/s) (i.e., 280 meters per second [m/s) (CGS/Willis Site Classification Map) using the Open Seismic Hazard Analysis software developed by USGS (USGS, 2019). ASCE 7-16 defines a site as Site Class D (stiff soil) if the V_{S30} ranges from 600 to 1,200 ft/s (180 to 370 m/s) and if the blow counts in the upper 100 feet range from 15 to 50 blows per foot. Accordingly, the site is classified as Site Class D.

Per the 2019 CBC, a site-specific ground motion hazard analysis shall be performed for structures on Site Class D with a mapped MCE_R, 5 percent damped, spectral response acceleration parameter at a period of 1 second (S_1) greater than or equal to 0.2g in accordance with Sections 21.2 and 21.3 of ASCE 7-16. We calculated that the S_1 for the site is equal to 0.826g using the 2020 Applied Technology Council [ATC] seismic design tool (web-based)]; therefore, a site-specific ground motion hazard analysis was performed for the project area.

The site-specific ground motion hazard analysis consisted of the review of available seismologic information for nearby faults and performance of probabilistic seismic hazard analysis (PSHA) and deterministic seismic hazard analysis (DSHA) to develop acceleration response spectrum (ARS) curves corresponding to the MCE_R for 5 percent damping. Prior to the site-specific ground motion hazard analysis, we obtained the mapped seismic ground motion values and developed the general MCE_R response spectrum for 5 percent damping in accordance with Section 11.4 of ASCE 7-16 (ATC, 2020). The V_{S30} is assumed to be 918 ft/s (i.e., 280 m/s) (CGS/Willis Site Classification Map) and the depths to V_S = 3,281 ft/s (i.e., 1,000 m/s) and V_S = 8,202 ft/s (i.e., 2,500 m/s) are assumed to be 722 feet (i.e., 220 meters) and 6,299 feet (i.e., 6,627 meters), respectively (Southern California Earthquake Center [SCEC] Velocity Model Version 4, Iteration 26, Basin Depth). These values were evaluated using the Open Seismic Hazard Analysis software developed by USGS (USGS, 2019).

The 2014 next generation attenuation (NGA) West-2 relationships were used to evaluate the site-specific ground motions. The NGA relationships that we used for developing the probabilistic and deterministic response spectra are by Chiou and Youngs (2014), Campbell and Bozorgnia (2014), Boore, Stewart, Seyhan, and Atkinson (2014), and Abrahamson, Silva, and Kamai (2014). The Open Seismic Hazard Analysis software developed by USGS (USGS, 2019) was used for performing the PSHA. The Calculation of Weighted Average 2014 NGA Models spreadsheet by the Pacific Earthquake Engineering Research Center was used for performing the DSHA (Seyhan, 2014).

PSHA was performed for earthquake hazards having a 2 percent chance of being exceeded in 50 years multiplied by the risk coefficients per ASCE 7-16. The maximum rotated components of ground motions were considered in PSHA with 5 percent damping. For the DSHA, we analyzed accelerations from characteristic earthquakes on active faults within the region using the Caltrans ARS (Caltrans, 2020c) seismic design tool (web-based) and the hazard curves and deaggregation plots at the site using the USGS Unified Hazard Tool application (USGS, 2020a). A magnitude 7.5 event on the Verdugo fault with a distance of 0.62 mile (i.e., 1.0 kilometer) from the site is the controlling earthquake. Hence, the DSHA was performed for the site using this event and corrections were made to the spectral accelerations for the 84th percentile of the maximum rotated component of ground motion with 5 percent damping. The results of our site-specific seismic hazard analysis are presented in Appendix E.

The site-specific MCE_R response spectrum was taken as the lesser of the spectral response acceleration at any period from the PSHA and DSHA, and the site-specific general response spectrum was determined by taking two-thirds of the MCE_R response spectrum with some conditions in accordance with Section 21.3 of ASCE 7-16. Figure 6 presents the site-specific MCE_R response spectrum and the site-specific design response spectrum. The general mapped design response spectrum calculated in accordance with Section 11.4 of ASCE 7-16 is also presented on Figure 6 for comparison. The site-specific spectral response acceleration parameters, consistent with the 2019 CBC, are provided in Section 12.3 of this report for the evaluation of seismic loads on buildings and other structures. The site-specific maximum considered earthquake geometric mean (MCE_G) peak ground acceleration, PGA_M, was calculated as 1.001g.

10.3 Liquefaction

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35 percent and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure and causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near saturated cohesionless soils at depths shallower than 50 feet below the ground surface. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The State of California Hazard Zones map (CDMG, 1999) indicates that the subject site is not located within a mapped area that is considered susceptible to seismically induced liquefaction (Figure 7). Based on the historic high groundwater depth of approximately 100 to 120 feet below the ground surface (CDMG, 1998) and the presence of dense sands with scattered gravel, it is our opinion that liquefaction and liquefaction-related seismic hazards (e.g., dynamic settlement, ground subsidence, and/or lateral spreading) are not design considerations for the project.

11 CONCLUSIONS

Based on the results of our evaluation, it is our opinion that the proposed BMPs at David M Gonzales Recreation Center are feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and construction of the project. In general, the following conclusions were made:

- The subject site is underlain by up to approximately 6 feet of undocumented fill underlain by granular alluvial materials. The fill and alluvium generally consisted of moist, loose to very dense, poorly graded sand, poorly graded sand with silt, well-graded sand, well-graded sand, silty sand, clayey sand, poorly graded gravel, and poorly graded gravel with silt. Variable amounts of gravel and cobbles (and possible boulders) were encountered in the fill and alluvium.

- Our five percolation tests performed in borings P-1 through P-5 indicate that the on-site soils tested at depths ranging from approximately 28 to 51 feet have adjusted percolation rates ranging from approximately 0.3 to 4.1 inches per hour. For design purposes, we recommend using a percolation rate of 2 inches per hour for both shallow (gallery) and deep (dry well) infiltration systems. However, this rate should be adjusted as needed in accordance with COLA guidelines.

- In general, excavations and drilling in the existing fill soil and alluvium should be feasible with earthmoving equipment in good working condition. However, difficult excavating and drilling conditions should be anticipated by the contractor where excavations encounter cobbles/boulders in the alluvium. Oversized materials should be anticipated in the undocumented fill and alluvium by the contractor.

- We anticipate that the on-site excavated materials should be suitable for re-use as engineered fill and trench backfill provided they are free of trash, debris, roots, contamination, deleterious materials, and cobbles or hard lumps of material in excess of 4 inches in diameter. Processing of the materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should be planned by the contractor.

- The on-site soils are generally granular and will be prone to caving during excavation. The on-site soils should be considered as Type C soils in accordance with United States Department of Labor Occupational Safety Health Administration (OSHA) regulations. Accordingly, temporary excavations deeper than 4 feet in depth should be laid back at inclinations of 1½ to 1 (horizontal to vertical) or flatter.

- Where excavations cannot be laid back, temporary shoring is anticipated. Shoring should be designed by the contractor to support the excavation sidewalls and to reduce the potential for settlement of adjacent structures, roadways and other site improvements. Shoring should be designed in accordance with OSHA regulations.

- Groundwater was not encountered in our exploratory borings to the total depth explored of approximately 51 feet. The depth to groundwater is anticipated to be similar to the historic high depth to groundwater level of approximately 100 to 120 feet below the ground surface (CDMG, 1998). Fluctuations in the level of groundwater will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors that were not evident at the time of our field evaluation.

- The site is not located within a mapped Seismic Hazards Zone considered susceptible to liquefaction (CDMG, 1999).
- The site is not located within an Earthquake Fault Zone with the potential for fault rupture as defined by the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 2018).
- Hydro-collapse is not considered a design issue given the proposed depth of the infiltration gallery (approximately 24 feet [CDM Smith, 2020]) and the results of our laboratory testing.
- The site is not located within a designated flood inundation zone from failure of a dam or the 100-year and 500-year flood events (FEMA, 2020).
- Based on our laboratory corrosion testing, the on-site soil can be classified as non-corrosive based on the Caltrans Corrosion Guidelines (Caltrans, 2018).

12 PRELIMINARY RECOMMENDATIONS

The following sections present our preliminary geotechnical recommendations for design and construction of the project. This project is in preliminary design phase and some aspects of the design will be subject to change. Detailed plans regarding the design of the BMPs have not been developed yet. Accordingly, the following recommendations should be considered preliminary. Ninyo & Moore should review the final plans and develop additional geotechnical recommendations as appropriate. These recommendations are based on our evaluation of the site geotechnical conditions, our understanding of the planned construction, and experience in the vicinity of the project. The work should be performed in conformance with the recommendations presented in this report, project specifications, and appropriate agency standards.

12.1 Earthwork

We anticipate that earthwork at the site will consist of cuts and fills associated with excavations to install the proposed BMP improvements, including the gallery, diversion structures, HDS units, pipelines, and maintenance holes, and drilling for proposed dry wells. Open cut trench and backfilling will also be involved to construct the proposed pipelines, including along Norris Avenue. Based on the preliminary plans (CDM Smith, 2020), excavations for the proposed BMP improvements, to be on the order of 12 to 24 feet in depth. Earthwork will also include finish grading for establishment of site drainage. Earthwork operations should be performed in accordance with the requirements of applicable governing agencies and the recommendations presented in the following sections.

12.1.1 Pre-Construction Conference

We recommend that grading and foundation plans be submitted to Ninyo & Moore for review to check for conformance to the recommendations provided in this report. We further recommend that a pre-construction conference be held to discuss the grading recommendations presented in this report. The owner and/or their representative, the governing agencies' representatives, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the work plan, project schedule, and earthwork requirements.

12.1.2 Clearing and Site Preparation

Prior to excavating or other earthwork, the proposed area of improvements should be cleared of surface obstructions, debris, pavement, abandoned utilities, and other deleterious materials. Obstructions that extend below finish grade, if any, should be removed and the resulting holes filled with compacted soils. Materials generated from the clearing operations should be removed from the project site and disposed at a legal dump site.

12.1.3 Excavation Characteristics

We anticipate that excavations and drilling in the undocumented fill and alluvium should be feasible with earthmoving equipment in good working order. The undocumented fill and alluvial materials generally consisted of moist, loose to very dense, poorly graded sand, poorly graded sand with silt, well-graded sand, well-graded sand, silty sand, clayey sand, poorly graded gravel, and poorly graded gravel with silt with variable amounts of organic material, gravel, and cobbles. Cobbles and possible boulders were encountered in our subsurface exploration and should be anticipated in the excavations. These oversized materials may lead to difficult excavating and/or drilling, where encountered. Processing of the excavated materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should be planned by the contractor.

12.1.4 Subgrade Preparation for the Infiltration Gallery

Based on our exploratory borings and CPTs, alluvium is anticipated at the bottom of the planned infiltration gallery that should be suitable for support of the gallery and overlying compacted fill. If undocumented fill is encountered at the bottom of the gallery excavation, it should be removed and replaced with suitable on-site material. We recommend that minimal compaction be performed on the exposed subgrade and and/or rock blanket placed beneath the gallery. If the subgrade of the infiltration gallery is compacted, we recommend that additional percolation testing be performed.

If foundations are to be installed along the bottom of the gallery, such as strip footings, the upper approximately 8-inches of subgrade, only beneath the foundations, should be scarified, moisture-conditioned to near optimum moisture content, and recompacted to a relative compaction of 90 percent as evaluated by ASTM International (ASTM) D 1557. If loose, soft, and/or wet materials are encountered beneath the foundations, removal and recompaction of the materials may be warranted. The excavation bottoms should be evaluated by our representative during the excavation work.

12.1.5 Subgrade Preparation for the Other Buried Structures and At-Grade Structures

In order to provide suitable support for proposed buried and/or at-grade structures, including, the catch basins, diversion structures, HDS units, and maintenance holes, we recommend that the existing undocumented fill and upper loose alluvial deposits be removed from beneath the structures. In addition, the structure foundations should be founded on 2 feet or more of newly compacted fill material. The over-excavation should remove undocumented fill and expose relatively dense alluvial deposits. Additional over-excavation of loose, soft, and/or wet areas may be appropriate. The excavation bottom should be evaluated by our representative during the excavation work. The limits of removal should extend approximately 2 feet beyond the footprint of the foundations. If drainage rock is placed beneath the foundations, this can be considered part of the 2-foot thick layer of compacted fill beneath the foundations. Prior to placing compacted fill and/or drainage rock, the upper approximately 8 inches of the exposed bottom should be scarified, moisture-conditioned to near optimum moisture content, and recompacted to a relative compaction of 90 percent as evaluated by ASTM D 1557.

12.1.6 Temporary Excavations and Shoring

We recommend that excavations be designed and constructed in accordance with OSHA regulations. These regulations provide shoring design parameters for excavations and trenches up to 20 feet deep based on the soil types encountered. Trenches over 20 feet deep should be designed by the contractor’s engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that top soil and alluvium be considered as OSHA Type C soil. For trench or other excavations, OSHA requirements regarding personnel safety should be met by using appropriate shoring or by laying back the slopes no steeper than 1½:1 (horizontal to vertical) in the site top soil and alluvium. Temporary excavations that encounter seepage may need shoring or may be mitigated by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis.

Based on our review of the project drawings, we anticipate that site excavations will be laid-back using temporary slopes (CDM Smith, 2020). Where slopes cannot be laid back, shoring may be appropriate. If shoring systems are used for site excavations, they should be designed for the anticipated soil conditions using the lateral earth pressure values shown on Figures 8 through 9 for braced and cantilevered excavations, respectively. The recommended design pressures are based on the assumption that the shoring system is constructed without raising the ground surface elevation behind the shored sidewalls of the excavation, that there are no surcharge loads, such as soil stockpiles and construction materials, and that no loads act above a 1:1 (horizontal to vertical) plane ascending from the base of the shoring system. For a shoring system subjected to the above-mentioned surcharge loads, the contractor should include the effect of these loads on the lateral earth pressures acting on the shored walls.

We anticipate that settlement of the ground surface will occur behind the shored excavations. The amount of settlement depends heavily on the type of shoring system, the contractor's workmanship, and soil conditions. To reduce the potential for distress to adjacent improvements, we recommend that the shoring system be designed to limit the ground settlement behind the shoring system to ½ inch or less. Possible causes of settlement that should be addressed include settlement during installation of the shoring elements, excavation for structure construction, construction vibrations, and removal of the support system. We recommend that shoring installation be evaluated carefully by the contractor prior to construction and that ground vibration and settlement monitoring be performed during construction.

The contractor should retain a qualified and experienced engineer to design the shoring system. The shoring parameters presented in this report are minimum requirements, and the contractor should evaluate the adequacy of these parameters and make the appropriate modifications for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed.

12.1.7 Fill Material

In general, the on-site soils should be suitable for reuse as fill materials, provided they are free of trash, debris, oversize material, or other deleterious materials. Fill should generally be free of rocks or lumps of material in excess of 4 inches in diameter. Rocks or hard lumps larger than approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site.

Imported fill material, if used, should also consist of clean, granular material with a low expansion potential, corresponding to an expansion index of 50 or less. The soil should also be tested for corrosive properties prior to importing. We recommend that the imported materials satisfy the Caltrans (2018) criteria for non-corrosive soils (i.e., soils having a chloride concentration of 500 parts per million [ppm] or less, a soluble sulfate content of approximately 0.15 percent (1,500 ppm) or less, a pH value of 5.5 or higher, or an electrical resistivity of 1,100 ohm-centimeters or more). Materials for use as fill should be evaluated by Ninyo & Moore prior to importing. The contractor should be responsible for the uniformity of import material brought to the site.

12.1.8 Fill Placement and Compaction

Fill material, including trench backfill, should be moisture conditioned and compacted in horizontal lifts to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Fill material with less than 5 percent fines (passing No. 200 sieve) should be compacted to 95 percent relative compaction in accordance with City of Los Angeles guidelines. Fill material should be moisture-conditioned to slightly above the laboratory optimum moisture content. The lift thickness for fill soils will depend on the type of compaction equipment used but generally should not exceed 8 inches in loose thickness. Special care should be exercised to avoid damaging pipes during compaction of trench backfill. Placement and compaction of the fill soils should be in general accordance with local grading ordinances and good construction practice.

12.2 Underground Utilities

We anticipate that underground pipelines will be supported on native alluvial deposits. Based on the preliminary plans, pipeline inverts may be on the order of 18 feet in depth.

12.2.1 Pipe Bedding

We recommend that pipes be supported on 6 inches or more of granular bedding material, such as sand, with a sand equivalent value of 30 or more. Bedding material should be placed around the pipe and 12 inches or more above the top of the pipe in accordance with the current “Greenbook” Standard Specifications for Public Works. We do not recommend the use of crushed rock as bedding material. It has been our experience that the voids within crushed rock are sufficiently large to allow fines to migrate into the voids, thereby creating the potential for sinkholes and depressions to develop at the surfaces.

Special care should be taken not to allow voids beneath the pipe. Compaction of the bedding material and backfill should proceed up both sides of the pipe. Trench backfill, including bedding material, should be placed in accordance with the recommendations presented in Section 12.1.

12.2.2 Modulus of Soil Reaction for Pipe Design

The modulus of soil reaction is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines for the purpose of evaluating deflection caused by the weight of the backfill above the pipe. We recommend that a modulus of soil reaction of 1,000 pounds per square inch be used for design, provided that granular bedding material is placed adjacent to the pipe, as recommended in the previous section.

12.3 Site-Specific Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the site-specific spectral response acceleration parameters in accordance with the CBC (2019) guidelines.

Table 2 – 2019 California Building Code Seismic Design Criteria

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	D
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	2.446g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.826g
Site-Specific Spectral Response Acceleration at 0.2-second Period, S_{MS}	2.393g
Site-Specific Spectral Response Acceleration at 1.0-second Period, S_{M1}	1.890g
Site-Specific Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.595g
Site-Specific Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	1.260g
Site-Specific Maximum Considered Earthquake Geometric Mean (MCE_G) Peak Ground Acceleration, PGA_M	1.001g

12.4 Foundations

It is our opinion that the proposed infiltration gallery may be supported on spread foundations and that other underground structures (i.e., catch basins, HDS units, etc.) may be supported by mat foundations. Spread foundations may also be used to support other at-grade structures, if planned. The following are our recommendations for project foundations:

12.4.1 Spread Footings

Spread footings for the infiltration gallery (i.e., strip footings) should be placed directly on low expansion alluvial materials and/or compacted fill in accordance with the recommendations presented in the Earthwork section of this report. Spread footings for at-grade structures bearing on low expansion compacted fill in accordance with the recommendations presented in the Earthwork section of this report should extend 18 inches or more below the lowest adjacent finished grade. Continuous and isolated footings should have a width of 24 inches or more. Continuous footings should be reinforced with two No. 4 steel reinforcing bars, one placed near the top and one placed near the bottom of the footings, and further detailed in accordance with the recommendations of the structural engineer.

Footings, as described above and bearing on alluvial materials and compacted fill, may be designed using a net allowable bearing capacity of 2,500 pounds per square foot (psf). Total and differential settlements for footings designed in accordance with the above recommendations are estimated to be less than approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively.

Footings bearing on alluvial materials and compacted fill may be designed using a coefficient of friction of 0.35, where the total frictional resistance equals the coefficient of friction times the dead load. Footings may be designed using a passive resistance value of 300 psf per foot of depth, with a maximum value of 3,000 psf. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance (including the maximum value) may be increased by one-third when considering loads of short duration such as wind or seismic forces.

12.4.2 Mat Foundations

Mat foundations for other underground structures (i.e., catch basins, HDS units, etc.) may be supported on alluvial materials and/or compacted fill in accordance with the recommendations presented in the Earthwork section of this report. Foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

The mat foundations may be designed using a net allowable bearing capacity of 4,000 pounds per square foot (psf). The total and differential settlement corresponding to this allowable bearing load are estimated to be less than approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively.

Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils directly underlying the mat. A design modulus of subgrade reaction (K) of 50 tons per cubic foot may be used for the subgrade soils in evaluating such deflections.

12.5 Lateral Earth Pressures

Walls for below-grade structures when constructed as recommended above may be designed for lateral pressures represented by the pressure diagram on Figure 10. To reduce the potential for pipe-to-wall differential settlement, which could cause pipe shearing, we recommend that a flexible pipe joint be located close to the exterior of the wall. The type of joint should be such that minor relative movement can be accommodated without distress. The pipe connections should be sufficiently flexible to withstand differential settlement of approximately ¾ inch.

12.6 Exterior Flatwork

We recommend that new exterior concrete sidewalks and flatwork (hardscape) have a thickness of 4 inches and be reinforced with No. 3 steel reinforcing bars placed 24 inches on-center (each way) near the mid-height of the slab. The hardscape should be underlain by 4 inches of clean sand and installed with crack-control joints at an appropriate spacing as designed by the structural engineer to reduce the potential for shrinkage cracking. Positive drainage should be established and maintained adjacent to flatwork. To reduce the potential for differential offset, joints between the new hardscape and adjacent curbs, existing hardscape, building walls, and/or other structures, and between sections of new hardscape, should be doweled.

12.7 Pavement Reconstruction

Trenching within the street right-of-way will result in the replacement of pavement for the project. In general, pavement repair should conform to the material and compaction requirements of the adjacent pavement sections. Aggregate base material should conform to the latest specifications in Section 200-2.2 for crushed aggregate base or Section 200-2.4 for crushed miscellaneous base of the Greenbook and should be compacted to a relative compaction of 95 percent in accordance with ASTM D 1557. Asphalt concrete should conform to Section 2036 of the Greenbook and should be compacted to a relative compaction of 95 percent in accordance with ASTM D 1560 or CT 304. Actual pavement reconstruction should conform to the requirements of the appropriate governing agency.

12.8 Corrosivity

Laboratory testing was performed on representative samples of near-surface soil to evaluate soil pH, electrical resistivity, water-soluble chloride content, and water-soluble sulfate content. The soil pH and electrical resistivity tests were performed in general accordance with California Test Method (CT) 643. Chloride content tests were performed in general accordance with CT 422. Sulfate testing was performed in general accordance with CT 417. The laboratory test results are presented in Appendix C.

The soil pH of the samples tested was measured to range from 6.9 and 7.6 and the electrical resistivity was measured to range from 7,455 and 7,775 ohm-centimeters. The chloride content of the samples was measured to range from 30 to 40 ppm. The sulfate content of the samples was measured to be 0.001 to percent by weight (i.e., 10 ppm). Based on the laboratory test results and Caltrans criteria (2018), the project site can be classified as a non-corrosive site, which is defined as having earth materials with a pH of more than 5.5, an electrical resistivity of more than 1,100 ohm-centimeters, chloride concentrations of less than 500 ppm, and less than 0.15 percent sulfates (i.e., 1,500 ppm).

12.9 Concrete Placement

Concrete in contact with soil or water that contains high concentrations of water-soluble sulfates can be subject to premature chemical and/or physical deterioration. Based on the CBC (2019), the potential for sulfate attack is negligible for water-soluble sulfate contents in soil ranging from 0.00 to 0.10 percent by weight, moderate for water-soluble sulfate contents ranging from 0.10 to 0.20 percent by weight, severe for water-soluble sulfate contents ranging from 0.20 to 2.00 percent by weight, and very severe for water-soluble sulfate contents over 2.00 percent by weight. The soil samples tested for this evaluation, using CT 417, indicate a water-soluble sulfate content of approximately 0.001 percent by weight (i.e., 10 ppm). Accordingly, the on-site soils are considered to have a negligible potential for sulfate attack. However, due to the potential variability of the on-site soils, consideration should be given to using Type II/V cement for the project.

To reduce the potential for shrinkage cracks in the concrete during curing, we recommend that the concrete for the proposed improvements, if applicable, be placed with a slump of 4 inches based on ASTM C 143. The slump should be checked periodically at the site prior to concrete placement. We further recommend that concrete cover over reinforcing steel for foundations be provided in accordance with CBC (2019). The structural engineer should be consulted for additional concrete specifications.

12.10 Stormwater Infiltration Gallery

Based on our subsurface evaluation, the park is generally underlain by granular alluvial deposits consisting of poorly graded sand, poorly graded sand with silt, well-graded sand, well-graded sand, silty sand, clayey sand, poorly graded gravel, and poorly graded gravel with silt with variable amounts of gravel and cobbles. The wide range of infiltration rates (0.3 and 4.1 inches per hour) is likely due to lateral and vertical variations in material types, including silt content of alluvial interbeds and lenses. Due to site variability and the number of percolation tests performed, we recommend that an infiltration rate of 2 inches per hour be used for design at David M. Gonzales Recreation Center for both shallow and deep infiltration based on our review of our boring logs and laboratory test results. We recommend that the bottoms of the infiltration BMPs be further evaluated during construction. Additional recommendations may be provided at that time if fine-grained materials are present along the bottom of the basin, such as removing the fine-grained material and replacing it with granular material.

Based on our evaluation, the potential for hydro-collapse settlement associated with infiltration is generally low due to the proposed depth of infiltration. However, we generally recommend a setback of 15 feet or more between settlement sensitive structures and proposed infiltration areas.

12.11 Drainage

Proper surface drainage is imperative for satisfactory site performance. Positive drainage should be provided and maintained to direct surface water away from existing foundations. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet or more away from foundations and tops of slopes. Surface waters should not be allowed to pond adjacent to footings. We recommend that above-ground structures, if constructed, have roof drains and downspouts installed to collect runoff.

12.12 Landscaping

Project landscaping should consist of drought tolerant plants. Landscape irrigation should be kept to a level just sufficient to maintain plant vigor. Overwatering should not be permitted

13 CONSTRUCTION OBSERVATION

The recommendations provided in this report are based on our understanding of the proposed project and our evaluation of the data collected based on subsurface conditions disclosed by widely spaced exploratory borings. It is imperative that the geotechnical consultant checks the interpolated subsurface conditions during construction. We recommend that Ninyo & Moore review the project plans and specifications prior to construction. It should be noted that, upon review of these documents, some recommendations presented in this report may be revised or modified.

During construction we recommend that the duties of the geotechnical consultant include, but not be limited to:

- Observing site clearing, grubbing, and removals.
- Observing excavation bottoms, and the placement and compaction of fill, including trench backfill.
- Observing the drilling of dry wells, if chosen for the project.
- Evaluating imported materials prior to their use as fill (if used).
- Performing field tests to evaluate fill compaction.
- Observing foundation excavations for bearing materials and cleaning prior to placement of reinforcing steel or concrete.
- Performing material testing services including concrete compressive strength and steel tensile strength tests and inspections.

The recommendations provided in this report assume that Ninyo & Moore will be retained as the geotechnical consultant during the construction phase of this project. If another geotechnical consultant is selected, we request that the selected consultant indicate to the owner and to our firm in writing that our recommendations are understood and that they are in full agreement with our recommendations.

14 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analysis presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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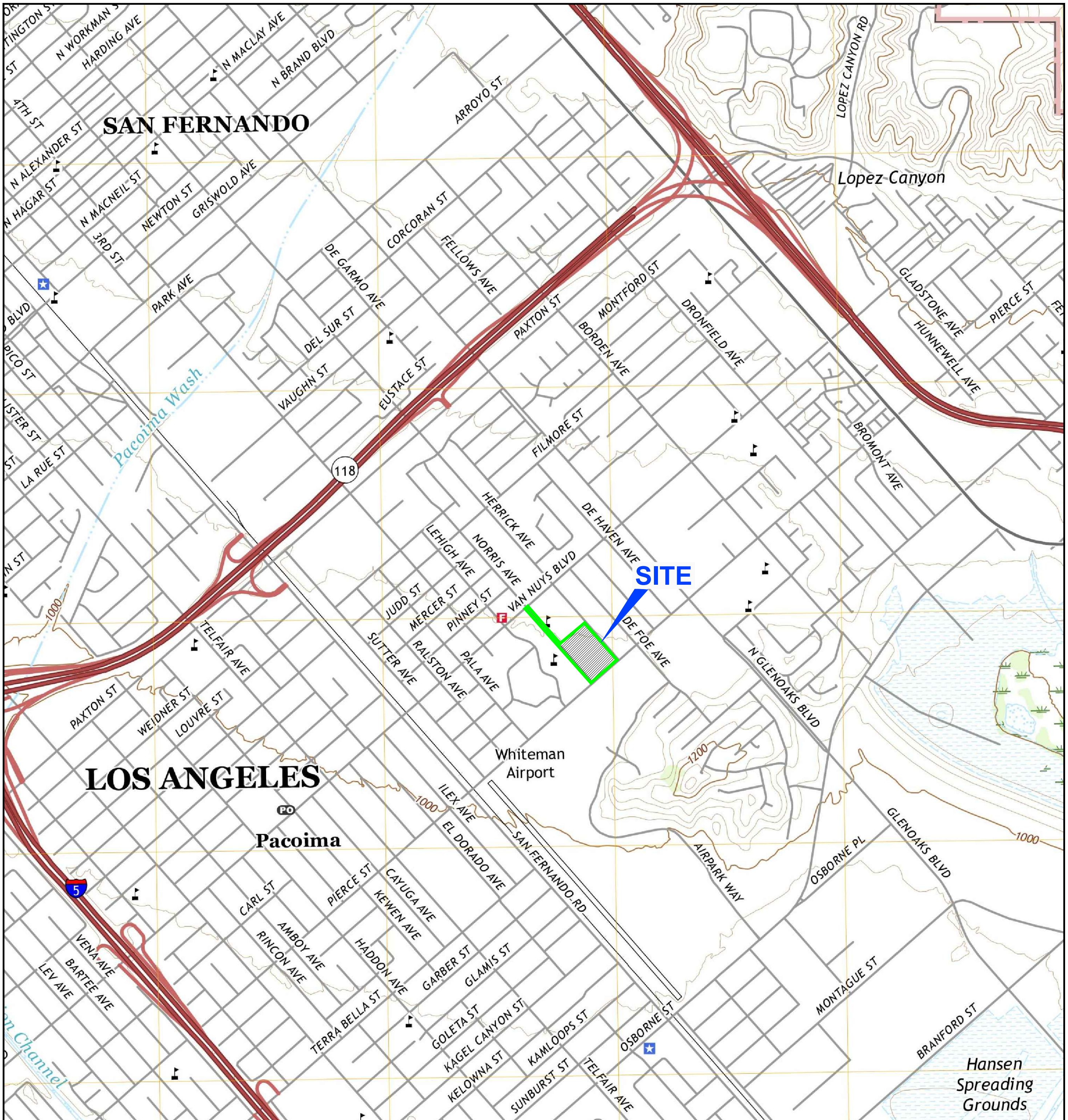
FIGURES



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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: USGS, 2018.

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FIGURE 1

SITE LOCATION

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

211294003 I 7/20

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

LEGEND

- SITE BOUNDARY
- **B-3** TD=33.5 — BORING; TD=TOTAL DEPTH IN FEET
- **P-5** TD=30.8 — BORING/PERCOLATION TEST; TD=TOTAL DEPTH IN FEET
- **CPT-5A** TD=12.9 — CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET
- PROPOSED INFILTRATION GALLERY

N

FEET

0 200 400

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: GOOGLE EARTH, 2020.

FIGURE 2

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

BORING, PERCOLATION TEST AND CPT LOCATIONS

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

211294003 I 7/20

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LEGEND

Site Boundary

B-3 TD=33.5 — BORING; TD=TOTAL DEPTH IN FEET

P-5 TD=30.8 — BORING/PERCOLATION TEST; TD=TOTAL DEPTH IN FEET

CPT-5A TD=12.9 — CONE PENETROMETER TEST; TD=TOTAL DEPTH IN FEET

- Infiltration Gallery (New)
- Diversion Structure (New)
- Hydrodynamic Separator (New)
- Maintenance Hole (New)
- Gravity Pipeline (New)
- Water
- Gas
- Storm Drain Inlets
- Storm Pipes
- Sewer Structures
- Sewer Pipes
- Sewer Laterals

N

FEET

0 200 400

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CDM SMITH, 2020

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FIGURE 3

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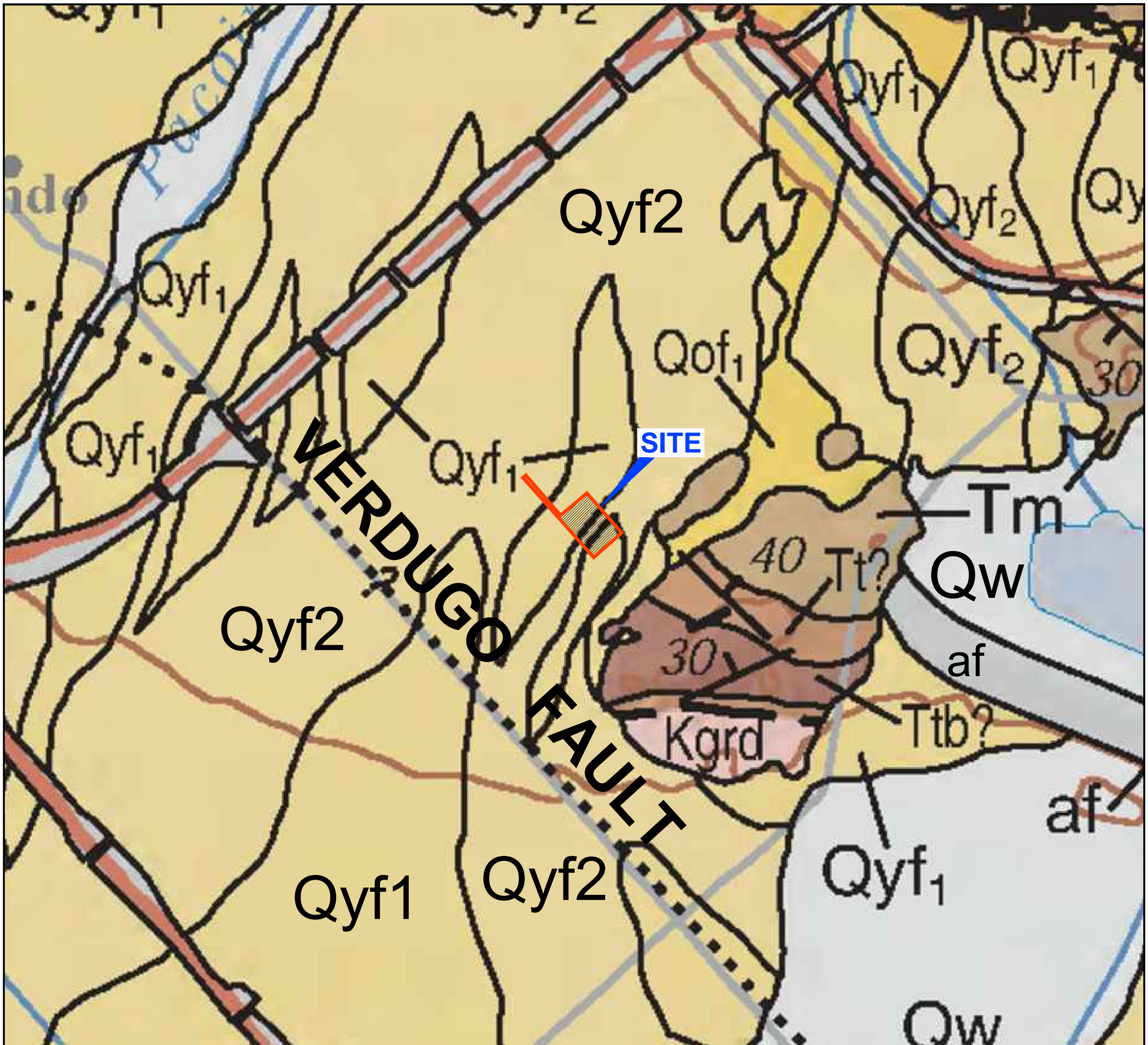
Geotechnical & Environmental Sciences Consultants

SITE PLAN

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

211294003 I 7/20



LEGEND

af	ARTIFICIAL FILL	Tt	TOPANGA FORMATION
Qw	WASH DEPOSITS	Ttb	TOPANGA FORMATION
Qyf	YOUNG ALLUVIAL FAN DEPOSITS	Kgrd	GRANODIORITE
Qof	OLD ALLUVIAL FAN DEPOSITS	— — ···	FAULT; DOTTED WHERE BURIED
Tm	MODELO FORMATION	⁓	GEOLOGIC CONTACT

N

FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: R.H. CAMPBELL, ET AL., 2014.

211294003_RG.dwg 07/01/2020 JDP

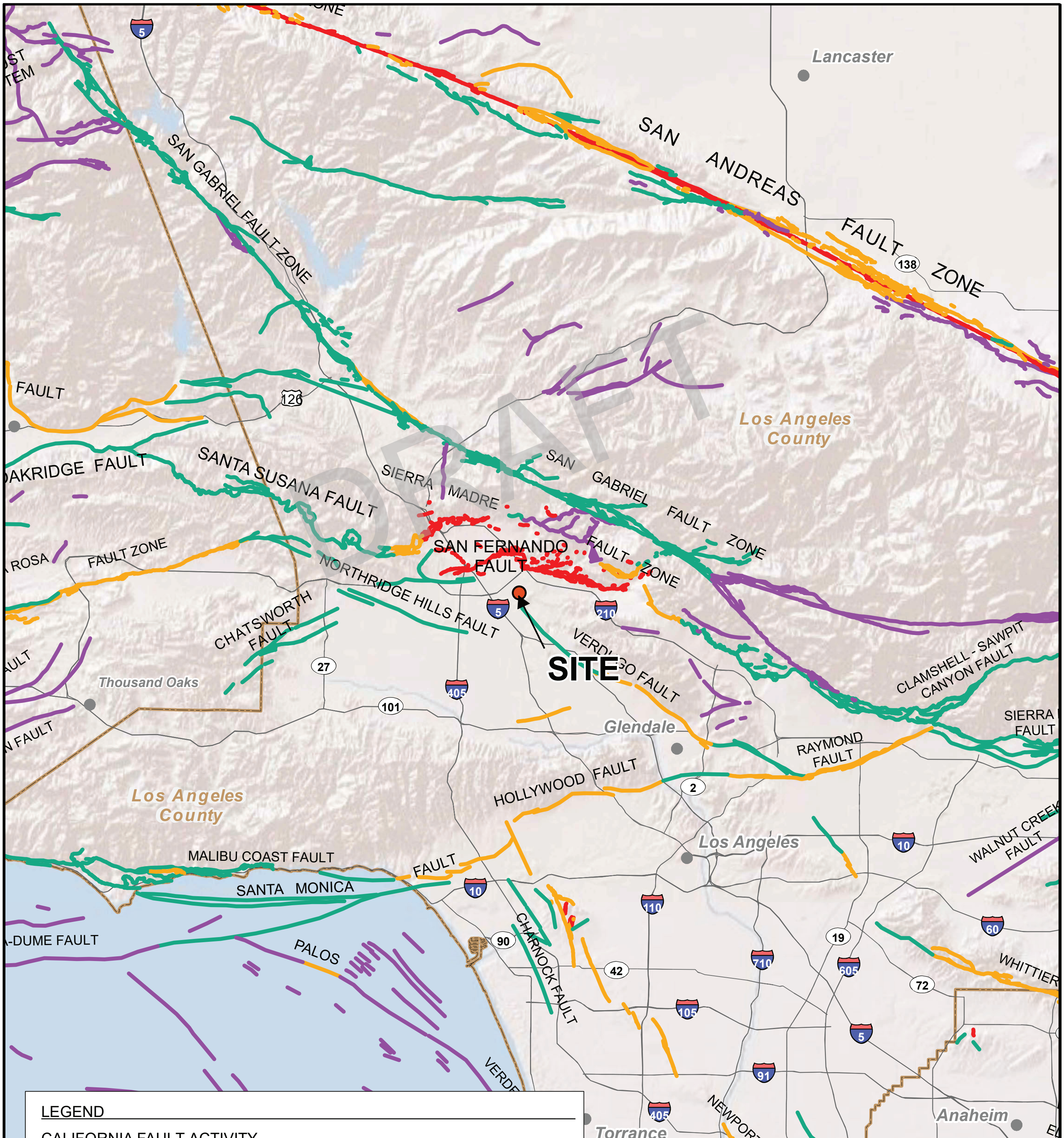
FIGURE 4

REGIONAL GEOLOGY

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

211294003 I 7/20

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

CALIFORNIA FAULT ACTIVITY

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (INACTIVE)
- STATE/COUNTY BOUNDARY

SOURCES: CALIFORNIA DIVISION OF MINES AND GEOLOGY, 1976, ENVIRONMENTAL GEOLOGY OF ORANGE COUNTY, CALIFORNIA, OPEN FILE REPORT 79-8.; JENNINGS, C.W., AND BRYANT, 2010, FAULT ACTIVITY MAP OF CALIFORNIA; ESRI SHADED RELIEF, 2017

N

MILES

0 8 16

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

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FIGURE 5

FAULT LOCATIONS

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

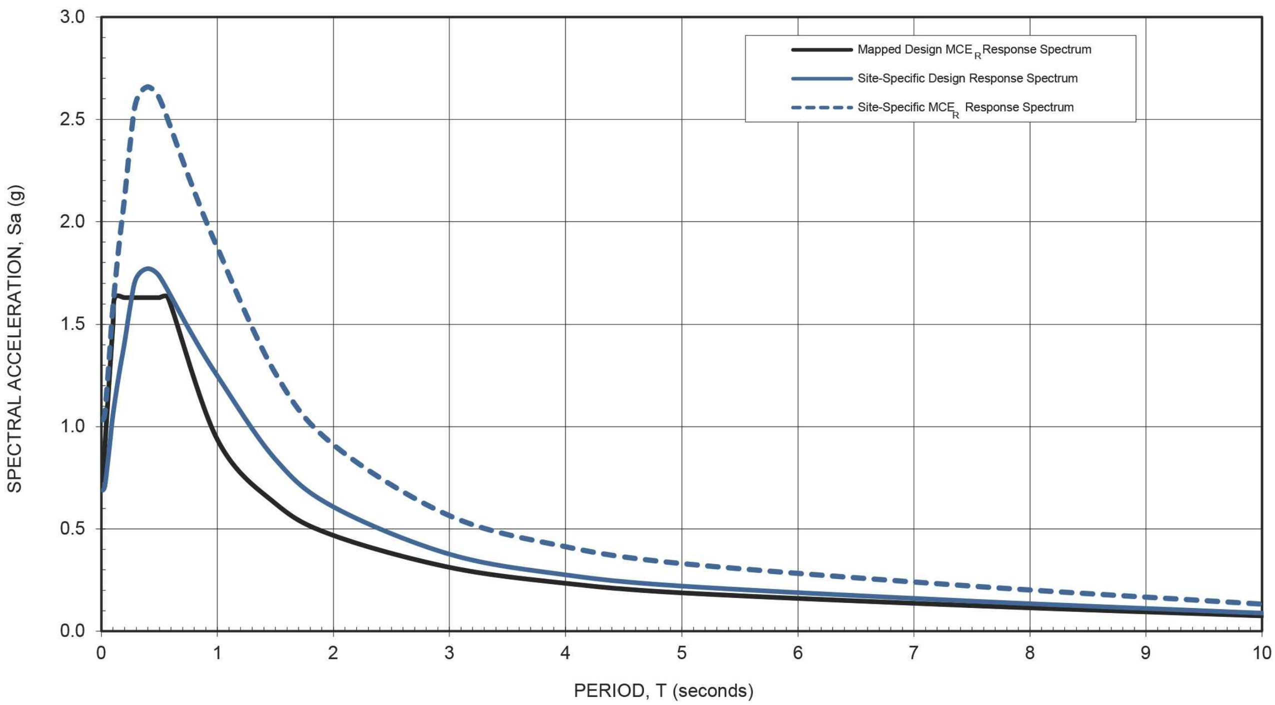
Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

211294003 | 7/20

PERIOD (seconds)	SITE-SPECIFIC MCE_R RESPONSE SPECTRUM Sa (g)	SITE-SPECIFIC DESIGN RESPONSE SPECTRUM Sa (g)
0.010	1.033	0.689
0.020	1.041	0.694
0.030	1.065	0.710
0.050	1.202	0.802
0.075	1.396	0.931
0.100	1.592	1.061
0.150	1.876	1.250
0.200	2.119	1.413
0.250	2.391	1.594
0.300	2.588	1.726
0.400	2.659	1.772

PERIOD (seconds)	SITE-SPECIFIC MCE_R RESPONSE SPECTRUM Sa (g)	SITE-SPECIFIC DESIGN RESPONSE SPECTRUM Sa (g)
0.500	2.603	1.735
0.750	2.222	1.482
1.000	1.872	1.248
1.500	1.260	0.840
2.000	0.911	0.608
3.000	0.565	0.376
4.000	0.413	0.275
5.000	0.330	0.220
7.500	0.220	0.147
10.000	0.132	0.088

S_{DS} = 1.595 g	S_{D1} = 1.260 g	S_{MS} = 2.393 g	S_{M1} = 1.890 g	PGA_M = 1.001 g



NOTES:

1 The probabilistic ground motion spectral response accelerations are based on the risk-targeted Maximum Considered Earthquake (MCE_R) having a 2% probability of exceedance in 50 years in the maximum direction using the Chiou & Youngs (2014), Campbell & Bozorgnia (2014), Boore et al. (2014), and Abrahamson et al. (2014) attenuation relationships and the risk coefficients.

2 The deterministic ground motion spectral response accelerations are for the 84th percentile of the geometric mean values in the maximum direction using the Chiou & Youngs (2014), Campbell & Bozorgnia (2014), Boore et al. (2014), and Abrahamson et al. (2014) attenuation relationships for deep soil sites considering a Mw 7.5 event on the Verdugo fault zone located 1.0 kilometers from the site. It conforms with the lower bound limit per ASCE 7-16 Section 21.2.2.

3 The Site-Specific MCE_R Response Spectrum is the lesser of spectral ordinates of deterministic and probabilistic accelerations at each period per ASCE 7-16 Section 21.2.3. The Site-Specific Design Response Spectrum conforms with lower bound limit per ASCE 7-16 Section 21.3.

4 The Mapped Design MCE_R Response Spectrum is computed from mapped spectral ordinates modified for Site Class D (stiff soil profile) per ASCE 7-16 Section 11.4. It is presented for the sake of comparison.

211294003_ARS.dwg 07/01/2020 JDP

FIGURE 6

ACCELERATION RESPONSE SPECTRA

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LEGEND

EARTHQUAKE-INDUCED LANDSLIDES

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

LIQUEFACTION

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

N

FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CDMG, 1999.

211294003_SHZ.dwg 07/01/2020 GK, JDP

FIGURE 7

SEISMIC HAZARD ZONES

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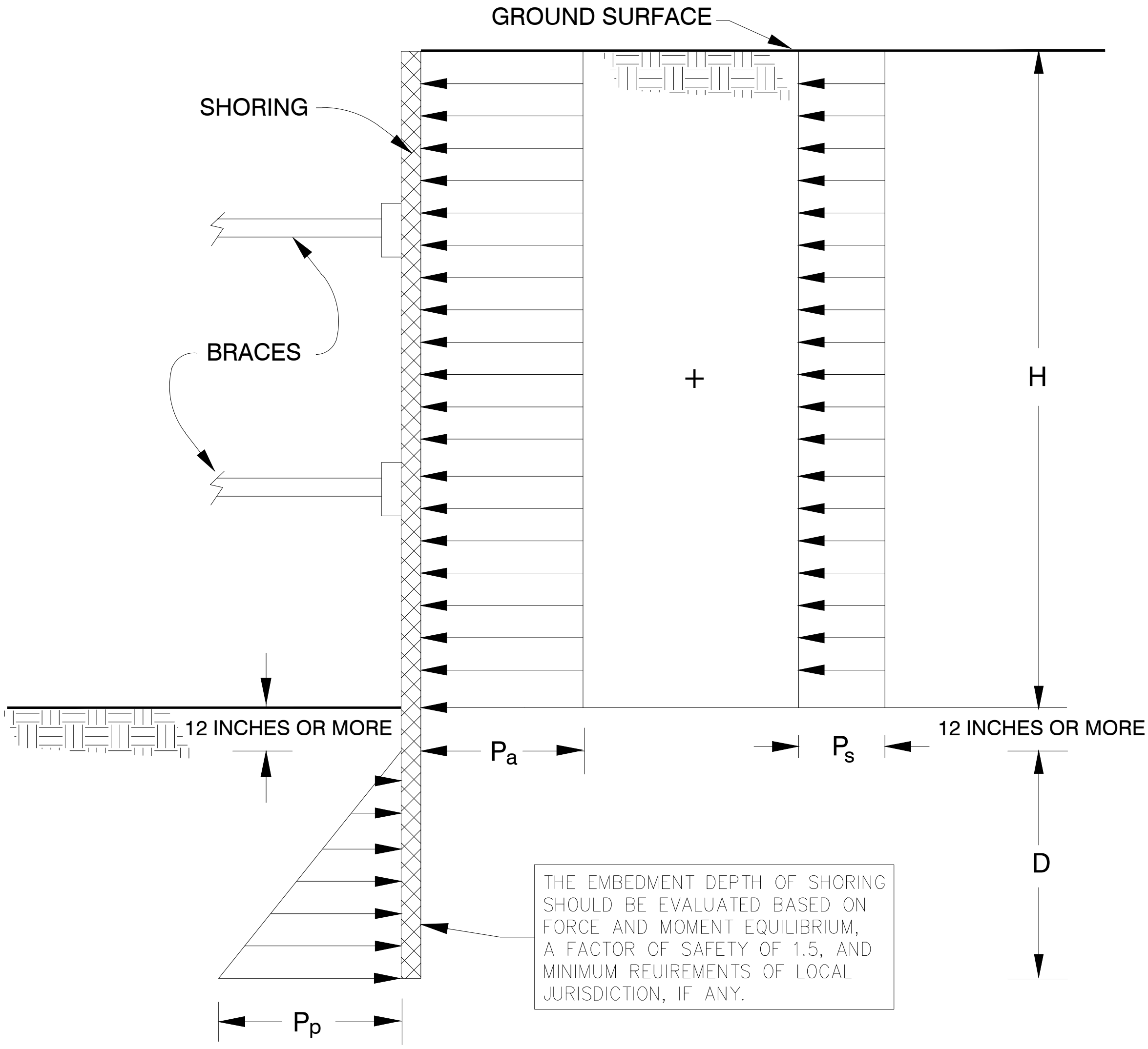

NOTES:

1. APPARENT LATERAL EARTH PRESSURE, P_a
   P_a = 24H psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   P_s = 120 psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
   P_p = 390D psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H AND D ARE IN FEET

NOT TO SCALE

211294003_D-LEPBE.dwg 07/02/2020 GK, JDP

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FIGURE 8

LATERAL EARTH PRESSURE FOR BRACED EXCAVATION

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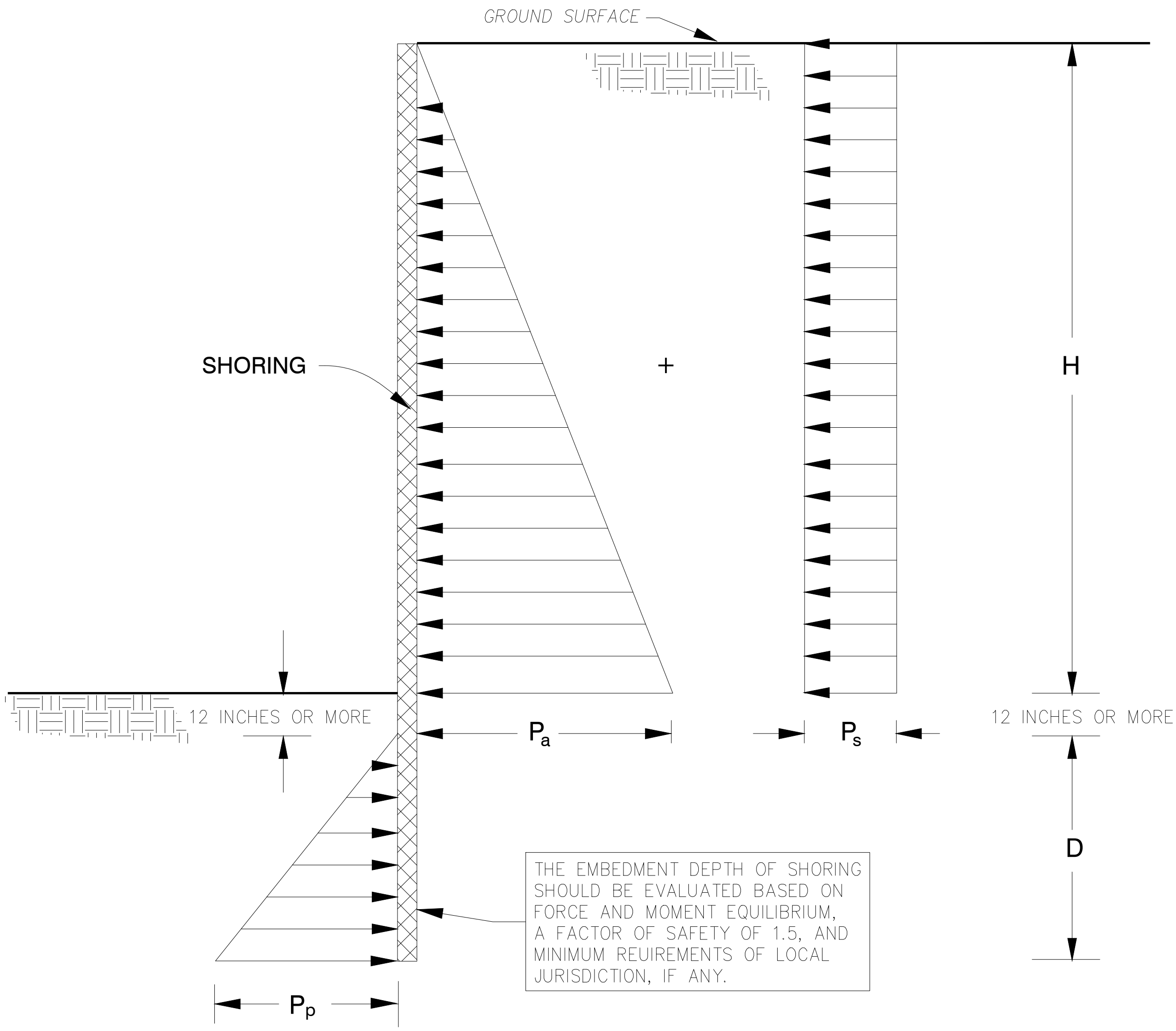

NOTES:

1. ACTIVE LATERAL EARTH PRESSURE, P_a
   P_a = 37H psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   P_s = 120 psf
3. PASSIVE LATERAL EARTH PRESSURE, P_p
   P_p = 390D psf
4. ASSUMES GROUNDWATER IS NOT PRESENT
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H AND D ARE IN FEET

NOT TO SCALE

211294003_D-LEPCS.dwg 07/01/2020 GK, JDP

FIGURE 9

LATERAL EARTH PRESSURES FOR TEMPORARY CANTILEVERED SHORING

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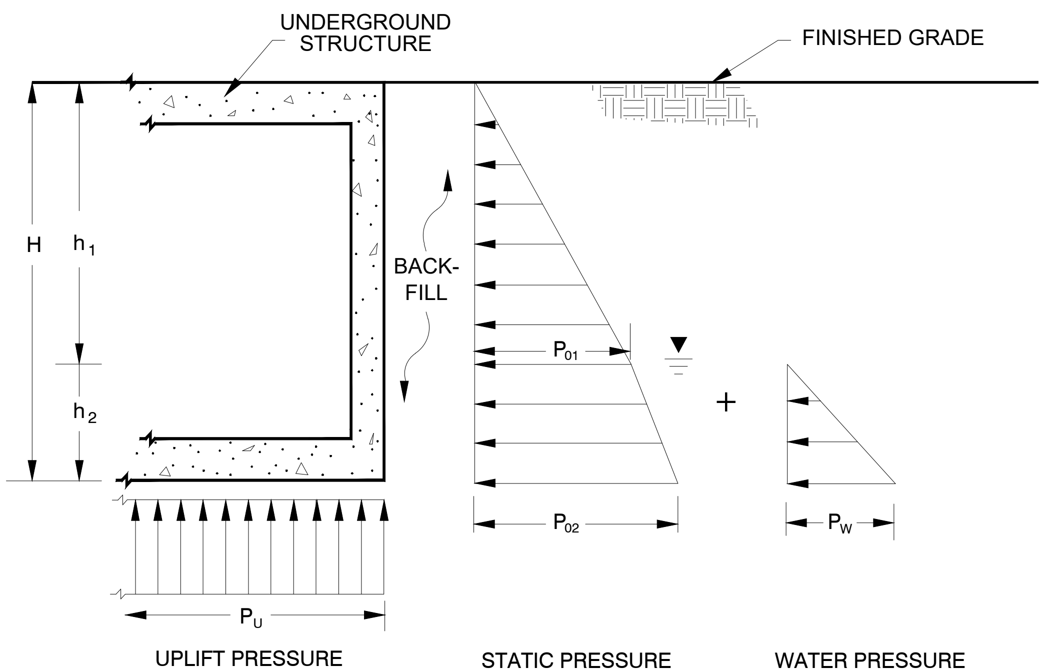

NOTES:

1. APPARENT LATERAL EARTH PRESSURES, P_{01} AND P_{02}
   $P_{01} = 57h_1$ psf
   $P_{02} = 57h_1 + 28h_2$ psf
2. HYDROSTATIC PRESSURE, P_w
   $P_w = 62.4\ h_2$ psf
3. UPLIFT PRESSURE, P_u
   $P_u = 62.4\ h_2$ psf
4. SURCHARGE PRESSURES CAUSED BY VEHICLES OR NEARBY STRUCTURES ARE NOT INCLUDED
5. H, h_1 AND h_2 ARE IN FEET
6. ▼ GROUNDWATER TABLE

NOT TO SCALE

211294003_D-EP.dwg 07/01/2020 GK, JDP

FIGURE 10

LATERAL EARTH PRESSURES FOR UNDERGROUND STRUCTURES

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APPENDIX A

Boring Logs

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following method.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of $1^3/_8$ inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3 inches, was lined with 1-inch-long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

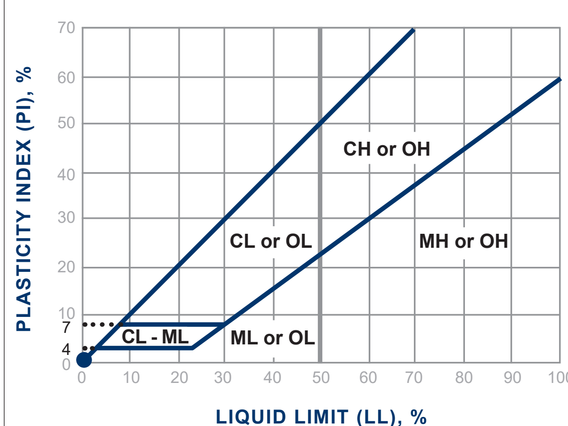
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions: Group Symbol	Secondary Divisions: Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

Consistency - Fine-Grained Soil

Consistency	Spooling Cable or Cathead: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								Groundwater encountered during drilling.
								Groundwater measured after drilling.
							SM	MAJOR MATERIAL TYPE (SOIL): Solid line denotes unit change.
							CL	Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Shear Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

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BORING LOG

DATE DRILLED 5/29/20 BORING NO. B-1

GROUND ELEVATION 1,043' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Hollow-Stem Auger (J&H Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 6 inches thick.
							SM	AGGREGATE BASE: Brown, moist, dense, poorly graded GRAVEL with sand; approximately 4 inches thick.
							SM	FILL: Brown, moist, dense, silty SAND; few gravel.
			27					ALLUVIUM: Brown, moist, dense, silty SAND; few gravel.
							SP-SM	Brown, moist, very dense, poorly graded SAND with silt and gravel; few cobbles.
10			50/2"	2.3	105.6			
			42					
							GP-GM	Brown, dry to moist, very dense, poorly graded GRAVEL with silt and sand; cobbles.
20			50/5"	1.5	113.4			
			16					Medium dense.
30			50/6"					Very dense.
			50/3"					
								Total Depth = 35.8 feet. Groundwater was not encountered during drilling. Backfilled with cement-bentonite and patched with rapid-set concrete on 5/29/20.
40								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due

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FIGURE A- 1

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DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 5/29/20 BORING NO. B-1 GROUND ELEVATION 1,043' ± (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (J&H Drilling) DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30" SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC DESCRIPTION/INTERPRETATION
40								to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED 5/28/20 BORING NO. B-2

GROUND ELEVATION 1,040' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (J&H Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 5.5 inches thick.
								AGGREGATE BASE: Brown, moist, dense, poorly graded GRAVEL with sand; approximately 4 inches thick.
							SM	FILL: Dark brown, moist, medium dense, silty SAND with gravel.
							SW-SM	ALLUVIUM: Brown, moist, medium dense, well-graded SAND with silt and gravel; interbeds of gravel.
			30	3.4	114.2			
							SP	Brown, moist, dense, poorly graded SAND with gravel.
10			21					
			44	2.8	119.1			
								Total Depth = 16.5 feet. Groundwater was not encountered during drilling. Backfilled with cement-bentonite grout and patched with rapid-set concrete on 5/28/20. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20								
30								
40								

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 4/2/20 BORING NO. B-3 GROUND ELEVATION 1,036' ± (MSL) SHEET 1 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (Baja Exploration) DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30" SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC **DESCRIPTION/INTERPRETATION**
0							SP-SM	FILL: Brown, moist, medium dense, poorly graded SAND with silt; few to little gravel; cobbles.
							SP-SM	ALLUVIUM: Brown, moist, very dense, poorly graded SAND with silt and gravel.
			89					
10			50/1"					Light brown; cobbles.
			54	2.9	118.6			Dense.
20			77					Very dense.
							GP	Light brown, moist, very dense, poorly graded GRAVEL with sand; cobbles.
			50/2"					
30			67					Cobbles.
			50/6"					
								Total Depth = 35.5 feet (Refusal). Groundwater was not encountered during drilling. Backfilled with cement-bentonite grout on 4/2/20. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due
40								

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211294003 | 7/20

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 4/2/20 BORING NO. B-3 GROUND ELEVATION 1,036' ± (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (Baja Exploration) DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30" SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC DESCRIPTION/INTERPRETATION
40								to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED	4/2/20	BORING NO.	P-1
GROUND ELEVATION	1,039' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Hollow-Stem Auger (Baja Exploration)		
DRIVE WEIGHT	140 lbs (Auto. Trip Hammer)	DROP	30"
SAMPLED BY KMB	LOGGED BY KMB	REVIEWED BY	GMC

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SP	FILL: Brown, moist, loose, poorly graded SAND with silt; trace gravel; few organics.
								Dense; few to little gravel; cobbles.
							SW-SM	ALLUVIUM: Brown, moist, dense, well-graded SAND with silt and gravel; cobbles.
			50	2.4	135.7			
10			89/7"					Very dense; interbeds of gravel and cobbles.
							SP-SM	Brown, moist, very dense, poorly graded SAND with silt and gravel.
			50/6"	3.9	127.1			
20			50/2"					
							SP	Brown, moist, very dense, poorly graded SAND; few to little gravel; cobbles.
			50/6"					
								Total Depth = 28.0 feet (Refusal). Groundwater was not encountered during drilling. In-situ percolation testing performed on 4/13/20. Backfilled with cement-bentonite grout on 4/16/20.
30								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40								

DATE DRILLED	4/1/20
BORING NO.	P-2
GROUND ELEVATION	1,037' ± (MSL)
SHEET	1 OF 2
METHOD OF DRILLING	8" Hollow-Stem Auger (Baja Exploration)
DRIVE WEIGHT	140 lbs (Auto. Trip Hammer)
DROP	30"
SAMPLED BY	KMB
LOGGED BY	KMB
REVIEWED BY	GMC

DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	Bulk				SM	FILL: Brown, moist, loose to medium dense, silty SAND; trace gravel; few organics.
					SP	ALLUVIUM: Brown, moist, dense, poorly graded SAND; trace gravel.
	Driven	21				Light brown; few to little gravel; cobbles.
					SW	Light brown, moist, medium dense, well-graded SAND.
10	Driven	38	3.0	122.9		
					SP	Light brown, moist, medium dense, poorly graded SAND; trace gravel.
	Driven	29				Dense.
20	Driven	50/3"				Very dense.
	Driven	73				Interbeds of gravel and cobbles.
					SP	Light brown, moist, very dense, poorly graded SAND with gravel; possible cobbles/ boulders.
30	Driven	88/11"	2.6	134.8		
						Total Depth = 37.0 feet (Refusal). Groundwater was not encountered during drilling. In-situ percolation testing performed on 4/13/20. Backfilled with cement-bentonite grout on 4/16/20.
40						

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 4/1/20 BORING NO. P-2 GROUND ELEVATION 1,037' ± (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (Baja Exploration) DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30" SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC DESCRIPTION/INTERPRETATION
40								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED	4/2/20	BORING NO.	P-3
GROUND ELEVATION	1,038' ± (MSL)	SHEET	1 OF 2
METHOD OF DRILLING	8" Hollow-Stem Auger (Baja Exploration)		
DRIVE WEIGHT	140 lbs (Auto. Trip Hammer)	DROP	30"
SAMPLED BY	KMB	LOGGED BY	KMB
REVIEWED BY	GMC		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	X						SC	FILL: Brown, moist, medium dense, clayey SAND; few gravel; cobbles; organics.
								Few to little gravel.
		X	24	3.3	114.1		SP	ALLUVIUM: Brown, moist, medium dense, poorly graded SAND with gravel.
10		X	39					Very dense; cobbles.
							SP-SM	Brown, moist, very dense, poorly graded SAND with silt and gravel.
		X	91/9"	2.3	133.1			
							SW	Light brown, moist, very dense, well-graded SAND; trace gravel.
20		X	76					
		X	50/4"					Well-graded sand with gravel; cobbles.
30		X	62					
							GP-GM	Brown, moist, very dense, poorly graded GRAVEL with silt and sand.
	X	X	50/3"					
40								

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FIGURE A- 9

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DATE DRILLED	4/2/20	BORING NO.	P-3
GROUND ELEVATION	1,038' ± (MSL)	SHEET	2 OF 2
METHOD OF DRILLING	8" Hollow-Stem Auger (Baja Exploration)		
DRIVE WEIGHT	140 lbs (Auto. Trip Hammer)	DROP	30"
SAMPLED BY	KMB	LOGGED BY	KMB
REVIEWED BY	GMC		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40			50/4"				SW	ALLUVIUM: (Continued) Light brown, moist, very dense, well-graded SAND; few gravel; possible cobbles/boulders.
							SM	Reddish yellow, moist, very dense, silty SAND.
			50/3"					
50			50/2"					
								Total Depth = 50.7 feet. Groundwater was not encountered during drilling. In-situ percolation testing performed on 4/15/20. Backfilled with cement-bentonite grout on 4/16/20. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
60								
70								
80								

DATE DRILLED 4/1/20 BORING NO. P-4

GROUND ELEVATION 1,033' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (Baja Exploration)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY KMB LOGGED BY KMB REVIEWED BY GMC

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, dense, silty SAND with gravel; few organics.
			50/6"					Very dense; cobbles.
							SP	ALLUVIUM: Light brown, moist, very dense, poorly graded SAND with gravel; cobbles.
							SW	Light brown, moist, medium dense, well-graded SAND.
10			12					
							SP-SM	Brown, moist, dense, poorly graded SAND with silt and gravel; cobbles.
			52	3.3	126.1			
20			47					Cobbles.
			80					Very dense.
30			88					
								Total Depth = 31.5 feet. Groundwater was not encountered during drilling. In-situ percolation testing performed on 4/14/20. Backfilled with cement-bentonite grout on 4/16/20. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40								

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PACOIMA, CALIFORNIA

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DATE DRILLED	4/1/20	BORING NO.	P-5
GROUND ELEVATION	1,034' ± (MSL)	SHEET	1 OF 1
METHOD OF DRILLING	8" Hollow-Stem Auger (Baja Exploration)		
DRIVE WEIGHT	140 lbs (Auto. Trip Hammer)	DROP	30"
SAMPLED BY	KMB	LOGGED BY	KMB
REVIEWED BY	GMC		

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Brown, moist, loose, silty SAND; few organics.
							SP	ALLUVIUM: Brown, moist, dense, poorly graded SAND with silt; few to little gravel; cobbles.
			82					Very dense.
							SP	Light brown, dry, medium dense, poorly graded SAND with gravel.
10			32	0.8	128.7			
							SM	Brown, moist, medium dense, silty SAND; few organics.
							SP	Light brown, moist, very dense, poorly graded SAND; few gravel; cobbles.
			56					
20			50/1"					Poorly graded sand with gravel; cobbles
							SP-SM	Light brown, moist, very dense, poorly graded SAND with silt and gravel; possible cobbles/ boulders.
			40					
30			50/3"					
40								

Total Depth = 30.8 feet.
Groundwater was not encountered during drilling.
In-situ percolation testing performed on 4/14/20.
Backfilled with cement-bentonite grout on 4/16/20.

Notes:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

APPENDIX B

CPT Soundings

APPENDIX B

CPT SOUNDINGS

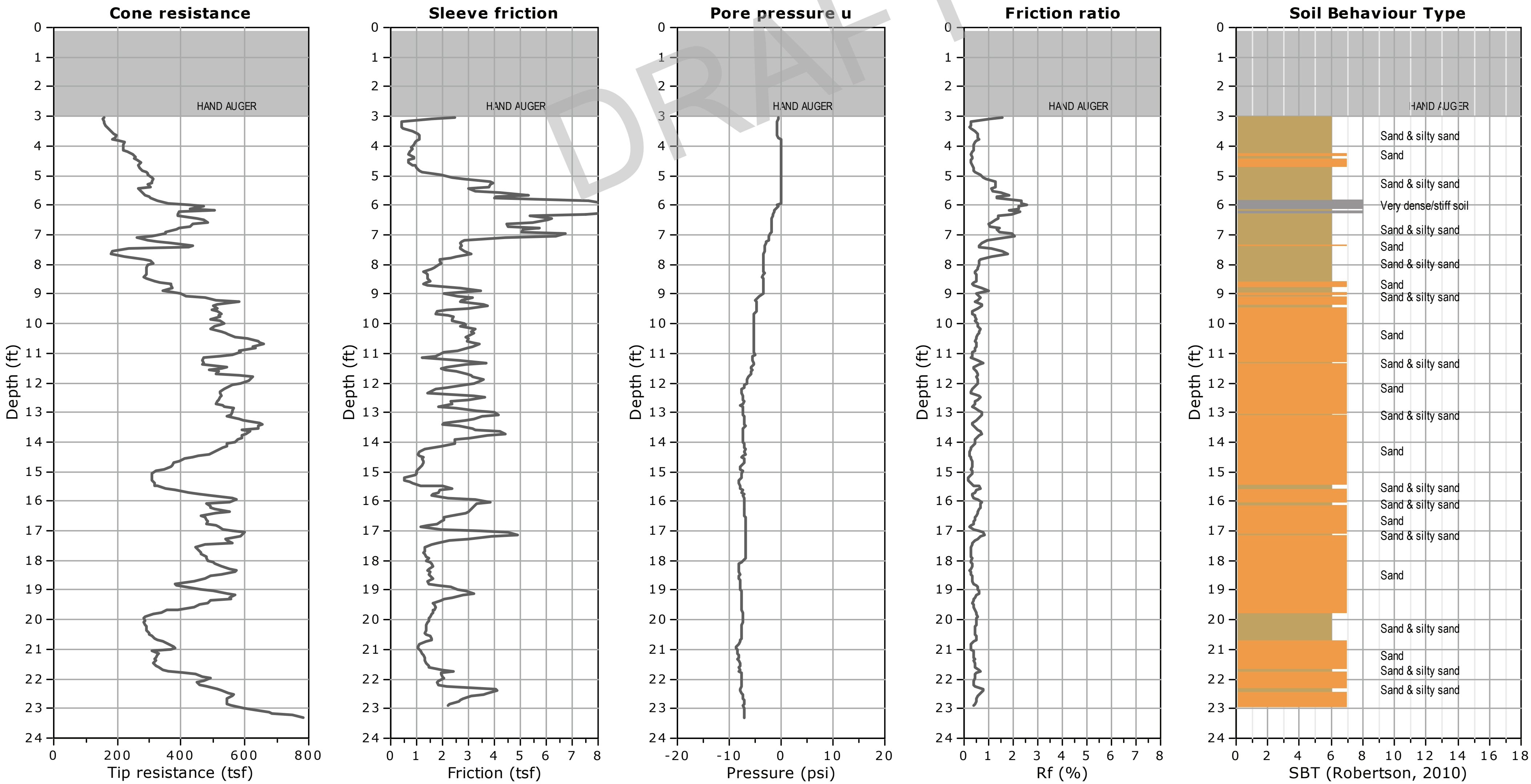
Field Procedure for Cone Penetration Testing

The cone penetration testing (CPT) described in this report was conducted by Kehoe Testing and Engineering in general accordance with ASTM D 5778. The cone penetrometer assembly used for this project consisted of a conical tip and a cylindrical friction sleeve. The conical tip had an apex angle of 60 degrees and a cross-section area of approximately 15 square centimeters. The interior of the CPT probe was instrumented with strain gauges that allowed simultaneous measurement of cone tip resistance and friction sleeve resistance during penetration. The cone hydraulically pushed into the soil using the reaction mass of a specially designed 30-ton truck at a constant rate while the cone tip resistance and sleeve friction were recorded at an approximately 1-inch interval and stored in digital form. The computer generated logs presented in the following pages include cone resistance, sleeve friction, pore pressure, and soil behavior type.

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

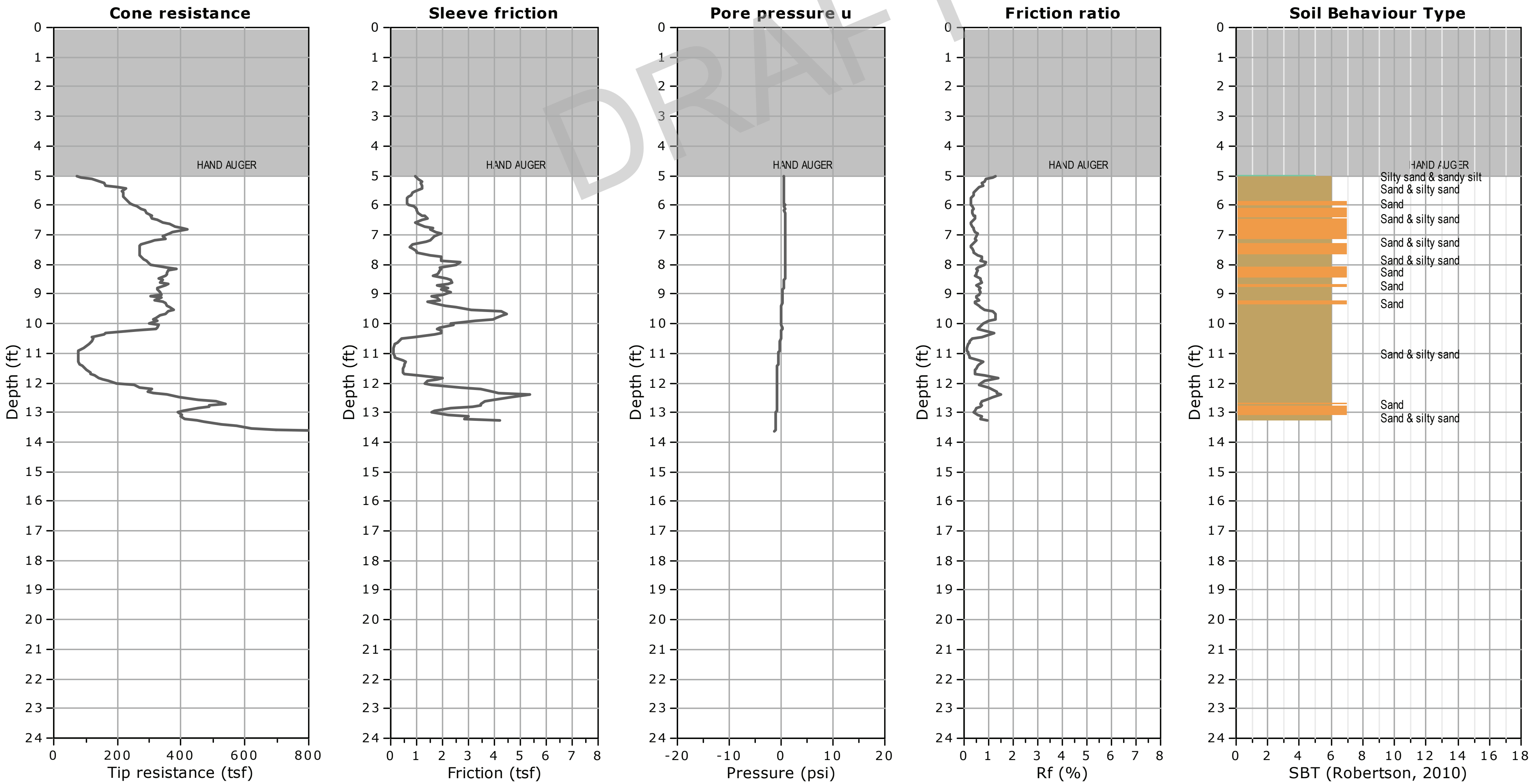
Project: Ninyo & Moore / Gonzalez Site
Location: Los Angeles County, CA

CPT-1
Total depth: 23.30 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

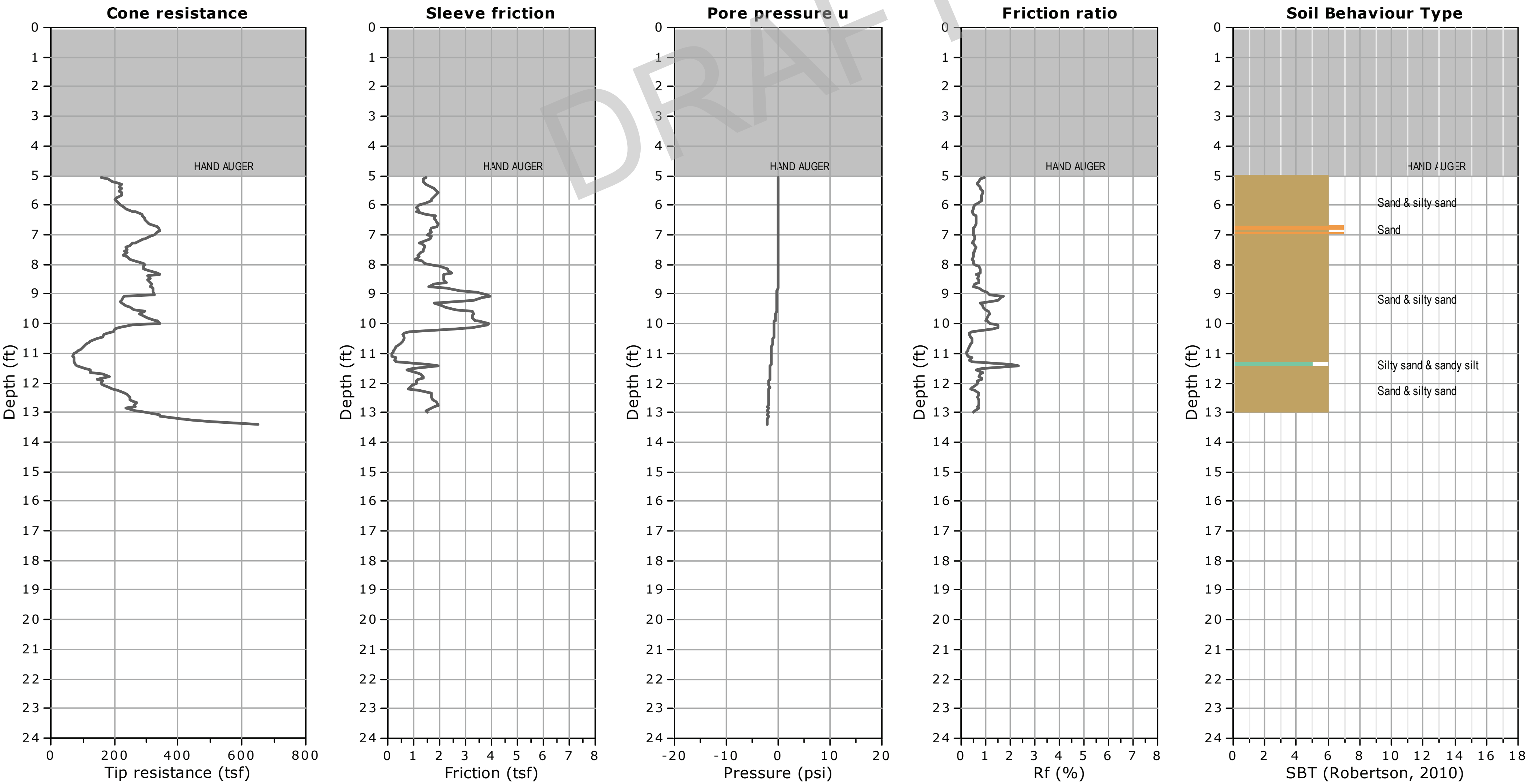
Project: **Ninyo & Moore / Gonzalez Site** **CPT-2**
Location: **Los Angeles County, CA** Total depth: 13.66 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Ninyo & Moore / Gonzalez Site**
Location: **Los Angeles County, CA**

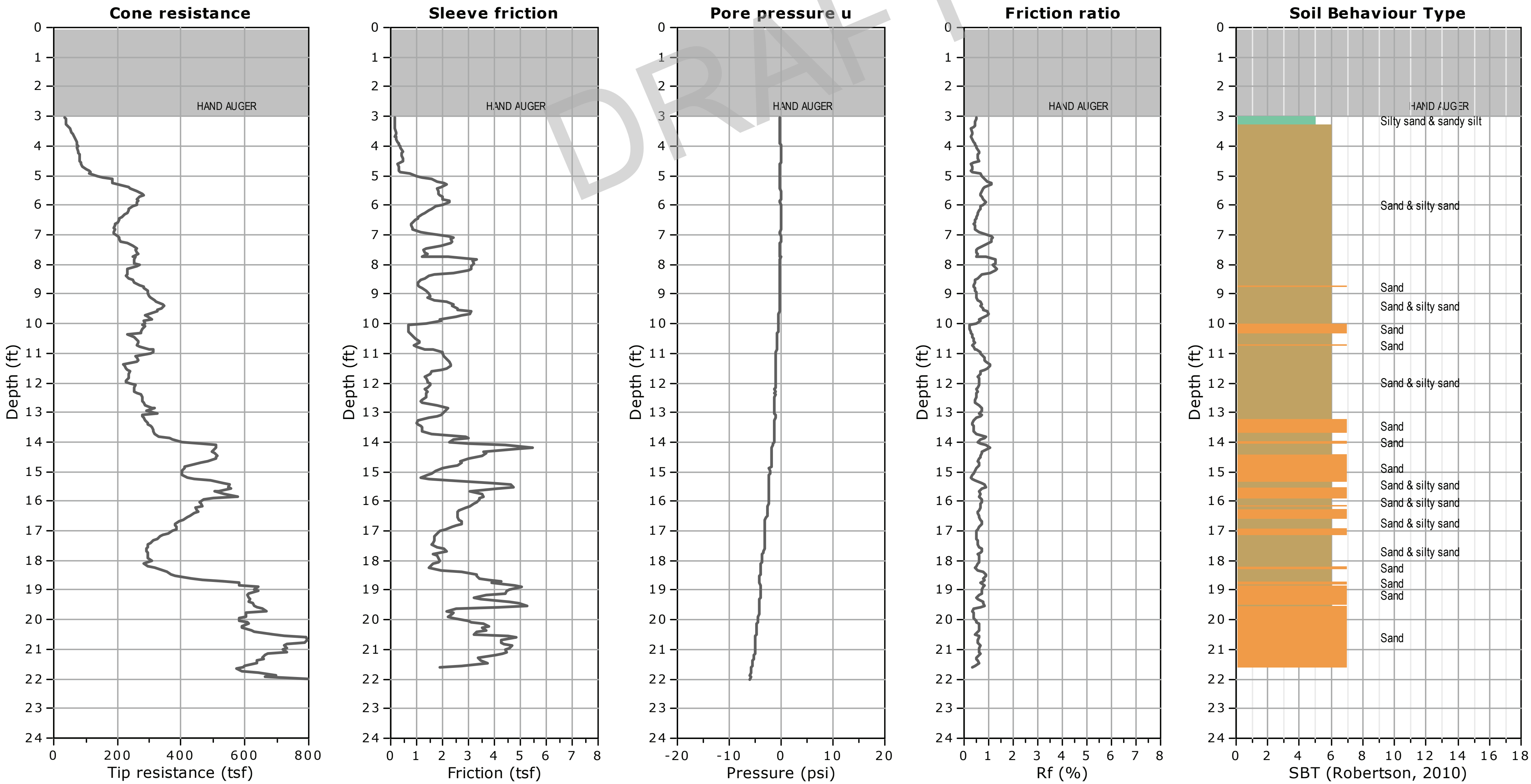
CPT-2A
Total depth: 13.41 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Ninyo & Moore / Gonzalez Site**
Location: **Los Angeles County, CA**

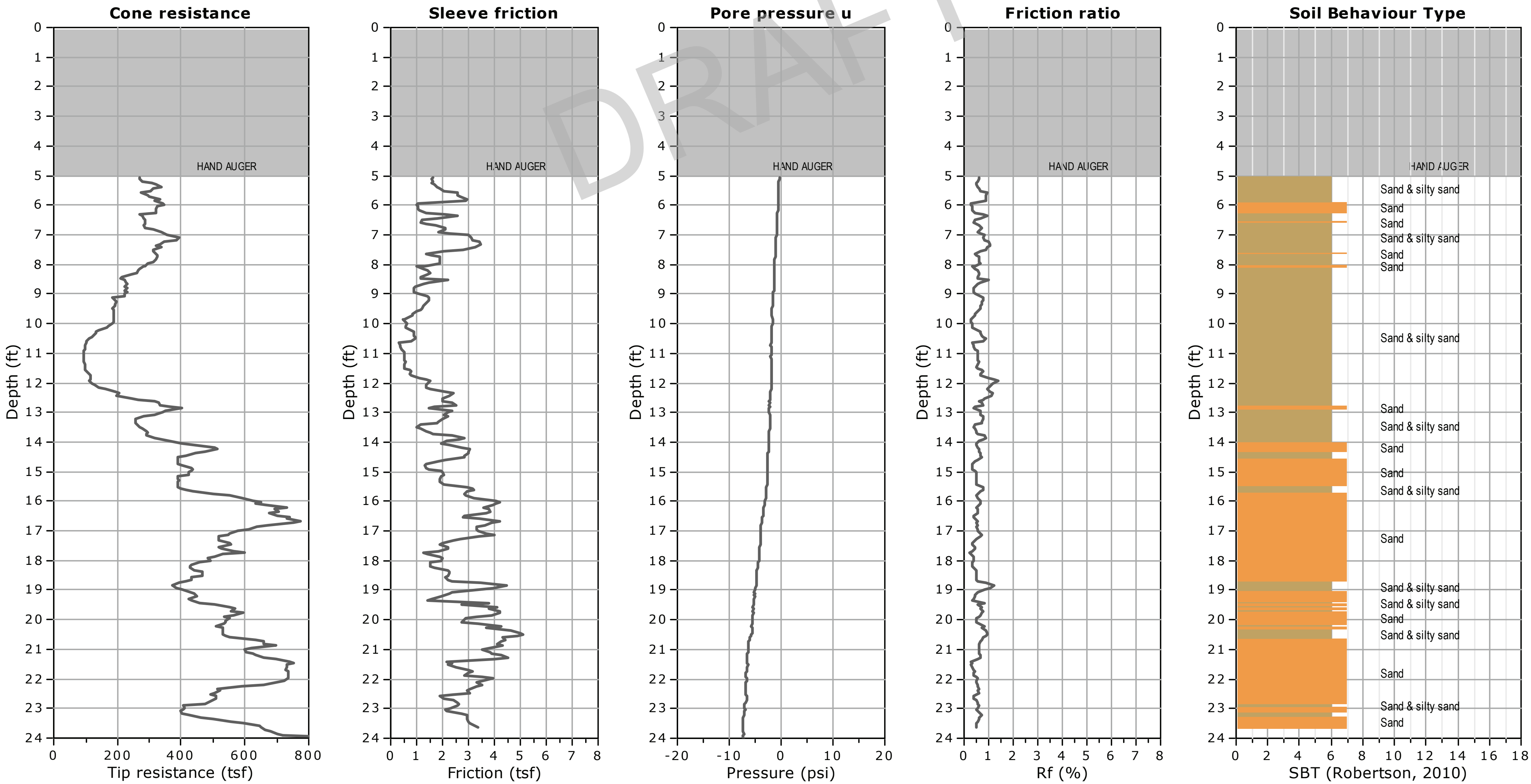
CPT-3
Total depth: 22.01 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Ninyo & Moore / Gonzalez Site**
Location: **Los Angeles County, CA**

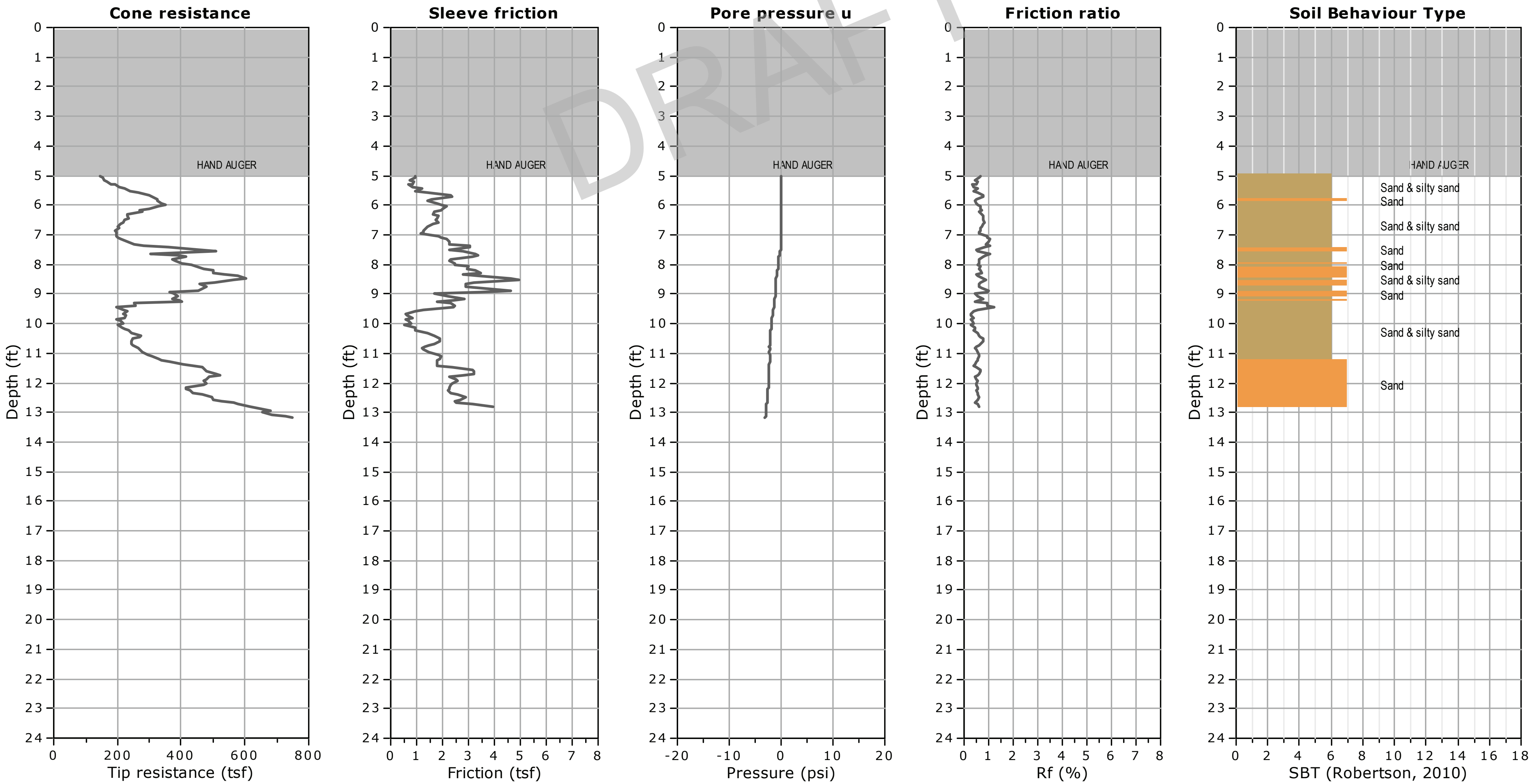
CPT-4
Total depth: 24.02 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: Ninyo & Moore / Gonzalez Site **CPT-5**

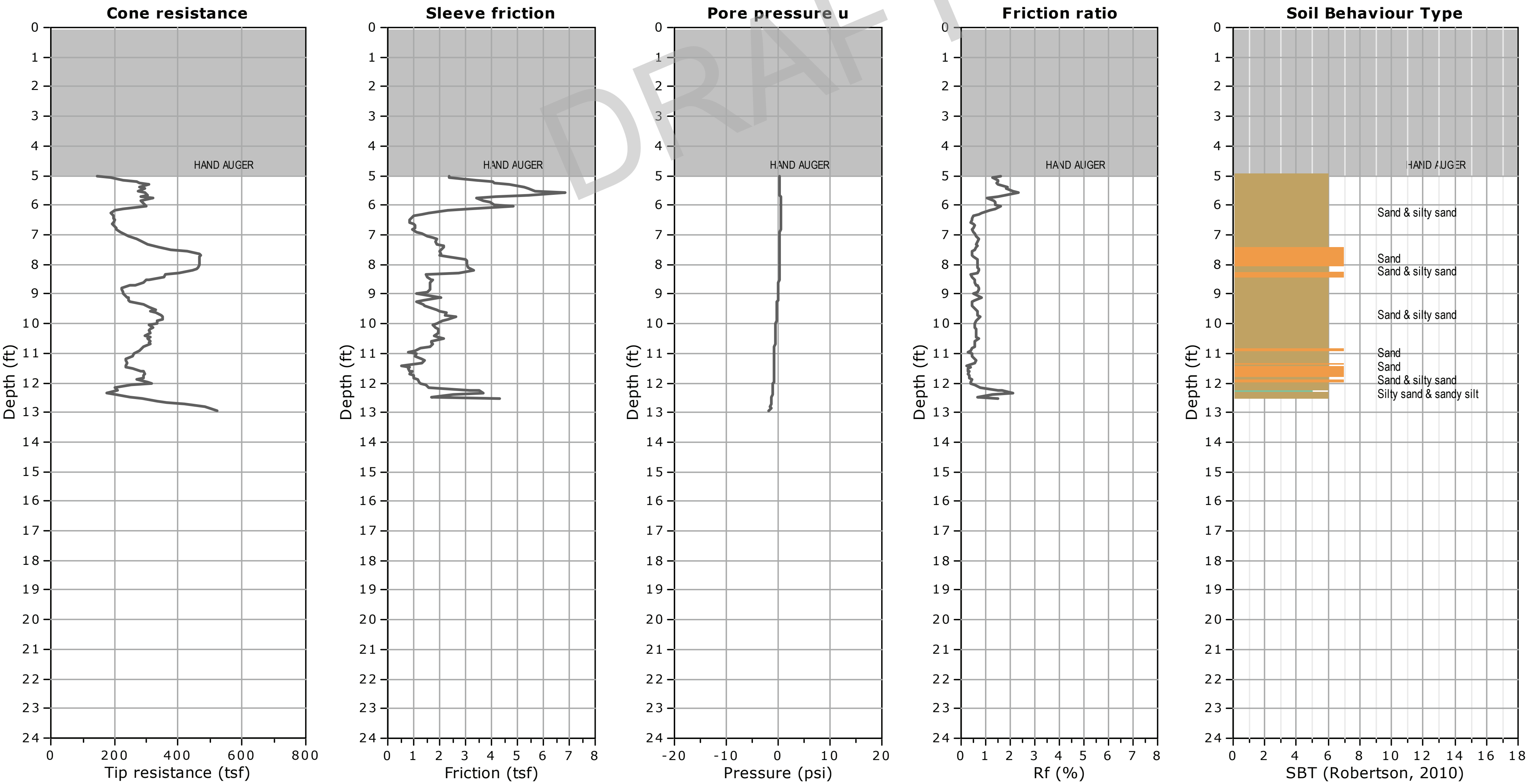
Location: Los Angeles County, CA Total depth: 13.19 ft, Date: 3/25/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Ninyo & Moore / Gonzalez Site** **CPT-5A**

Location: **Los Angeles County, CA** Total depth: 12.93 ft, Date: 3/25/2020



APPENDIX C

Geotechnical Laboratory Testing

APPENDIX C

GEOTECHNICAL LABORATORY TESTING

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix B.

In-Place Moisture and Density Tests
The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix B.

Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures C-1 through C-8. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

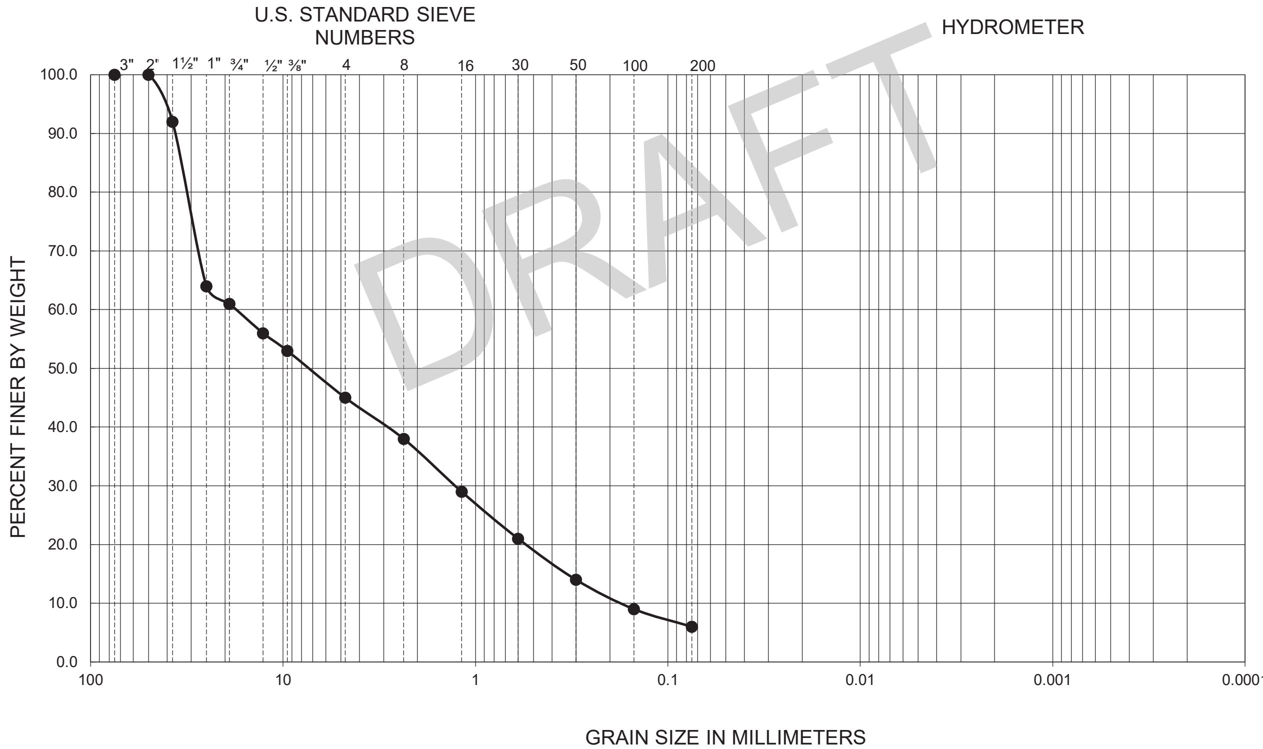
200 Wash
An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the tests are presented on Figure C-9.

Consolidation Test
Consolidation testing was performed on a selected relatively undisturbed soil sample in general accordance with ASTM D 2435. The sample was inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are summarized on Figure C-10.

Direct Shear Tests
Direct shear tests were performed on relatively undisturbed samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figures C-11 through C-13.

Soil Corrosivity Tests
Soil pH and resistivity tests were performed on a representative sample in general accordance with California Test (CT) 643. The soluble sulfate and chloride content of the selected sample were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure C-14.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	20.0-20.9	--	--	--	0.17	1.20	17.74	104.4	0.5	6	GP-GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-1

GRADATION TEST RESULTS

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PACOIMA, CALIFORNIA

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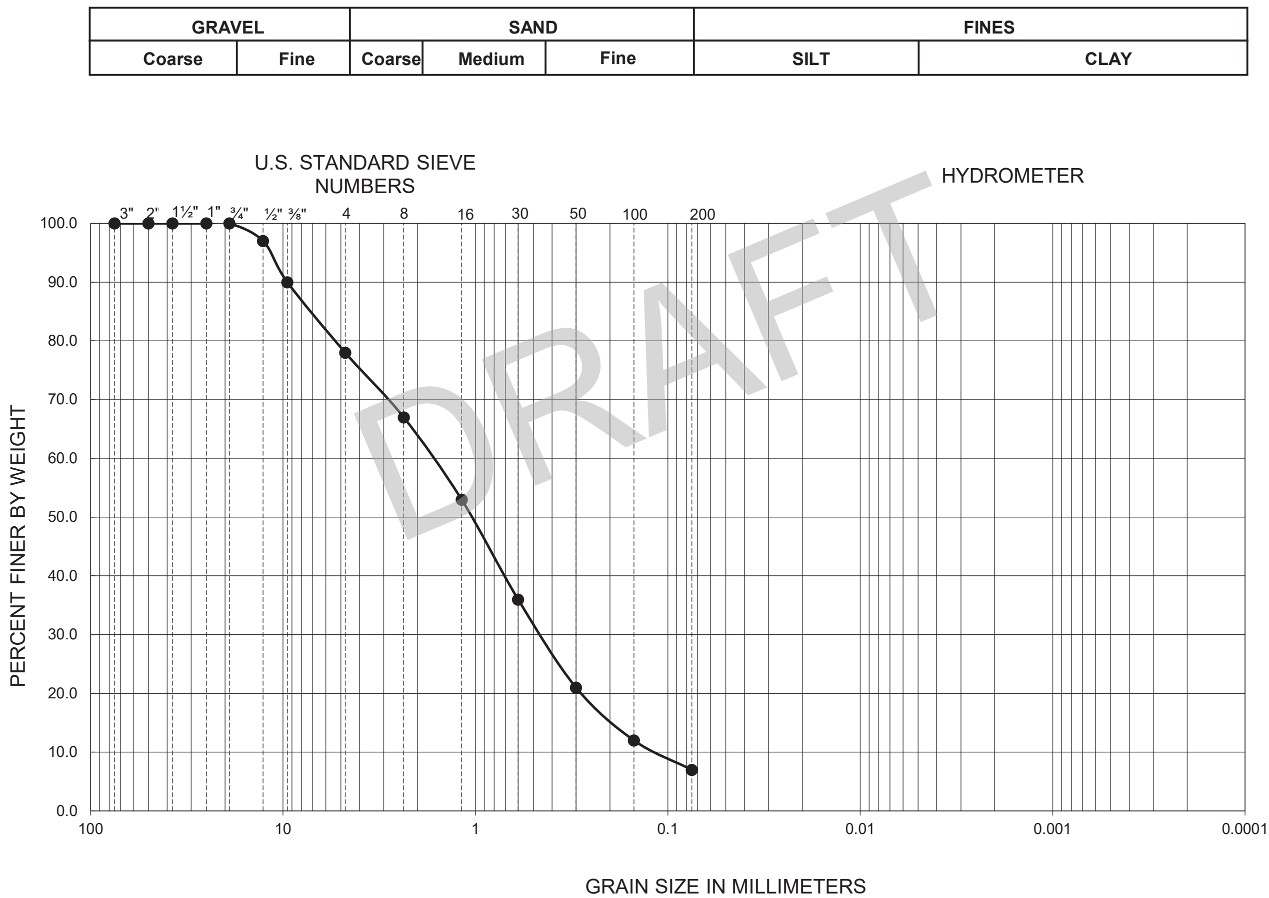

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-2	5.0-6.5	--	--	--	0.115	0.46	1.60	13.9	1.2	7	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-2

GRADATION TEST RESULTS

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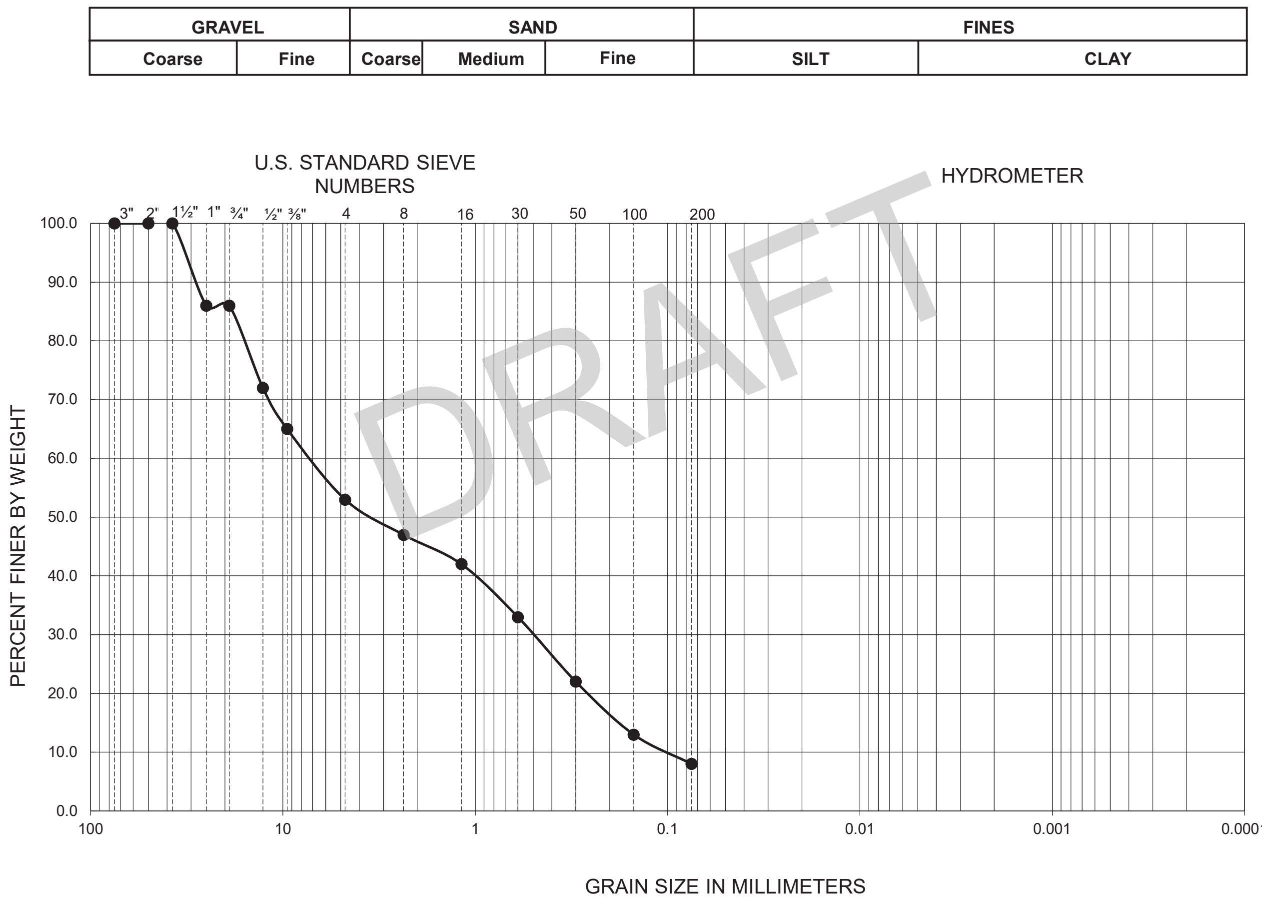

Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-3	10.0-10.6	--	--	--	0.10	0.50	7.30	73.0	0.3	8	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-3

GRADATION TEST RESULTS

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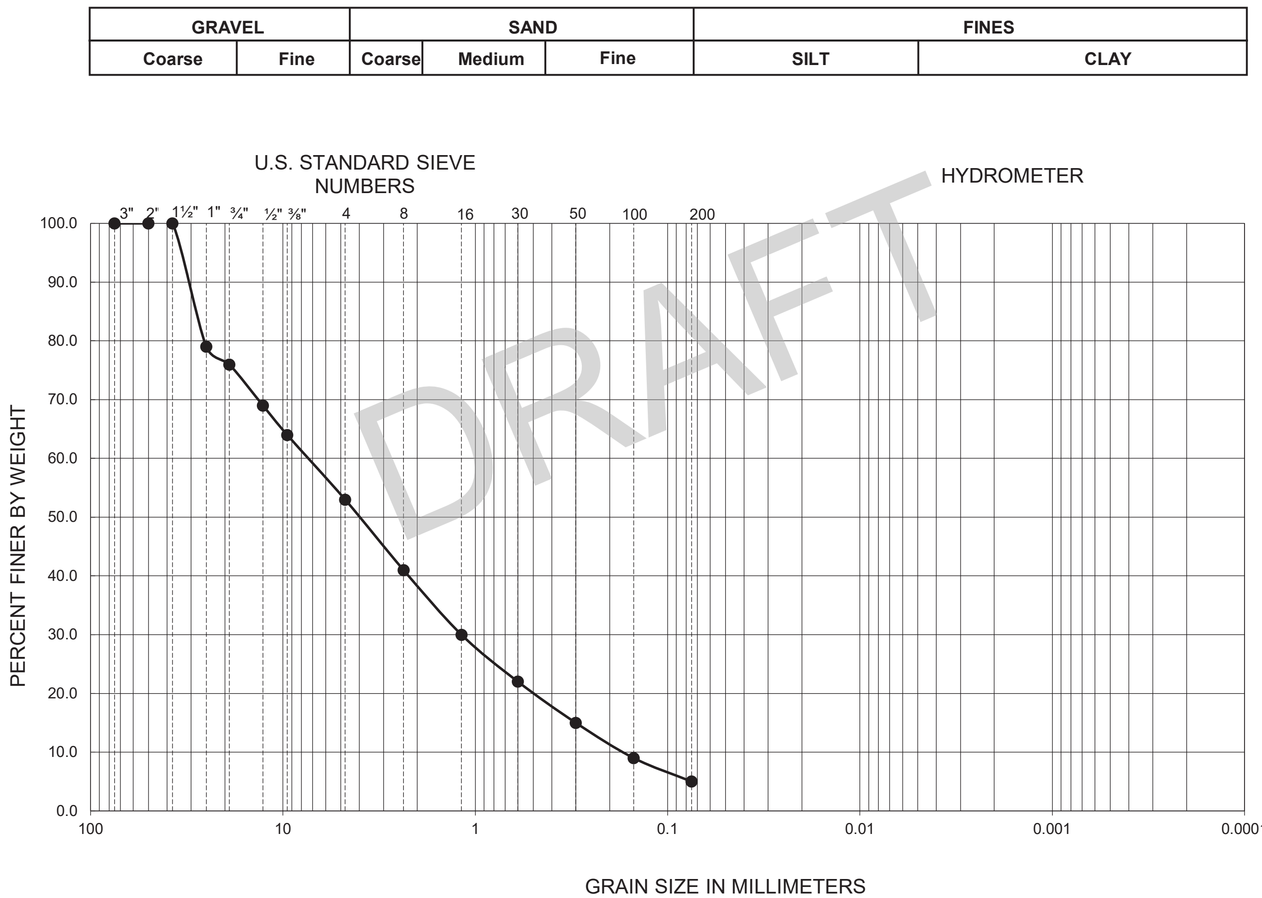
PACOIMA, CALIFORNIA



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-1	5.0-6.5	--	--	--	0.17	1.18	7.40	43.5	1.1	5	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-4

GRADATION TEST RESULTS

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Geotechnical & Environmental Sciences Consultants

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
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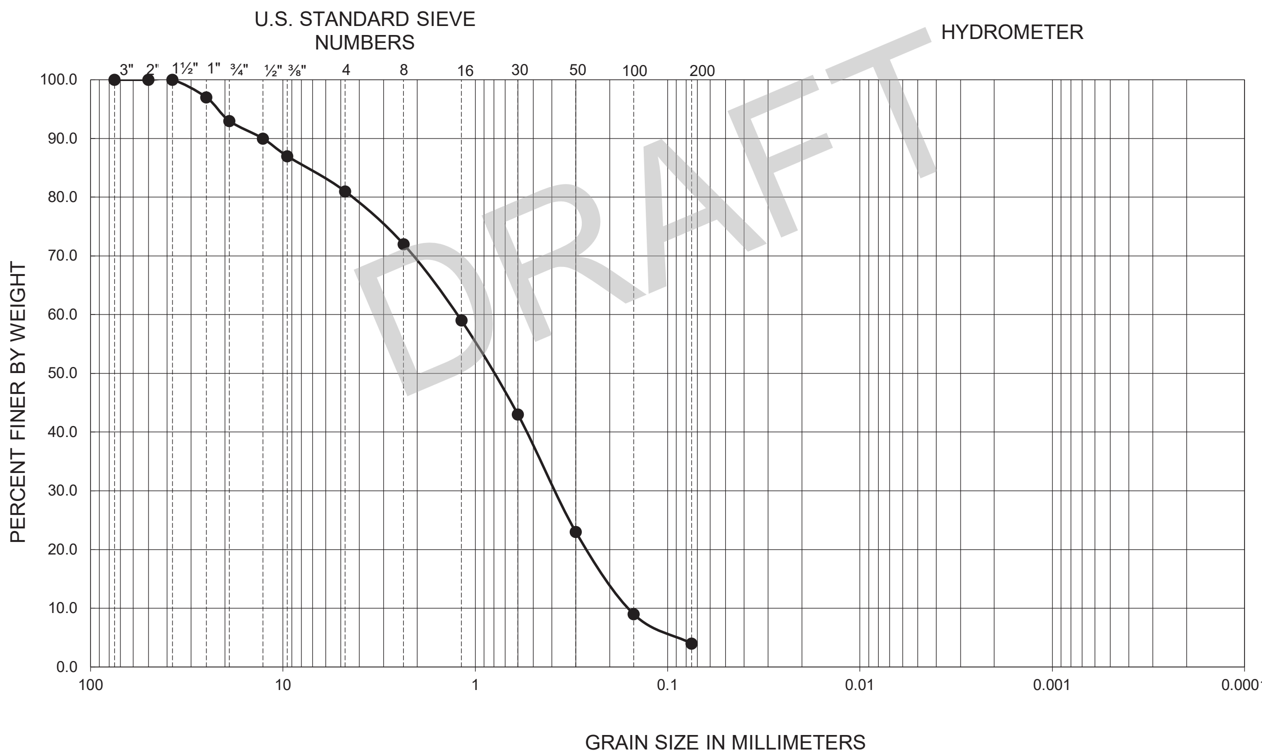
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-3	5.0-6.5	--	--	--	0.16	0.38	1.20	7.5	0.8	4	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-5

GRADATION TEST RESULTS

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Geotechnical & Environmental Sciences Consultants

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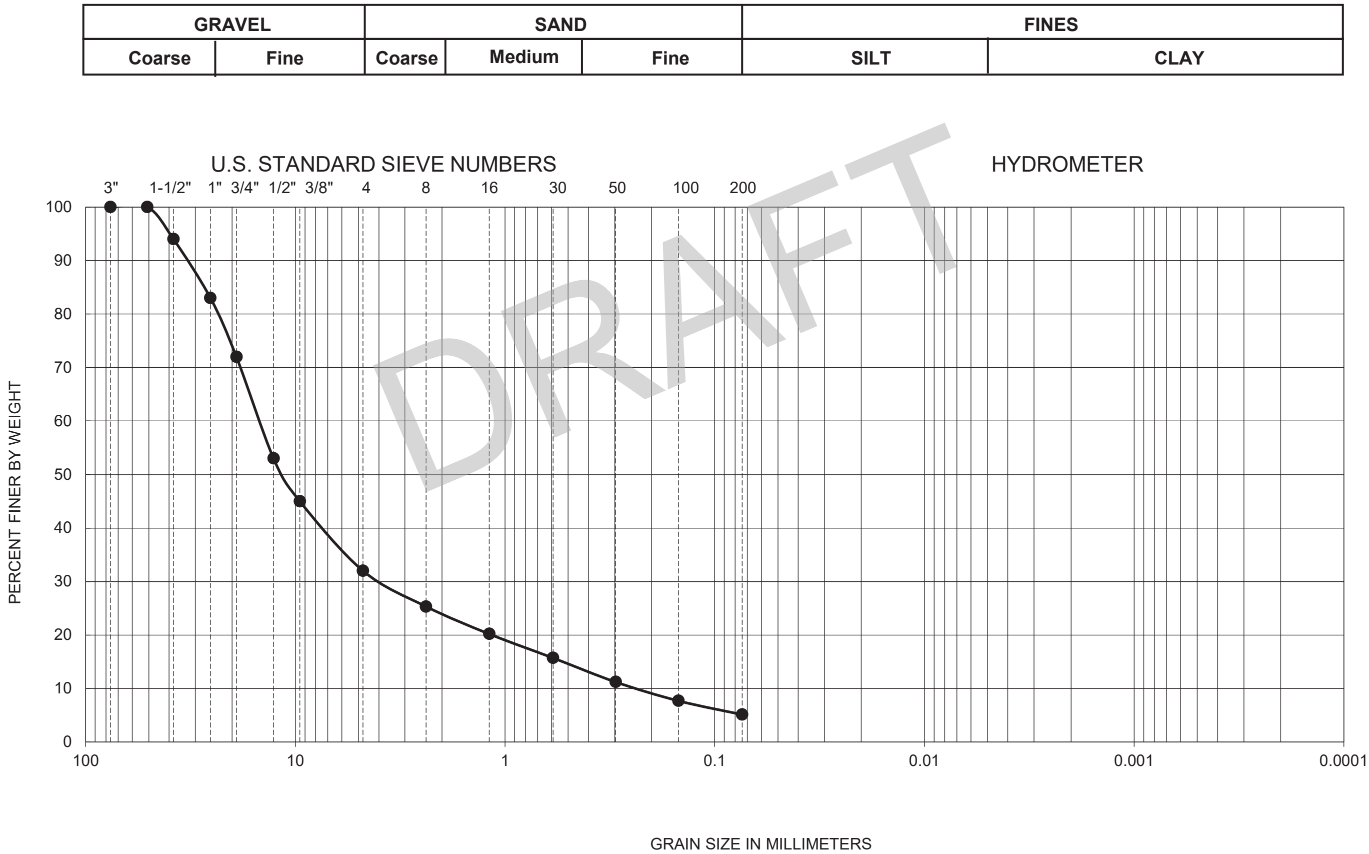
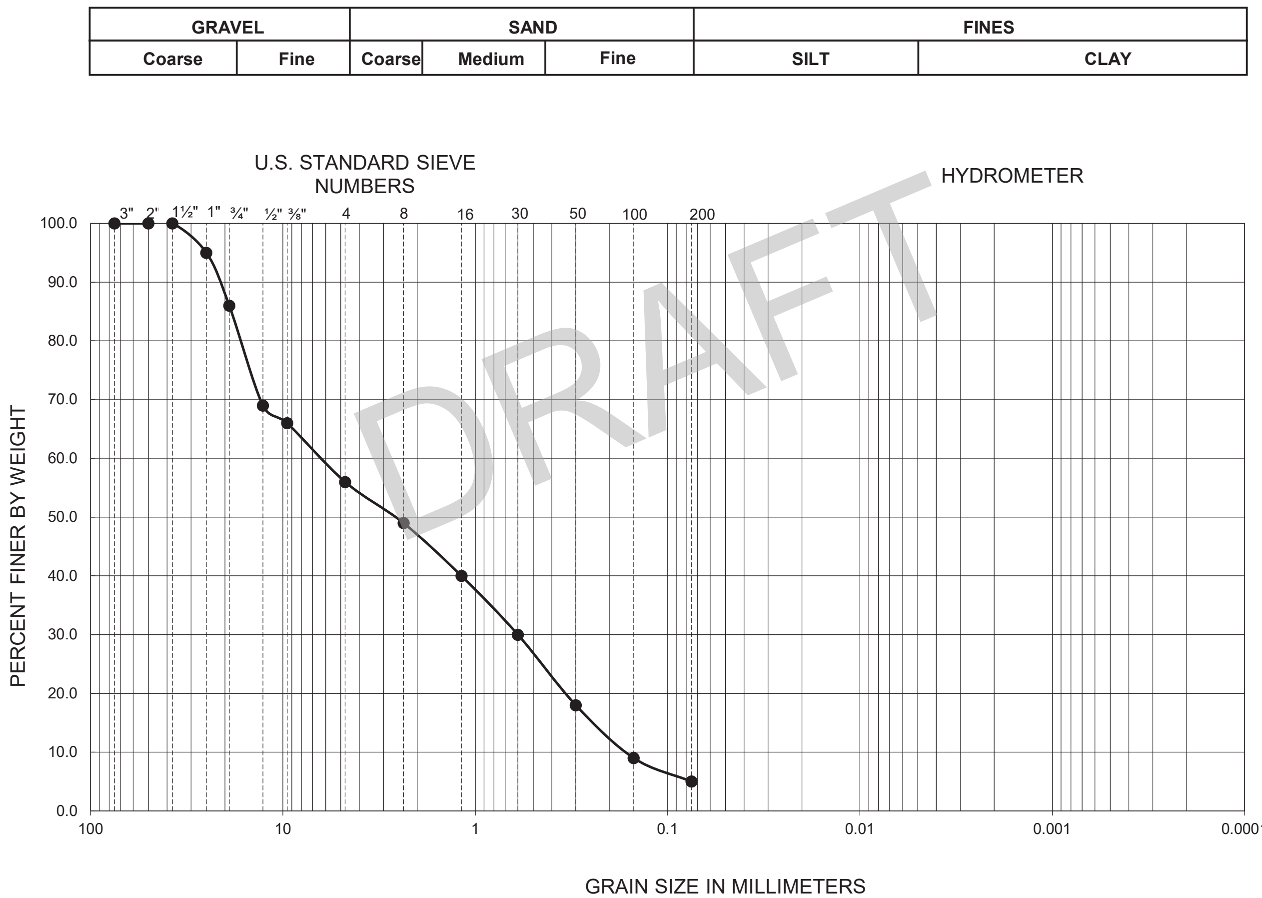


Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-3	35.0-38.0	--	--	--	0.24	4.05	15.0	62.5	4.6	5	GP-GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-4	15.0-16.5	--	--	--	0.17	0.60	6.20	36.5	0.3	5	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-7

GRADATION TEST RESULTS

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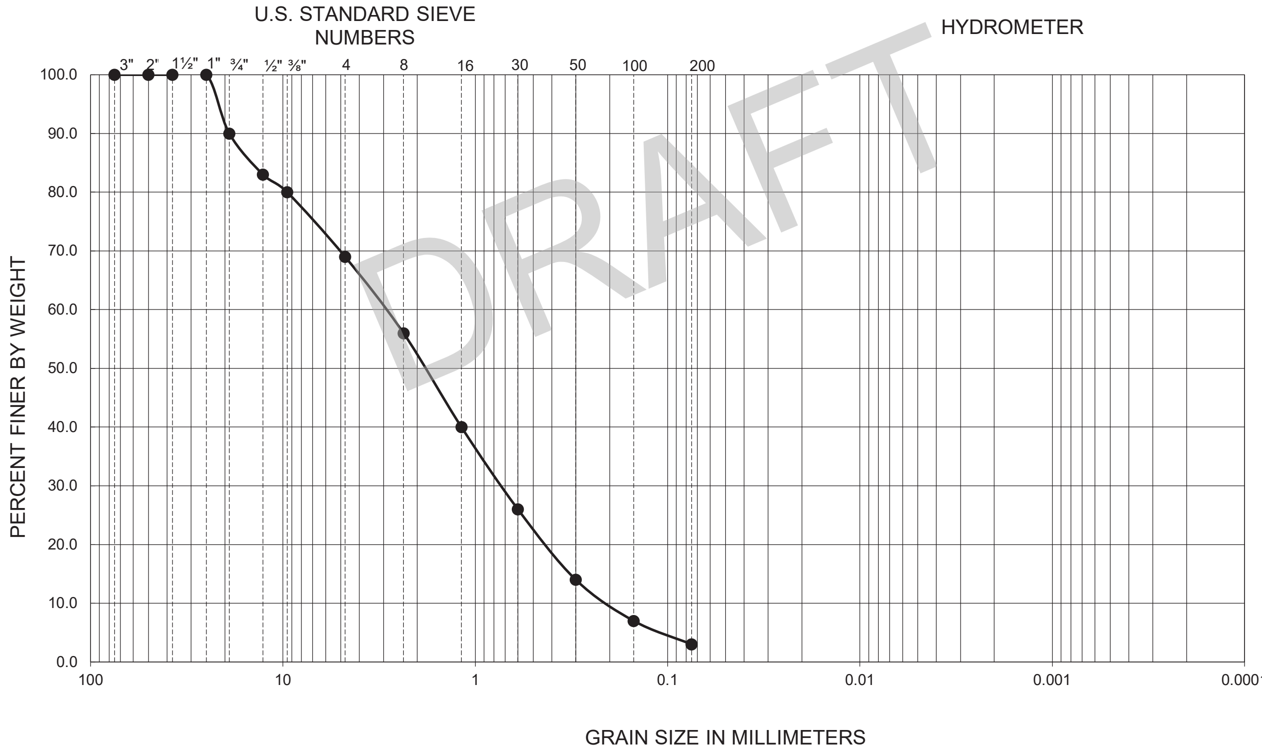
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-5	10.0-11.0	--	--	--	0.21	0.74	2.80	13.3	0.9	3	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE C-8

GRADATION TEST RESULTS

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Geotechnical & Environmental Sciences Consultants

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-1	10.0-10.7	POORLY GRADED SAND WITH SILT AND GRAVEL	60	6	SP-SM
B-2	15.0-16.5	POORLY GRADED SAND WITH GRAVEL	68	4	SP
B-3	25.0-25.2	POORLY GRADED GRAVEL WITH SAND	24	4	GP
P-1	15.0-16.0	POORLY GRADED SAND WITH SILT AND GRAVEL	85	6	SP-SM
P-2	0.0-5.0	SILTY SAND	97	24	SM
P-2	30.0-31.4	POORLY GRADED SAND WITH GRAVEL	51	4	SP
P-3	15.0-16.3	POORLY GRADED SAND WITH SILT AND GRAVEL	76	12	SP-SM
P-3	50.0-50.7	SILTY SAND	100	19	SM
P-4	0.0-5.0	SILTY SAND WITH GRAVEL	85	22	SM
P-5	25.0-26.5	POORLY GRADED GRAVEL WITH SAND	68	7	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

FIGURE C-9

NO. 200 SIEVE ANALYSIS TEST RESULTS

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Geotechnical & Environmental Sciences Consultants

LABOE TOS NO. 25 - DAVID M. GONZALES RECREATION CENTER
PACOIMA, CALIFORNIA

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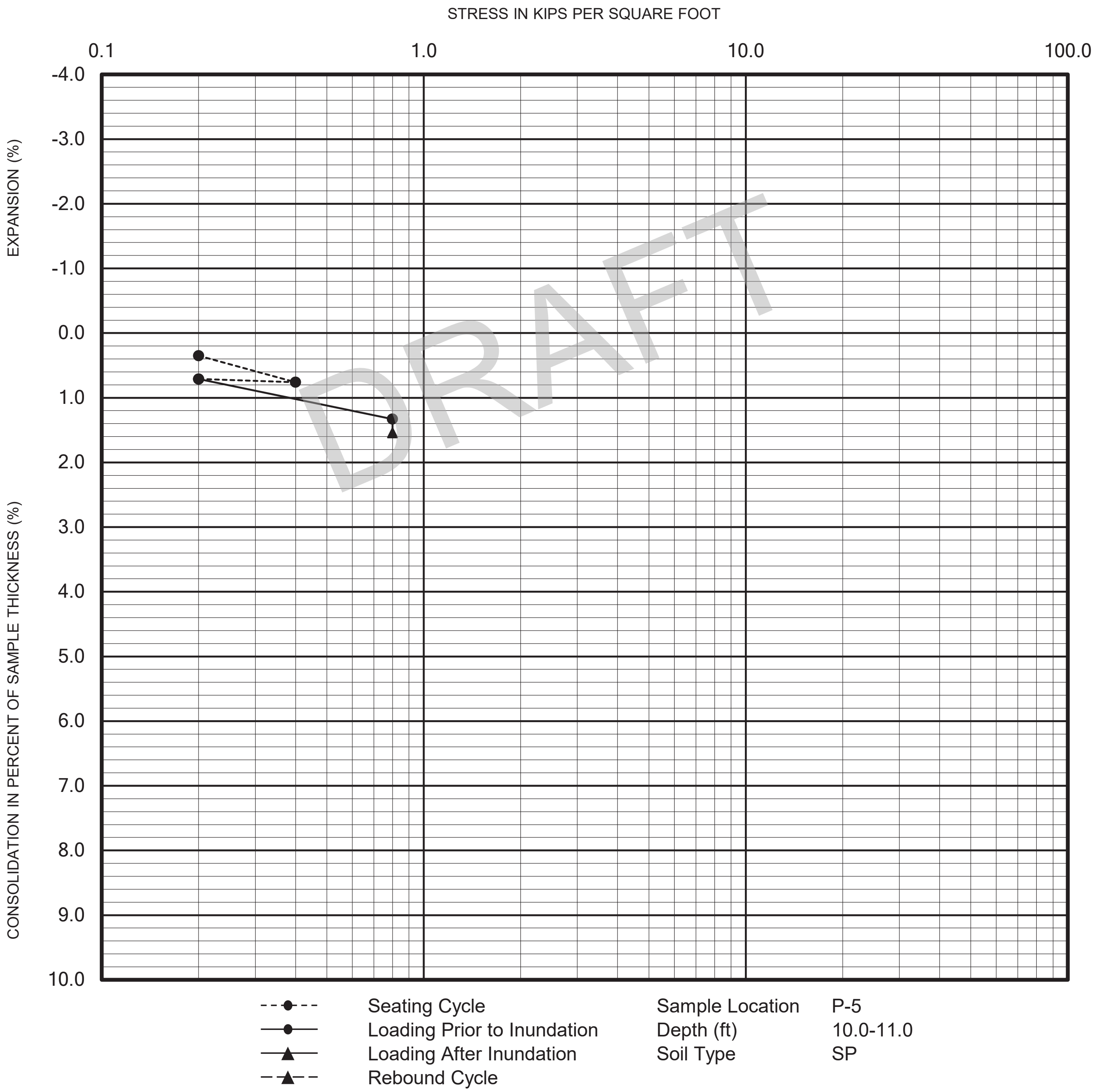

Sample Location	P-5
Depth (ft)	10.0-11.0
Soil Type	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

FIGURE C-10

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CONSOLIDATION TEST RESULTS

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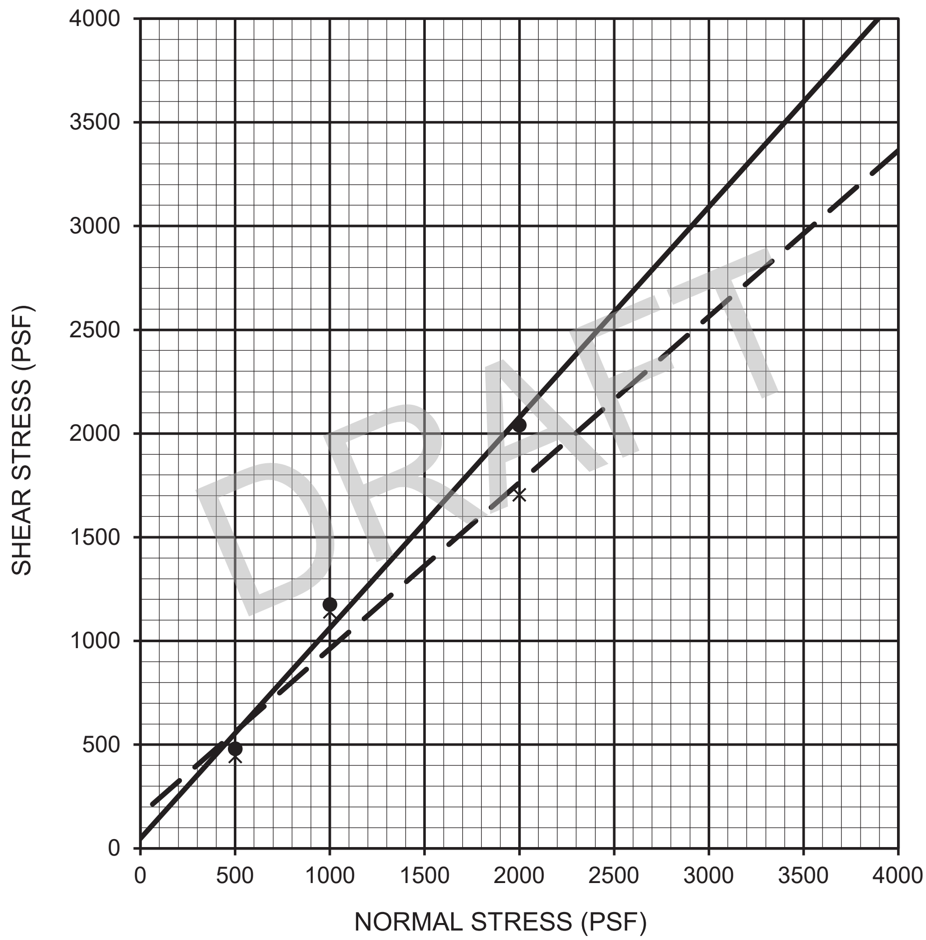

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
WELL-GRADED SAND WITH SILT	—●—	B-2	5.0-6.5	Peak	48	45	SW-SM
WELL-GRADED SAND WITH SILT	- - X - -	B-2	5.0-6.5	Ultimate	162	39	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE C-11

DIRECT SHEAR TEST RESULTS

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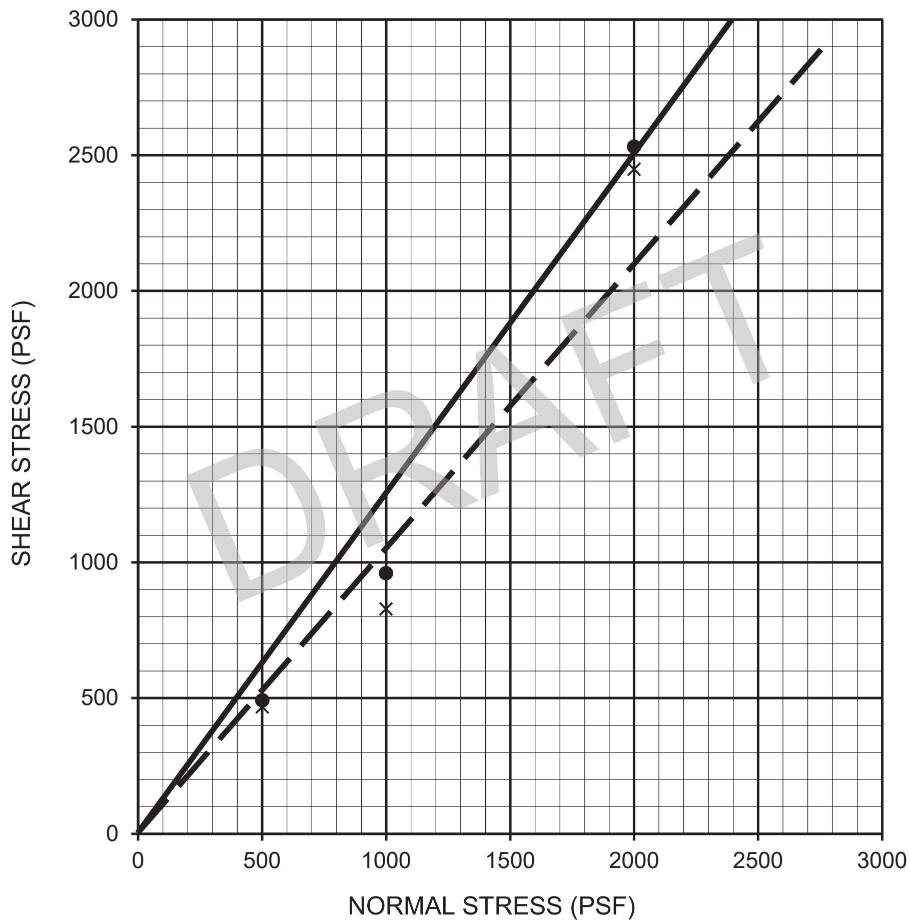

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
POORLY GRADED SAND WITH GRAVEL	—●—	P-3	5.0-6.5	Peak	0	50	SP
POORLY GRADED SAND WITH GRAVEL	- - X - -	P-3	5.0-6.5	Ultimate	0	49	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE C-12

DIRECT SHEAR TEST RESULTS

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Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

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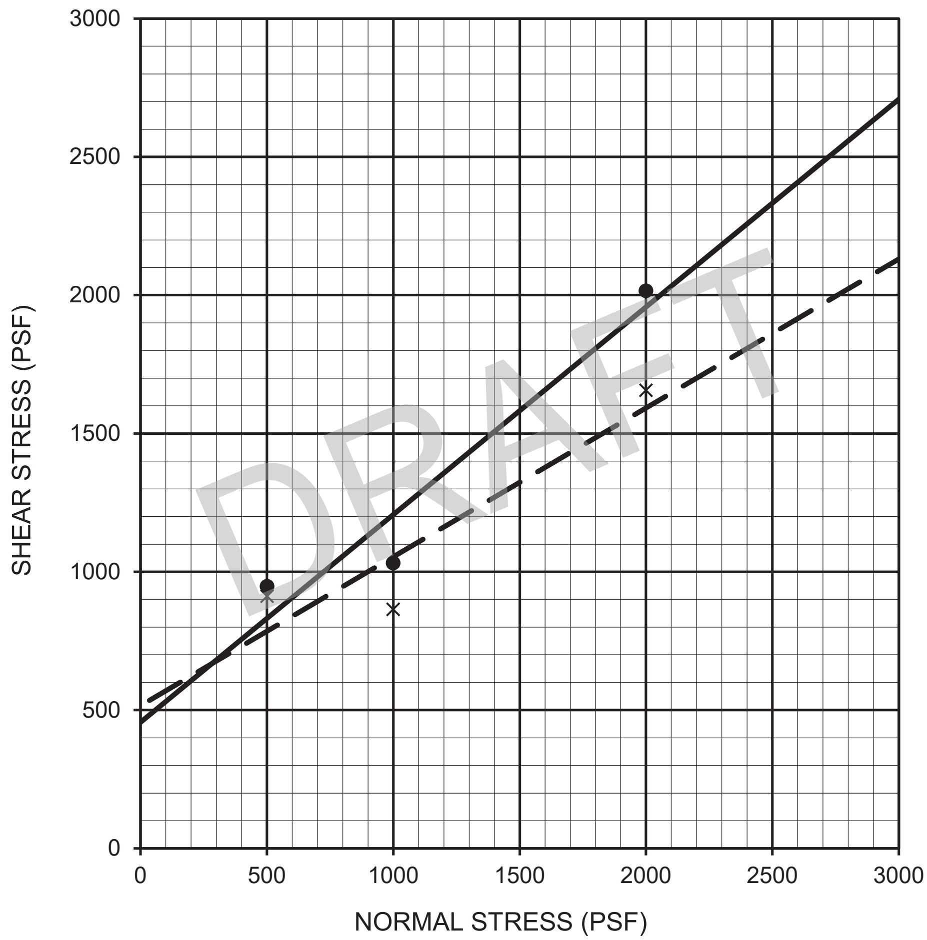

Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
POORLY GRADED SAND WITH GRAVEL	——●——	P-5	10.0-11.0	Peak	456	37	SP
POORLY GRADED SAND WITH GRAVEL	– – X – –	P-5	10.0-11.0	Ultimate	516	28	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE C-13

DIRECT SHEAR TEST RESULTS

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PACOIMA, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
P-2	0.0-5.0	6.9	7,455	10	0.001	40
P-4	0.0-5.0	7.6	7,775	10	0.001	30

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE C-14

CORROSIVITY TEST RESULTS

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PACOIMA, CALIFORNIA

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APPENDIX D

Drum Characterization Test Results and Transportation Manifest

SunStar Laboratories, Inc.

PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

08 June 2020

Spencer Marcinek
Ninyo & Moore
475 Goddard, Ste. 200
Irvine, CA 92618

RE: LABOE Stormwater /David M. Gonzales

Enclosed are the results of analyses for samples received by the laboratory on 06/01/20 14:46. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mike Jaroudi
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
COMPOSITE 1	T202431-01	Soil	05/29/20 00:00	06/01/20 14:46

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

DETECTIONS SUMMARY

Sample ID: COMPOSITE 1 **Laboratory ID:** T202431-01

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**20**	10	mg/kg	EPA 8015B	
Barium	**53**	1.0	mg/kg	EPA 6010b	
Chromium	**2.4**	2.0	mg/kg	EPA 6010b	
Cobalt	**4.4**	2.0	mg/kg	EPA 6010b	
Copper	**7.7**	1.0	mg/kg	EPA 6010b	
Lead	**6.5**	3.0	mg/kg	EPA 6010b	
Nickel	**2.5**	2.0	mg/kg	EPA 6010b	
Vanadium	**11**	5.0	mg/kg	EPA 6010b	
Zinc	**12**	1.0	mg/kg	EPA 6010b	

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Mike Jaroudi, Project Manager

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	Reported:
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

COMPOSITE 1

T202431-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0060218	06/02/20	06/02/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**20**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*72.6 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0060138	06/01/20	06/02/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**53**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**2.4**	2.0	"	"	"	"	"	"	
Cobalt	**4.4**	2.0	"	"	"	"	"	"	
Copper	**7.7**	1.0	"	"	"	"	"	"	
Lead	**6.5**	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**2.5**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**11**	5.0	"	"	"	"	"	"	
Zinc	**12**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0060139	06/01/20	06/02/20	EPA 7471A Soil	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0060218 - EPA 3550B GC										
Blank (0060218-BLK1)				Prepared & Analyzed: 06/02/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*82.6*		*"*	*101*		*81.8*	*65-135*			
LCS (0060218-BS1)				Prepared & Analyzed: 06/02/20						
C13-C28 (DRO)	420	10	mg/kg	505		82.8	75-125			
Surrogate: p-Terphenyl	*80.3*		*"*	*101*		*79.5*	*65-135*			
LCS Dup (0060218-BSD1)				Prepared & Analyzed: 06/02/20						
C13-C28 (DRO)	430	10	mg/kg	505		84.5	75-125	2.13	20	
Surrogate: p-Terphenyl	*77.6*		*"*	*101*		*76.8*	*65-135*			

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0060138 - EPA 3050B										
Blank (0060138-BLK1)				Prepared: 06/01/20 Analyzed: 06/02/20						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							
LCS (0060138-BS1)				Prepared: 06/01/20 Analyzed: 06/02/20						
Arsenic	85.4	5.0	mg/kg	100		85.4	75-125			
Barium	88.9	1.0	"	100		88.9	75-125			
Cadmium	89.1	2.0	"	100		89.1	75-125			
Chromium	89.2	2.0	"	100		89.2	75-125			
Lead	87.5	3.0	"	100		87.5	75-125			
Matrix Spike (0060138-MS1)	**Source: T202424-01**			Prepared: 06/01/20 Analyzed: 06/02/20						
Arsenic	63.2	5.0	mg/kg	100	ND	63.2	75-125			QM-05
Barium	162	1.0	"	100	137	24.3	75-125			QM-05
Cadmium	62.4	2.0	"	100	0.345	62.1	75-125			QM-05
Chromium	75.2	2.0	"	100	11.4	63.8	75-125			QM-05
Lead	84.1	3.0	"	100	134	NR	75-125			QM-05

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0060138 - EPA 3050B										
Matrix Spike Dup (0060138-MSD1)	**Source: T202424-01**		Prepared: 06/01/20 Analyzed: 06/02/20							
Arsenic	59.9	5.0	mg/kg	94.3	ND	63.5	75-125	5.30	20	QM-05
Barium	154	1.0	"	94.3	137	17.5	75-125	4.94	20	QM-05
Cadmium	59.6	2.0	"	94.3	0.345	62.8	75-125	4.60	20	QM-05
Chromium	70.1	2.0	"	94.3	11.4	62.3	75-125	7.01	20	QM-05
Lead	79.9	3.0	"	94.3	134	NR	75-125	5.08	20	QM-05

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0060139 - EPA 7471A Soil										
Blank (0060139-BLK1)				Prepared: 06/01/20 Analyzed: 06/02/20						
Mercury	ND	0.10	mg/kg							
LCS (0060139-BS1)				Prepared: 06/01/20 Analyzed: 06/02/20						
Mercury	0.369	0.10	mg/kg	0.391		94.4	80-120			
Matrix Spike (0060139-MS1)	**Source: T202424-01**			Prepared: 06/01/20 Analyzed: 06/02/20						
Mercury	0.634	0.10	mg/kg	0.391	0.396	60.9	75-125			QM-05
Matrix Spike Dup (0060139-MSD1)	**Source: T202424-01**			Prepared: 06/01/20 Analyzed: 06/02/20						
Mercury	0.717	0.10	mg/kg	0.417	0.396	77.1	75-125	12.3	20	

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Mike Jaroudi, Project Manager

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Providing Quality Analytical Services Nationwide

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	06/08/20 14:27

Notes and Definitions

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Ninyo & Moore
Address: 475 Goddard Suite 200, Irvine CA
Phone: 949.753.7070 Fax: 949.753.7071
Project Manager: Spencer Marcinek

Date: 6/1/2020 Page: 1 Of 1
Project Name: LABOE Stormwater Capture Program / David M. Gonzales
Collector:
Client Project #: 211294003
Batch #: T202431
EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	8015 TPHS				Laboratory ID #	Comments/Preservative	Total # of containers
Composite 1	5/28/2020	12:30	Soil	jar									X	X				01		

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
Kelly B...	6/1/2020 2:17	[signature]	6-1-20 14:17
[signature]	6-1-20 14:46	[signature]	6/1/20 1446

Total # of containers: 1
Chain of Custody seals Y/N/NA: N
Seals intact? Y/N/NA: NA
Received good condition/cold: 3.7 c

Notes

Turn around time: STD

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T202431

Client Name: Ninyo & Moore   Project: Laboe Stormwater Capture Program / David M. Gonzales

Delivered by: ☐ Client ☒ SunStar Courier ☐ GSO ☐ FedEx ☐ Other

If Courier, Received by: Dave   Date/Time Courier Received: 6·1·20 14:17

Lab Received by: Brian   Date/Time Lab Received: 6·1·20 14:46

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due : 6/27/20

Temperature: Cooler #1 3.7	°C +/- the CF (+ 1.2°C) = 4.9	°C corrected temperature	
Temperature: Cooler #2	°C +/- the CF (+ 1.2°C) =	°C corrected temperature	
Temperature: Cooler #3	°C +/- the CF (+ 1.2°C) =	°C corrected temperature	
Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☒ **Yes**	☐ **No**
If NO:			
Samples received on ice?	☐ Yes	☐ **No → Complete Non-Conformance Sheet**	
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ **No → Complete Non-Conformance Sheet**	

Custody seals intact on cooler/sample	☐ Yes	☐ No*	☒ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked   Cooler/Sample Review - Initials and date: BB 6·2·20

Comments:

Page 1 of 1

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202431

Client: Ninyo & Moore
Project: LABOE Stormwater /David M. Gonzales
Project Manager: Mike Jaroudi
Project Number: 211294003

Report To:
Ninyo & Moore
Spencer Marcinek
475 Goddard, Ste. 200
Irvine, CA 92618

Date Due:	06/08/20 17:00 (5 day TAT)		
Received By:	Brian Charon	Date Received:	06/01/20 14:46
Logged In By:	Dan Marteski	Date Logged In:	06/01/20 16:58

DRAFT

Samples Received at:	**3.7°C**		
Custody Seals	No	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirme	No		

Analysis	Due	TAT	Expires	Comments
T202431-01 COMPOSITE 1 [Soil] Sampled 05/29/20 00:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	06/08/20 15:00	5	11/25/20 00:00	
8015 Carbon Chain	06/08/20 15:00	5	06/12/20 00:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By

Date

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

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15 April 2020

Spencer Marcinek
Ninyo & Moore
475 Goddard, Ste. 200
Irvine, CA 92618

RE: LABOE Stormwater /David M. Gonzales

Enclosed are the results of analyses for samples received by the laboratory on 04/07/20 13:03. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mike Jaroudi
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WC-1	T201980-01	Soil	04/01/20 12:00	04/07/20 13:03
WC-2	T201980-02	Soil	04/02/20 12:00	04/07/20 13:03

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

DETECTIONS SUMMARY

Sample ID: WC-1 **Laboratory ID:** T201980-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**53**	1.0	mg/kg	EPA 6010b	
Chromium	**6.2**	2.0	mg/kg	EPA 6010b	
Cobalt	**3.1**	2.0	mg/kg	EPA 6010b	
Copper	**5.3**	1.0	mg/kg	EPA 6010b	
Nickel	**2.1**	2.0	mg/kg	EPA 6010b	
Vanadium	**8.5**	5.0	mg/kg	EPA 6010b	
Zinc	**11**	1.0	mg/kg	EPA 6010b	

Sample ID: WC-2 **Laboratory ID:** T201980-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**54**	1.0	mg/kg	EPA 6010b	
Chromium	**5.4**	2.0	mg/kg	EPA 6010b	
Cobalt	**3.5**	2.0	mg/kg	EPA 6010b	
Copper	**7.3**	1.0	mg/kg	EPA 6010b	
Nickel	**2.6**	2.0	mg/kg	EPA 6010b	
Vanadium	**11**	5.0	mg/kg	EPA 6010b	
Zinc	**14**	1.0	mg/kg	EPA 6010b	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-1

T201980-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0040722	04/07/20	04/10/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*87.1 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0040827	04/08/20	04/09/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**53**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**6.2**	2.0	"	"	"	"	"	"	
Cobalt	**3.1**	2.0	"	"	"	"	"	"	
Copper	**5.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**2.1**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**8.5**	5.0	"	"	"	"	"	"	
Zinc	**11**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0040826	04/08/20	04/08/20	EPA 7471A Soil	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-1

T201980-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	0040829	04/08/20	04/13/20	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

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Mike Jaroudi, Project Manager

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-1

T201980-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	0040829	04/08/20	04/13/20	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	1.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	1.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*75.4-139*		*"*	*"*	*"*	*"*	
Surrogate: Dibromofluoromethane		*99.8 %*	*73.1-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*99.7 %*	*82.6-117*		*"*	*"*	*"*	*"*	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-2

T201980-02 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0040722	04/07/20	04/10/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*88.7 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0040827	04/08/20	04/09/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	04/09/20	"	
Arsenic	ND	5.0	"	"	"	"	04/09/20	"	
Barium	**54**	1.0	"	"	"	"	04/09/20	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	04/09/20	"	
Chromium	**5.4**	2.0	"	"	"	"	04/09/20	"	
Cobalt	**3.5**	2.0	"	"	"	"	04/09/20	"	
Copper	**7.3**	1.0	"	"	"	"	04/09/20	"	
Lead	ND	3.0	"	"	"	"	04/09/20	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**2.6**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**11**	5.0	"	"	"	"	04/09/20	"	
Zinc	**14**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0040826	04/08/20	04/08/20	EPA 7471A Soil	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-2

T201980-02 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	0040829	04/08/20	04/13/20	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

WC-2

T201980-02 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	0040829	04/08/20	04/13/20	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	1.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	1.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*103 %*	*75.4-139*		*"*	*"*	*"*	*"*	
Surrogate: Dibromofluoromethane		*97.7 %*	*73.1-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*99.5 %*	*82.6-117*		*"*	*"*	*"*	*"*	

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475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040722 - EPA 3550B GC										
Blank (0040722-BLK1)				Prepared: 04/07/20 Analyzed: 04/09/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*90.4*		*"*	*102*		*88.6*	*65-135*			
LCS (0040722-BS1)				Prepared: 04/07/20 Analyzed: 04/09/20						
C13-C28 (DRO)	450	10	mg/kg	510		88.5	75-125			
Surrogate: p-Terphenyl	*88.7*		*"*	*102*		*86.9*	*65-135*			
LCS Dup (0040722-BSD1)				Prepared: 04/07/20 Analyzed: 04/09/20						
C13-C28 (DRO)	440	10	mg/kg	510		86.3	75-125	2.55	20	
Surrogate: p-Terphenyl	*86.9*		*"*	*102*		*85.1*	*65-135*			

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475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040827 - EPA 3050B										
Blank (0040827-BLK1)				Prepared: 04/08/20 Analyzed: 04/09/20						
Antimony	ND	3.0	mg/kg							
Silver	8.08	2.0	"							B-ND
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							
LCS (0040827-BS1)				Prepared: 04/08/20 Analyzed: 04/09/20						
Arsenic	98.9	5.0	mg/kg	100		98.9	75-125			
Barium	99.9	1.0	"	100		99.9	75-125			
Cadmium	99.4	2.0	"	100		99.4	75-125			
Chromium	99.6	2.0	"	100		99.6	75-125			
Lead	99.9	3.0	"	100		99.9	75-125			
Matrix Spike (0040827-MS1)	**Source: T201972-01**			Prepared: 04/08/20 Analyzed: 04/09/20						
Arsenic	67.6	5.0	mg/kg	94.3	2.02	69.5	75-125			QM-05
Barium	139	1.0	"	94.3	74.1	69.1	75-125			QM-05
Cadmium	70.2	2.0	"	94.3	0.317	74.1	75-125			QM-05
Chromium	83.5	2.0	"	94.3	16.1	71.5	75-125			QM-05
Lead	74.3	3.0	"	94.3	9.12	69.1	75-125			QM-05

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475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040827 - EPA 3050B										
Matrix Spike Dup (0040827-MSD1)	**Source: T201972-01**		Prepared: 04/08/20 Analyzed: 04/09/20							
Arsenic	60.3	4.5	mg/kg	90.9	2.02	64.1	75-125	11.3	20	QM-05
Barium	127	0.91	"	90.9	74.1	58.8	75-125	8.79	20	QM-05
Cadmium	62.3	1.8	"	90.9	0.317	68.1	75-125	12.0	20	QM-05
Chromium	72.9	1.8	"	90.9	16.1	62.5	75-125	13.5	20	QM-05
Lead	67.5	2.7	"	90.9	9.12	64.2	75-125	9.69	20	QM-05

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475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040826 - EPA 7471A Soil										
Blank (0040826-BLK1)				Prepared & Analyzed: 04/08/20						
Mercury	ND	0.10	mg/kg							
LCS (0040826-BS1)				Prepared & Analyzed: 04/08/20						
Mercury	0.407	0.10	mg/kg	0.403		101	80-120			
Matrix Spike (0040826-MS1)		**Source: T201972-01**		Prepared & Analyzed: 04/08/20						
Mercury	0.384	0.10	mg/kg	0.397	0.0460	85.0	75-125			
Matrix Spike Dup (0040826-MSD1)		**Source: T201972-01**		Prepared & Analyzed: 04/08/20						
Mercury	0.406	0.10	mg/kg	0.391	0.0460	92.1	75-125	5.67	20	

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040829 - EPA 5030 GCMS										
Blank (0040829-BLK1)				Prepared: 04/08/20 Analyzed: 04/13/20						
Bromobenzene	ND	2.5	ug/kg							
Bromochloromethane	ND	2.5	"							
Bromodichloromethane	ND	2.5	"							
Bromoform	ND	2.5	"							
Bromomethane	ND	2.5	"							
n-Butylbenzene	ND	2.5	"							
sec-Butylbenzene	ND	2.5	"							
tert-Butylbenzene	ND	2.5	"							
Carbon tetrachloride	ND	2.5	"							
Chlorobenzene	ND	2.5	"							
Chloroethane	ND	2.5	"							
Chloroform	ND	2.5	"							
Chloromethane	ND	2.5	"							
2-Chlorotoluene	ND	2.5	"							
4-Chlorotoluene	ND	2.5	"							
Dibromochloromethane	ND	2.5	"							
1,2-Dibromo-3-chloropropane	ND	5.0	"							
1,2-Dibromoethane (EDB)	ND	2.5	"							
Dibromomethane	ND	2.5	"							
1,2-Dichlorobenzene	ND	2.5	"							
1,3-Dichlorobenzene	ND	2.5	"							
1,4-Dichlorobenzene	ND	2.5	"							
Dichlorodifluoromethane	ND	2.5	"							
1,1-Dichloroethane	ND	2.5	"							
1,2-Dichloroethane	ND	2.5	"							
1,1-Dichloroethene	ND	2.5	"							
cis-1,2-Dichloroethene	ND	2.5	"							
trans-1,2-Dichloroethene	ND	2.5	"							
1,2-Dichloropropane	ND	2.5	"							
1,3-Dichloropropane	ND	2.5	"							
2,2-Dichloropropane	ND	2.5	"							
1,1-Dichloropropene	ND	2.5	"							
cis-1,3-Dichloropropene	ND	2.5	"							
trans-1,3-Dichloropropene	ND	2.5	"							
Hexachlorobutadiene	ND	2.5	"							
Isopropylbenzene	ND	2.5	"							

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Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040829 - EPA 5030 GCMS										
Blank (0040829-BLK1)				Prepared: 04/08/20 Analyzed: 04/13/20						
p-Isopropyltoluene	ND	2.5	ug/kg							
Methylene chloride	ND	10	"							
Naphthalene	ND	2.5	"							
n-Propylbenzene	ND	2.5	"							
Styrene	ND	2.5	"							
1,1,2,2-Tetrachloroethane	ND	2.5	"							
1,1,1,2-Tetrachloroethane	ND	2.5	"							
Tetrachloroethene	ND	1.5	"							
1,2,3-Trichlorobenzene	ND	2.5	"							
1,2,4-Trichlorobenzene	ND	2.5	"							
1,1,2-Trichloroethane	ND	2.5	"							
1,1,1-Trichloroethane	ND	2.5	"							
Trichloroethene	ND	1.5	"							
Trichlorofluoromethane	ND	2.5	"							
1,2,3-Trichloropropane	ND	2.5	"							
1,3,5-Trimethylbenzene	ND	2.5	"							
1,2,4-Trimethylbenzene	ND	2.5	"							
Vinyl chloride	ND	2.5	"							
Benzene	ND	2.5	"							
Toluene	ND	2.5	"							
Ethylbenzene	ND	2.5	"							
m,p-Xylene	ND	5.0	"							
o-Xylene	ND	2.5	"							
Surrogate: 4-Bromofluorobenzene	*52.2*		*"*	*50.0*		*104*	*75.4-139*			
Surrogate: Dibromofluoromethane	*49.5*		*"*	*50.0*		*99.0*	*73.1-125*			
Surrogate: Toluene-d8	*49.8*		*"*	*50.0*		*99.5*	*82.6-117*			
LCS (0040829-BS1)				Prepared: 04/08/20 Analyzed: 04/13/20						
Chlorobenzene	41.8	2.5	ug/kg	50.0		83.6	65.2-124			
1,1-Dichloroethene	42.8	2.5	"	50.0		85.6	60.9-131			
Trichloroethene	43.2	1.5	"	50.0		86.3	62.1-126			
Benzene	42.8	2.5	"	50.0		85.6	65.3-127			
Toluene	39.8	2.5	"	50.0		79.5	64.3-122			
Surrogate: 4-Bromofluorobenzene	*50.0*		*"*	*50.0*		*99.9*	*75.4-139*			
Surrogate: Dibromofluoromethane	*48.1*		*"*	*50.0*		*96.2*	*73.1-125*			
Surrogate: Toluene-d8	*50.1*		*"*	*50.0*		*100*	*82.6-117*			

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Mike Jaroudi, Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number: 211294003	**Reported:**
Irvine CA, 92618	Project Manager: Spencer Marcinek	04/15/20 16:02

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0040829 - EPA 5030 GCMS										
Matrix Spike (0040829-MS1)		**Source: T201980-02**		Prepared: 04/08/20 Analyzed: 04/13/20						
Chlorobenzene	43.2	2.5	ug/kg	49.8	ND	86.7	65.2-125			
1,1-Dichloroethene	49.4	2.5	"	49.8	ND	99.2	60.9-131			
Trichloroethene	46.1	1.5	"	49.8	ND	92.6	62.1-126			
Benzene	45.7	2.5	"	49.8	ND	91.7	65.3-127			
Toluene	42.7	2.5	"	49.8	ND	85.7	64.3-125			
Surrogate: 4-Bromofluorobenzene	*50.3*		*"*	*49.8*		*101*	*75.4-139*			
Surrogate: Dibromofluoromethane	*47.8*		*"*	*49.8*		*96.0*	*73.1-125*			
Surrogate: Toluene-d8	*50.1*		*"*	*49.8*		*101*	*82.6-117*			
Matrix Spike Dup (0040829-MSD1)		**Source: T201980-02**		Prepared: 04/08/20 Analyzed: 04/13/20						
Chlorobenzene	41.2	2.5	ug/kg	49.8	ND	82.7	65.2-125	4.74	20	
1,1-Dichloroethene	48.6	2.5	"	49.8	ND	97.6	60.9-131	1.61	20	
Trichloroethene	44.3	1.5	"	49.8	ND	88.9	62.1-126	4.10	20	
Benzene	44.3	2.5	"	49.8	ND	89.0	65.3-127	2.99	20	
Toluene	40.7	2.5	"	49.8	ND	81.8	64.3-125	4.66	20	
Surrogate: 4-Bromofluorobenzene	*50.5*		*"*	*49.8*		*101*	*75.4-139*			
Surrogate: Dibromofluoromethane	*49.0*		*"*	*49.8*		*98.4*	*73.1-125*			
Surrogate: Toluene-d8	*50.0*		*"*	*49.8*		*100*	*82.6-117*			

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project:	LABOE Stormwater /David M. Gonzales	
475 Goddard, Ste. 200	Project Number:	211294003	**Reported:**
Irvine CA, 92618	Project Manager:	Spencer Marcinek	04/15/20 16:02

Notes and Definitions

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
B-ND	The analyte is found in the method blank at a level greater than the reporting limit but the associated samples are ND. There is no impact on data.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SunStar Laboratories, Inc.
25712 Commercentre Dr
Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Ninyo & Moore
Address: 475 Goddard Suite 200, Irvine CA
Phone: 949.753.7070 Fax: 949.753.7071
Project Manager: Spencer Marcinek

Date: 4/7/2020 Page: 1 Of 1
Project Name: LABOE Stormwater Capture Program/David M Gonzales
Collector:
Client Project #: 211294003
Batch #: T201980
EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	8015 TPHS				Laboratory ID #	Comments/Preservative	Total # of containers
WC-1	4/3/2020	12:00pm	Soil	jar	X								X	X				01		1
WC-2	4/3/2020	12:00pm	Soil	jar	X								X	X				02		1
																				2

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
	4/7/2020 12:45		4-7-20 12:45
	4-7-20 13:03		4/7/20 1303

Total # of containers:
Chain of Custody seals Y/N/NA: N
Seals intact? Y/N/NA: NA
Received good condition/cold: 2.6°
Turn around time:

Notes

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T201980

Client Name: Ninyo & Moore

Project: LABOE Stormwater Capture Program/David M Gonzales

Delivered by: ☐ Client ☒ SunStar Courier ☐ GSO ☐ FedEx ☐ Other

If Courier, Received by: Dave

Date/Time Courier Received: 4-7-20 12:45

Lab Received by: Brian

Date/Time Lab Received: 4-7-20 13:03

Total number of coolers received: 0 Thermometer ID: SC-1 Calibration Due: 6/27/20

Temperature:	Cooler #1	1.4	°C +/- the CF (+ 1.2°C) =	2.6	°C corrected temperature
Temperature:	Cooler #2		°C +/- the CF (+ 1.2°C) =		°C corrected temperature
Temperature:	Cooler #3		°C +/- the CF (+ 1.2°C) =		°C corrected temperature

Temperature criteria = ≤ 6°C (no frozen containers) Within criteria? ☒ **Yes** ☐ **No**

If NO:

Samples received on ice? ☐ Yes ☐ **No → Complete Non-Conformance Sheet**

If on ice, samples received same day collected? ☐ Yes → Acceptable ☐ **No → Complete Non-Conformance Sheet**

Custody seals intact on cooler/sample	☐ Yes	☐ No*	☒ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: DM 4-7-20

Comments:

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T201980

Client: **Ninyo & Moore** — **Project Manager:** **Mike Jaroudi**

Project: **LABOE Stormwater /David M. Gonzales** — **Project Number:** **211294003**

Report To:

Ninyo & Moore
Spencer Marcinek
475 Goddard, Ste. 200
Irvine, CA 92618

Date Due:	04/14/20 17:00 (5 day TAT)		
Received By:	Dan Marteski	Date Received:	04/07/20 13:03
Logged In By:	Dan Marteski	Date Logged In:	04/07/20 16:54

Samples Received at:	**2.6°C**		
Custody Seals	No	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confir	No		

Analysis	Due	TAT	Expires	Comments
T201980-01 WC-1 [Soil] Sampled 04/01/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	04/14/20 15:00	5	09/28/20 12:00	
8015 Carbon Chain	04/14/20 15:00	5	04/15/20 12:00	
8260	04/14/20 15:00	5	04/15/20 12:00	
T201980-02 WC-2 [Soil] Sampled 04/02/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	04/14/20 15:00	5	09/29/20 12:00	
8015 Carbon Chain	04/14/20 15:00	5	04/16/20 12:00	
8260	04/14/20 15:00	5	04/16/20 12:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22	7470/71 Hg

Reviewed By ____________________ Date ____________

Manifest

SOIL SAFE OF CA - TPST
Non-Hazardous Soils

↓ Manifest # ↓

Date of Shipment:	Responsible for Payment:	Transport Truck #:	Facility #:	Approval Number:	Load #
5/14/20		979/8300	A07	AS-1725	0011

Generator and/or Consultant

Generator's Name and Billing Address:
CITY OF LOS ANGELES DEPARTMENT OF RECREATION AND PARKS
211 NORTH FIGUEROA STREET
3RD FLOOR, SUITE 350
LOS ANGELES, CA 90012

Generator's Phone #: 818-517-6081
Person to Contact:
FAX#:
Customer Account Number

Consultant's Name and Billing Address:

Consultant's Phone #:
Person to Contact:
FAX#:
Customer Account Number

Generation Site (Transport from): *(name & address)*
DAVID M. GONZALES RECREATION CENTER
10943 HERRICK AVE.
PACOIMA, CA 91331

Site Phone #:
Person to Contact:
FAX#:

DRAFT

Designated Facility (Transport to): *(name & address)*
SOIL SAFE
12328 HIBISCUS AVENUE
ADELANTO, CA 92301

Facility Phone #: (800) 862-8001
Person to Contact: JOE PROVANSAL
FAX#: (760) 246-8004

Transporter Name and Mailing Address:
BELSHIRE
25971 TOWNE CENTRE DRIVE
FOOTHILL RANCH, CA 92610
BESI: 318192

Transporter's Phone #: 949-460-5200
CAR000183913
Person to Contact: LARRY MOOTHART
450647
FAX#: 949-460-5210
Customer Account Number

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐	8 DM	Soil	44080	39100	4980
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐					2.49

List any exception to items listed above:
Scale Ticket # 166210

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils descried in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: Generator ☑ Consultant ☐ JUAN MONZON
Signature and date:
Month 5 Day 06 Year 20

Transporter

Transporter's certification: I/We acknowledge receipt of the soil referenced above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that the soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name: Carlos Villa
Signature and date: Carlos Villa
Month 05 Day 06 Year 20

Recycling Facility

Discrepancies:
10943HER
2289347

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name: J. PROVANSAL
Signature and date: 5.14.20

Please print or type.

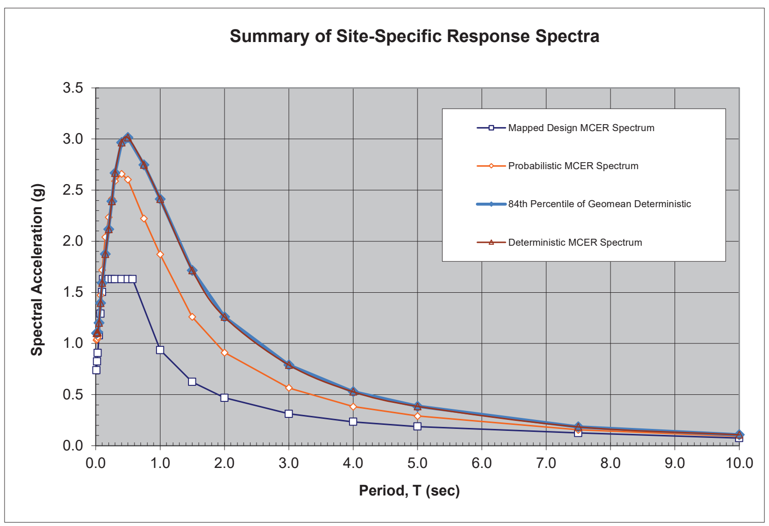
TRANSPORTER COPY

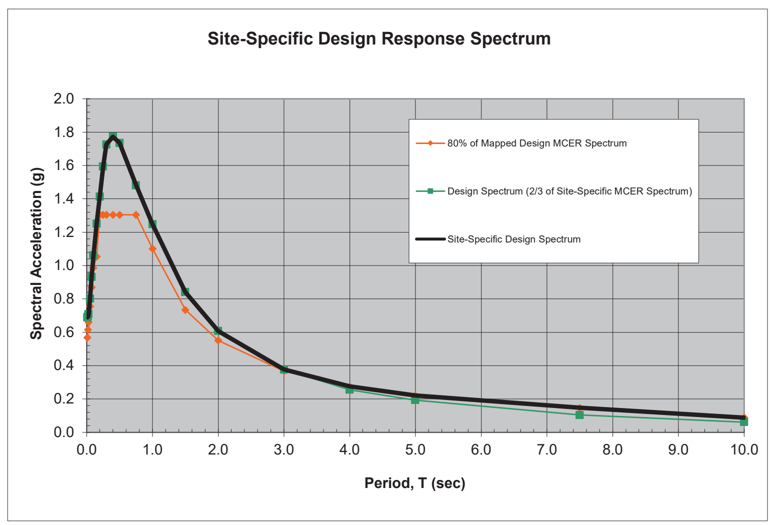
APPENDIX E

Site-Specific Ground Motion Hazard Analysis

Site Class	Mapped Spectral Response Acceleration Parameters		Site Coefficients		Spectral Response Acceleration Parameters Adjusted for Site Effects		Design Spectral Response Acceleration Parameters		Period			Vs30 (m/sec)	Risk Coefficients			PGA		Site-Specific MCE_G PGA
	Ss (g)	S1 (g)	Fa	Fv	Sms (g)	Sm1 (g)	Sds (g)	Sd1 (g)	To (sec)	Ts (sec)	T_L (sec)		C_{RS}	C_{R1}	Ratio	F_{PGA}	PGA_M (g)	PGA_M (g)
D	2.446	0.826	1.000	1.700	2.446	1.404	1.631	0.936	0.115	0.574	8.0	280	0.906	0.892	-0.0175	1.1	1.109	1.001

Mapped Design MCE_R Response Spectrum (Fa and Fv per Section 11.4 of ASCE 7 -16)		Period (sec)	Probabilistic MCE_R Response Spectrum				Deterministic MCE_R Response Spectrum				Site-Specific MCE_R Response Spectrum	Site-Specific MCE_R Response Spectrum - 150% Limit of Design	Mapped Design MCE_R Response Spectrum (Fa and Fv per Section 21.3 of ASCE 7-16)	80% of Mapped Design MCE_R Response Spectrum (Fa and Fv per Section 21.3 of ASCE 7-16)	Site-Specific Design Response Spectrum	Site-Specific Design Response Spectrum with 80% Limit
			Geomean 2% in 50 Years	Max Horiz Direction Response to Geomean	Geomean 2% in 50 Years Rotated	1% Chance of Collapse in 50 Years (Method 1)	84th Percentile of Geomean	Max Horiz Direction Response to Geomean	84th Percentile of Geomean Rotated	Deterministic Limit on Response Spectrum						
Period (sec)	Sa (g)		Sa (g)	Max/Mean	Sa (g)	Sa (g)	Sa (g)	Max/Mean	Sa (g)	Sa (g)	Sa (g)	Sa (g)	Sa (g)	Sa (g)	Sa (g)	Sa (g)
0.01	0.737	0.01	1.037	1.100	1.140	1.033	1.001	1.100	1.101	1.101	1.033	1.033	0.710	0.568	0.689	**0.689**
0.02	0.823	0.02	1.045	1.100	1.149	1.041	1.006	1.100	1.107	1.107	1.041	1.041	0.768	0.615	0.694	**0.694**
0.03	0.908	0.03	1.069	1.100	1.176	1.065	1.009	1.100	1.110	1.110	1.065	1.065	0.826	0.661	0.710	**0.710**
0.05	1.078	0.05	1.206	1.100	1.327	1.202	1.093	1.100	1.203	1.203	1.202	1.202	0.942	0.754	0.802	**0.802**
0.075	1.291	0.075	1.478	1.100	1.626	1.473	1.269	1.100	1.396	1.396	1.396	1.396	1.087	0.869	0.931	**0.931**
0.1	1.504	0.1	1.725	1.100	1.898	1.719	1.447	1.100	1.592	1.592	1.592	1.592	1.232	0.985	1.061	**1.061**
0.115	1.631	0.15	2.047	1.100	2.251	2.040	1.705	1.100	1.876	1.876	1.876	1.876	1.318	1.054	1.250	**1.250**
0.2	1.631	0.2	2.242	1.100	2.467	2.235	1.926	1.100	2.119	2.119	2.119	2.119	1.631	1.305	1.413	**1.413**
0.25	1.631	0.25	2.401	1.113	2.671	2.417	2.150	1.113	2.391	2.391	2.391	2.391	1.631	1.305	1.594	**1.594**
0.3	1.631	0.3	2.544	1.125	2.862	2.588	2.371	1.125	2.667	2.667	2.588	2.588	1.631	1.305	1.726	**1.726**
0.4	1.631	0.4	2.562	1.150	2.946	2.659	2.580	1.150	2.967	2.967	2.659	2.659	1.631	1.305	1.772	**1.772**
0.5	1.631	0.5	2.459	1.175	2.889	2.603	2.565	1.175	3.014	3.014	2.603	2.603	1.631	1.305	1.735	**1.735**
0.574	1.631	0.75	2.003	1.238	2.479	2.222	2.222	1.238	2.749	2.749	2.222	2.222	1.631	1.305	1.482	**1.482**
1	0.936	1	1.614	1.300	2.098	1.872	1.857	1.300	2.414	2.414	1.872	1.872	1.377	1.101	1.248	**1.248**
1.5	0.624	1.5	1.066	1.325	1.413	1.260	1.295	1.325	1.715	1.715	1.260	1.260	0.918	0.734	0.840	**0.840**
2	0.468	2	0.757	1.350	1.022	0.911	0.933	1.350	1.259	1.259	0.911	0.911	0.688	0.551	0.608	**0.608**
3	0.312	3	0.452	1.400	0.633	0.565	0.564	1.400	0.790	0.790	0.565	0.565	0.459	0.367	0.376	**0.376**
4	0.234	4	0.296	1.450	0.429	0.383	0.364	1.450	0.528	0.528	0.383	0.413	0.344	0.275	0.255	**0.275**
5	0.187	5	0.217	1.500	0.326	0.291	0.257	1.500	0.385	0.385	0.291	0.330	0.275	0.220	0.194	**0.220**
7.5	0.125	7.5	0.116	1.500	0.174	0.155	0.123	1.500	0.184	0.184	0.155	0.220	0.184	0.147	0.104	**0.147**
10	0.075	10	0.068	1.500	0.103	0.092	0.071	1.500	0.107	0.107	0.092	0.132	0.110	0.088	0.061	**0.088**





Deterministic Seismic Hazard Analysis Input Verdugo	
M_W:	7.5
R_{RUP} (km):	1.0
R_{JB} (km):	0.0
R_X (km):	1.22
Ry0 (km):	999
V_{S30} (m/sec):	280
U:	0
F_{RV}:	1
F_{NM}:	0
F_{HW}:	1
Dip (deg):	55
Z_{TOR} (km):	0
Z_{HYP} (km):	999
$Z_{1.0}$ (km):	0.22
$Z_{2.5}$ (km):	2.02
W (km):	999
Vs30Flag:	inferred
F_{AS}:	no
Region	California

Deterministic Seismic Hazard Analysis Output (50th Percentile)

Chiou & Youngs (2014)		Campbell & Bozorgnia (2014)		Boore et al. (2014)		Abrahamson et al. (2014)	
Period (sec)	S_a (g)	Period (sec)	S_a (g)	Period (sec)	S_a (g)	Period (sec)	S_a (g)
0.01	0.796	0.01	0.533	0.01	0.563	0.01	0.554
0.02	0.803	0.02	0.553	0.02	0.549	0.02	0.549
0.03	0.809	0.03	0.586	0.03	0.544	0.03	0.517
0.05	0.855	0.05	0.667	0.05	0.582	0.05	0.523
0.075	0.975	0.075	0.746	0.075	0.683	0.075	0.603
0.1	1.096	0.1	0.798	0.1	0.817	0.1	0.713
0.15	1.288	0.15	0.840	0.15	1.012	0.15	0.974
0.2	1.493	0.2	0.874	0.2	1.135	0.2	1.217
0.25	1.660	0.25	0.970	0.25	1.194	0.25	1.421
0.3	1.760	0.3	1.065	0.3	1.253	0.3	1.588
0.4	1.835	0.4	1.201	0.4	1.229	0.4	1.660
0.5	1.841	0.5	1.210	0.5	1.166	0.5	1.512
0.75	1.584	0.75	1.126	0.75	0.912	0.75	1.123
1	1.272	1	0.989	1	0.740	1	0.861
1.5	0.785	1.5	0.752	1.5	0.507	1.5	0.583
2	0.541	2	0.577	2	0.361	2	0.400
3	0.290	3	0.380	3	0.219	3	0.245
4	0.171	4	0.242	4	0.148	4	0.173
5	0.109	5	0.164	5	0.109	5	0.135
7.5	0.046	7.5	0.069	7.5	0.056	7.5	0.078
10	0.025	10	0.040	10	0.034	10	0.049

Deterministic Seismic Hazard Analysis Output (84th Percentile)

Chiou & Youngs (2014)		Campbell & Bozorgnia (2014)		Boore et al. (2014)		Abrahamson et al. (2014)	
Period	S_a	Period	S_a	Period	S_a	Period	S_a
0.01	1.302	0.01	0.827	0.01	1.018	0.01	0.915
0.02	1.318	0.02	0.859	0.02	1.004	0.02	0.903
0.03	1.339	0.03	0.913	0.03	1.015	0.03	0.837
0.05	1.410	0.05	1.053	0.05	1.145	0.05	0.840
0.075	1.583	0.075	1.216	0.075	1.390	0.075	0.970
0.1	1.767	0.1	1.309	0.1	1.655	0.1	1.145
0.15	2.080	0.15	1.340	0.15	1.956	0.15	1.551
0.2	2.441	0.2	1.384	0.2	2.093	0.2	1.948
0.25	2.755	0.25	1.542	0.25	2.167	0.25	2.320
0.3	2.964	0.3	1.745	0.3	2.272	0.3	2.687
0.4	3.173	0.4	2.062	0.4	2.253	0.4	3.004
0.5	3.255	0.5	2.163	0.5	2.180	0.5	2.822
0.75	2.921	0.75	2.181	0.75	1.766	0.75	2.165
1	2.405	1	1.968	1	1.473	1	1.704
1.5	1.528	1.5	1.528	1.5	1.014	1.5	1.187
2	1.067	2	1.171	2	0.726	2	0.835
3	0.575	3	0.776	3	0.444	3	0.511
4	0.340	4	0.478	4	0.301	4	0.358
5	0.215	5	0.329	5	0.220	5	0.279
7.5	0.091	7.5	0.139	7.5	0.112	7.5	0.160
10	0.049	10	0.080	10	0.065	10	0.100

Chiou & Youngs (2014)		Campbell & Bozorgnia (2014)		Boore et al. (2014)		Abrahamson et al. (2014)	
Site Param List:		**Site Param List:**		**Site Param List:**		**Site Param List:**	
Longitude	-118.41335	Longitude	-118.41335	Longitude	-118.41335	Longitude	-118.41335
Latitude	34.268397	Latitude	34.268397	Latitude	34.268397	Latitude	34.268397
Vs30	280	Vs30	280	Vs30	280	Vs30	280
Vs30 Type	Inferred	Vs30 Type	Inferred	Vs30 Type	Inferred	Vs30 Type	Inferred
Depth 1.0 km/sec (m)	220	Depth 1.0 km/sec (m)	220	Depth 1.0 km/sec (m)	220	Depth 1.0 km/sec (m)	220
Depth 2.5 km/sec (km)	2.02	Depth 2.5 km/sec (km)	2.02	Depth 2.5 km/sec (km)	2.02	Depth 2.5 km/sec (km)	2.02

IMR Param List:	
Gaussian Truncation	None
Tectonic Region	Active Shallow Crust
Component	RotD50
Std Dev Type	Total
Additional Epistemic Uncertainty	(Disabled)
IML/Prob Param List:	
Map Type	IML@Prob
Probability	0.02
Forecast Param List:	
Eqk Rup Forecast	Mean UCERF3
Mean UCERF3 Presets	(POISSON ONLY) Both FM Branch Averaged
Apply Aftershock Filter	False
Aleatory Mag-Area StdDev	0
Background Seismicity	Include
Treat Background Seismicity As	Point Sources
Use Quad Surfaces (otherwise gridded)	False
Fault Grid Spacing	1
Probability Model	Poisson
Sect Upper Depth Averaging Tolerance (km)	100
Use Mean Upper Depth	True
Rup Mag Averaging Tolerance	1
Rupture Rake To Use	Def. Model Mean
Fault Model(s)	Both
Ignore Cache	FALSE
TimeSpan Param List:	
Duration (Years)	50

Probabilistic Seismic Hazard Analysis (2% in 50 years)							
Chiou & Youngs (2014)		Campbell & Bozorgnia (2014)		Boore et al. (2014)		Abrahamson et al. (2014)	
Period (sec)	S_a (g)	Period (sec)	S_a (g)	Period (sec)	S_a (g)	Period (sec)	S_a (g)
0.01	1.146	0.01	0.784	0.01	1.236	0.01	1.040
0.02	1.162	0.02	0.805	0.02	1.234	0.02	1.034
0.03	1.213	0.03	0.847	0.03	1.290	0.03	0.985
0.05	1.334	0.05	0.986	0.05	1.586	0.05	1.015
0.075	1.569	0.075	1.236	0.075	2.109	0.075	1.168
0.1	1.797	0.1	1.430	0.1	2.479	0.1	1.391
0.15	2.159	0.15	1.584	0.15	2.679	0.15	1.915
0.2	2.504	0.2	1.647	0.2	2.604	0.2	2.355
0.25	2.742	0.25	1.779	0.25	2.543	0.25	2.678
0.3	2.860	0.3	1.971	0.3	2.550	0.3	2.915
0.4	2.892	0.4	2.070	0.4	2.401	0.4	2.997
0.5	2.823	0.5	2.074	0.5	2.298	0.5	2.718
0.75	2.350	0.75	1.947	0.75	1.789	0.75	1.968
1	1.857	1	1.675	1	1.447	1	1.507
1.5	1.142	1.5	1.198	1.5	0.919	1.5	1.029
2	0.786	2	0.894	2	0.654	2	0.714
3	0.409	3	0.593	3	0.404	3	0.426
4	0.235	4	0.379	4	0.287	4	0.299
5	0.145	5	0.300	5	0.222	5	0.230
7.5	0.060	7.5	0.160	7.5	0.132	7.5	0.144
10	0.032	10	0.085	10	0.082	10	0.100

DRAFT

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2.4.2 Hydrology and Hydraulics

A draft Hydrologic and Hydraulic Analysis Technical Memorandum, compiled during the preliminary design phase, can be found in the following pages.

Memorandum

To: *Bryan Powell, PE LA BOE Prop O Clean Water Bond Division*

From: *Scott Dellinger, PE; Paul Caswell; David Powers, PE, PH, D.WRE, CFM; Paul Glenn, PE, PG; Samuel Hwang.*

Date: *06/30/20*

Subject: *CDM Smith TOS 25 Hydrologic and Hydraulic Analysis Technical Memorandum*

The Task Order Solicitation (TOS) No. 25, Stormwater Capture Parks Program (Program) objectives are to provide sustainable water supply using stormwater resources, alleviate local flooding, improve water quality, and provide recreational, social, and economic benefits. The basic foundation of the Program is to capture and infiltrate the 85th percentile design storm event at nine parks located in the San Fernando Basin. CDM Smith was tasked with the design of the capture and infiltration at three of the parks:

- David M. Gonzales Recreation Center
- Fernangeles Recreation Center
- Strathern Park

To determine the specifications for the infrastructure required to divert the 85th percentile design storm event at each park site and to size infiltration structures, CDM Smith analyzed and updated preliminary hydrologic and hydraulic calculations provided by the Los Angeles Department of Water and Power (LADWP) in collaboration with the City of Los Angeles Bureau of Sanitation (LASAN) concept reports. This Technical Memo (TM) documents CDM Smith's hydrologic and hydraulic analysis methodology, assumptions, and results.

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Section 1

Introduction

As presented in the City of Los Angeles, Department of Public Works, Bureau of Engineering, Pre-Qualified On-Call, Wastewater and Environmental Engineering Services Consultant Contract, Task Order Solicitation (TOS) No. 25, Stormwater Capture Parks Program, Pre-Design and Design Services, June 12, 2019, the Los Angeles Department of Water and Power (LADWP) and the Los Angeles Department of Public Works Bureau of Engineering (BOE) are committed to pursuing the Stormwater Capture Parks Program (Program).

As part of the Program, TOS 25 was created that includes stormwater diversion and capture at nine city-owned parks located in the San Fernando Basin for water supply and subsequently water quality benefits. The captured stormwater will be pre-treated for gross pollutants and infiltrated to recharge the San Fernando Groundwater basin. CDM Smith was tasked with the design and implementation of three of the parks including (**Figure 1-1**):

- David M. Gonzales Recreation Center
- Fernangeles Recreation Center
- Strathern North Park

This technical memorandum (TM) documents the hydrologic and hydraulic analysis used to size the diversions, conveyance and pre-treatment infrastructure required to deliver the 85th percentile water quality design storm event to underground infiltration galleries or drywells at the three park sites as well as to estimate annual stormwater capture at each site.

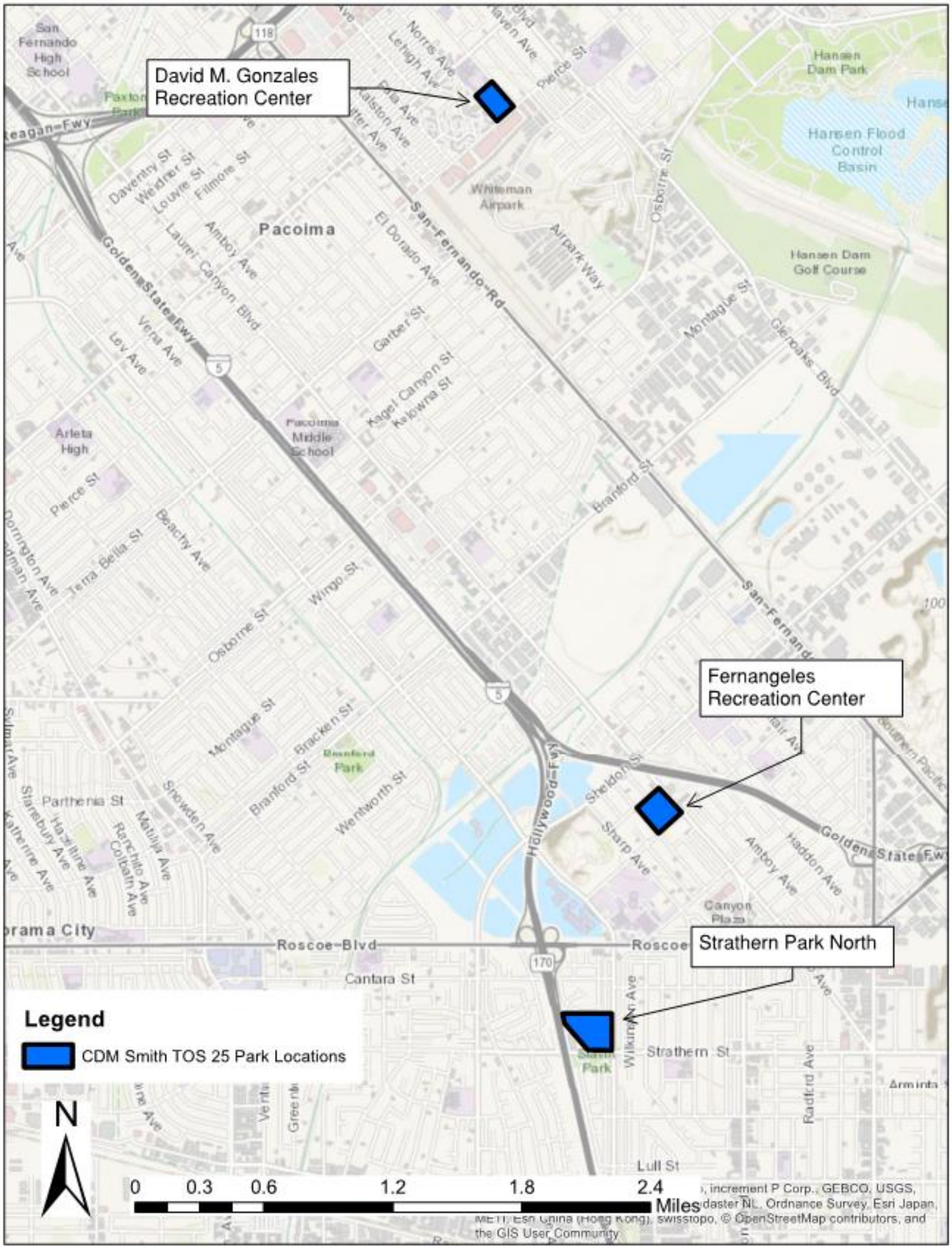

Figure 1-1 CDM Smith TOS 25 Parks

Section 2

Methodology

This section details the available data and methodology used for the development of the 85th percentile design storm event hydrographs for each of the three park sites.

2.1 Available Data

2.1.1 Concept Reports

Conceptual study reports were created for each of the nine parks by LADWP and the City of Los Angeles Bureau of Sanitation (LASAN) as a starting point detailing the:

- Project Background
- Project Alternatives
- Project Description
- Water Supply Benefit
- Water Quality Benefit
- Environmental Considerations
- Implementation Schedule
- Cost Estimate
- Funding Opportunities
- Study Recommendations
- Limitations

In addition, the data provided in the reports included preliminary catchment areas, 85th percentile rain event depth, 85th percentile design storm calculations, annual capture estimates, and preliminary infiltration gallery size. The data provided was used as baseline and was confirmed or refined for pre-design hydrology calculations.

2.1.2 Geodatabase

A Geographic Information System (GIS) geodatabase was compiled to aid in the analysis of the parks and their immediate surroundings as well as to evaluate all areas that could be included as part of a park's capture area. Data was acquired through the Los Angeles Region Imagery Acquisition Consortium (LARIAC) program which includes high resolution orthogonal aerial imagery, 1-foot contours and a digital elevation model (DEM). Data was also gathered from the City of Los Angeles and Los Angeles County online databases NavigateLA, Los Angeles GeoHub and the Los Angeles County GIS Data Portal. The coverages and their sources are presented in **Table 2-1** below.

Table 2-1 GIS Coverages and Sources

Coverage	Source
High resolution orthogonal aerial imagery	LARIAC
1-foot contours	LARIAC
Digital elevation model	LARIAC
LA County storm drain pipes and catch basins	https://egis3.lacounty.gov/dataportal/2013/08/08/los-angeles-county-storm-drain-system/
LA County 85th and 95th percentile rainfall	https://egis3.lacounty.gov/dataportal/2016/05/05/85th-and-95th-percentile-rainfall/
LA County soil types	https://egis3.lacounty.gov/dataportal/2011/01/27/soil-types/
City of LA storm drain pipes	http://geohub.lacity.org/datasets/storm-pipes
City of LA storm drain inlets	http://geohub.lacity.org/datasets/storm-drain-inlets
City of LA general land-use plan	http://geohub.lacity.org/datasets/general-plan-land-use-gplu

2.1.3 As-builts

As-builts were acquired in areas where City of Los Angeles and Los Angeles County GIS coverages did not provide adequate information. In these circumstances, the as-builts provided information regarding the direction of flow during an 85th percentile design storm event at junctions.

2.2 Catchment Delineation

The catchments to the park areas were delineated based on the geodatabase developed in Section 2.1.2 and the as-builts gathered in Section 2.1.3. In some instances, there were missing or incomplete data. In these circumstances, limited field investigations were conducted to determine the general direction of flow at questionable areas.

2.3 Hydrocalc

In accordance with RFP TOS No. 25, Hydrocalc v.1.03 was used to determine the peak flow and volume for the 85th percentile design storm event. Hydrocalc is based on the Los Angeles County Department of Public Works Hydrology Manual (2006) (Hydrology Manual) that uses the Modified Rational Method.

2.3.1 Inputs

The catchment area specific inputs for Hydrocalc v.1.03 include:

- Catchment area
- Flow path length
- Flow path slope
- 85th percentile design storm rainfall depth
- Percent impervious
- Soil type

Each of these inputs were confirmed or refined based on data provided in the Concept Reports based on the available data while following calculation procedures presented in the Hydrology Manual.

2.3.2 Outputs

Hydrocalc v1.03 provides a hydrograph resulting from the specified catchment for peak discharge and volume to a specific diversion point along with the overall hydrograph shape. Hydrocalc also calculates peak intensity, undeveloped and developed runoff coefficients, time of concentration, peak flow rate, and 24-hr runoff volume.

2.3.3 Sensitivity Analysis

The 2006 Hydrology Manual specifies a maximum drainage area of 40 acres for using the Rational Method hydrology method; however, there is no maximum drainage area specified for using the Modified Rational Method hydrology approach. Hydrocalc v1.03 is based on the Modified Rational Method, but due to limited documentation it was determined that a sensitivity analysis should be performed to verify that the drainage areas did not exceed the ability of a single basin analysis to reasonably reflect the runoff characteristics.

Tributary areas for each park can be found in **Table 2-2** below.

Table 2-2 TOS 25 Park Tributary Areas

Site	Tributary	Tributary Area (ac)
David M. Gonzales Recreation Center	1	310
	2	449
Fernangeles Recreation Center	1	143
	2	160
	3	5
	4	9
Strathern North Park	1	449
	2	25

To ensure that the tributary areas providing flow to the parks in the Program do not exceed the calculation capabilities of the single-basin analysis in Hydrocalc v1.03, a multi-basin analysis was performed using the largest of the subwatersheds (Strathern Tributary Area 1) to compare the performance of a multi-catchment approach with a single catchment. Eleven sub-tributary areas were created within the Strathern North Park Tributary Area 1, each under 40 acres in size, for the comparison (**Figure 2-1**).

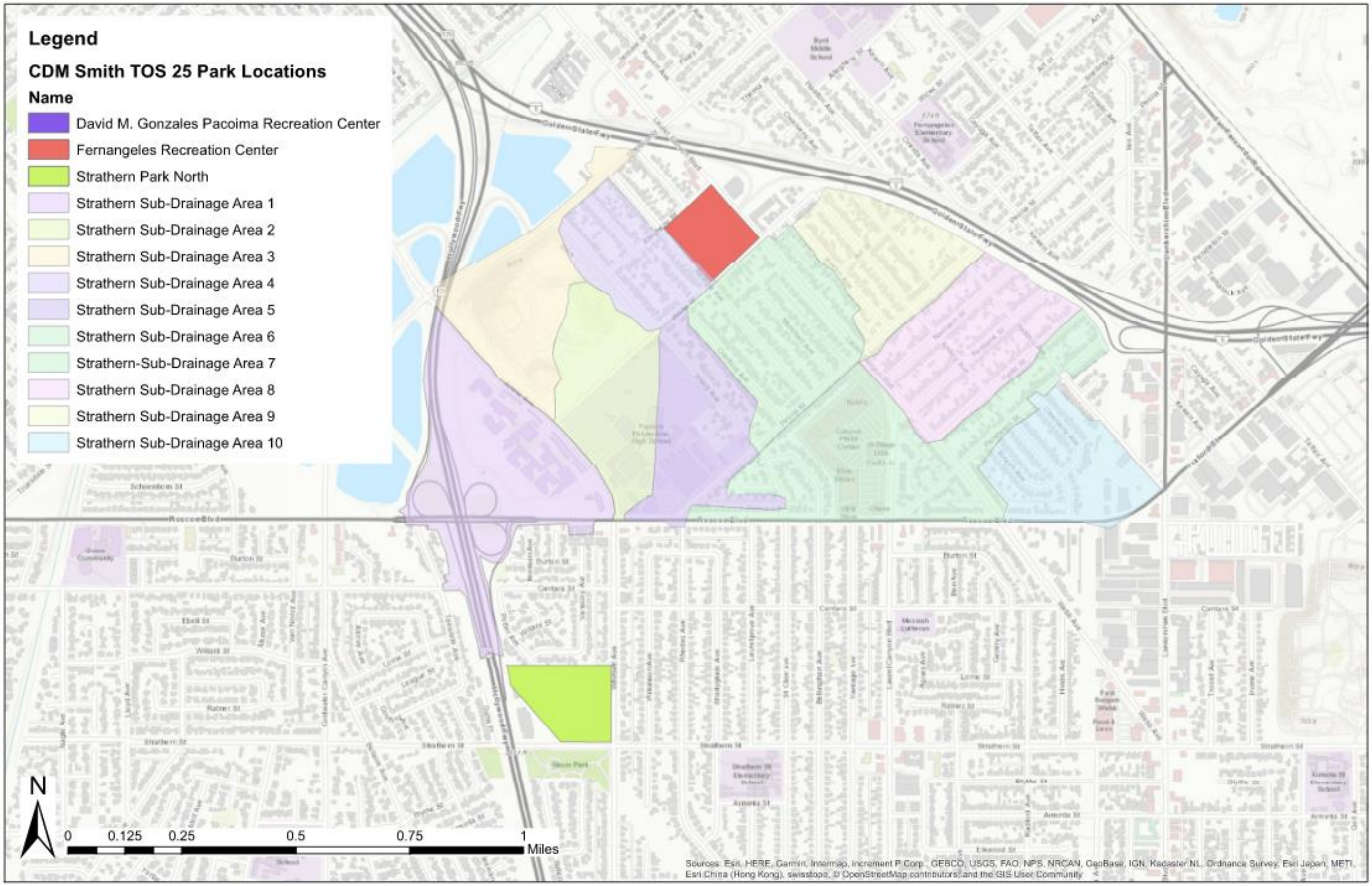

Figure 2-1 Strathern North Park Sub-Drainage Areas

The impervious area, flow path, slope, and soil type for each sub-tributary area were calculated following the same methodology as the single-basin analysis. The inputs were entered into Hydrocalc multi-basin analysis tool which provided a single hydrograph for each sub-basin. The time of concentration was calculated from the bottom of successive sub-basins to the proposed diversion point using the equation from the Hydrology Manual (**Figure 2-2**).

$$T_C = \frac{0.31 * L^{0.483}}{(C_d * I_t)^{0.519} * S^{0.135}}$$

$$I_t = I_{1440} * \left(\frac{1440}{t}\right)^{0.47}$$

$$C_d = (0.9 * IMP) + (1.0 - IMP) * C_u$$

Where:

Where:	T_C	= Time of concentration in minutes
	L	= Longest flow path length from watershed boundary to outlet in feet
	C_d	= Developed runoff coefficient, ratio of runoff rate to rainfall intensity in in/in
	I_t	= Intensity at time t in in/hr
	S	= Slope of longest flow path in ft/ft
	IMP	= Percent Impervious, percent expressed as 0.0 to 1.0
	C_u	= Undeveloped runoff coefficient, ratio of runoff rate to rainfall intensity in in/in

Figure 2-2 Time of Concentration Equation and Variables (Hydrology Manual Page 67)

The time of concentration provided an offset time for each sub-drainage hydrograph allowing the creation of a multi-basin analysis hydrograph covering the entire catchment area. The resulting composite hydrograph is shown in **Figure 2-3**.

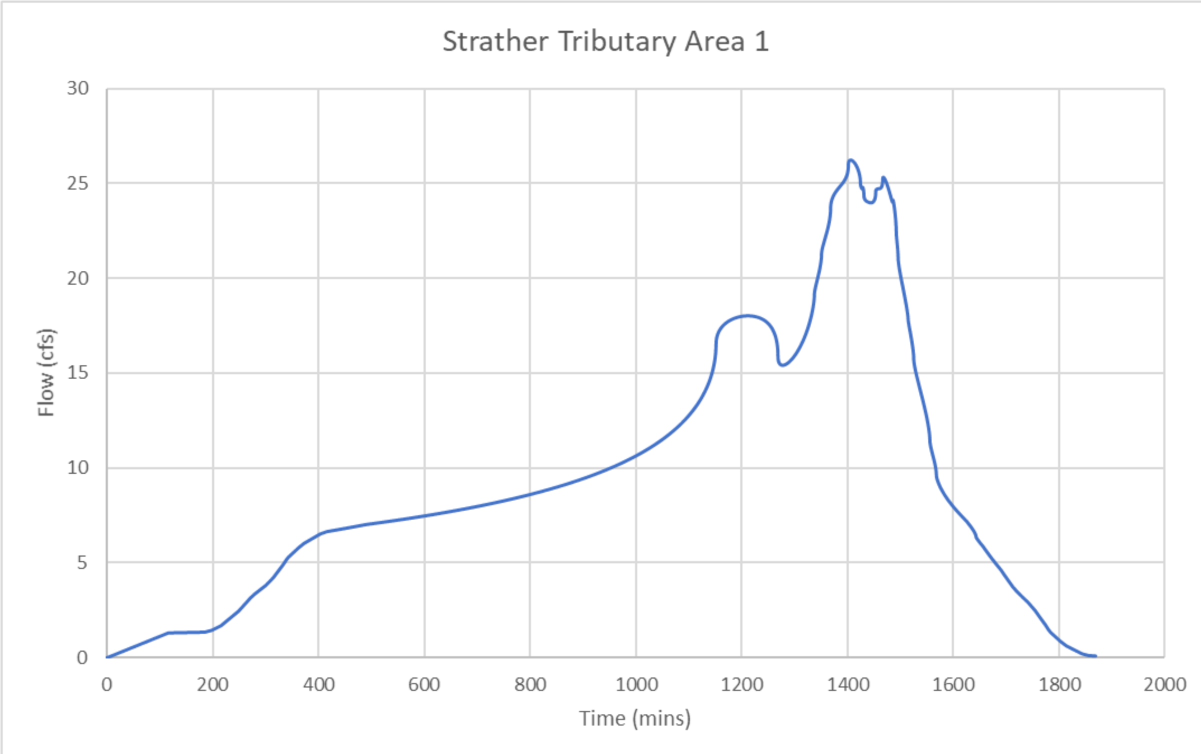

Figure 2-3 Strathern North Park Tributary 1 Multi-Basin Analysis Hydrograph

The resulting multi-basin hydrograph for the 85th percentile event was compared with the single-basin analysis (**Table 2-3**). The results of the sensitivity analysis demonstrates that the single-basin analysis provides a reasonable approach for determining the peak flow rate and volume associated with the 85th percentile design storm event for these catchment areas.

Table 2-3 Sensitivity Analysis Results

Single-Basin Approach		Multi-Basin Approach		Percent Difference	
85th Percentile Peak Flowrate (cfs)	85th Percentile Total Volume (ft^3)	85th Percentile Peak Flowrate (cfs)	85th Percentile Total Volume (ft^3)	85th Percentile Peak Flowrate (%)	85th Percentile Total Volume (%)
27.80	1,004,694	26.23	1,022,568	5.7	1.8

2.4 PCSWMM

PCSWMM is a robust hydrologic and hydraulic modeling software program that runs on the US Environmental Protection Agency Stormwater Management Model (SWMM) engine. It can be used for single event or continuous simulation and combines both runoff and routing calculations to create a holistic model. For this project, only the routing functions were utilized as all runoff calculations were pre-processed in Hydrocalc.

The hydraulic models require three major groups of inputs: upstream boundary conditions, system layout and geometry, and downstream outfall conditions. There are several different outputs that may be generated in the form of tables, graphs, and system profiles. Outputs are primarily used for the following purposes: sizing infrastructure (conveyance pipes, diversion structures, pretreatment BMPs and infiltration BMPs), ensuring full capture of 85^{th} percentile design storm event, and enabling adequate bypass or overflow for larger storms.

The following are some general notes and assumptions:

1. **Upstream Boundary Condition:** Each diversion has its own respective inflow hydrograph assigned to its most upstream node. The hydrographs are sized to the 85^{th} percentile event as well as any additional design storm events as needed for analysis. Hydrographs were generated and pre-processed outside of the software using Hydrocalc. In special scenarios, Hydrocalc output was manipulated to more accurately represent existing conditions.

2. **System Layout and Geometry:** Invert elevations and slopes of existing storm drains have been extracted from as-built drawings. All elevations have been converted from the National Geodetic Vertical Datum of 1929 (NGVD29) to the North American Vertical Datum of 1988 (NAVD88) using the following formula: NAVD88 = NGVD29 + 2.6'.

3. **Downstream Outfall Conditions:** Outfalls are located at points of infiltration and downstream bypass.

4. **Infiltration Rate:** All infiltration rates are based on the most recent geotechnical investigations at each site.

5. **Infiltration Gallery:** All galleries are modeled based on the dimensions and void ratio of the Stormprism EQ from Precon Products. To account for the 95 percent void ratio of the system, the modeled area assigned to the BMP storage nodes are equal to the true footprint reduced by a factor of 0.05. The true footprint refers to the physical area available for infiltration. The gravel layer directly underneath the gallery modules are not accounted for as additional storage.

6. **Infiltration Model:** The entire footprint of the infiltration gallery is assumed to be available for infiltration. According to correspondence with the vendors, the coarse gravel layer underneath the concrete modules allows quick dispersion through the infiltration openings. Infiltration is modeled as a link connecting the gallery to an outfall with arbitrary pipe length and slope. A flow limit is assigned to the link, equal to the specified true footprint multiplied by the site's respective infiltration rate.

7. **Manholes:** Manholes are placed at intervals no greater than 400', proposed catch basins, hydrodynamic separators, and changes of direction in pipe alignment. PCSWMM assumes a minimum manhole storage area of 12.56 square feet.

8. **Model versions:** The modeled alternatives have two versions: static and dynamic. The dynamic model sizes the project components considering infiltration processes. The static model conservatively sizes the project components assuming no infiltration processes

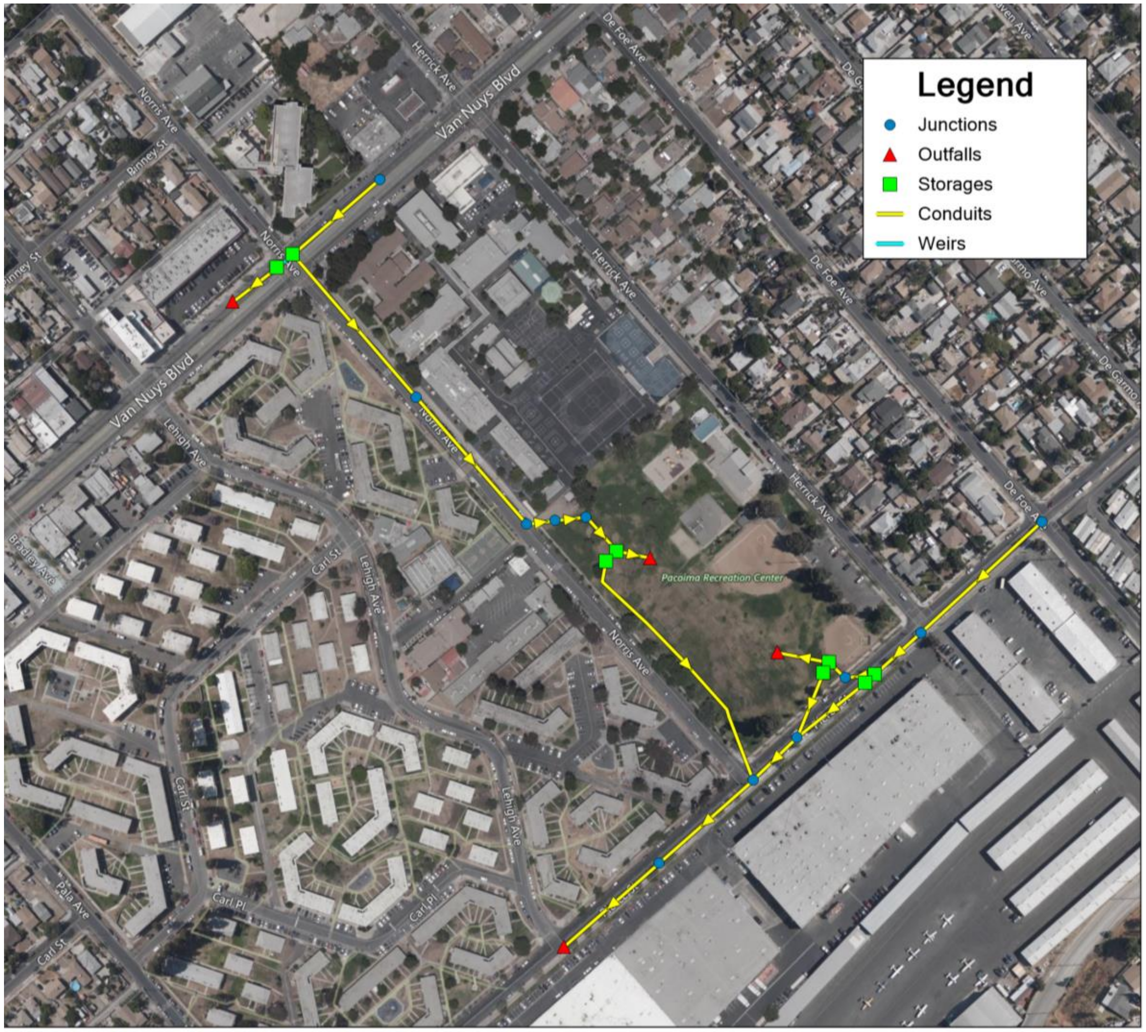

Figure 2-4 Alternative 1 SWMM Baseline Model: Weir Diversion and Overflow

Section 3

Results

This section provided the results of the hydrology analysis.

3.1 David M. Gonzales Recreation Center

Using the Rational Method, the annual runoff capture was calculated for each tributary area and summed to provide a total annual capture volume. **Figure 3-1** shows the annual runoff equation used in both the project concept reports and by CDM Smith to provide a point of comparison for the hydrologic analysis.

$$\text{Annual Runoff (AFY)} = C \times I \times A$$

C = Imperviousness value (based on land use)
I = Rainfall intensity (in/yr)
A = Tributary area (acre)

Figure 3-1 Rational Method Annual Runoff Equation

The total annual capture volume along with the capture volume from a 24-Hr 85th percentile storm is provided in **Table 3-2**. The results were compared to the original project concept report to illustrate any increase or decrease in potential water supply benefit at David M. Gonzales Recreation Center.

The results of the hydrologic analysis of David M. Gonzales catchment areas are shown in **Figure 3-2** and summarized in **Table 3-1** below.

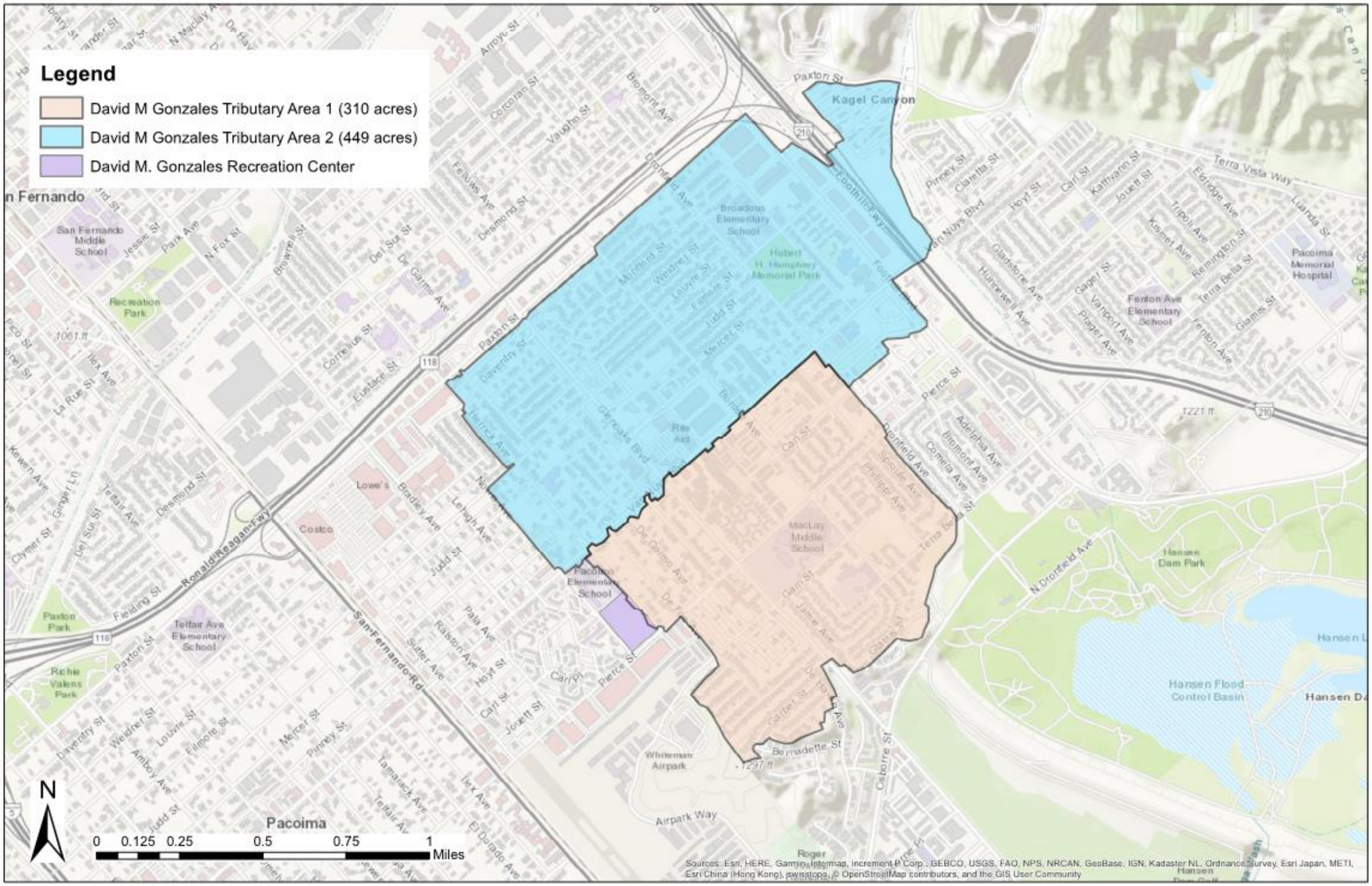

Figure 3-2 David M. Gonzales Recreation Center Tributary Area

Table 3-1 David M. Gonzales Hydrologic Analysis Results

Tributary Area	Size (ac)	Impervious Area (%)	85th Percentile Storm Peak (cfs)	85th Percentile Storm Volume (ac-ft)
Tributary Area 1	310	60	28.87	16.35
Tributary Area 2	449	67	36.87	25.97

Table 3-2 David M. Gonzales CDM Smith Hydrology Updates

Project Concept Report		CDM Smith		Difference	
85th Percentile Storm Volume (ac-ft)	Annual Runoff Capture (ac-ft)	85th Percentile Storm (ac-ft)	Annual Runoff Capture (ac-ft)	85th Percentile Storm (%)	Annual Runoff Capture (%)
30	359	42	552	33	42

3.2 Discussion and Limitations

The Modified Ration Method is an accepted standard of practice for design projects; however, there are limitations to note including:

- Based on simplified and area weighted parameters as opposed to more detailed information
- Routing is through simplified parameter time of concentration and does not account for watershed-scale conveyance storage or attenuation of flows

Although there are some limitations to the Modified Ration Method, it is the most widely used method for infrastructure design and generally offers a conservative, and standardized approach.

3.3 Infiltration Gallery Sizing

Accounting for a factor of safety and per guidance from vendors, infiltration galleries were sized to maintain a minimum freeboard of 6” to 1’. For David Gonzales Recreation Center, the infiltration galleries were configured to maintain 1’ of freeboard during the 85th percentile event. The proposed infiltration gallery, with internal height of 14’, was manually iterated to find a footprint that resulted in a maximum depth of about 13’.

Figure 3-3 and **Figure 3-4**, shown below, depict the BMP storage-depth curves for both dynamic and static models. **Table 3-3** shows the minimum gallery footprint for the baseline model for both dynamic and static models.

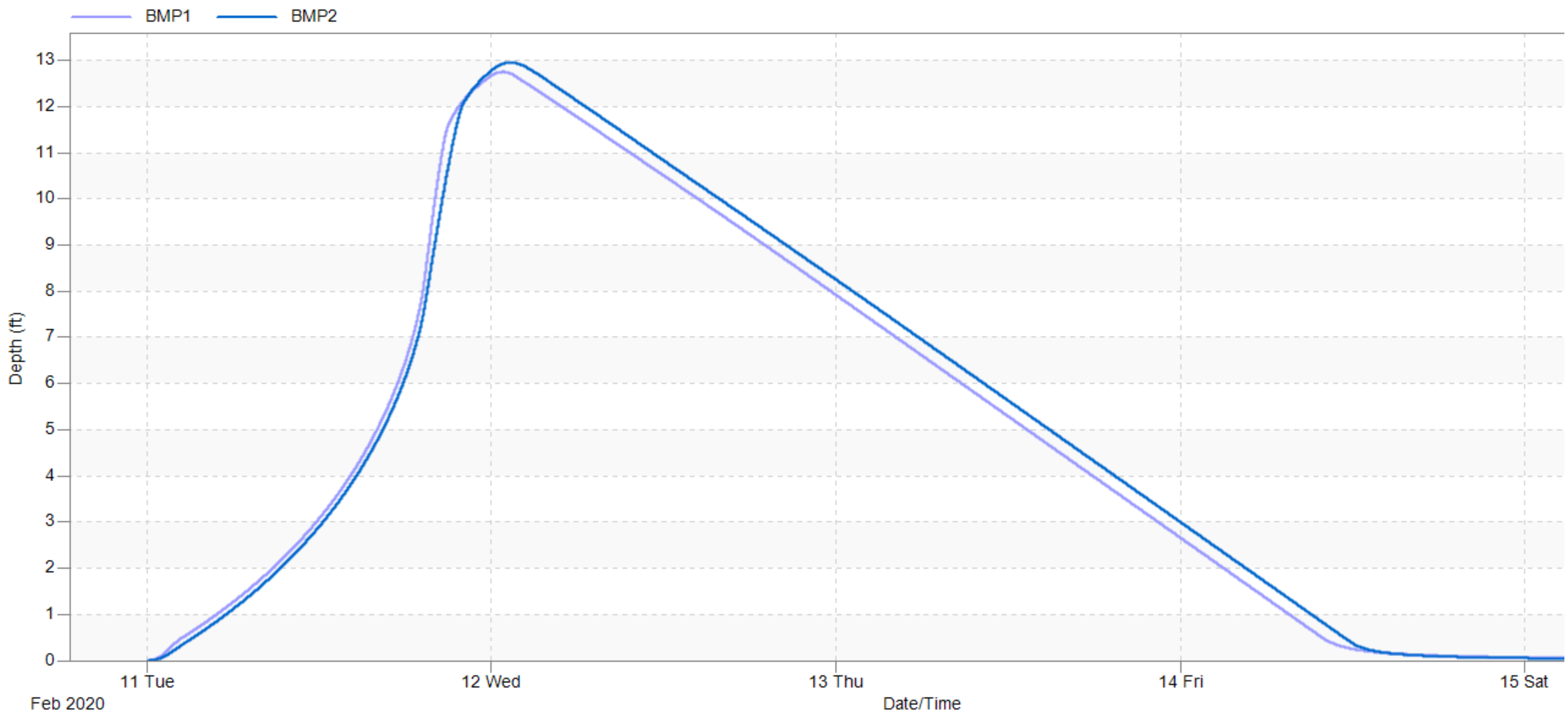

Figure 3-3 Dynamic Model BMP Storage-Depth Curve

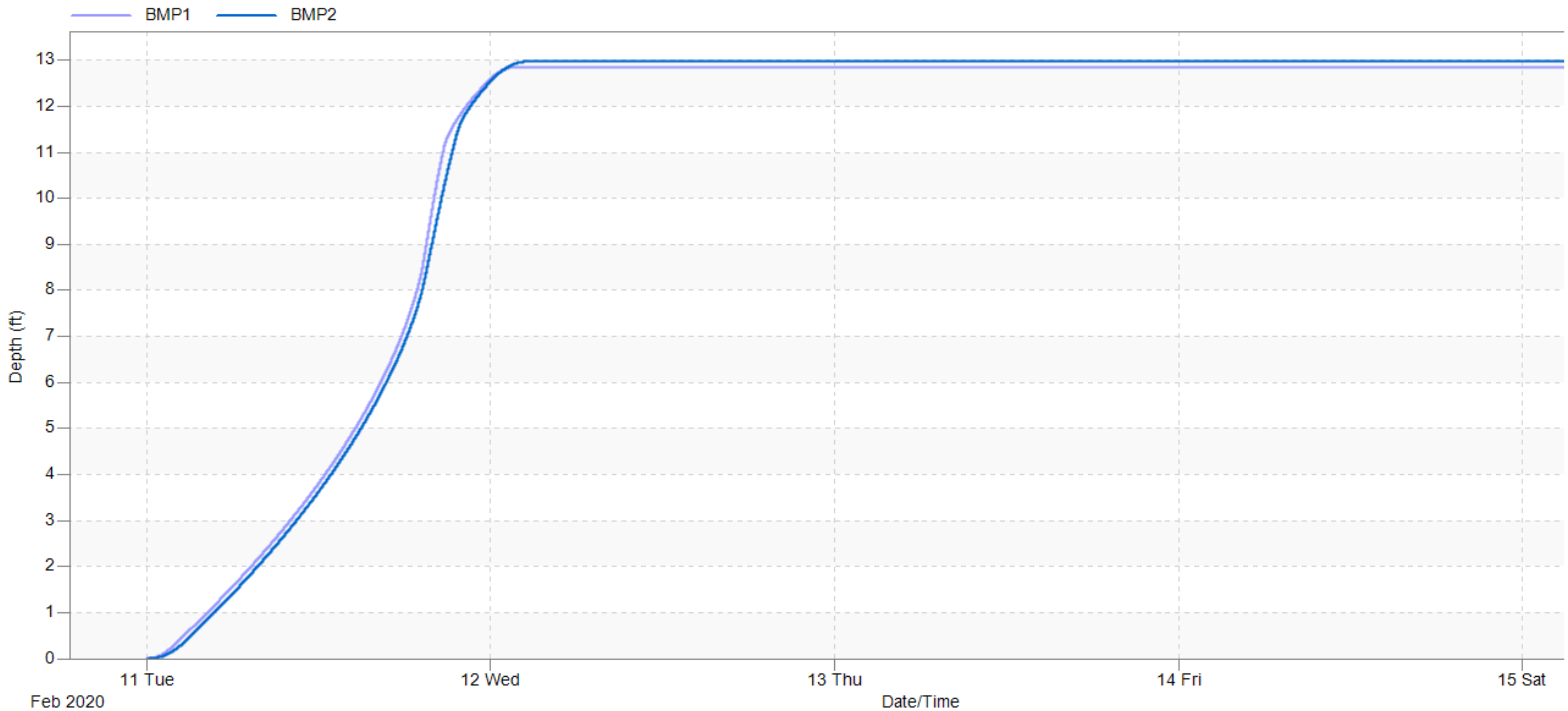

Figure 3-4 Static Model BMP Storage-Depth Curve

Table 3-3 Baseline Alternative: Minimum Infiltration Gallery Footprint

BMP	Dynamic (SF)	Static (SF)
1 (Pierce)	41,500	58,000
2 (Van Nuys)	65,000	91,000

3.4 Diversion Structure

Alternative 1 for David M. Gonzales Recreation Center calls for two diversions, one off Van Nuys Blvd and the other off Pierce St. The baseline model consists of a rectangular diversion structure with a weir wall, like **Figure 3-5** depicts below. The diversion structure is configured within the model as two storage nodes with a weir link connecting the two and a pipe connection representing the diversion. The weir height has been manually iterated to allow full capture of the 85th percentile storm. The weir length and diversion structure height have been configured to allow bypass of larger storm events.

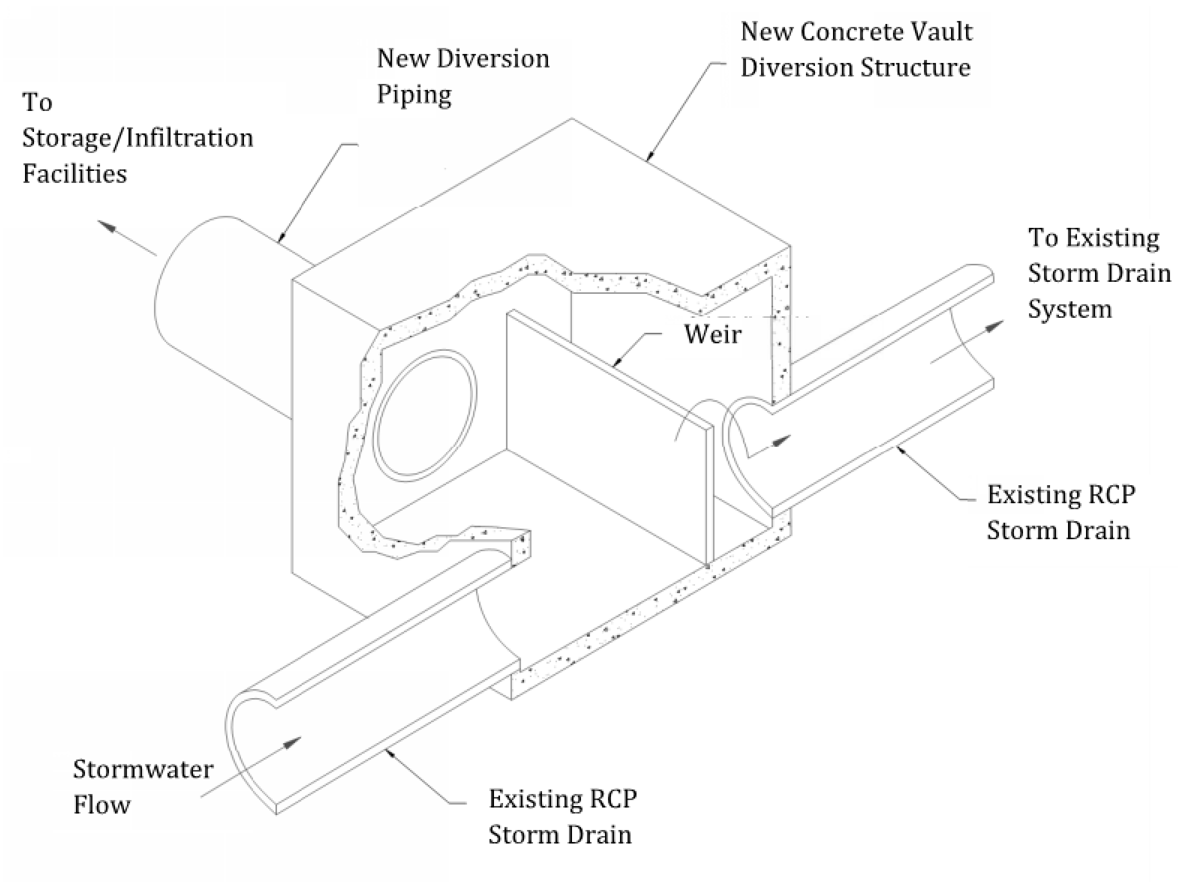

Figure 3-5 Weir Diversion Structure

An alternate diversion structure configuration uses a drop structure where the diversion pipe is placed at a lower elevation than the main storm drain, like **Figure 3-6** depicts below. The drop structure is configured as a single storage node with a single pipe connection representing the diversion. The drop required has been manually iterated to allow full capture of the 85th percentile storm.

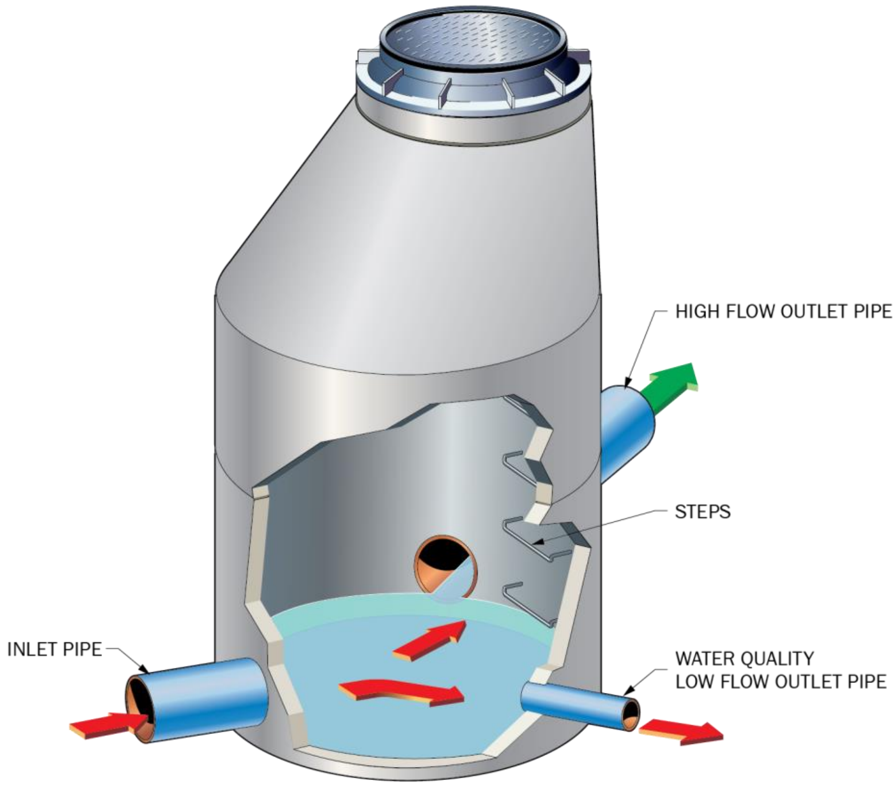

Figure 3-6 Drop Diversion Structure

Required diversion configuration, whether weir or drop height, are directly related to the downstream HGL. Therefore, each diversion geometry is extremely sensitive to the downstream gallery elevation and maximum associated water depth. To have the most functional comparison between the two diversion techniques, both model iterations use the same inlet pipe offsets at each gallery. The inlet pipes into BMP1 and BMP2 enter at 8' and 6.7' off gallery bottom, respectively.

Table 3-4 outlines the diversion structure and infiltration gallery dimensions for both techniques. All results are shown for the dynamic model.

Table 3-4 Diversion Structure Dimensions

Type	Pierce St Diversion	Van Nuys Blvd Diversion
Weir	LxWxH = 20’x10’x8’ Weir Length = 12’ Weir Height = 4.4’ Gallery Elevation = 1010.15’ Gallery Footprint = 41,500 SF	LxWxH = 20’x12’x8’ Weir Length = 14’ Weir Height = 2.4’ Gallery Elevation = 1017’ Gallery Footprint = 65,000 SF
Drop	LxWxH = 20’x10’x12’ Drop Height = 4.5’ Gallery Elevation = 1005.65’ Gallery Footprint = 41,500 SF	LxWxH = 20’x12’x12’ Drop Height = 2.5’ Gallery Elevation = 1014.5’ Gallery Footprint = 65,000 SF

Based on initial results of the hydraulic model, both drop structure and weir structures appear to be functional diversion techniques. However, each is limited by its own constraints and requires additional feasibility analysis in detailed design. A drop structure will require deeper excavation where there may be concerns with additional costs, system maintenance, overflow routing, and structural loading. A weir structure will likely impact the existing HGL within its direct vicinity creating localized flooding concerns and upstream hydraulic impact exceeding requirements in the Los Angeles County Flood Control District (LACFCD) permit.

3.5 Overflow Configuration

Although adequate diversion structure design will allow bypass of larger peak flows, some type of overflow configuration is still needed downstream to account for the additional volume of water entering the diversion system. Because the infiltration galleries are sized according to volume and flow rate of the 85th percentile storm, larger storm events will cause surcharging or flooding without active overflow measures.

The most commonly used overflow measures within infiltration galleries are either a weir wall or a stand pipe. These two, along with several other overflow configurations have been modeled and tested within SWMM. Overflow from each gallery is routed back into the existing storm drain system on Pierce St. Overflow measure alternatives and their results are described and displayed in **Table 3-5** below.

Table 3-5: Overflow Techniques Description and Modeling Results

Overflow Technique	Description	Model Configuration	Result
Weir Wall	A weir wall of height equal to the freeboard level is constructed on the wall(s) of the gallery modules. Overflows into a channel with outlet pipe.	Add weir link from gallery to overflow pipe. Sized to maintain about 0.5’ of freeboard at the 10-year event	Weir wall lengths of 43’ at BMP1 and 34’ at BMP2.

Overflow Technique	Description	Model Configuration	Result
Stand Pipe	A stand pipe is placed within a gallery module so that the inlet is at height equal to the freeboard level. Stand pipe may outlet at any elevation given structural considerations.	Add bottom orifice link from gallery to overflow pipe. Sized to maintain 0.5' of freeboard at the 10-year event	Stand pipe diameters of 13' at BMP1 and 10' at BMP2.
Additional Diversion Structure	Additional diversion structures are proposed closer to infiltration facility with weir height elevation equal to freeboard level.	Add junction node with weir connection to existing storm drain on Pierce St.	14' length and 4.7' tall weir at BMP1 and 14' length and 7' tall weir at BMP2
Larger Gallery	A larger gallery is sized to take into account larger flow rates and volume.	Increase BMP storage footprints	Footprint exceeds available space.

The internal weir wall and stand pipe are both functional overflow techniques. However, preference is given to the weir wall technique. The modular configuration of the infiltration galleries allows for seamless integration of a weir wall along the edges of the structure. Further, the installation of the required large diameter stand pipe may be both structurally and spatially infeasible within the infiltration gallery modules.

3.6 Hydraulics Discussion and Limitations

The hydraulic model, as configured currently, represents a functional tool that can be used to preliminarily size proposed diversion structures, storm drains, BMPs, and overflow measures. Further refinement of the model, however, calls for verification of existing assumptions and consideration of additional design components such as:

- **Infiltration Gallery Representation:** The void ratio and storage height were based on a single vendor's infiltration gallery configuration. As these numbers are bound to differ by product, further refinement calls for optimized models configured to the specific dimensions of the selected vendor.

- **Infiltration Gallery Storage:** Current storage curves assigned to each gallery only account for the voids within the gallery modules. The volume storage within the typical 12" – 24" gravel layer underneath the infiltration galleries is not accounted for. Future model iterations may test the effects of including this additional storage which may range from a reduced footprint to an increased freeboard and lowered weir height.

- **Infiltration Rate:** Site infiltration rates are based on the most recent geotechnical testing conducted on each site. According to vendor correspondence, the model assumes constant infiltration by the entire footprint of the infiltration galleries. This assumption should be further verified.

- **Desilting Basin:** The desilting basin proposed at the front ends of each gallery is not currently accounted for within the model.

- **Inlet Pipe Offset:** The inlet pipe can enter the gallery structure at almost any height. Increasing the inlet pipe offset would increase BMP burial depth but reduce upstream required weir height. Future cost-benefit analysis should be performed to determine if a shorter weir height is needed at the expense of deeper excavation.

2.4.3 Right of Way and LACFCD Conceptual Approval

The Project will divert from a Los Angeles County Flood Control District (LACFCD) storm drain. Confirmation of conceptual approval by LACFCD is included in the following pages.

The figure below is a screen shot from the Zone Information and Map Access System (ZIMAS) of the City of Los Angeles, demonstrating that the parcel on which the Project will be built is government-owned land and currently zoned as open space.

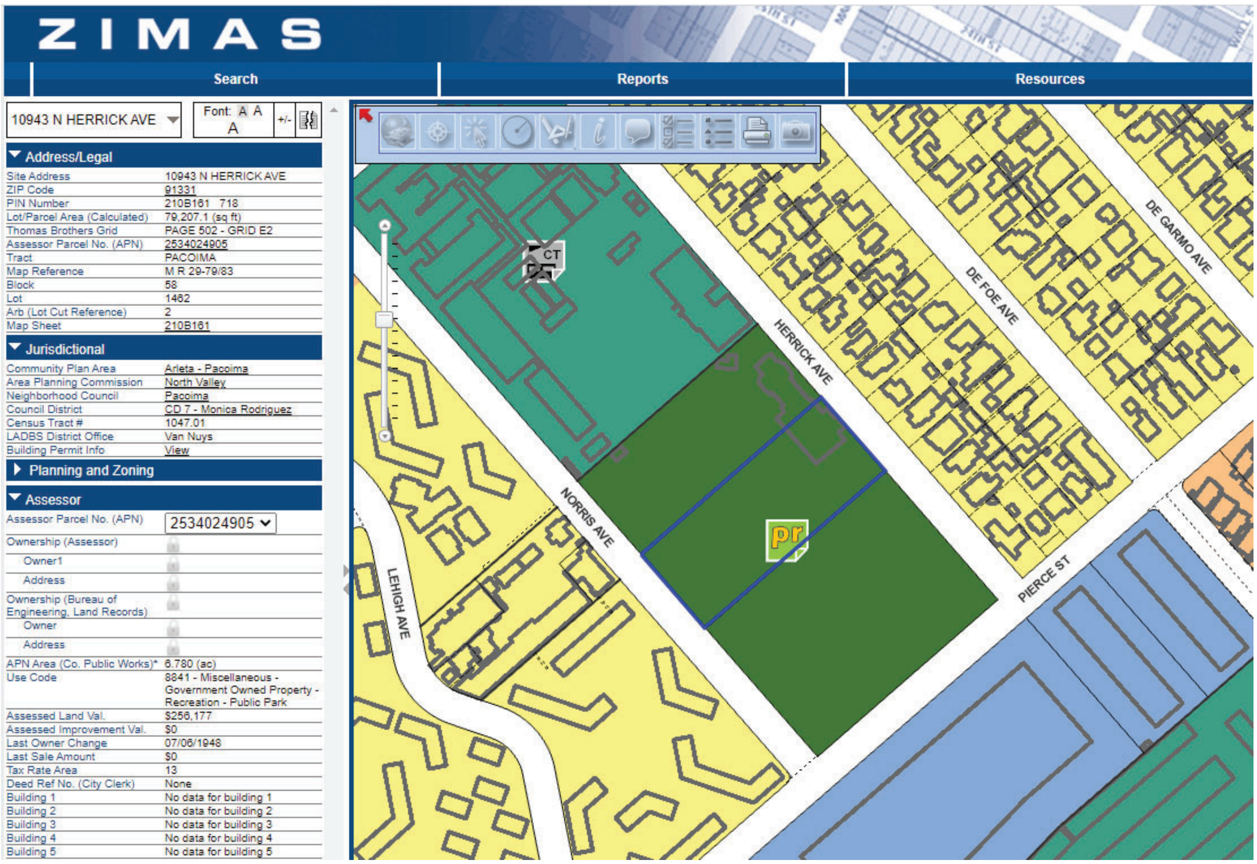

Figure ZIMAS View for David M. Gonzales Recreation Center

The following pages contain inter-agency e-mail correspondence between LADWP and LACFCD regarding conceptual approval of the Project by LACFCD. The correspondence demonstrates that LADWP initiated the approval process in July 2020, and conceptual approval is pending review by LACFCD and anticipated to be complete in October 2020.

From: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Sent: Tuesday, October 13, 2020 8:59 AM
To: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

Hi Ryan,

We will send you the electronic approval letter shortly.

Meanwhile could you please confirm the address for Art?

Mr. Art Castro
Watershed Management Group
Los Angeles Department of Water and Power
111 North Hope Street, Room 318
Los Angeles, CA 90012

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Monday, October 12, 2020 6:42 PM
To: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Hi Nayiri,

Can you send me an email by tomorrow, October 12th, to officially explain and confirm what to do for the conceptual approval portion of the application as we discussed over the phone last week?

Thank you

Ryan

From: Aghakhani, Ryan
Sent: Wednesday, October 7, 2020 3:47 PM
To: 'Nayiri Vartanian' <NVARTANIAN@dpw.lacounty.gov>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

Nayiri,

Any updates on if this would need to be submitted at the application deadline?

Thanks again.

Ryan

From: Aghakhani, Ryan
Sent: Tuesday, October 6, 2020 10:37 AM
To: 'Nayiri Vartanian' <NVARTANIAN@dpw.lacounty.gov>
Cc: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval
Importance: High

Nayiri,

Are there any updates to this? We are fast approaching the October 15th deadline.

Ryan

From: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Sent: Wednesday, September 9, 2020 3:15 PM
To: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Cc: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>
Subject: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

---

Hi Ryan,

The conceptual approval letter is being reviewed by our admin and you should be getting it shortly.

Thank you,

Nayiri Vartanian, P.E.
Associate Civil Engineer
Los Angeles County Public Works
Office: (626) 458-7159

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Wednesday, September 09, 2020 1:33 PM
To: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Hi Nayiri,

I wanted to follow up with you on the status of the draft letter.

Thank you

Ryan

From: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Sent: Monday, August 17, 2020 4:54 PM
To: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Cc: Luis Garcia <LuGarcia@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Tonthat, Peter <Peter.Tonthat@ladwp.com>
Subject: Re: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

Hi Ryan,
I would need to discuss this with our admin and get back to you. Thanks,

-Nayiri

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Monday, August 17, 2020 3:58:49 PM
To: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Cc: Luis Garcia <LuGarcia@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Tonthat, Peter <Peter.Tonthat@ladwp.com>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual

Approval

CAUTION: External Email. Proceed Responsibly.

Hi Nayiri,

I'm following up to see if an email approval would suffice. Please advise on how to proceed.

Thank you.

Ryan Aghakhani
Watershed Management Group | Water Resources Division
Los Angeles Department of Water and Power
111 N. Hope Street, Room 318
Los Angeles, CA 90012
(213) 367-2022

From: Nayiri Vartanian [mailto:NVARTANIAN@dpw.lacounty.gov]
Sent: Thursday, August 13, 2020 9:13 AM
To: Aghakhani, Ryan
Cc: Luis Garcia; Ernesto Rivera
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

Hey Ryan,

Unfortunately we do not have a sample letter. We were hopping to take you up on your offer and ask you for one.
However, if you don't have one readily available, we can figure out a way to proceed with the approval process.

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Thursday, August 13, 2020 8:47 AM
To: Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Cc: Luis Garcia <LuGarcia@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Tonthat, Peter <Peter.Tonthat@ladwp.com>
Subject: RE: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Thank you Nayiri for that information,

Do you by any chance have a sample draft letter we can work off?

Thank you

Ryan Aghakhani
Watershed Management Group | Water Resources Division
Los Angeles Department of Water and Power
111 N. Hope Street, Room 318
Los Angeles, CA 90012
(213) 367-2022

From: Nayiri Vartanian [mailto:NVARTANIAN@dpw.lacounty.gov]
Sent: Thursday, August 13, 2020 8:32 AM
To: Aghakhani, Ryan
Cc: Luis Garcia; Ernesto Rivera
Subject: [EXTERNAL] Stormwater Capture Parks Program - SCWP R2 LACFCD Conceptual Approval

---

Good morning Ryan,

Attached is a list of storm drain details for each connection, that we were able to pull from our records.

Please not that (as highlighted in the attached chart):

- Valley Plaza Park North, the northerly connection is in close proximity of a Caltrans drainage, and would need to be confirmed during the detailed site study that it connects to our drainage.
- North Hollywood Park, the Gallery No 3 connection is not LACFCD maintained and it's a LA City drain.

We would also request you to please send a draft letter for us to confirm the conceptual approval.

Should you need to discuss further we could set up a meeting.

Thank you!

Nayiri Vartanian, P.E.
Associate Civil Engineer
Los Angeles County Public Works
Office: (626) 458-7159

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Friday, July 31, 2020 4:04 PM
To: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Genevieve Osmena <gosmena@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>

Cc: Tonthat, Peter <Peter.Tonthat@ladwp.com>; Castro, Art <Art.Castro@ladwp.com>
Subject: RE: [EXTERNAL] RE: SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Hi Ernesto,

I have attached the requested Concept Reports for the Parks we will be applying for in RD2:
David M Gonzales, Valley Plaza Park North, Valley Plaza Park South, North Hollywood Park

I've also included Concept Reports for Parks Projects we intend to be applying for in RD3 for future reference:
Alexandria Park, Whitsett Fields Park North

Please let me know if you have any questions

Thank you

Ryan Aghakhani
Watershed Management Group | Water Resources Division
Los Angeles Department of Water and Power
111 N. Hope Street, Room 318
Los Angeles, CA 90012
(213) 367-2022

From: Ernesto Rivera [mailto:ERIVERA@dpw.lacounty.gov]
Sent: Thursday, July 30, 2020 11:55 AM
To: Aghakhani, Ryan; Genevieve Osmena; Nayiri Vartanian
Cc: Tonthat, Peter; Castro, Art
Subject: RE: [EXTERNAL] RE: SCWP R2 LACFCD Conceptual Approval

Ryan,
Do you guys have concept reports you can share for these? Art had previously provided us the concept report for Strathern. Thanks much.

Ernesto J Rivera, P.E.
Civil Engineer
Los Angeles County Public Works
Office: (626) 458-6110

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Wednesday, July 29, 2020 8:20 AM
To: Genevieve Osmena <gosmena@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>
Cc: Tonthat, Peter <Peter.Tonthat@ladwp.com>
Subject: RE: [EXTERNAL] RE: SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Thank you Genevieve,
Middle of August would be a good time period to receive a draft to review. We do not have a template so we can use your template.

Ernesto and Nayiri,
I look forward to working with you to complete this. Please let me know what you need from us.

Thank you

Ryan Aghakhani
Watershed Management Group | Water Resources Division
Los Angeles Department of Water and Power
111 N. Hope Street, Room 318
Los Angeles, CA 90012
(213) 367-2022

From: Genevieve Osmena [mailto:gosmena@dpw.lacounty.gov]
Sent: Tuesday, July 28, 2020 10:15 AM
To: Aghakhani, Ryan
Cc: Ernesto Rivera; Nayiri Vartanian
Subject: [EXTERNAL] RE: SCWP R2 LACFCD Conceptual Approval

Hi Ryan,

Please work directly with Ernesto Rivera and Nayiri Vartanian of my team to coordinate their review and recommendations for the four stormwater capture park projects you mention below. I have cc'd them above. Thank you also for the fact sheets – they may need to ask you for additional information if we have any questions.

For the conceptual approval, we have a template letter of our own that we typically use, but feel free to share your template as well if you already have one drafted that has project-specific language that you may want us to consider or reference. What is your time frame to receive the conceptual approval?

Thanks,

Genevieve Osmeña
Senior Civil Engineer
Los Angeles County Public Works

Office: 626-458-4322

From: Aghakhani, Ryan <Ryan.Aghakhani@ladwp.com>
Sent: Wednesday, July 22, 2020 3:37 PM
To: Genevieve Osmena <gosmena@dpw.lacounty.gov>
Subject: SCWP R2 LACFCD Conceptual Approval

CAUTION: External Email. Proceed Responsibly.

Hi Genevieve,

We are currently preparing to apply for round 2 of the SCWP. We will be applying for Measure W funding for 4 parks that are part of our Stormwater Capture Parks Program. The park projects we will be applying for are Valley Plaza Park North and South, David M Gonzales, and North Hollywood Park. I have attached a factsheet of the program as a whole for your reference where you can see the location of the specified parks projects. We are currently wrapping up the pre-design phase for these projects.

As you know, part of the SCWP funding application process is to confirm conceptual approval from the LACFCD whenever your infrastructure will be involved. Please let me know if a simple email confirmation will suffice from you or your team. Alternatively, we can send you a draft letter where the LACFCD can confirm conceptual approval.

Please let me know if you require additional information to confirm conceptual approval.

Thank you in advance for your consideration.

Ryan Aghakhani
Watershed Management Group | Water Resources Division
Los Angeles Department of Water and Power
111 N. Hope Street, Room 318
Los Angeles, CA 90012
(213) 367-2022

2.4.4 Utility Investigation

During the park's preliminary design phase, BOE sent letters to various utility companies requesting confirmation of the presence or absence of utilities. The utilities' responses are summarized in the table below.

Table Underground Utilities

Utility Company	Response	Facility Presence
AT&T	Received	No facilities present
SoCal Gas Distribution	Pending Fee	Pipelines present
SoCal Gas Transmission	Received	No facilities present
Charter	Received	Aerial facilities present
Petroleum	Received	No facilities present

A detailed utility investigation should be conducted during the design phase to physically locate all utilities that may not have been identified in the preliminary phase, including the identification of the following utilities, at a minimum, through potholing:

- Sewer laterals on Norris Avenue between the schools and the 8-inch diameter sanitary sewer main.
- Water laterals on Norris Avenue between the schools and the 8-inch water main.
- Gas laterals on Norris Avenue between the schools and the 2-inch gas line.
- 63-inch RCP storm water pipe on Pierce Street.
- 84-inch RCP storm water pipe on Van Nuys Blvd.

Additional information and preliminary utility maps have been extracted from preliminary design reports and are included in the following pages.

2.4 Existing Utilities

In order to determine the location of existing subsurface utilities, the CDM Smith team submitted request letters to the utilities listed in **Table 2-1**.

Table 2-1 Utility Contact List

Utility Company	Response	Facility Presence
AT&T	Received	No facilities present
SoCal Gas Distribution	Pending Fee	Pipelines present
SoCal Gas Transmission	Received	No facilities present
Charter	Received	Aerial facilities present
Petroleum	Received	No facilities present

Online databases provided additional information regarding the subsurface utilities present at and around the park. By correlating shapefiles from the City's GIS database[2] and relevant as-builts drawings from LABOE and LADWP, it was determined that there are sanitary sewer, storm, water, gas, and oil lines surrounding the recreation center. The following record/as-built drawings[3] were used to verify the locations of existing subsurface utilities and are included for reference in **Appendix B**.

- Reference Drawing Set 1: Norris Avenue, Pierce Street. to Van Nuys Bl., LADWP, 2000
- Reference Drawing Set 2: Pierce Street, Sta 23+00 to Sta. 32+00 Plan and Profile, Los Angeles County Flood Control District, 1968
- Reference Drawing Set 2: Pierce Street, Sta. 1+28.00 to Sta. 2+40.00 Plan and Profile, Los Angeles County Flood Control District, 1968
- Reference Drawing Set 3: Herrick Avenue, Plan and Profile of Sewer from Pierce Street. to Sta. 11+28, City of Los Angeles, 1958
- Reference Drawing Set 3: Herrick Avenue, Plan and Profile of Sewer from Sta. 11+28 to Sta. 23+60, City of Los Angeles, 1958
- Reference Drawing Set 4: Van Nuys Boulevard, Plan and Profile from Sta. 30+30.00 to Sta. 41+27.86, Los Angeles County Flood Control District, 1974

Figure 2-12 shows the approximate locations and alignments of subsurface utilities. The water pipelines are owned by the LADWP; the sanitary sewer are owned and maintained by LABOE and the Los Angeles Department of Sanitation (LASAN); the storm drains are under the jurisdiction of the Los Angeles Flood Control District (LACFCD); the gas pipes are owned by the Southern California Gas Company (SoCal Gas); and the oil pipe is owned by Richmond Oil.

[2] https://data.lacity.org/

[3] As-built drawings are dated prior to 1992; therefore, it is assumed that the elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29). In order to convert these elevations to the approximate North American Vertical Datum of 1988 (NAVD88), the following conversion formula was used: NAVD88 = NGVD29 + 2.6.

Figure 2-12 David M. Gonzales Recreation Center Utilities

The following utilities are present on Norris Avenue between Van Nuys Boulevard and Pierce Street:

- 8-inch diameter vitrified clay pipe (VCP) sanitary sewer located along the street centerline, which is offset 18 feet from both the north and south curb lines. See Reference Drawing Set 1.
- 8-inch diameter ductile iron (DI) water pipeline, the centerline of which is offset 6 feet from the south curb line and 12 feet from the street centerline. There is also an abandoned 6-inch cast iron (CI) water pipeline on Norris Avenue, the centerline is offset 2 feet from the active water line. See Reference Drawing Set 1.
- 2-inch diameter gas pipeline, the centerline of which is offset 5 feet from the north curb line and 13 feet from the street centerline. There is also an abandoned 2-inch diameter gas line on Norris Avenue, the centerline of which is offset 1 foot from the active gas line. See Reference Drawing Set 1.
- Overhead utility lines along the south side of the street from Van Nuys Boulevard to Pierce Street.

The following utilities are present on Pierce Street between Herrick Avenue and Norris Avenue:

- 63-inch diameter reinforced concrete pipe (RCP) storm drain, the centerline of which is offset 18 feet from the street centerline. The alignment of this storm drain runs approximately underneath the southeast curb line of Pierce Street. Stormwater in the 63-inch storm drain is conveyed south towards the intersection of Pierce Street and Norris Avenue, where the storm drain transitions into a 90-inch diameter RCP. At the intersection of Pierce Street and Norris Avenue, there is a 75-inch diameter RCP lateral that ends just west of the intersection. Based on the as-built drawings, the 63-inch storm drain has an average pipe slope of 1.06 percent and average depth to pipe crown of approximately 9 feet below grade surface (bgs). See Reference Drawing Set 2.
- 18-inch diameter VCP sanitary sewer located along the street centerline, which is 18 feet offset from both the east and west curb lines. Based on the as-built drawings, the sanitary sewer line has an average pipe slope of 1.06% and average depth to pipe crown of approximately 9 feet bgs. See Reference Drawing Set 2.
- 12-inch diameter water pipeline, the centerline of which is offset 5 feet from the east curb line and 13 feet from the street centerline. There is also an abandoned 8-inch diameter water pipeline along Pierce Street, the centerline of which is offset 3 feet west from the active water line. See Reference Drawing Set 2.
- Streetlights on the west side of the street and overhead utility lines along the east and west side of the street from Norris Avenue to Herrick Avenue as shown in **Figure 2-13**. It is observed that the power poles on the east side of the street appear to be installed directly above the 63-inch RCP storm drain, which is corroborated by Reference Drawing Set 2.

Figure 2-13 Overhead Utility Lines on Pierce Street facing Northeast

The following utilities are present on Herrick Avenue between Van Nuys Boulevard and Pierce Street:

- 18-inch diameter VCP sanitary sewer, the centerline of which is 16 feet offset from the south curb line and 2 feet offset from the street centerline. Based on the as-built drawings, the sewer has an average pipe slope of 0.94 percent and average depth to pipe crown of approximately 9 feet bgs. See Reference Drawing Set 3.
- 2-inch diameter gas pipeline, the centerline of which is offset 6 feet from the north curb line and 12 feet from the street centerline. See Reference Drawing Set 3.
- 6-inch diameter water pipeline, the centerline of which is 6 feet offset from the south curb line and 12 feet offset from the street centerline. See Reference Drawing Set 3.
- 14-inch diameter oil pipeline, the centerline of which is offset 12 feet from the north curb line and 6 feet from the street centerline. Based on the as-built drawings, the oil line has average depth to pipe crown of 2 to 3 feet bgs. See Reference Drawing Set 3.
- Overhead utility lines are located along the south side of the street from Van Nuys Boulevard to Pierce Street.

The following utilities are present on Van Nuys Boulevard between Herrick Avenue and Norris Avenue:

- 84-inch diameter RCP storm drain, the centerline of which is offset 19 feet from the west curb line and 18 feet from the street centerline. Based on the as-built drawings, the storm drain has an average pipe slope of 0.323 percent and depth to pipe crown ranging from 7 to 12 feet bgs. See Reference Drawing Set 4.
- 8-inch diameter VCP sanitary sewer, the centerline of which is offset 10 feet from the west curb line and 27 feet from the street centerline. The sewer has a pipe slope of 1.4% starting south of Herrick Avenue and transitions to a pipe slope of 0.3% midway between Herrick Avenue and Norris Avenue. Based on the as-built drawings, the depth to pipe crown ranges from 7 to 9 feet bgs. See Reference Drawing Set 4.
- 8-inch diameter water pipeline, the centerline of which is offset 12 feet from the east curb line and 25 feet from the street centerline. See Reference Drawing Set 4.
- 4-inch diameter gas pipeline, the centerline of which is offset 6 feet from the west curb line and 31 feet from the street centerline. See Reference Drawing Set 4.
- Overhead utility lines along the west side of the street from Norris Avenue to Herrick Avenue

2.5 Site Survey

A topographical site survey is being conducted to confirm elevations at the site as well as verify locations and invert elevations of existing subsurface utilities. This survey information will be incorporated into the fifty percent (50%) design documents.

2.6 Geotechnical Investigations

Geotechnical investigations were conducted to evaluate the subsurface conditions at the site and provide recommendations for the design and construction of the proposed structures. This subsection summarizes the findings of the investigation, specifically related to onsite soil types, historic groundwater levels, and soil percolation rates. General recommendations for subgrade and bedding/foundation preparations will be covered in detail within the pending Geotechnical Investigation Report, when available, in **Appendix C.**

ATTACHMENTS FOR SECTION 2.5:

MONITORING

2.5 Monitoring

Baseline monitoring of the Project area was not performed for this feasibility study. Instead, previously collected data used for the WMMS model was applied to the modeling scenarios, and past field efforts identifying flooding concerns were noted.

The monitoring approach for the Project will involve wet and dry weather runoff sampling during both pre- and post-construction, and for long-term operations and maintenance. Monitoring will focus on three impacted water sources: (1) water sampled before going into the infiltration gallery, (2) captured stormwater, and (3) groundwater. The table below provides a summary of the currently expected monitoring frequency. These will be confirmed in the Project specific monitoring plan to be developed.

Table Example Monitoring Frequency

	Pre-Construction (2 yrs) Annually	Post-Construction (3 yrs) Annually	Long-Term O&M (~40 yrs)
Runoff Sampling	2 Wet, 2 Dry	2 Wet, 2 Dry	TBD
Infiltration Gallery Sampling	N/A	2 Wet	TBD
Groundwater Sampling	1 Dry	2 Dry	TBD

Notes:
(1) Long-Term O&M monitoring frequency will be determined following Post-Construction Monitoring and will depend on the needs of the Project.

To assess water quality before entering the Project area, water samples will be taken from the runoff of the 759-acre tributary area. Water samples taken from the infiltration gallery and groundwater monitoring wells will be used to assess captured stormwater and its potential impact on groundwater. Water samples will be collected and analyzed for pollutants of concern in the Upper Los Angeles River (ULAR) Watershed, specifically those regulated by Total Maximum Daily Loads (TMDL).

The following project elements will be monitored: general water quality (e.g., temperature, pH, conductivity, and dissolved oxygen), total suspended sediments, indicator bacteria, metals, chlorinated pesticides, BNAs, and continuous flow measurements. An autosampler will be used to take composite samples.

As proposed, the Project will install flow monitoring and level monitoring equipment for the bypass vaults, desilting basins, and infiltration basins. For the gravity flow pipes, a submerged flow sensor is proposed. The following monitoring equipment are proposed for each facility:

- Gravity pipes – Submerged velocity area flow sensor, Hach AV9000 flow meter, or approved equivalent.
- Infiltration galleries – Pressure level sensor, Global Water model WL450, or approved equivalent.
- Desilting basins – An ultrasonic level sensor, the Siemens Hydroranger, or approved equivalent.

All monitoring equipment will be monitored by the proposed PLC. The data would be available to LASAN via Supervisory Control and Data Acquisition (SCADA), which will be provided for remote monitoring of flow meters, level monitoring, and alarms.

Remote control will be provided if the Project will implement motorized slide gates or motorized valves. If manual slide gates or valves are selected for the design, remote control will not be necessary.

Reductions in pollutant loading will be quantified using sample pollutant concentrations in conjunction with flow measurements. If problems arise with the flow equipment or the Project faces other limitations, modeling will be used to calculate reduced flow in the sub-drainage area upon Project implementation.

The infiltration galleries will be monitored to determine whether captured runoff will contaminate the Project area's underlying soil and groundwater. Parameters that can affect drinking water and human health will also be monitored to determine their effects on groundwater. The same parameters will then be sampled in groundwater near the infiltration galleries and compared against the baseline groundwater monitoring results to detect any seeping runoff.

Additionally, level sensors will be installed in a representative subset of infiltration galleries to examine the relationship between rainfall, rain intensity, and capture capacity. This data will also be used to examine how the capacity and infiltration rates of the infiltration galleries change over the life of the Project.

A sample monitoring plan is included in the following pages, and a detailed plan specific to this Project will be developed during the design phase.

Monitoring Plan

Fernangeles Park Stormwater Capture Project

Prepared by: Watershed Protection Program, LASAN, City of Los Angeles

May 2020
Version 2.0

1. Table of Contents

Section

List of Tables

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Attachments

2. Introduction

Project Overview

The Fernangeles Park Stormwater Capture Project (hereafter referred to as the “Project”), located in the Tujunga Wash watershed of the Upper Los Angeles River Watershed within the San Fernando Valley Groundwater Basin, will entail construction of a 1.6-acre underground infiltration gallery to capture and infiltrate stormwater at Fernangeles Park. This would include installation of three catch basin inlets, pipes, a cross gutter, two hydrodynamic separator units, flow measuring devices, and educational signage. The Project will be designed to capture stormwater runoff from a 292-acre tributary area and infiltrate local stormwater runoff by implementing BMPs. The project will attempt to recharge the groundwater basin, alleviate localized flooding in the area, improve water quality of stormwater runoff, and attenuate peak flow at downstream water bodies. Implementation of the Project will capture approximately 192 AFY by diverting surface flow to the park and the green street along Morehart Avenue. The project will be designed to capture and infiltrate 100% of the runoff from the drainage area.

Monitoring Objectives

The primary goal of this monitoring plan is to measure the effectiveness of the Project once completed, including metrics specific to the identified benefits. The project will receive flows from the surrounding neighborhood with a total area of approximately 292-acres. Flows from this area will converge into reinforced concrete pipes (RCPs), where water will be diverted into the infiltration gallery. Pre-Construction (baseline) Monitoring will focus on characterizing the existing flow and pollutant loads of runoff from the tributary area as well as the water quality of the San Fernando Groundwater Basin. Post-Construction Monitoring will determine the amount of stormwater captured as well as efficacy of contaminant removal through the Project’s filtration gallery. This monitoring plan will be adapted, as necessary to fulfill the scope of work requirements of the funding source for this water quality improvement project, the Safe Clean Water (SCW) Program.

Study Questions

This monitoring program will examine the following study questions:

Pre-Construction (Baseline) Monitoring

1. What are the existing pollutant loads and water quality conditions coming from the 292-acre tributary area during dry and wet weather?

2. What are the baseline conditions of the groundwater in the Project drainage area?

Post-Construction (BMP Effectiveness) Monitoring

1. How much stormwater has been captured and recharged into the San Fernando Groundwater Basin by the project during wet-weather?

2. Do the infiltration galleries function as designed regarding capture capacity and infiltration rates relative to the quantity and intensity of the rainfall?

3. Do the infiltration galleries function as designed regarding contaminant removal? How much pollutant load has been captured and removed?

The data gathered from this monitoring program will help provide a basis for future implementation of similar types of BMPs that utilize infiltration systems. Furthermore, the information obtained from this study will demonstrate how this BMP project performs under varying conditions, which may assist in the design of similar projects in the future, as well as optimize the performance and operation and maintenance of this particular system at Fernangeles Park.

Monitoring Strategy and Design

The monitoring program is divided into three phases: Pre-construction Monitoring, Post-Construction Monitoring, and Long-Term Operation and Maintenance (O&M) Monitoring. Monitoring will focus on three impacted water sources: (1) Water that is sampled before going into the filtration gallery, (2) captured stormwater, and (3) groundwater. Water samples will be taken from the runoff of the 292-acre tributary area to assess the water quality before entering the Project area. Water samples taken from the infiltration gallery and groundwater monitoring wells will be used to assess captured stormwater and its potential impact on groundwater. Flow rates, pollutant concentrations, and general water quality parameters will be measured in the

Pre-Construction phase to determine existing pollutant loads and compared with similar measurements in the Post-Construction phase. Flow of water into the Project will be used to calculate how much water has been captured and recharged into the groundwater basin. Infiltration gallery water level, pollutant concentrations, and water quality measurements will be obtained to determine whether there is potential for captured runoff to contaminate underlying soil and groundwater. The measure of effective pollutant removal from urban and stormwater runoff will be considered the pollutant load reduction, quantified by multiplying volume captured with pollutant concentration. Long-Term O&M monitoring will be conducted for the life of the project (50 years) to determine the continued effectiveness of the Project.

Water samples will also be collected at each source for laboratory analysis of the parameters listed below in ***Table 2***. Additionally, parameters that have the potential to affect drinking water and human health will be monitored to determine the effect on groundwater. Analytes detected at insignificant levels in the optimization phase, with the exception of target analytes, may be excluded from future sampling.

3. Sampling Procedures and Analytical Methods

Monitoring Sites

The selection of the monitoring sites was based on consideration of the following factors: (1) goals of the study, (2) design of the system, (3) site accessibility and (4) safety of field personnel and the general public. Site locations are contingent on design plans and location of treatment facilities. During the Post-Construction phase of monitoring, the sites may be modified, depending on accessibility and actual location and construction of the Project. A map overview of the monitoring sites is shown below in **Figure 1**.

1. Urban and Storm Runoff Monitoring – Three sites will be established for water sampling and flow measurements of the 292-acre tributary area runoff during Pre- and Post-Construction Monitoring activities (FP-1, FP-2, FP-3).

2. Infiltration Gallery Monitoring – A monitoring site, FP-4 will be established for water sampling and water level measurements of the captured stormwater inside the infiltration gallery for Post-Construction Monitoring activities.

3. Groundwater Monitoring - One groundwater monitoring well (FP-GW) to be established for water sampling. Upon approval, FP-GW will be the Department of Water Resources' groundwater well ID:02N15W25L001S or an equivalent Public Water System well.

Figure 1. Fernangeles Park Stormwater Capture Project Monitoring Locations

Note: FP-GW monitoring site is located outside of this map.

Sampling Frequency

Sampling will be conducted on an annual basis according to the frequency listed in ***Table 1***, depending on the type of monitoring and the phase in which it is conducted. Pre-construction Monitoring will be conducted for a period of 2 years, Post-construction Monitoring will be conducted for a period of 3 years, and Long-Term O&M will be conducted for the life of the project (estimated at 50 years).

Table 1. Monitoring Frequency of Fernangeles Park

	Pre-Construction (2 Yrs) Annually	Post-Construction (3 yrs) Annually	Long-Term O&M (~50 yrs)
Runoff Sampling	2 Wet, 2 Dry	2 Wet, 2 Dry	TBD
Infiltration Gallery Sampling	N/A	2 Wet	TBD
Groundwater Sampling	1 Dry	2 Dry	TBD

Note: Long-Term O&M monitoring frequency will be determined following Post-Construction Monitoring and will depend on the needs of the Project.

Wet weather sampling will occur when rainfall events meet the following criteria: (1) rainfall is greater than or equal to 0.1 inch; and (2) the onset of rainfall is preceded by at least 72 hours of dry-weather.

Dry weather sampling will be scheduled so that the sampling is preceded by at least 3 days of dry weather. Furthermore, dry weather sampling events will be spaced at least one month apart, if feasible within the confines of the construction schedule.

Sample Collection and Delivery Procedures

During dry weather Pre-Construction sampling, FP-1, FP-2, FP-3, and FP-GW will be monitored by collecting grab samples. Following Project implementation, FP-1, FP-2, FP-3, FP-4, and FP-GW will be monitored by grab samples.

During wet weather, stormwater runoff samples will be collected from the monitoring sites with a refrigerated autosampler to take composite samples representing the entirety of a given rainfall event or with a manual 3-hour composite. For the infiltration gallery, water grab samples will be collected up to 24 hours after a rainfall event.

All field monitoring/sampling procedures will adhere to the guidelines found in the Surface Water Ambient Monitoring Program (SWAMP) sampling SOP, "Field Collection of Water Samples."

Analytical Methods

Chemical Parameters

Water samples will be analyzed in LA Sanitation Environmental Monitoring Division's laboratory or contract laboratory by the methods listed in ***Table 2*** or equivalent.

Table 2. List of Parameters and Analytical Methods

Parameter/Type	Recommended Method	Target Reporting Limit	Units	Monitoring Type
Conventionals				
Total Hardness	SM2340C	2	mg/L	Runoff, Infiltration, Groundwater
Total Dissolved Solids	SM2540C	10	mg/L	Runoff, Infiltration, Groundwater
Fecal Indicator Bacteria (FIB)				
E. coli	SM9223B	1	MPN/100ml	Runoff, Infiltration, Groundwater
Metals				
Copper (Total and Dissolved)	EPA 200.8	0.5	µg/L	Runoff, Infiltration, Groundwater
Lead (Total and Dissolved)	EPA 200.8	0.5	µg/L	Runoff, Infiltration, Groundwater
Mercury	EPA 1631	0.5	µg/L	Runoff, Infiltration, Groundwater
Zinc (Total and Dissolved)	EPA 200.8	1	µg/L	Runoff, Infiltration, Groundwater
Nutrients				
Ammonia as Nitrogen	SM4500-NH3 C	0.1	mg/L	Runoff
Nitrite (NO_2), Nitrate (NO_3)	EPA 300.0	0.1	mg/L	Runoff
Organic Compounds				
4,4'-DDE	EPA 8279C/EPA625	50	ng/L	Runoff, Infiltration, Groundwater
4,4'-DDT	EPA 8279C/EPA625	10	ng/L	Runoff, Infiltration, Groundwater
G-Chlordane	EPA 607	100	ng/L	Runoff, Infiltration, Groundwater

Physical Parameters

General water quality characteristics are listed below in ***Table 3***.

Table 3. Field Observations and Water Quality Measurements

Parameter	Equipment	Equipment Accuracy and Range	Calibrate	Applicable Water Quality Standard
Temperature	YSI EXO2 or equivalent	±0.01°C (-5 to 35°C) ±0.05°C (35 to 50°C)	Calibrate <24 hours	None
Dissolved Oxygen (DO)	YSI EXO2 or equivalent	±0.1mg/L (0 to 20mg/L)	Calibrate <24 hours	None
pH	YSI EXO2 or equivalent	±0.1 pH units (0 to 14 pH)	Calibrate <24 hours	Title 22 Hazardous Waste (pH > 2 and < 12.5)
Turbidity	YSI EXO2 or	±0.3 NTU	Calibrate	None

	equivalent	(0-1000 NTU)	<24 hours	
Specific Conductivity	YSI EXO2 or equivalent	±.001 mS/cm (0 to 100 mS/cm)	Calibrate <24 hours	None
Color	Observation	--	--	None
Odor	Observation	--	--	None

Field Equipment

Prior to the start of construction, area-velocity flow meters will be utilized to continuously measure flow rate and volume discharged from the drainage areas. A telemetric system will be established for remote access to real time flow data. If permanent sensors cannot be installed, flow will be measured during site visits using a portable hand-held instrument when flow is adequate, or by using an alternative method, during low flow conditions. A level sensor will be installed inside the catch basin to determine the amount of water being captured. General water quality measurements (listed in Table 3 above) will be recorded concurrently with sampling events using a multi-parameter sonde.

Sample Types and Holding Requirements

Sample handling requirements are summarized in ***Table 4***. All sample bottles must be identified with the project title, appropriate identification number, analyses to be performed, date and time of sample collection, and sampler's initials. A field duplicate and a field blank will be included for each sampling event.

Samples must be stored on ice in a cooler during transport to the laboratory. Chain-of-custody (COC) forms are completed by the sampler for all samples, placed in a plastic envelope and kept inside the cooler with the samples. The laboratory staff is responsible for inspecting the condition of the samples, signing the COC, and reconciling the label information to the COC form. At this point, the laboratory becomes responsible for sample custody. Samples may be disposed of when the analysis is completed, and all analytical quality assurance/quality control procedures are reviewed and accepted.

Table 4. Sample Types, Required Volume, and Handling Requirements

Constituents	Sample Volume/ Mass	Containers (#, size and type)	Preservation	Holding Time
Bacteria	500mL	(1) 500mL Plastic (sterile)	Store Cool at 6ºC	6 hours

Metals	1L	(1) 1L Plastic Acid washed	Store Cool at 6ºC	6 months
Nitrate (NO_3-N) Nitrite (NO_2-N)	500 mL	(1) 500 mL Plastic Bottle	Store Cool at 4ºC	48 hours
Total Ammonia (NH_3-N) Total Nitrogen	500 mL	(1) 500 mL Plastic Bottle	Store Cool at 4ºC Add sulfuric acid, pH < 2	28 days
Total Suspended Solids	1000 mL	(1) 1000 mL Plastic Bottle	Store Cool at 4ºC	7 days

4. Data Quality Objectives

This monitoring plan will ensure high-quality data, evaluated by its comparability, representativeness, and completeness.

Comparability of the data is defined as the similarity of data generated by different monitoring programs. For this monitoring plan, this objective will be ensured by standardization of procedures for field measurements, sample collection, sample preparation, laboratory analysis, and site selection; adherence to quality assurance protocols and holding times; and reporting in standard units.

Representativeness is defined as the degree to which the environmental data generated by the monitoring program accurately and precisely represent actual environmental conditions. Data accuracy is the closeness of data to the true environmental value, whereas data precision is the closeness of two or more measurements to each other. Representativeness will be ensured by the methodical selection of characteristic sampling locations, methods, and parameters; calibration of measurement instruments; and validation of data using quality control samples. Quality control samples include field blanks to verify data accuracy and field duplicates to verify data precision.

Data completeness is a measure of the amount of successfully collected and validated data relative to the amount of data planned to be collected for the project. A project objective for percent completeness is based on the percentage of the data needed for the program or study to reach valid conclusions.

Quality assurance and quality control, including standard methods and procedures as well as data management and validation, will follow standards set by the Watershed Protection Program Quality Assurance Project Plan (WPPQAPP).

5. Data Management and Reporting

Data management will involve field staff (WPD), as well as laboratory staff (EMD/contract laboratory). WPD will record and maintain all field data collected during sampling events. This field log sheet will register all information during a particular sampling event, such as date, time, name of field personnel, sampling location, sample ID, name of sampling program, and visual inspection of the site as well as additional comments that may be relevant to the Project. All field data will be entered into a digital database. EMD/contract laboratory will record and log all samples analyzed, and all laboratory data will be entered into Laboratory Information Management System (LIMS). Upon validation from each respective laboratory supervisor, EMD/contract laboratory will submit the validated data electronically to WPD. Field log sheets and hard copies of lab results will be filed in a project specific folder at WPD. Data files will have an access log showing activities and changes made to the file. All data files, at WPD and EMD/contract laboratory, are saved on a network drive and are backed-up in an archive. Records will be maintained for a minimum of five years after project completion. All data will be compiled and reviewed by WPD's Field Team Coordinator. Final approval and validation of the data will be conducted by WPD's Project QA Officer.

Monitoring Reports that summarize the findings of this monitoring program will be prepared by Watershed Protection according to the requirements of the Safe Clean Water Program and/or by request of the Project Manager. These reports will include basic elements such as an overview of monitoring activities, a thorough assessment of all data collected, including tables summarizing sampling events, comparisons to applicable standards, and graphs depicting spatial and temporal patterns among constituents and a summary of the results, and conclusions based on the salient findings. The format of these reports may vary according to the requirements they are meeting, or the information they are conveying. An adaptive approach to monitoring reports or summaries will be taken as the requirements of the Safe Clean Water program are finalized.

6. Adaptive Management

An adaptive approach to monitoring will be crucial in order to provide the most useful information for the design and operation of the Project. The schedule, water quality parameters, and monitoring equipment may be modified depending on changes to Project design, regulatory revisions, and advances in new scientific technology. Monitoring may also be adapted to the needs of the project as they develop, e.g., additional needs to assess impacts on the environment or public health, optimization data, and/or data that may be needed to determine maintenance protocols and schedules.

Attachment 1. Monitoring Equipment Costs

Item Description	Qty	Unit Cost	Extended Cost	Replacement Cycle (yr)
Campbell Scientific Weather Station	1	$2,400	$2,400	10
Campbell Scientific Datalogger CR1000	1	$1,800	$1,800	10
Campbell Scientific Communication Hardware	1	$3,800	$3,800	10
Geotech Groundwater Sampling Pump Kit	1	$3,000	$3,000	5
YSI Multiparameter Sonde (Model EXO2)	1	$7,600	$7,600	5
YSI EXO Handheld Display Unit	1	$3,400	$3,400	5
YSI EXO Sonde Sensors	1	$12,000	$12,000	2
ISCO 6712FR Sampler with 4 Bottle Configuration	4	$8,000	$32,000	5
ISCO Flow Sensor	3	$1,300	$3,900	5
ISCO Flow Module	3	$2,400	$7,200	5
ISCO Communication Hardware	4	$4,000	$16,000	5
Solinst Levelogger Edge Water Level Datalogger	1	$300	$300	10
Monitoring Equipment Enclosure (stainless steel)	4	$9,200	$36,800	15
Ruggedized Laptop Computer	1	$5,300	$5,300	10
Utility Trailer (On-site secure housing for Monitoring Equipment)	1	$3,400	$3,400	10
		Total	**$138,900**	

Attachment 2. Monitoring Labor and Laboratory Analysis Costs

Pre-Construction (Baseline Monitoring)			
Item Description	**Annual Cost**	**Years**	**Extended Cost**
Laboratory Analysis	$33,800	2	$67,600
Labor: Sampling & Observations	$7,500	2	$15,000
Labor: Real-time Monitoring Systems (O&M)	$6,000	2	$12,000
Labor: Data Management & Reporting	$7,500	2	$15,000
Subtotal	**$54,800**	**2**	**$109,600**

Post-Construction (BMP Effectiveness Monitoring)			
Item Description	**Annual Cost**	**Years**	**Extended Cost**
Laboratory Analysis	$52,000	3	$156,000
Labor: Sampling & Observations	$9,200	3	$27,600
Labor: Real-time Monitoring Systems (O&M)	$6,000	3	$18,000
Labor: Data Management & Reporting	$9,200	3	$27,600
Subtotal	**$76,400**	**3**	**$229,200**

Total **$338,800**

Attachment 3. Monitoring Cost Summary (First 5 Year Period)

Monitoring Cost Summary (First 5 Year Period)			
Item Description	**Annual Cost**	**Years**	**Extended Cost**
Pre-Construction Monitoring	$54,800	2	$109,600
Post-Construction Monitoring	$76,400	3	$229,200
Monitoring Contingency (5% of Monitoring Total)	$6,560	3	$19,680
Equipment Initial Purchase Cost	$138,900	-	$138,900
Equipment Replacement Cost	$4,167	3	$12,501
Subtotal			**$509,881**

Note:

The costs associated with Long-Term O&M Monitoring are not shown here, because this phase of monitoring will be funded by the Project's O&M budget. Additionally, Long-Term O&M monitoring is contingent upon the findings from the 3-year post-construction period as well as the operational needs of the Project and will be adapted as such. If significant additional monitoring costs are incurred following Post-Construction, these costs will be absorbed by the Project's contingency funds.

ATTACHMENTS FOR SECTION 2.6:

O & M

2.6 Operations and Maintenance

The operations and maintenance (O&M) activities will include inspection and cleaning of the diversion structures, slide gates, hydrodynamic separators, desilting basins, and infiltration galleries. Part of the cleaning process may include vacuuming accumulated materials and replacing necessary accessories as needed for each facility. Responsibility for the maintenance of the recreational features will be with the Department of Recreation and Parks. An overview of the O&M requirements for the Project's stormwater components are outlined in Table 1.

Table 1 Typical O&M Guidelines

BMP Component	O&M Plan
Diversion Structures, Maintenance Holes, and Desilting Basin	Structures shall be periodically inspected and maintained to prevent accumulation of debris and potential for vector breeding.
	If vector breeding is occurring at a site from contained stormwater or inadequately maintained BMPs, the Greater Los Angeles County Vector Control District can fine site owners for violating the California Health and Safety Code (Section 2060 – 2067).
Infiltration Facilities	Regular inspections shall take place to ensure that the pretreatment sediment removal BMP is working efficiently.
	The infiltration facility shall be maintained to prevent clogging. Maintenance activities include checking for debris/sediment accumulation and removing such debris with a vacuum truck.
Permeable Pavement Operations and Maintenance	Check for sediment accumulation to ensure that flow onto the permeable pavement is not restricted. Remove any accumulated sediment. Stabilize any exposed soil.
	Portions of pavement should be swept with a vacuum street sweeper at least twice per year or as needed to maintain infiltration rates.
	Tasks include trash collection, sweeping, and spot weeding. Ensure landscaping materials (soil, mulch, grass clippings, etc.) are not stockpiled on permeable pavement surfaces.

A draft estimate of O&M activities and costs is included in Table 2. This estimate includes the number of crew needed per event, hours per event, staff expertise, and projected O&M costs per year. Note that an updated O&M cost estimate is available in the Attachment for Section 7.1 (Cost & Schedule). A detailed O&M plan will be developed during the design phase.

Table 2 Draft Estimate of O&M Activities

Description	No. of Times per year	No. of Personnel	Hours Per visit	Personnel Expertise Level	Unit Price	Annual Total
Common Maintenance						**$ 15,000**
Vacuum Truck Rental	6				$ 2,500	$ 15,000
Diversion and Pre-Treatment						**$ 42,000**
Diversion Structure - Inspection and Cleaning	6	2	4	Trash Removal Crew	$ 2,500	$ 15,000
Slide Gates/Valves Maintenance	2	2	5	Trash Removal Crew	$ 1,500	$ 3,000
Pre-treatment - Inspection and Cleaning (Vacuum)	6	2	5	Vactor Truck Operator	$ 1,500	$ 9,000
Pipeline and Maintenance holes - Inspection and Cleaning	6	2	4	Trash Removal Crew	$ 2,500	$ 15,000
Infiltration Gallery						**$ 67,500**
Dry Season Inspection and Cleaning (Vacuum)	3	2	5	Vactor Truck Operator	$ 7,500	$ 22,500
Wet Season Inspection and Cleaning (Vacuum)	6	2	5	Vactor Truck Operator	$ 7,500	$ 45,000
Electrical Service, Controls, Instrumentation						**$ 7,700**
Electrical Usage	12				$ 225	$ 2,700
Electrical and Instrumentation Maintenance	1	2	4	Electrician	$ 5,000	$ 5,000
					Total Estimated O&M Cost	**$ 132,200**

Safe, Clean Water Program
Operations and Maintenance Commitment

The Los Angeles Department of Water and Power (LADWP) proposes to implement three stormwater capture projects that will be constructed on facilities owned by the City of Los Angeles. These projects will treat stormwater runoff and recharge the San Fernando Groundwater Basin. These projects include the following:

- David M. Gonzales Recreation Center Stormwater Capture Project
- Valley Plaza Park Stormwater Capture Project
- North Hollywood Park Stormwater Capture Project

As required by the City of Los Angeles Charter Section 580 (see attached), the operations and maintenance commitments of the projects are the responsibility of the Los Angeles Department of Public Works, with the Bureau of Sanitation and Environment (LASAN) as the responsible Bureau. LASAN is responsible for collecting, cleaning, and recycling solid and liquid waste, including stormwater and urban runoff within the City of Los Angeles. LASAN will own, operate, and maintain the water quality components of these projects as part of LASAN's fixed assets.

As Inter-City agencies, LADWP will coordinate with LASAN for operations and continued maintenance throughout the useful lives of the projects.

If you have any questions or require additional information, please contact Mr. Art Castro, Manager of LADWP's Watershed Group, at (213) 367-2966.

Print

Los Angeles Charter and Administrative Code

Sec. 514. Transfer of Powers.

(a) **Charter Created Powers and Duties.** The Mayor may propose the transfer of any of the powers, duties and functions of the departments, offices and boards of the City set forth in the Charter to another department, office or board created by the Charter or by ordinance. The transfer shall be effective if approved by ordinance adopted by a two-thirds vote of the Council, or if the Council fails to disapprove the matter within 45 days after submittal by the Mayor of all documents necessary to accomplish the transfer, including the proposed ordinance transferring powers, duties or functions, and any related ordinances or resolutions concerning personnel or funds affected by the transfer. The Council on its own initiative may, by ordinance, adopted by a two-thirds vote of the Council, subject to the veto of the Mayor or by a three-fourths vote of the Council over the veto of the Mayor, make any such transfer.

(b) **Exceptions.** The power of the Mayor and Council to act as provided in this section shall not extend to:

(1) Elected Offices;

(2) Proprietary Departments;

(3) Los Angeles City Employees' Retirement System;

(4) Department of Fire and Police Pensions;

(5) City Ethics Commission;

(6) The disciplinary functions of the Fire Department and the Police Department as contained in Sections 1060 and 1070; and

(7) The Police Department and the Fire Department, if the transfer or consolidation would significantly alter or affect the primary purpose or character of the departments.

(c) **Ordinance Created Powers and Duties.** Powers, duties and functions established by ordinance may be transferred or eliminated by an ordinance proposed by the Mayor or Council. If the Mayor proposes a transfer or elimination, the action shall be effective if approved by ordinance adopted by a majority vote of the Council, or if the Council fails to disapprove the matter within 45 days after submittal by the Mayor of all documents necessary to accomplish the transfer or elimination, including the proposed ordinance transferring powers, duties or functions, and any related ordinances or resolutions concerning personnel or funds affected by the transfer or elimination.

Print

Los Angeles Charter and Administrative Code

Sec. 580. Public Works Department Powers and Duties.

The Department of Public Works shall have the following powers and duties:

(a) design, construct, excavate and maintain streets and public works improvements including but not limited to bridges, public parkways and rights-of-way, sanitary sewers and storm drains, water and sewer treatment facilities, landfills and public rights-of-way lighting facilities owned by the City;

(b) design and construct public buildings belonging to the City, except those under the jurisdiction of the Proprietary Departments and the Department of Recreation and Parks;

(c) dispose of solid waste; and

(d) perform other duties as may be assigned by ordinance, if not inconsistent with Section 514.

ATTACHMENTS FOR SECTION 3.2:

24-HOUR STORM CAPACITY

ATTACHMENTS FOR SECTION 3.3:

EVENT-BASED DESIGN DETAILS

ATTACHMENTS FOR SECTION 3.4:

LONG-TERM PERFORMANCE

ATTACHMENTS FOR SECTION 4.1:

NEXUS

4.1 Nexus

The figure below depicts a visual representation of the anticipated flow regime and how the water supply benefit is realized. Confirmation of the groundwater augmentation benefit is included in the following pages.

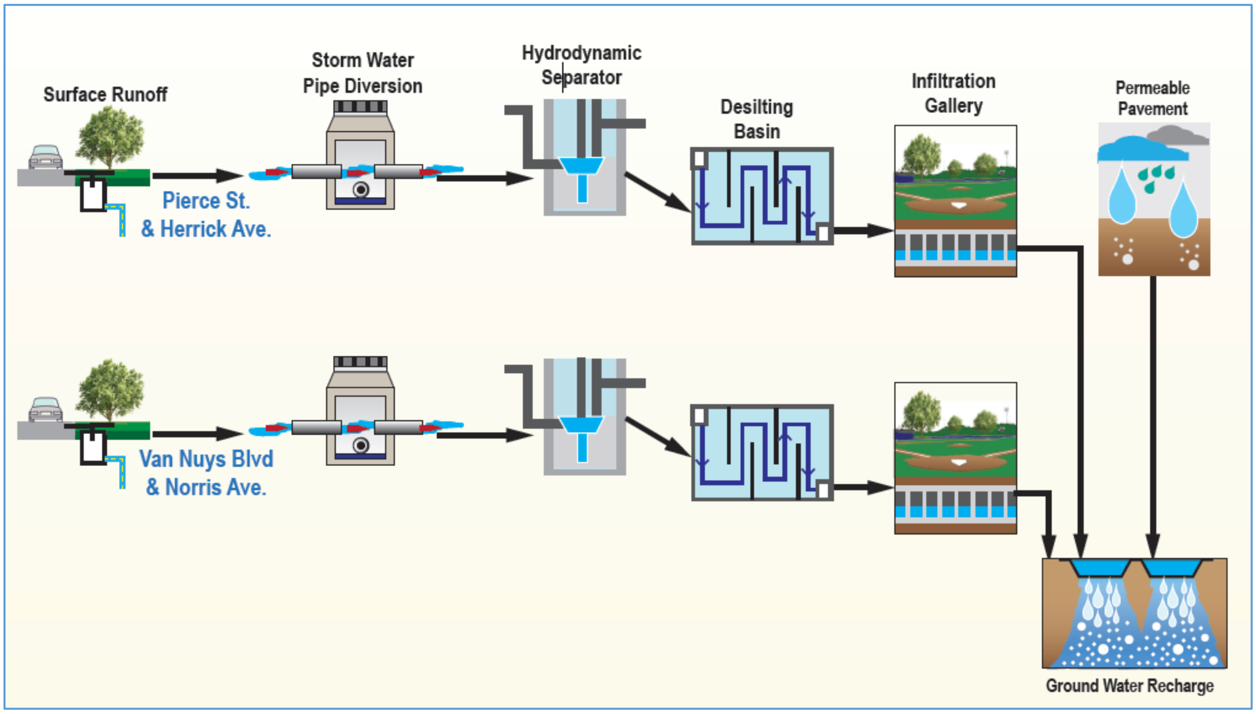


Figure Process Flow Diagram

Safe, Clean Water Program
Groundwater Supply Confirmation

The Los Angeles Department of Water and Power (LADWP) proposes to implement three stormwater capture projects that will be constructed on facilities owned by the City of Los Angeles. These projects will treat stormwater runoff and recharge the San Fernando Groundwater Basin. These projects include the following:

- David M. Gonzales Recreation Center Stormwater Capture Project
- Valley Plaza Park Stormwater Capture Project
- North Hollywood Park Stormwater Capture Project

Each project is a part of an overall long term plan to enhance local water supply reliability. The principle of the projects involve capturing rainfall and runoff from open space and urban surface areas for either direct use or groundwater recharge.

The projects will capture and infiltrate stormwater through the use of diversion structures, catch basins, hydrodynamic separators, pump stations, underground infiltration galleries, and other stormwater components to recharge the San Fernando Groundwater Basin. The estimated annual wet weather capture volume was modeled using the EPA's Storm Water Management Model (SWMM 5.1) using 10-year historical rain data (1997-2007). The dry weather contribution was estimated based on low flow diversion monitoring data from 2012 to 2016, where the median value for dry weather runoff is approximately 84 gallons per day per impervious acre of land. The estimated combined total groundwater supply benefit based on this preliminary assessment is 2,100 acre-feet per year for these projects.

As a part of the Stormwater Capture Parks Program, these projects provide water supply, water quality and other multi-benefits to help achieve Los Angeles County's objectives as defined by the Safe, Clean Water Program Ordinance. Fully endorsed by the Upper Los Angeles River Area (ULARA) Watermaster, these projects are key to restoring and maintaining the health of the San Fernando Basin.

If you have any questions or require additional information, please contact Rafael Villegas, Manager of LADWP's Water Rights and Groundwater Management Group, at (213) 367-1289.

ATTACHMENTS FOR SECTION 4.2:

BENEFIT MAGNITUDE

ATTACHMENTS FOR SECTION 4.3:

COST EFFECTIVENESS

ATTACHMENTS FOR SECTION 5.1:

COMMUNITY INVESTMENT

5.1 Community Investment Benefits

Investing in this disadvantaged community, which has also been designated as a high park needs area, is central to the Project. The Project concept was developed incorporating comments received from the community and the public at large during public engagement sessions. Design and construction of the Project will create a significant number of new jobs while prioritizing local hire, and upon completion, the Project will enhance the fabric of the community by upgrading the park. Six distinct community investment benefits are expected to be achieved by the Project, with at least 40 trees added by the Project. LADWP is coordinating with the Trust for Public Land to add an additional 55 trees to the proposed grove of trees at the park, for a total of up to 95 new trees. Other key features include a new playground, basketball court, handball court, natural multipurpose soccer field, upgraded ball fields with integral shade structures, upgraded athletic equipment, new park benches, hydration stations, educational signage, a new LED sports lighting system, new sod, enhanced irrigation at the park, proposed EV chargers, and a permeable pavement parking lot with native landscaping.

Note that adding 95 trees would not restrict installation of the recreational improvements discussed. However, due to limited space, it is possible that planting 95 trees at the park would limit expansion of recreational features beyond the existing scope, such as including a second soccer field. The benefits described in this section of the SCW Projects Module are based on the minimum net increase of the 40 trees that are confirmed as part of the Project. It is expected that the additional trees that are likely to be planted as a result of coordination with the Trust for Public Land will add significant benefits for the area and the Project.

5.1.1 Improved flood management, flood conveyance, or flood risk mitigation

As shown in Figure 1, under current conditions there are a significant number of flooding complaints that have been reported within a two-mile radius of the drainage area that will be served by the Project. This portion of the San Fernando Valley has a well-documented history of flooding issues that are especially severe during large storm events.

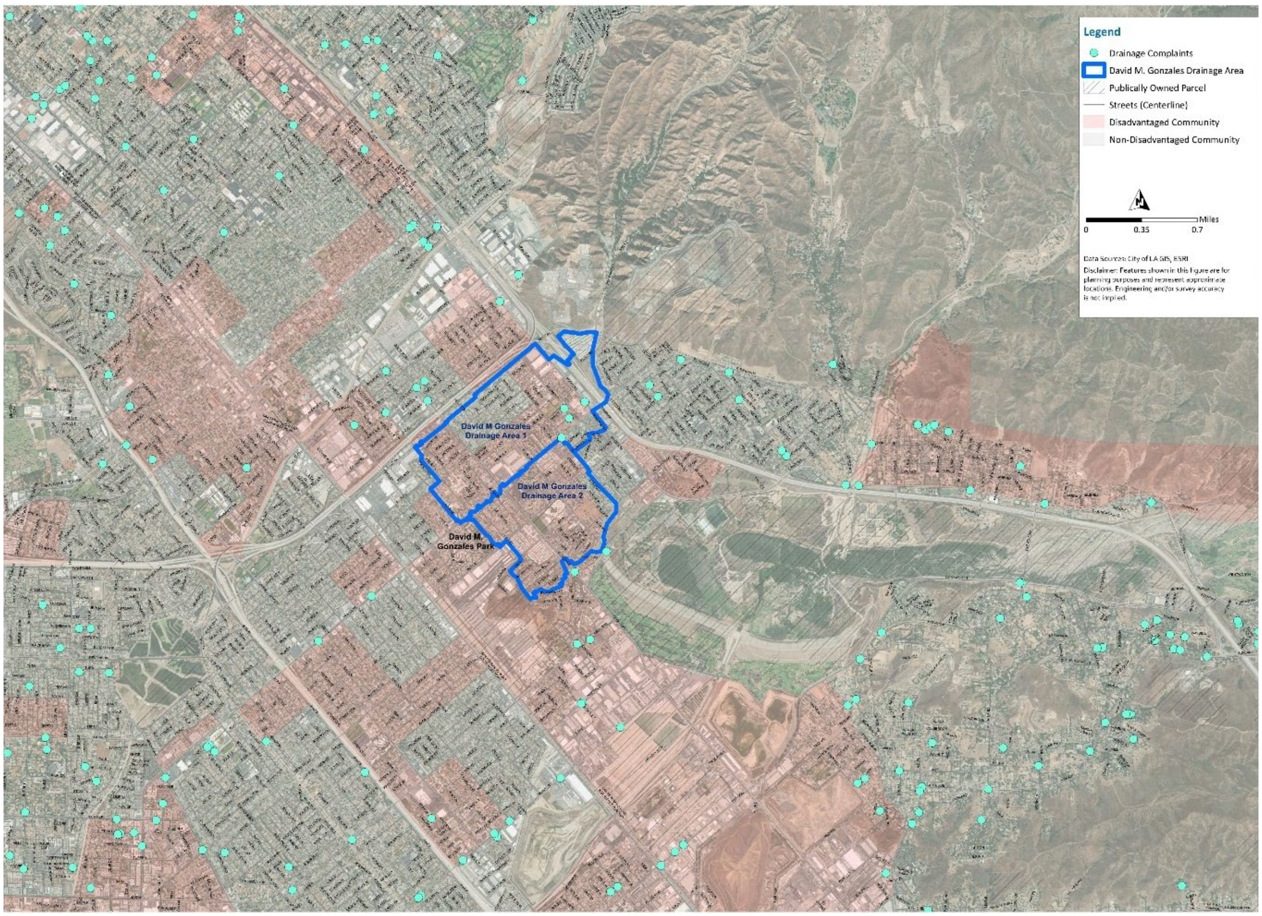


Figure 1 Flooding Complaints in the Vicinity of David M. Gonzales Recreation Center

5.1.2 Creation, enhancement, or restoration of parks, habitat, or wetlands

As shown in Figure 2, at certain times during the year the existing field becomes barren due to a lack of sufficient irrigation to keep existing vegetation alive. The Project will include new grass throughout the park and a new irrigation system that will allow the community to enjoy the park, facilitate the upkeep of the turf areas, allow park maintenance staff to more easily avoid dry conditions. The Project will also add a minimum of 40 California-native trees. For more detail, please refer to Section 5.1 (Community Investment Benefits) of the SCW Projects Module. More detail on recreational features is included in Section 5.1.4 below.

Figure 2 Dry Conditions at David M. Gonzales Recreation Center

5.1.3 Improved public access to waterways

The Project does not claim to improve access to waterways.

5.1.4 Enhanced or new recreational opportunities

Figure 3 illustrates key recreational improvements at David M. Gonzales Recreation Center. Note that recreational features will be finalized with feedback from the community and with approval from RAP. Please refer to Section 5.1 (Community Investment Benefits) of the SCW Projects Module for details.

5.1.5 Greening of schools

The Project will add a minimum of 40 California-native trees, many of which will be clustered in a grove where the park and Pacoima Elementary School come together. The school has a gate that effectively makes the park an extension of the school playgrounds, which will allow the students to enjoy the ecosystem benefits of the trees, as well as the new playground, on a daily basis. Figure 3 illustrates the location of the school and the tree placement.

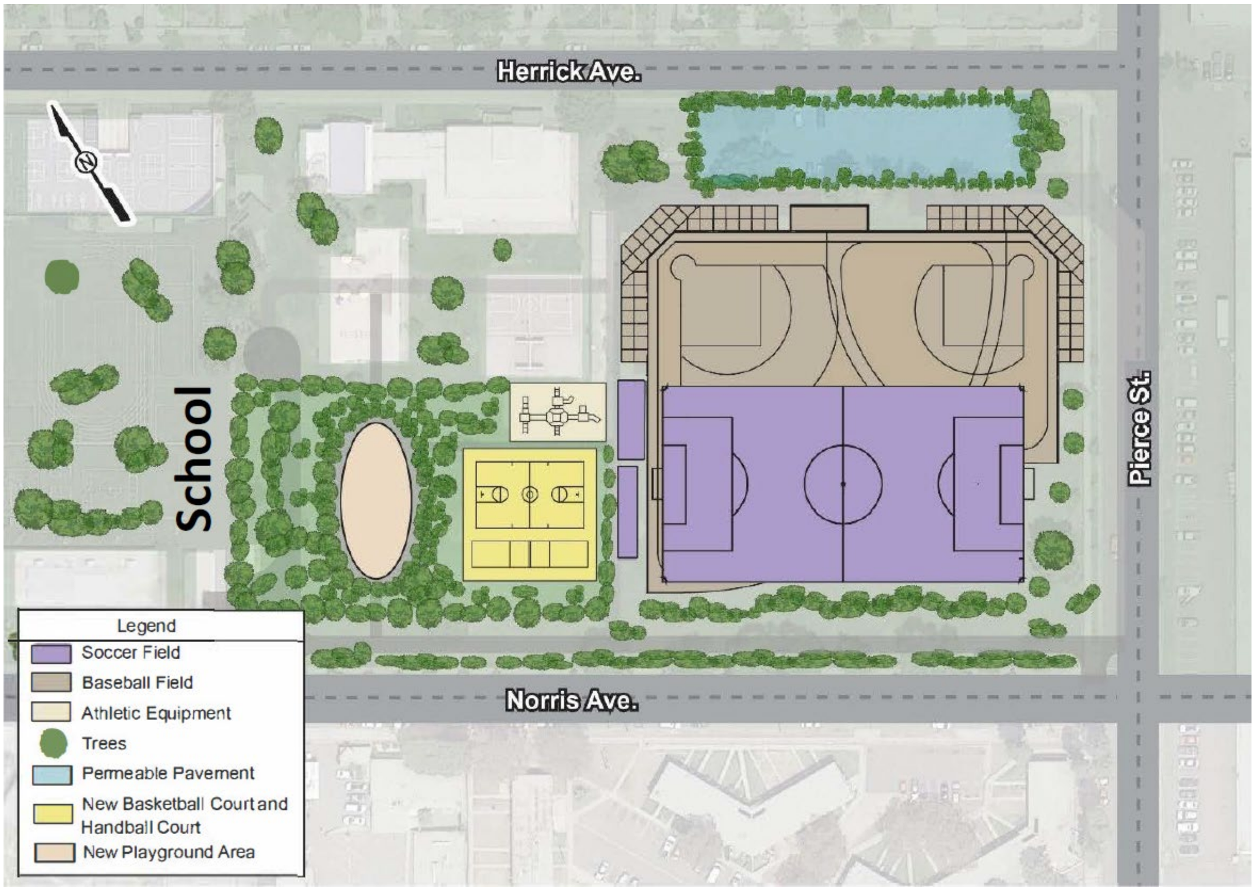


Figure 3 Overview of Above-Ground Project Improvements

5.1.6 Reducing local heat island effect and increasing shade

Please refer to Section 5.1 (Community Investment Benefits) of the SCW Projects Module.

5.1.7 Increasing shade or the number of trees or other vegetation

Please refer to Section 5.1 (Community Investment Benefits) of the SCW Projects Module.

5.2 Local Support (Outreach)

Figure 4 depicts an example of outdoor banners that have been placed at the park, providing information to the public and guiding members of the community to an online survey that solicits community feedback.

Figure 4 Example Outreach Banners

Table 1 provides a summary of outreach conducted by the time of submittal of this report.

Table 1 Community Outreach Events Conducted

Forum	Audience	Date	Summary
Virtual – WebEx	Council District 7	June 10, 2020	Presented overview of Project and Project details, and answered staff questions.
Virtual – Zoom	Key stakeholders	July 15, 2020	Presented overview of Project and Project details, and answered stakeholder questions.
Virtual – Zoom	Community	August 22, 2020	Presented overview of Project and Project details, and answered questions from the community.

The Project was able to garner support from several organizations because it provides crucial benefits to the disadvantaged community, ranging from improved recreational opportunities to an enhanced local ecosystem with air quality benefits for the area within the vicinity of the underserved park. This application includes support letters from Pacoima Beautiful, Council for Watershed Health, Mountains Recreation and Conservation Authority, ULAR EWMP Watershed Management Group, and City of Los Angeles Council District 7.

6.1 Nature-Based Solutions

The parking lot for the park will be replaced with permeable pavement and will include native landscaping, as shown in Figure 5.

Figure 5 Illustration of Proposed Improvements to the Parking Lot at David M. Gonzales Recreation Center Before (Left) and After (Right)

Table 2 is an example initial tree list, but specific species of trees and other plants will be confirmed during the detailed design phase of the Project.

Table 2 Example Tree Species

Recommended Trees for Turf Areas	Recommended Trees for Dry Non-turf Areas
Afrocarpus gracilior	Cercis occidentalis
Arbutus 'Marina'	Chilopsis linearis 'Bubba' or 'Timeless Beauty'
Dalbergia sissoo	Dalbergia sissoo
Geijera parviflora	Hesperocyparis forbesii
Handroanthus impetiginosus	Leptospermum 'Dark Shadows'
Jacaranda mimosifolia	Parkinsonia 'Desert Museum'
Lophostemon confertus	Pinus eldarica
Pinus torreyana	Quercus agrifolia (natural form)
Pinus eldarica	Tecoma stans
Pistacia chinensis	Vachellia farnesiana
Pistacia 'Red Push'	Vitex agnus-castus
Prosopis 'Maverick'	
Quercus agrifolia (natural form)	
Quercus buckleyi	
Quercus shumardii	
Taxodium mucronatum	
Tipuana tipu	

ATTACHMENTS FOR SECTION 5.2:

LOCAL SUPPORT

Pacoima Beautiful

ENVIRONMENTAL EDUCATION, LEADERSHIP DEVELOPMENT & ADVOCACY

August 24, 2020

Mr. David R. Pettijohn, Director of Water Resources
Los Angeles Department of Water and Power
111 North Hope Street, Room 1460
Los Angeles, CA 90012

Subject: Stormwater Capture Parks Program

Dear Mr. Pettijohn,

On behalf of Pacoima Beautiful, we are pleased to support the Los Angeles Department of Water and Power's (LADWP) implementation of the Stormwater Capture Parks Program (Program).

The Program will provide improvements that will benefit both the community and the urban watershed. This includes replenishing the San Fernando Groundwater Basin with up to 2,912 acre-feet of stormwater per year from a 5,686-acre drainage area, improving the water quality in the Los Angeles River, alleviating localized flooding, and enhancing recreational amenities across nice parks.

Pacoima Beautiful is a grassroots organization that has long supported policies, programs and projects that will create a safer and cleaner community. The Program is aligned with Pacoima Beautiful's mission to promote a healthy and sustainable San Fernando Valley.

As a result, I fully support the Program and LADWP's application for funding through the Los Angeles County's Safe Clean Water Program.

If you have any questions about this letter of support, please contact me at (818) 899-2454 or via email at vpadilla@pacoimabeautiful.org.

Sincerely,

Veronica Padilla

Veronica Padilla
Executive Director

Cc: Mr. Art Castro
Manager of Watershed Management
Los Angeles Department of Water and Power
111 North Hope Street, Room 308
Los Angeles, CA 90012

COUNCIL FOR
WATERSHED HEALTH

November 20, 2019

Mr. David R. Pettijohn, Director of Water Resources
Los Angeles Department of Water and Power
111 North Hope Street, Room 1460
Los Angeles, CA 90012

Subject: Letter of Support for the Stormwater Capture Park Program

Dear Mr. Pettijohn,

On behalf of Council for Watershed Health, we are pleased to support the Los Angeles Department of Water and Power's (LADWP) implementation of the $230.1 Million Stormwater Capture Parks Program (Program). The Program will provide improvements that will benefit both the community and the urban watershed. This includes replenishing the San Fernando Groundwater Basin with approximately 2,900 acre-feet of stormwater per year, improving the water quality in the Los Angeles River, alleviating localized flooding, and enhancing recreational amenities. The following nine projects comprise the Program with estimated annual yields:

- Strathern Park North – 294 AFY
- Valley Plaza Park North – 457 AFY
- Valley Plaza Park South – 136 AFY
- Whitsett Fields Park North – 98 AFY
- Alexandria Park – 91 AFY
- North Hollywood Park – 1,176 AFY
- Valley Village Park – 134 AFY
- Fernangeles Park – 192 AFY
- David M. Gonzales Rec Center – 335 AFY

Our Vision 2025 inspires Council for Watershed Health to work toward a Southern California that is a model of sustainable, urban watershed management, with clean waters, reliable local water supplies, restored native habitats, ample parks and open spaces, integrated flood management, and revitalized rivers and urban centers. We believe the proposed suite of LADWP multi-benefit park project enhancements will be an important step towards increasing localized stormwater capture potential while improving water quality in our rivers and ocean. As a result, we fully support the Project and LADWP's application for funding through the Los Angeles County's Safe Clean Water Program. If you have any questions, please feel free to contact me at eileen@watershedhealth.org or by phone at 213-229-9945.

Sincerely,

Eileen Alduenda
Executive Director, Council for Watershed Health

Cc: Mr. Art Castro | Manager of Watershed Management
Los Angeles Department of Water and Power
111 North Hope Street, Room 308
Los Angeles, CA 90012

MOUNTAINS RECREATION & CONSERVATION AUTHORITY
Los Angeles River Center & Gardens
570 West Avenue Twenty-Six, Suite 100
Los Angeles, California 90065
Phone (323) 221-9944 Fax (323) 221-9934

November 22, 2019

Mr. David R. Pettijohn, Director of Water Resources
Los Angeles Department of Water and Power
111 North Hope Street, Room 1460
Los Angeles, CA 90012

Subject: Letter of Support for the Stormwater Capture Park Program

Dear Mr. Pettijohn,

On behalf of Mountains Recreation & Conservation Authority (MRCA), we are writing in support of the Los Angeles Department of Water and Power's (LADWP) implementation of the $230.1 Million Stormwater Capture Parks Program (Program). The Program will provide improvements that will benefit both the community and the urban watershed. This includes replenishing the San Fernando Groundwater Basin with approximately 2,900 acre-feet of stormwater per year, improving the water quality in the Central Branch of Tujunga Wash and ultimately the Los Angeles River, alleviating localized flooding, and enhancing recreational amenities.

The Program complements efforts underway by our joint powers authority partner the Santa Monica Mountains Conservancy (SMMC), with support by the MRCA, to address the unique needs of the Upper Los Angeles River Watershed. The SMMC's legislatively created Upper Los Angeles River and Tributaries (ULART) Working Group is currently working on the development of a Revitalization Plan for the Upper Los Angeles River Watershed, as mandated by Assembly Bill 466 and Senate Bill 1126. The anticipated completion date of this plan is Spring/Summer 2020. The Revitalization Plan studies the Upper LA River and Tributaries and throughout this process and has identified upwards of 200+ Opportunity Areas throughout Aliso Canyon Wash, Pacoima Wash, Tujunga Wash, Verdugo Wash, Burbank Western Channel, and the Arroyo Seco.

LADWP staff have provided the ULART team with details on the Program's nine project sites that are located along the Central Branch of the Tujunga Wash and these sites will be included within the ULART Revitalization Plan as Opportunity Areas. Aside from an introductory analysis, the Working Group did not study the Central Branch of Tujunga Wash, yet the nine distributed project sites of LAWDP's Program offer an excellent way from top to bottom to implement a water quality and re-use system. The Program benefits the Working Group's effort because it essentially further expands the identified projects throughout the ULART area, without significant resources needing to be utilized by the ULART team. We hope that the Program can go further to implement varying kinds of multi-benefit green infrastructure improvements that will complement the type of projects proposed in the ULART Revitalization Plan (e.g. use of natural systems, regional connectivity, wildlife corridors, tree planting for urban cooling, etc.) and encourage your staff to meet with the ULART team to identify how to further improve your proposed projects.

For these reasons, we support the Program and LADWP's application for funding through the Los Angeles County's Safe Clean Water Program. If you have any questions about this letter of support, please contact me at (323) 221-9944 ext. 190.

Sincerely,

Brian Baldauf
Chief of Watershed Planning

Cc: Mr. Art Castro
Manager of Watershed Management
Los Angeles Department of Water and Power
111 North Hope Street, Room 308
Los Angeles, CA 90012

October 8, 2020

Mr. David R. Pettijohn, Director of Water Resources
Los Angeles Department of Water and Power
111 North Hope Street, Room 1460
Los Angeles, CA 90012

Safe Clean Water Program

RE: Letter of Support for the Department of Water and Power's David M Gonzales, Valley Plaza North and South, and North Hollywood Park Projects under the Upper Los Angeles Enhanced Watershed Management Plan

Dear Watershed Area Steering Committee:

The Upper Los Angeles Watershed Management Group (ULAR WMG) would like to express our collective support for the Department of Water and Power's (DWP) David M Gonzales, Valley Plaza North and South, and North Hollywood Park Stormwater Capture Projects and their application for Measure W funding. As a collaborator on these Projects, we are well familiarized with the scope of intended work, which includes the construction of underground infiltration galleries to capture and infiltrate stormwater and dry weather flows, recharging the San Fernando Groundwater Basin, and tailored to meet our compliance efforts as detailed in the Upper Los Angeles River (ULAR) Enhanced Watershed Management Program (EWMP). In addition, it will provide vital community enhancement benefits in the form of park improvements and educational signage in an areal extent that is within—and surrounded by—Disadvantaged Communities (DAC).

The ULAR EWMP was developed with the intention of utilizing a multi-pollutant approach that maximizes the retention and use of urban runoff as a resource for groundwater recharge and irrigation, while also creating additional benefits for the communities in the ULAR watershed through a combination "toolbox" of Distributed and Regional Stormwater Projects to address applicable stormwater quality regulations. DWP's four Park Projects will target pollutants through volume capture from three LA River-adjacent subwatershed areas (664949, 665249, and 668649) that require 13-63% Critical Load Reduction to meet the City's compliance targets—and will capture, treat and store an incredible ~2300AF of collective flows annually during 85th percentile storm events—eliminating nearly all of the Regional BMP requirements in two subwatershed areas and exceeding the third. As such, the David M Gonzales, Valley Plaza North and South, and North Hollywood Park Projects are considered crucial Regional Projects of the ULAR EWMP Implementation Plan, helping us strive to achieve our Recipe for Final EWMP Compliance as detailed in Appendix 7.A.44-45 and 51.

The ULAR WMG recognizes the need and value of prioritizing stormwater projects within our ULAR Watershed Management Area (WMA) and are focused on high-priority Projects that best capture local water and reduces our reliance on imported sources—further strengthening the need for these Projects to be actualized to attain our Region's water quality and resiliency goals. As such, as the ULAR Watershed Lead—on behalf of the ULAR WMG—we offer our full support to the Department of Water and Power in its effort to obtain Measure W grant funding for their collective Park Projects. We are confident that these Projects will help to restore the water quality and beneficial uses of the LA River and contribute towards the overarching compliance efforts of the ULAR EWMP.

Sincerely,

Dawn M Petschauer

Dawn Petschauer
Upper LA River Watershed Lead
On behalf of the ULAR EWMP WMG

cc: Art Castro, Department of Water and Power
Peter Tonthat, Department of Water and Power
Noel Le, Department of Water and Power
Alfredo Magallanes, City of Los Angeles, LASAN

MONICA RODRIGUEZ
COUNCILWOMAN, 7TH DISTRICT

September 28, 2020

Dear Members of the Measure W Administrative Oversight Committee,

Please accept these written comments for the public record in regards to item four on the Measure W Administrative Oversight Committee Meeting agenda dated September 17, 2020. Due to technical difficulties, oral comments on behalf of Council District 7 were not heard in committee.

On behalf of Councilwoman Rodriguez, I would like to express our office's support for the David M. Gonzales Stormwater Capture Project being put forward by the Los Angeles Department of Water and Power (LADWP).

David M. Gonzales is a critical community recreation space in the park-poor neighborhood of Pacoima, adjacent to the San Fernando Gardens public housing community. Pacoima is a disadvantaged community, and ranks amongst the most heavily polluted in California according to CalEnviroScreen. Investments in this type of green infrastructure here are long overdue. We are thrilled at the multi-benefit aspects of this project:

The scope of work for this project includes many highly-desired community recreational amenities for the park. We know that these are, in fact, community driven desires because they were born from active community participation in Prop 68 community outreach meetings. There were 420 surveys collected for that effort, with an average of nearly 100 participants at each of the three public meetings. Unfortunately, even after this incredible participation, our community was disappointed to learn the City was not awarded funds for this project. The LADWP David M. Gonzales Stormwater Capture Project helps achieve several of those recreational scope elements.

Beyond recreation use, the project would fulfill various environmental goals outlined by the community in the Upper LA River and Tributaries (ULART) Master Plan, including watershed management, development of multiple benefit projects, reduction of flood risk, and engaging with underserved communities. David M. Gonzales's location just over a mile from the Pacoima Wash, a proposed project site in the ULART plan, could create a great linkage towards a connected network of multi-benefit water quality improvements that complement one another.

The Seventh District has not seen the level of investment necessary through previous initiatives to reverse the decades of environmental impacts it has faced, therefore, we are excited for the opportunity to bring long overdue investments through Measure W for this initiative.

For these reasons, we ask for this body's approval to move forward the David M. Gonzales Stormwater Capture Project, in order to advance our systemic vision towards environmental justice for this long-overlooked community.

Sincerely,

Paola Bassignana
Planning Deputy, 7th District

ATTACHMENTS FOR SECTION 7.1:

COST & SCHEDULE

7.1 Cost and Schedule

A breakdown of the Project capital cost is provided in Table 1. A more detailed construction cost estimate was produced for this Project and included in the following pages. In developing the cost estimate, the following factors were considered: local market conditions, labor prevailing wage rates, Caltrans' equipment rates, site accessibility, Los Angeles market factors, level of design, and risk factors. Quantity take-offs were developed based on the 30 percent design plans. The cost estimate does not explicitly include Taxes, Contractor Overhead, Profit and Risk or an owner's reserve for change orders. CEQA, Outreach and Legal Support are assumed to be included in the design costs and as such are not broken out in the table below.

Table 1 Capital Cost Estimate

Description		Item Total
STORMWATER CAPTURE PARKS PROGRAM		
General	$	367,500
Diversion and Pre-treatment	$	910,000
Yard Piping	$	1,681,710
Infiltration Gallery	$	14,108,452
Optional Overflow Facilities	$	413,685
Electrical Service, Controls, Instrumentation	$	300,000
Startup and Testing	$	20,000
Park Improvements	$	1,670,000
SUBTOTAL (1)	**$**	**19,471,347**
Mobilization – 2% of Subtotal (1)	$	389,427
Permits Allowances – 1.5% to 3% of Subtotal (1)	$	292,070
Other Allowances – 3% of Subtotal (1)	$	584,140
SUBTOTAL (2)	**$**	**20,736,984**
Estimating Contingency – 15% of Subtotal (2), used **15%**	$	3,110,548
SUBTOTAL (3)	**$**	**23,847,532**
Escalation – 3% per year of Subtotal (3), used **compound amount factor: (1+i)^n**	$	1,452,315
SUBTOTAL (4)	**$**	**25,299,846**
Construction Contingency – 15% of Subtotal (4)	$	3,794,977
TOTAL ESTIMATED PROJECT CONSTRUCTION COST	**$**	**29,095,000**
Project Right of Way Estimated Cost	$	-
Design Phases Cost[1], used **21.2%**	$	6,168,140
Construction Phases Cost[1], used **13.25%**	$	3,855,088
TOTAL ESTIMATED PROJECT COST	**$**	**39,118,228**

Notes:
1. Per City Budget Guidelines for Proposition O Projects

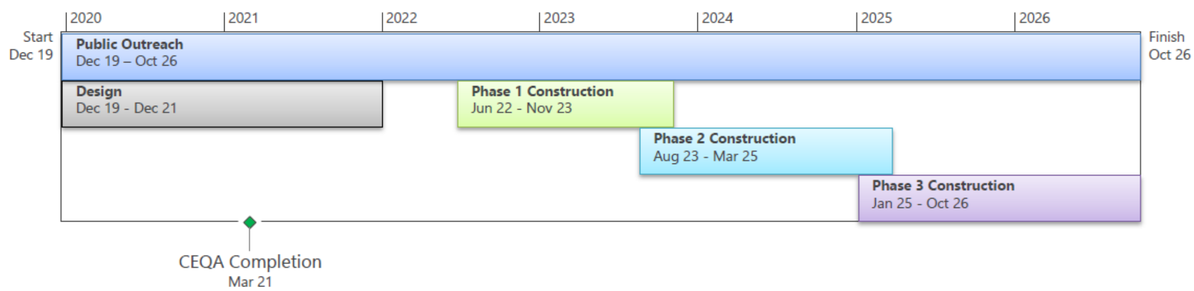
The O&M costs were developed on the basis that the City would maintain various components of the system throughout the 40-year life cycle. Refer to Table 2 for a summary of annual O&M costs. Monitoring costs were calculated as 0.5% of the capital cost for 40 years.

Table 2 Annual O&M Cost Estimate

Description	Frequency	No. of Times per Year	Unit Price	Total
Common Maintenance				**$ 21,000**
Vacuum Truck Rental	Bi-Monthly	6	$ 3,500	$ 21,000
Diversion and Pre-treatment				**$ 34,750**
Diversion Structure – Inspection and Cleaning	Bi-Monthly	6	$ 3,000	$ 18,000
Valves Maintenance	Annually	1	$ 1,500	$ 1,500
Pre-treatment – Inspection and Cleaning (Vacuum)	Bi-Monthly	6	$ 1,500	$ 9,000
Desilting Basin – Inspection and Cleaning	Every 2 Yrs	0.5	$ 7,500	$ 3,750
Pipeline and Manholes – Inspection and Cleaning	Annually	1	$ 2,500	$ 2,500
Infiltration Gallery				**$ 105,000**
Dry Season Inspection and Cleaning (Vacuum)	Annually	1	$ 7,500	$ 7,500
Wet Season Inspection and Cleaning (Vacuum)	Monthly	6	$ 15,000	$ 90,000
Deep Inspection and Cleaning	Every 2 Yrs	0.5	$ 15,000	$ 7,500
Electrical Service, Controls, Instrumentation				**$ 17,200**
Electrical Usage	Monthly	12	$ 600	$ 7,200
Electrical and Instrumentation Maintenance	As Needed	1	$ 10,000	$ 10,000
			TOTAL ESTIMATED O&M COST	**$ 177,950**

The Project's detailed design is expected to be complete in December of 2021. Construction is expected to commence in June 2022 and end in November 2023, for a total duration of about 1.5 years. A preliminary schedule is included in the figure below, and a detailed design schedule is included at the end of this attachment.

Figure Stormwater Capture Parks Program Schedule



Preliminary Construction Phasing*

Phase 1: Valley Village, Strathern, Fernangeles & D. M. Gonzales

Phase 2: Valley Plaza No. & North Hollywood Part 1

Phase 3: No. Hollywood Part 2, Valley Plaza So., Alexandria & Whitsett

*Construction schedules will be carefully managed and rolled out sequentially, as funding becomes available, to reduce impacts to the community.

BUREAU OF ENGINEERING
PROJECT CONSTRUCTION COST ESTIMATE

Project Title: Gonzales Park - Stormwater Capture Park Program

Scope:

Work Order:

Client Dept.: Bureau of Engineering

Project Manager:

Project Engineer:

Type of Estimate: ☐ Class "B" ☑ Class "C" ☐ Class "O"

Description	Unit	Quantity	Unit Price	Item Total
STORMWATER CAPTURE PARKS PROGRAM				
General				***$ 367,500***
Temporary Construction Fencing w Gates	LF	2,050	$ 50.00	$ 102,500
Protection of Existing Structures / Trees	LS	1	$ 15,000.00	$ 15,000
SWPPP Implementation	LS	1	$ 50,000.00	$ 50,000
Utility Relocation	LS	1	$ 100,000.00	$ 100,000
Traffic Control	LS	1	$ 100,000.00	$ 100,000
Diversion and Pretreatment				***$ 910,000***
Temporary Diversion During Construction	LF	1	$ 25,000.00	$ 25,000
Diversion Structure - Van Nuys Blvd	LS	1	$ 85,000.00	$ 85,000
Diversion Structure - Norris Ave	LS	1	$ 85,000.00	$ 85,000
Hydrodynamic Separator / Pretreatment Device	EA	2	$ 75,000.00	$ 150,000
Bypass Vault	EA	2	$ 75,000.00	$ 150,000
Isolation Valve 36"	EA	2	$ 35,000.00	$ 70,000
Pretreatment Device (HDS units)	EA	2	$ 90,000.00	$ 180,000
Desilting Basin - 40' x 64'	LS	1	$ 75,000.00	$ 75,000
Desilting Basin - 40' x 80'	LS	1	$ 90,000.00	$ 90,000
Yard Piping				***$ 1,681,710***
Piping to Storage (36" RCP)	LF	1,130	$ 350.00	$ 395,500
Manhole MH 1 DIA 60" 14' D	EA	1	$ 28,000.00	$ 28,000
Manhole MH 2 DIA 60" 12' D	EA	1	$ 24,000.00	$ 24,000
Manhole MH 3 DIA 60" 11' D	EA	1	$ 22,000.00	$ 22,000
Manhole MH 4 DIA 60" 11' D	EA	1	$ 22,000.00	$ 22,000
Excavation	CY	8,635	$ 9.00	$ 77,715
Native Backfill / Compaction	CY	6,908	$ 15.00	$ 103,620
Soil Export Offsite (NON-HAZ)	CY	1,727	$ 20.00	$ 34,540
Temporary Sheet Piling	SF	12,940	$ 35.00	$ 452,900
Trench Boxes - Manholes	EA	4	$ 5,000.00	$ 20,000
Trench Shoring - Pipelines	SF	27,120	$ 13.00	$ 352,560
Concrete Demolition & Disposal	SF	2,500	$ 3.50	$ 8,750
Pavement Demolition & Disposal	SF	6,750	$ 3.00	$ 20,250
Concrete Restoration	SF	2,500	$ 7.75	$ 19,375
Pavement Restoration	SF	6,750	$ 6.00	$ 40,500
Access Road	SF	10,000	$ 6.00	$ 60,000
Infiltration Gallery				***$ 14,108,452***
Clearing and Grubbing	SF	188,025	$ 0.50	$ 94,013
Excavation	CY	99,766	$ 9.00	$ 897,894
Structural Shoring Gallery #1	SF	11,200	$ 35.00	$ 392,000
Structural Shoring Gallery #2	SF	16,200	$ 35.00	$ 567,000
Soil Export Offsite (Non HAZ)	CY	58,704	$ 20.00	$ 1,174,080
Drain Rock (Aggregate Import)	CY	7,285	$ 50.00	$ 364,250
Filter Fabric - 2 Layers	SY	27,870	$ 5.50	$ 153,285
Native Backfill and Compaction	CY	41,062	$ 15.00	$ 615,930
Underground Storage Tanks	CF	1,500,000	$ 6.50	$ 9,750,000
Maintenance Holes - Access Hatches	EA	10	$ 10,000.00	$ 100,000
Optional Overflow Facilities				***$ 413,685***
Piping to Overflow (36" RCP)	LF	215	$ 350.00	$ 75,250
Piping to Overflow (48" RCP)	LF	80	$ 470.00	$ 37,600
Manhole MH 5 DIA 60" 15' D	EA	1	$ 30,000.00	$ 30,000

BUREAU OF ENGINEERING
PROJECT CONSTRUCTION COST ESTIMATE

Project Title: Gonzales Park - Stormwater Capture Park Program

Scope:

Work Order: Client Dept.: Bureau of Engineering

Project Manager: Project Engineer:

Type of Estimate: ☐ Class "B" ☑ Class "C" ☐ Class "O"

Description	Unit	Quantity	Unit Price	Item Total
Manhole MH 6 DIA 60" 13' D	EA	1	$ 26,000.00	$ 26,000
Overflow Channel	EA	2	$ 45,000.00	$ 90,000
Excavation	CY	1,715	$ 9.00	$ 15,435
Native Backfill / Compaction	CY	1,370	$ 15.00	$ 20,550
Soil Export Offsite (NON-HAZ)	CY	345	$ 20.00	$ 6,900
Trench Boxes - Manholes	EA	2	$ 5,000.00	$ 10,000
Trench Shoring - Pipelines	SF	5,400	$ 13.00	$ 70,200
Storm Drain Connections to Existing	LS	1	$ 15,000.00	$ 15,000
Trafffic Control	LS	1	$ 10,000.00	$ 10,000
Pavement Demolition & Disposal	SF	750	$ 3.00	$ 2,250
Pavement Restoration	SF	750	$ 6.00	$ 4,500
Electrical Service, Controls, Instrumentation				***$ 300,000***
Electrical Service	LS	1	$ 100,000.00	$ 100,000
Instrumentation & Controls	LS	1	$ 200,000.00	$ 200,000
Startup and Testing				***$ 20,000***
Startup and Testing	LS	1	$ 20,000.00	$ 20,000
Park Improvements				***$ 1,670,000***
Baseball Field Improvements	LS	1	$ 300,000.00	$ 300,000
Soccer Field Improvements	LS	1	$ 100,000.00	$ 100,000
Landscaping, Irrigation and Tree Replacement	LS	1	$ 350,000.00	$ 350,000
Electrical High Mast Lighting	EA	8	$ 65,000.00	$ 520,000
Other Park Improvements	LS	1	$ 400,000.00	$ 400,000

BUREAU OF ENGINEERING
PROJECT CONSTRUCTION COST ESTIMATE

Project Title: Gonzales Park - Stormwater Capture Park Program

Scope:

Work Order:

Client Dept.: Bureau of Engineering

Project Manager:

Project Engineer:

Type of Estimate: ☐ Class "B" ☑ Class "C" ☐ Class "O"

Description	Unit	Quantity	Unit Price	Item Total
PARK IMPROVEMENTS STORMWATER CAPTURE PARKS PROGRAM TOTAL				***$ 19,471,347***
		0	$ -	$ -
		0	$ -	$ -
Subtotal (1)				**$ 19,471,347**

Mobilization - 0% to 7% of Subtotal (1), used **2%**	$ 389,427
Permits Allowances - 1% to 3% of Subtotal (1), used **1.5%**	$ 292,070
Other Allowances - 5% of Subtotal (1), used **3%**	$ 584,140
Subtotal (2)	**$ 20,736,984**
Estimating Contingency - 10% to 25% of Subtotal (2), used 15**%**	$ 3,110,548
Subtotal (3)	**$ 23,847,532**
Escalation - 3% per year of Subtotal (3), used **compound amount factor: (1+i)^n**	$ 1,452,315
Subtotal (4)	**$ 25,299,846**
Construction Contingency - 10% to 20% of Subtotal (4), used ~ **15%**	$ 3,794,977
Total Estimated Project Construction Cost	**$ 29,095,000**
Project Right of Way Estimated Cost	**$ -**
Design Phases Cost (Per City Budget Guidelines for Proposition O Projects), used **21.2%**	$ 6,168,140
Construction Phases Cost (Per City Budget Guidelines for Proposition O Projects), used **13.25%**	$ 3,855,088
Total Estimated Project Cost	**$ 39,118,228**

Assumptions:

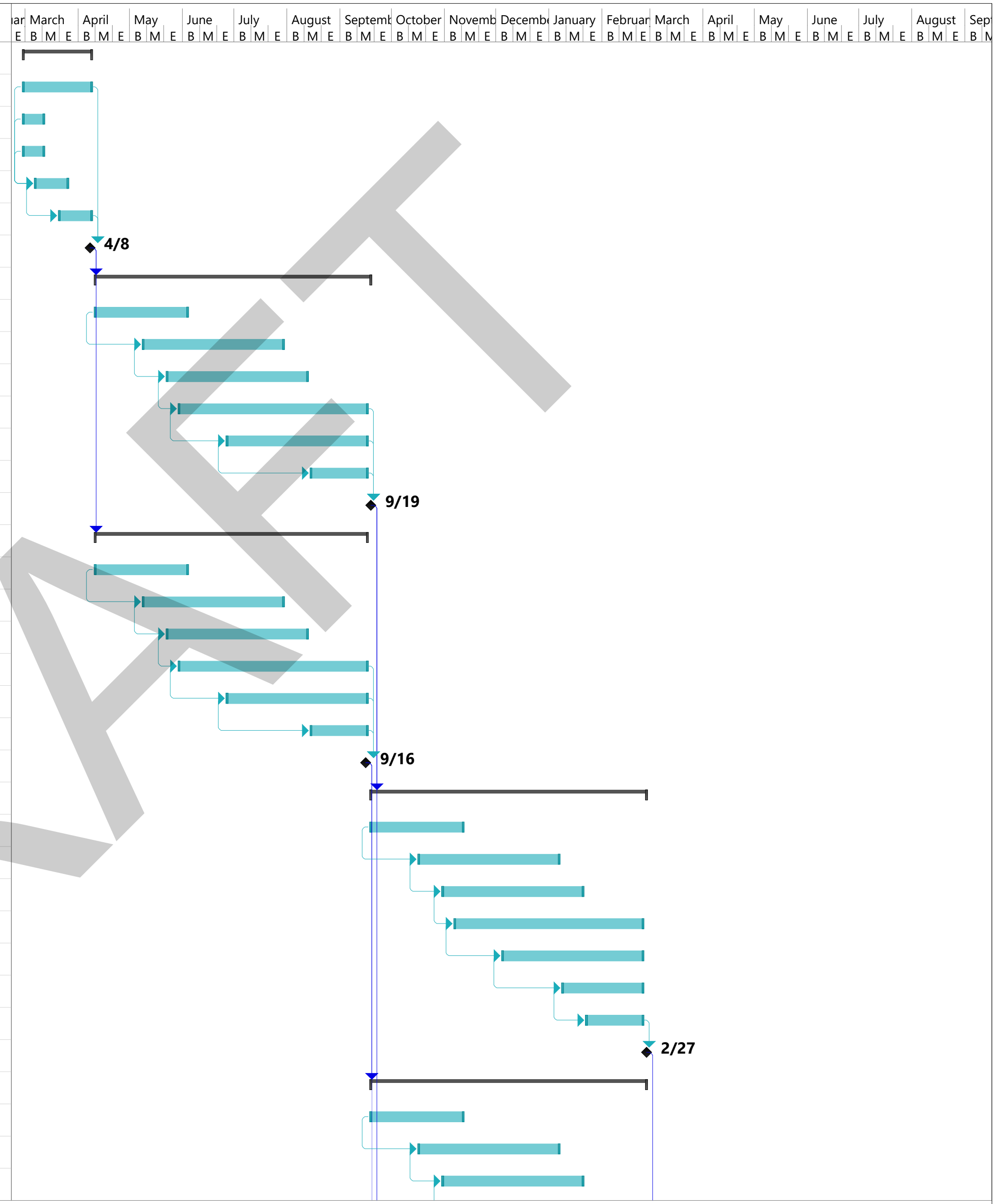
Prepared by: Dan Schottlander CPE — Date: 08/25/20

Checked by: Behjat Zanjani PE — Date: 08/25/20

Approved by: — Date:

Client Approval: — Date:

ID	Task Name	Duration	Start	Finish
1	**Initial Construction Support Activities**	**30 days**	**2/28/22**	**4/8/22**
2	Mobilization, Temporary Facilities and Fencing	30 days	2/28/22	4/8/22
3	Approval of Submittals for Precast Infiltration Gallery	10 days	2/28/22	3/11/22
4	Approvals of Submittals for Piping, HDS, material, etc.	10 days	2/28/22	3/11/22
5	Demolition/Removal of Existing Amenities/Equipment	15 days	3/7/22	3/25/22
6	Site Clearing, Preparation	15 days	3/21/22	4/8/22
7	Completion of Initial Construction Support Activities	0 days	4/8/22	4/8/22
8	**Infiltration Gallery No. 1 - West Side**	**115 days**	**4/11/22**	**9/19/22**
9	Shoring System	40 days	4/11/22	6/3/22
10	Excavation	60 days	5/9/22	7/29/22
11	Crushed Stone Layer	60 days	5/23/22	8/12/22
12	Desilting Basin and Infiltration Gallery	80 days	5/30/22	9/16/22
13	Backfill and Compaction and Crushed Stone along Perimeter Walls	60 days	6/27/22	9/16/22
14	Remove Shoring System	25 days	8/15/22	9/16/22
15	Completion of Infiltration Gallery No. 1 - West Side	0 days	9/19/22	9/19/22
16	**Infiltration Gallery No. 2- West Side**	**115 days**	**4/11/22**	**9/16/22**
17	Shoring System	40 days	4/11/22	6/3/22
18	Excavation	60 days	5/9/22	7/29/22
19	Crushed Stone Layer	60 days	5/23/22	8/12/22
20	Desilting Basin and Infiltration Gallery	80 days	5/30/22	9/16/22
21	Backfill and Compaction and Crushed Stone along Perimeter Walls	60 days	6/27/22	9/16/22
22	Remove Shoring System	25 days	8/15/22	9/16/22
23	Completion of Infiltration Gallery No. 1 - West Side	0 days	9/16/22	9/16/22
24	**Infiltration Gallery No. 1- East Side**	**115 days**	**9/19/22**	**2/27/23**
25	Shoring System	40 days	9/19/22	11/11/22
26	Excavation	60 days	10/17/22	1/6/23
27	Crushed Stone Layer	60 days	10/31/22	1/20/23
28	Infiltration Gallery	80 days	11/7/22	2/24/23
29	Backfill and Compaction and Crushed Stone along Perimeter Walls	60 days	12/5/22	2/24/23
30	Overflow Structure and Onsite Piping and Testing	35 days	1/9/23	2/24/23
31	Remove Shoring System	25 days	1/23/23	2/24/23
32	Completion of Infiltration Gallery No. 1 - East Side	0 days	2/27/23	2/27/23
33	**Infiltration Gallery No. 2 - East Side**	**115 days**	**9/19/22**	**2/27/23**
34	Shoring System	40 days	9/19/22	11/11/22
35	Excavation	60 days	10/17/22	1/6/23
36	Crushed Stone Layer	60 days	10/31/22	1/20/23



Project: DMG_Construction Sch
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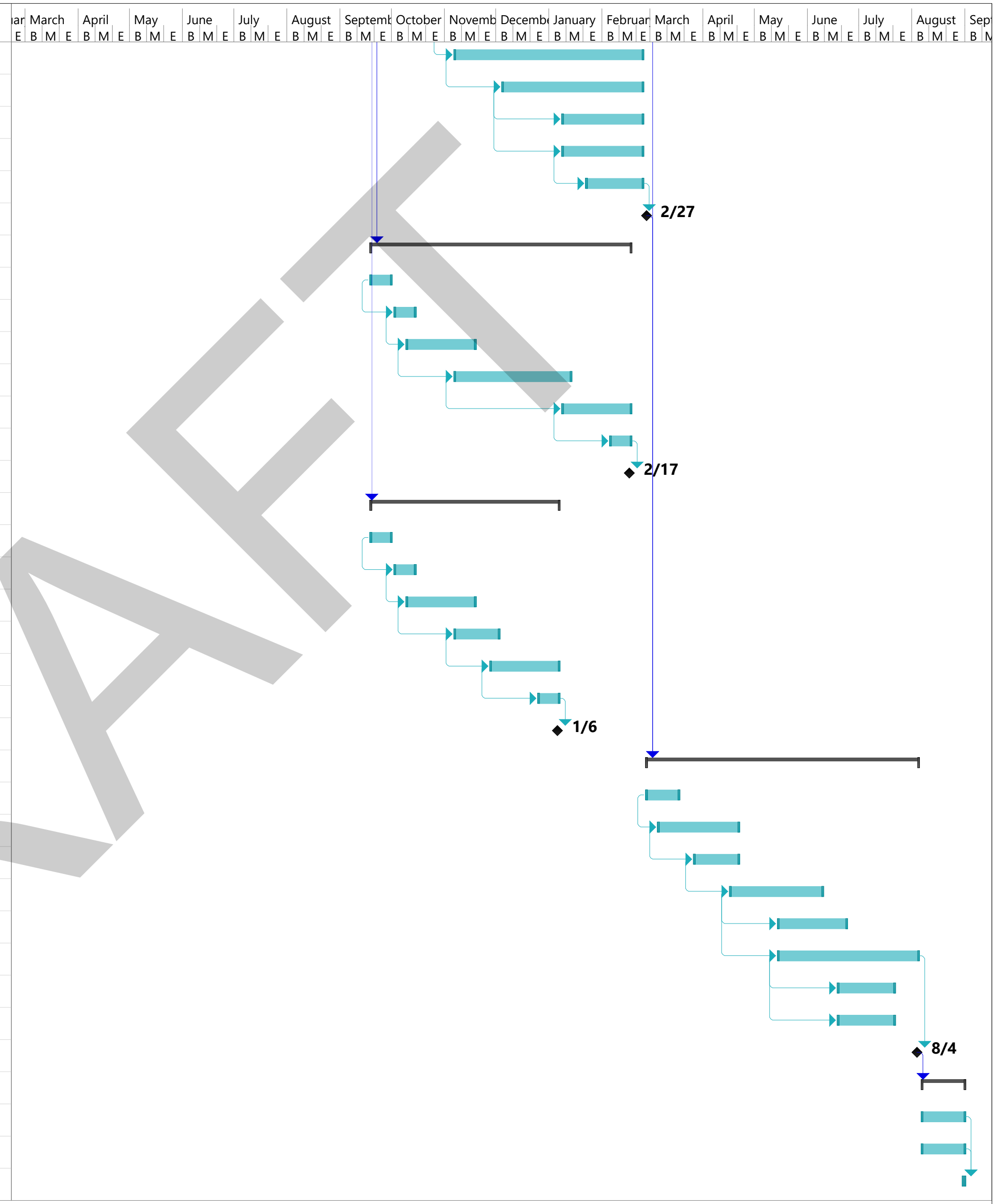
Task	Project Summary	Manual Task	Start-only	Deadline	
Split	Inactive Task	Duration-only	Finish-only	Progress	
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress	
Summary	Inactive Summary	Manual Summary	External Milestone		

ID	Task Name	Duration	Start	Finish
37	Infiltration Gallery	80 days	11/7/22	2/24/23
38	Backfill and Compaction and Crushed Stone along Perimeter Walls	60 days	12/5/22	2/24/23
39	Overflow piping connection structure and offsite piping	35 days	1/9/23	2/24/23
40	Overflow Structure and Onsite Piping and Testing	35 days	1/9/23	2/24/23
41	Remove Shoring System	25 days	1/23/23	2/24/23
42	Completion of Infiltration Gallery No. 2 - East Side	0 days	2/27/23	2/27/23
43	**Influent Facilities to Infiltration Gallery No. 1**	**110 days**	**9/19/22**	**2/17/23**
44	Shoring System	10 days	9/19/22	9/30/22
45	Excavation	10 days	10/3/22	10/14/22
46	Hydrodynamic Seperator, Bypass Structure and Bypass Piping	30 days	10/10/22	11/18/22
47	Offsite Piping from Diversion Structure	50 days	11/7/22	1/13/23
48	Diversion Structure	30 days	1/9/23	2/17/23
49	Pipeline and Structure Acceptance Testing	10 days	2/6/23	2/17/23
50	Completion of Influent Facilities to Infiltration Gallery No. 1	0 days	2/17/23	2/17/23
51	**Influnt Facilities to Infiltration Gallery No. 2**	**80 days**	**9/19/22**	**1/6/23**
52	Shoring System	10 days	9/19/22	9/30/22
53	Hydrodynamic Separator	10 days	10/3/22	10/14/22
54	Bypass Vault and Onsite Bypass Piping	30 days	10/10/22	11/18/22
55	Offsite Piping from Diversion Structure	20 days	11/7/22	12/2/22
56	Diversion Structure	30 days	11/28/22	1/6/23
57	Pipeline and Structure Acceptance Testing	10 days	12/26/22	1/6/23
58	Completion of Influent Facilities to Infiltration Gallery No. 2	0 days	1/6/23	1/6/23
59	**Site Work and Amenities**	**115 days**	**2/27/23**	**8/4/23**
60	Install Site Electrical and Instrumentation Conduits	15 days	2/27/23	3/17/23
61	Final Site Grading	35 days	3/6/23	4/21/23
62	Irrigation System	20 days	3/27/23	4/21/23
63	Stands, Fencing, Backstops and Other Amenities	40 days	4/17/23	6/9/23
64	Roadways, Parking Lots and Site Restoration	30 days	5/15/23	6/23/23
65	Loaming and Seeding, and Artificial Turf	60 days	5/15/23	8/4/23
66	Transformer(s), Electrical/Site Light Panels, Restore Site Lighting	25 days	6/19/23	7/21/23
67	Instrumentation and Control Panel(s)	25 days	6/19/23	7/21/23
68	Completion of Site Work and Amenities	0 days	8/4/23	8/4/23
69	**Startup and Testing**	**19 days**	**8/7/23**	**8/31/23**
70	Final Punchlist Items	19 days	8/7/23	8/31/23
71	Start-up and Equipment Testing	19 days	8/7/23	8/31/23
72	Construction Complete and Start of Reliability Acceptance Testing	1 day	8/31/23	8/31/23



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Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

ATTACHMENTS FOR SECTION 7.2:

COST SHARE

7.2 Cost Share

LADWP has committed to matching 50 percent of the total capital cost of the Project. The dollar-to-dollar funding match, which will rely on LADWP's general fund, will support the Project as it moves through the construction phase and create a significant number of new jobs while prioritizing local hire. Documentation of leveraged funds is included in the following pages.

Safe, Clean Water Program

Summary of Funding Sources

The Los Angeles Department of Water and Power (LADWP) is committed to the implementation of stormwater capture projects to enhance local groundwater supplies, improve water quality and provide various community benefits. LADWP commits to funding the following projects in the amount equal to 50% of the capital cost of each project by using LADWP's general funds as well as potential grant funds.

Project Name	**Percent Funding Match**
David M. Gonzales Recreation Center Stormwater Capture Project	50%
Valley Plaza Park Stormwater Capture Project	50%
North Hollywood Park Stormwater Capture Project	50%

If you have any questions or require additional information, please contact Mr. Art Castro, Manager of LADWP's Watershed Group at (213) 367-2966.

ATTACHMENTS FOR SECTION 8.1:

ENVIRONMENTAL DOCUMENTS AND PERMITS

8.1 Environmental Documents and Permits

8.1.1 Immediate Impact

Immediate impacts stemming from the Project implementation would consist of noise and traffic control at less-than-significant levels. Noise impacts that arise from exposure to construction activities and construction machinery operation specifications to curb noise impacts will be indicated to the contractors of the proposed Project. Traffic controls will be established to mitigate impacts on traffic that may arise from construction activities and scheduling.

The sports fields and areas within the Project limits will have construction impacts that will limit their use. Additionally, periodic maintenance of the facilities will need to be coordinated with park staff to mitigate negative impacts to planned park activities.

8.1.2 Cumulative Impact

No other projects are known near the proposed Project that would have a cumulative impact and trigger further review beyond the Mitigated Negative Declaration (MND) prepared by LADWP.

8.1.3 Potential CEQA Categorization

As the lead agency per CEQA, LADWP is developing an MND for the Stormwater Capture Parks Program projects. The MND will outline any environmental issues and define any necessary mitigation. The current status is that the Draft MND is under development by LADWP and is expected to be available for public review in October 2020. It is not anticipated that NEPA would apply, though if any federally derived funding were to be identified for the Project, that funding could trigger a need to complete NEPA documentation.

8.1.4 Permitting

An example planning-level project schedule, including estimated time for permitting, is included in Table 1 below. The Project is not expected to affect LACFCD right of way but will involve diverting stormwater from the LACFCD system. LADWP will initiate coordinating with the LACFCD early in the design process and apply for necessary permits in a timely manner.

Table 1 Project Schedule Summary

Preliminary Project Schedule																				
Task Name	YR1-FY21/22				YR2-FY22/23				YR3-FY23/24				YR4-FY24/25				YR5-FY25/26			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Planning																				
Baseline Monitoring																				
Design																				
Permitting																				
Procurement																				
Construction																				
Outreach																				

Table 2 provides a list of the permits anticipated to be required for the Project and an estimate of timing to complete the permitting process. Permit requirements should be revisited and confirmed during detailed design.

Table 2 Anticipated Permitting Requirements

Agency[1]	Permit	Purpose	Permitting Process	Estimated Processing Time
BOE	Section 62.105 of the Los Angeles Municipal Code (LAMC): Excavation Permit	For construction in any property, street or other right-of-way owned by, to be owned by, or under the control of the City. Construction projects requiring public rights-of-ways to be trenched or excavated must obtain an excavation permit. Electrolier and pull box relocations, monitoring wells, soil borings, and pothole drilling in public right-of-ways also need an excavation permit.	Online application form can be found at https://engpermits.lacity.org/epermits/index1.cfm Hard copy form may also be obtained from the local District Office. Application must be filled out and submitted. Copies of drawings/sketch or images of the proposed plan can be submitted electronically or mailed.	N/A
LADOT	Temporary Traffic Control Plan	For temporary street, lane, and sidewalk closures.	Worksite Temporary Traffic Control Plan will be prepared and submitted for closures under 72 hours. Closures for durations of 72 hours or longer will require a B-Permit from the Bureau of Street Services (BSS).	N/A
LADOT	Signal Modification /Temporary Signal and Temporary Signing and Striping Plan	For work within an intersection.	Develop and submit for review a signal modification/temporary signal, temporary signing, and striping plan.	N/A

Agency[1]	Permit	Purpose	Permitting Process	Estimated Processing Time
LADBS	Building, Plumbing, and/or Sewer Connection Permits	For private property construction, alteration, or repair work on buildings in the City of Los Angeles. Building permits, plumbing permits, and sewer connection permits can be obtained from LADBS.	An online account shall be required with LADBS to apply for an online permit. During design, LADBS will review and approve the geotechnical report, grading/excavation plan, structural, and electrical.	N/A
LACFCD	Flood Control Permit (Construction Permit)	For any work, encroachment, or activity within or affecting LACFCD right-of-way, facilities, interests, or jurisdiction, including, but not limited to, new flood control facility construction, recreational and greenway improvements, modifications to existing facilities, and best management practices (BMPs) installation for water quality improvements. A construction permit is required for encroachment onto and/or alteration of LACFCD right-of-way for new construction.	LACFCD should be contacted prior to the permit application to discuss preliminary concerns. Apply for Flood Construction Permit online at EpicLA. Permit owner and contractor will also need to create EpicLA accounts. May require Letter of Authorization, Contractor Information, Engineering Plans, Structural Report, As-Built Drawing, Right-of-Way Map, Hydraulic Analysis, and Soils Report.	May require several reviews of up to 4-6 weeks each
RAP	Right-of-Entry Permit	For any work within a City park.	A Right-of-Entry permit is an administrative procedure; hence, there is no official permit application or any written submittal procedures. Permit approval will require early and continuous consultation with the Superintendent of the Pacific Region, and coordination with RAP staff shall be performed during design.	N/A

Agency[1]	Permit	Purpose	Permitting Process	Estimated Processing Time
			RAP will review the Project proposal and plans from two key perspectives: recreational uses and park maintenance conflicts. All projects are first reviewed at the regional level. More complex actions (based on extent and length of construction) may also require approval of park headquarters. RAP headquarters will typically not approve a permit unless approval is recommended at the regional level.	
BSL	A-Permit	For relocation of any streetlights or conduits.	Submit a request and provide a brief description of the electrolier and location of electrolier and/or pullbox to be relocated. This can be done via the public counter, phone, e-mail, fax or letter. Meeting will be scheduled with BSL. A sketch based on a field check of the subject property showing distances and locations of electrolier to be relocated and proposed construction, a copy of the approved Class "A" Permit for the new construction, pictures of the site and proposed equipment to be relocated, and the Conditional Agreement form requesting approval for electrical relocation will be submitted.	N/A
Bureau of Street Services (StreetsLA)	Tree Removal	For construction that impacts or removes any street trees.	An arborist report will be required, along with a tree removal application, to be submitted to StreetsLA for review. The removal of any City-owned trees requires the Board of Public Works approval and the tree replacement ratio to be 2:1.	3 months

Agency[1]	Permit	Purpose	Permitting Process	Estimated Processing Time
RWQCB	General Permit for Discharges of Storm Water Associated with Construction Activity	For discharges of stormwater associated with construction activity that results in the disturbance of one acre or more of total land area or whichever is part of a larger common area of development. Clearing, grading, and disturbances to the ground, and excavation, are subject to this permit.	A Storm Water Pollution Prevention Plan (SWPPP) shall be developed by a certified Qualified SWPPP Developer (QSD) to address water pollution controls during construction. The SWPPP is recommended to be prepared during the design stage. A Notice of Intent (NOI) shall be prepared and submitted to the City for review, and the signed NOI with fee shall be sent to the State Water Resources Control Board (SWRCB). The SWPPP shall be completed to 100% for City review during construction mobilization and implemented during construction with City staff oversight. Notice of Termination (NOT) shall be submitted at the end of project construction activities.	3-4 months
CalOSHA	Construction Permit (Project Permit or Annual Permit)	To construct a trench or an excavation 5 feet or deeper into which any person is required to descent.	Project Administrator must obtain the Project Permit. Project Administrator has overall onsite responsibility for the planning, quality, management, or completion of Project and must have a valid and applicable contractor's license issued by the Contractors State License Board. Only one Project Permit is required for multiple projects that are part of the same contract, when the work is the installation of essentially similar structures and for multiple permit-required activities at one worksite. Employers other than the Project Administrator that will directly engage in a permit-required activity must have an Annual Permit.	Submit copy of Permit to City in advance of construction excavation activities

Agency[1]	Permit	Purpose	Permitting Process	Estimated Processing Time
SCAQMD	Mitigation Plan under Rule 1166 Notification – Volatile Organic Compound (VOC) Emissions from Decontamination of Soil	For excavation and/or projects involving the handling/transportation of VOC- contaminated soils. Rule 1166 establishes requirements to control the emission of VOCs from excavating, grading, handling, and treatment of VOC-contaminated soil.	An approved mitigation plan must be obtained from SCAQMD before excavating underground storage tanks or piping that has stored VOCs, excavation or grading of soil containing VOCs, handling or storage of VOC-contaminated soils, and treatment of VOC-contaminated soil. A Site-specific Plan is required for larger excavation and/or projects with VOC-contaminated soil and can be applied for using Form 400-A and Form 400-CEQA.	Notify 24 hours prior of intent to excavate known or suspected VOC storage and/or transfer equipment or handling of known or suspected VOC contaminated soil

Abbreviations:

(1) BOE – Los Angeles Department of Public Works Bg LADOT – Los Angeles Department of Transportation

(2) LADBS – Los Angeles Department of Building and Safety LACFCD – Los Angeles County Flood Control District RAP – Los Angeles Department of Recreation and Parks BSL – Los Angeles Bureau of Street Lighting

(3) RWQCB – Regional Water Quality Control Board

(4) CalOSHA – California Occupational Safety and Health Administration SCAQMD – South Coast Air Quality Management District

ATTACHMENTS FOR SECTION 8.2:

VECTOR MINIMIZATION

8.2 Vector Minimization

Managing mosquitoes and other vectors in stormwater management structures is critical for protecting public health. With careful planning, such structures can be designed, built, operated, and maintained in a way that minimizes opportunities for the proliferation of vectors.

Although the Project is in its early phases, vector minimization and coordination with the Local Vector Control agency will be essential for the Project's long-term success. Thus, LADWP intends to mitigate and minimize vectors by consulting the State of California's Department of Public Health checklist for minimizing vector production in stormwater management structures.

Dry and wet systems require different types of vector control strategies. Because the Project will include only wet systems, guidelines for both are provided below.

Furthermore, the Project is a closed system, with water being diverted from an existing underground stormwater pipe to underground infiltration facilities. As a result, the Project is unlikely to contribute to a vector issue. Nonetheless, the above described coordination will still be performed.

8.2.1 Wet Systems

Wet systems are any structures designed with features such as sumps, vaults, and/or basins that hold water longer than four days and include structures that hold water permanently. Examples include open catch basins, concrete retention basins, Delaware sand filters, and a variety of underground proprietary devices.

Proposed strategies to explore further in the design phase include, but are not limited to, the following:

- Sealing (completely or partially) sumps, vaults, and/or basins that hold water longer than four days.
- Using tight fitting covers with gaps or holes no greater than 1/16-inch (2mm).
- Sealing pick holes or using mosquito proof inserts when using manhole covers.
- Maintaining inlet/outlet conveyance pipes submerged to prevent adult mosquito entry into the main water storage area.
- Fitting conveyance pipes with flapper valves, collapsible fabric tubes, or other barriers to prevent adult mosquito entry into main water storage area.
- Designing structures with safe and sufficient access to permanent water areas for inspection, maintenance, and/or vector control activities when needed.
- Inspecting the BMP components as suggested in the Project O&M guidelines and adjusting as necessary.
- Providing clearly visible signage with information indicating the type of structure (e.g., extended detention basin), ownership, and contact information.

ATTACHMENTS FOR SECTION 8.6:

TECHNICAL REPORTS

ATTACHMENTS FOR SECTION 8.7:

OTHER