PRELIMINARY
LOW IMPACT DEVELOPMENT (LID) PLAN
FOR
US STORAGE CENTER
(529 CUTTER WAY)

CITY CASE #: CUP 23-08 & SPR 23-268

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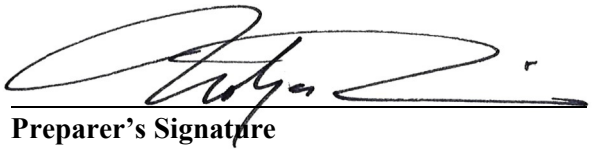
Date: December 4, 2023
Revised: February 12, 2024

Project Title: US Storage Center (529 Cutter Way)
Preliminary LID Plan

PREPARER'S CERTIFICATION

The selection, sizing and design of storm water treatment and other storm water quality and quantity control measures in this LID Plan meet the requirements of the Los Angeles Regional Water Quality Control Board Order No. R4-2021-0105/NPDES No. CAS004004.

This report has been prepared by or under the oversight of the following registered civil engineer who attests to the technical information contained herein and has judged the qualifications of reference data upon which recommendations, conclusions, and decisions are based.



Preparer's Signature

2/12/2024
Date

Nobu Murakami
Preparer's Printed Name

Water Resources Engineer
Preparer's Title/Position

R.C.E. #78149 / Exp. 09/30/2025
Registration # / Expiration

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Company Name

Preparer's Licensure:



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I. INTRODUCTION

A. Project Location

This Low Impact Development (LID) Plan is for the proposed US Storage Center project (herein referred to as "the project"). The project is located on 529 Cutter Way in the City of Covina, the Los Angeles County, California. Refer to Appendix A for a vicinity map of the project. Applicable APNs are 8434-013-010 and 8434-012-091.

B. Project Description

The overall project parcel gross area is approximately 2.55 acres and the project net area is approximately 2.25 acres. The project will redevelop the site from an existing manufacturing land use to a proposed self-storage land use (allowed with a CUP). The project will consist of proposed 3-story self-storage building with rental office along with surface improvements such as secured parking areas, walkways, and landscaping. Existing building and associated improvements are to be demolished. Based on the conceptual site plan prepared/revised by KSP Studio (dated February 2024), the proposed self-storage building footprint is expected to be approximately 183,584 square feet. There will be a total of approximately 13 auto parking spaces to be provided (including standard, ADA, and EV capable spaces). The overall drainage management area is approximately 2.25 acres. For the purpose of on-site mitigation design (i.e. – underground infiltration facility design), the drainage management area is approximately 1.97 acres and the proposed impervious and pervious footprints are approximately 78,327 square feet (~91%) and 7,404 square feet (~9%), respectively. The remaining portion of the site (~0.28 acre) consists of landscape areas and is considered "self-treating landscape" areas that drain. There is a sliver of walkway ramp near the southerly edge that would be directed to the self-treating landscape areas and would be challenging to drain towards the proposed infiltration facility. As such, the proposed underground infiltration facility is being upsized to account for the impervious walkway ramp. The construction of the proposed storm water management BMPs for the project would address the requirements of the Los Angeles County Low Impact Development (LID) standards.

C. Drainage Conditions

The project site lies within the eastern-central portion of the San Gabriel River Watershed. The central and lower portions of the watershed is urbanized with the lower part of the river flowing through a fully improved concrete-lined channels (including the Big Dalton Wash, Walnut Creek, and San Gabriel River) that would not be susceptible to hydromodification impacts.

In the existing condition, the site consists of an existing residential building and associated surface improvements such as driveway, parking and landscape areas. The drainage management area is approximately 2.25 acres with approximately 21 percent of impervious footprint. On-site runoff generally drains in a southerly direction towards W San Bernardino Road to an existing catch basin (curb inlet). This catch basin drains into an existing 18-inch lateral reinforced concrete pipe (RCP) that connects into an existing mainline box culvert along Cutter Way (maintained by Los Angeles County Public Works). This existing mainline storm drain drains in a southeasterly direction and eventually discharges into the Big Dalton Wash. The Big Dalton Wash drains to the Walnut Creek, San Gabriel River, and eventually drains to the San Pedro Bay near Long Beach and then to Pacific Ocean.

In the post-project condition, the post-project drainage management area is approximately 2.25 acres with approximately 79 percent of impervious footprint. The drainage management area to the proposed storm water best management practice (BMP) is approximately 1.97 acres. The post-project drainage characteristics will be maintained as similar to the pre-project condition. Runoff from the site will be collected via a proposed on-site private storm drain system (including catch basins and storm drain pipes) towards the BMP in the southeasterly area of the project. The proposed BMP will be an underground infiltration facility (including a pre-treatment facility), which provides adequate mitigation capacity to retain the low-flow water quality volume and address the storm water quality management requirements. Overflow from the proposed underground infiltration facility is anticipated to be conveyed via a storm drain pipe and connect into the aforementioned existing catch basin along W San Bernardino Road.

D. Low Impact Development (LID) Requirements

On July 23, 2021, the Los Angeles Regional Water Quality Control Board (RWQCB) adopted Order No. R4-2021-0105 / NPDES Permit No. CAS004004 for municipal storm water and urban runoff discharges within the coastal watersheds of Los Angeles and Ventura Counties. To comply with the Permit requirements, the County of Los Angeles Department of Public Works prepared the Low Impact Development Standards Manual, dated February 2014. This version of the LID Standards Manual is being referenced on the County of Los Angeles Department of Public Works. As a Permittee of the County of Los Angeles, the storm water management requirements in the LID Standards Manual are enforced by the City of Covina.

To conform to the requirements of the aforementioned LID Standards Manual, this Low Impact Development (LID) Plan has been prepared specific to this project to document the proposed storm water management mitigation measures and post-construction operation and maintenance responsibilities.

E. Designated Project Categories

A project would be considered as the "Designated Project" and would need to conform to the requirements for "Designated Projects" in the LID Standards Manual, if it met one or more of the following categories (Categories 1 thru 9) below. Based on the category descriptions, the project meets Category 1, 6, and 9. As such, the project is identified as the "Designated Project".

1. All development projects equal to one acre or greater of disturbed area and adding more than 10,000 square feet of impervious surface area;
2. Industrial parks with 10,000 square feet or more of surface area;
3. Commercial malls with 10,000 square feet or more of surface area;
4. Retail gasoline outlets with 5,000 square feet or more of surface area;
5. Restaurants (Standard Industrial Classification [SIC] Code 5812) with 5,000 square feet or more of surface area;
6. Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces;

7. Automotive service facilities (SIC Codes: 5013, 5014, 5511, 5541, 7532-7534, or 7536-7539) with 5,000 square feet or more of surface area;
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), where the development will:
    - Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and
    - Create 2,500 square feet or more of impervious surface area.
9. Redevelopment projects, which are developments that result in creation or addition or replacement of either: (1) 5,000 square feet or more of impervious surface on a site that was previously developed as described in the above bullets; or (2) 10,000 square feet or more of impervious surface area on a site that was previously developed as a single family home.
    - Where 50 percent or more of the impervious surface of a previously developed site is proposed to be altered and the previous development project was not subject to post-construction stormwater quality control measures, the entire development site (e.g., both the existing development and the proposed alteration) must meet the requirements of the LID Standards Manual.
    - Where less than 50 percent of the impervious surface of a previously developed site is proposed to be altered and the previous development project was not subject to post-construction stormwater quality control measures, only the proposed alteration must meet the requirements of the LID Standards Manual.
    - Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, which does not disturb additional area and maintains the original grade and alignment, is considered routine maintenance activity. Redevelopment does not include repaving of existing roads to maintain original line and grade.

F. Geotechnical Investigation and Infiltration Testing

A project-specific geotechnical investigation report, including the infiltration testing results, has been prepared for the project by Southern California Geotechnical and a copy of the report is to

be included in Appendix E of this report for reference. The geological data in the report such as the project's soil type, field infiltration rates, and groundwater condition, as well as the recommendation from the project-specific geotechnical engineer were considered in the design of the proposed best management practices (BMPs) for this project. The permanent BMP design is discussed in Section II.

Based on the site-specific geotechnical investigation report, prepared by Southern California Geotechnical, the field (in-situ) infiltration rates at two locations near the southeasterly area of the site were observed as 3.1 in/hr, and 19.8 in/hr (at depths of 9 to 10 feet below the existing grades). The groundwater was not encountered to a depth of at least 50' below the existing grades. Based on the provided data and anticipated BMP location, a field infiltration rate of 3.1 in/hr (a more conservative value) was selected for the proposed BMP design along with a factor of safety of 4 (based on the guidelines from the LID Manual). As such, the design infiltration rate of 0.8 in/hr was used for design purpose. Below is a summary of the reduction factor and measured/design infiltration rates for this project.

Reduction Factor	
Double-Ring Infiltrometer	$RF_t = 1$
Site Variability, number of tests, and thoroughness of subsurface investigation	$RF_v = 2$
Long-term siltation plugging and maintenance	$RF_v = 1$
Total Reduction Factor, RF= $RF_t + RF_v + RF_v$	**RF** = 4
Measured Infiltration Rate (MIR) Applied	**MIR =** 3.1 in/hr
Design Infiltration Rate (DIR) = Measured Infiltration Rate (MIR)/RF	**DIR =** 0.8 in/hr

G. Receiving Water Impairments

Impairments to the project's receiving waters are identified as follows:

Receiving Water	**EPA Approved 303(d) List Impairments**	**TMDL Status**
Walnut Creek	Benthic Community Effects Indicator Bacteria pH	TMDL required
San Gabriel Reach 3	Indicator Bacteria	Being addressed with USEPA approved TMDL
San Gabriel Reach 2	Cyanide Temperature Lead	TMDL required Being addressed with USEPA

		approved TMDL
San Gabriel Reach 1	pH Temperature	TMDL required
San Gabriel River Estuary	Dioxin Nickel Oxygen, Dissolved Copper Indicator Bacteria	TMDL required Being addressed with USEPA approved TMDL

H. Pollutants of Concern

Based on the proposed land use, the project's anticipated pollutants of concern are as follows:

- Bacteria and Viruses, nutrients, pesticides, sediment/suspended solids, trash & debris, metals, oil & grease, and toxic organic compounds.

Based on the receiving water impairments, the project-specific pollutants of concern would be bacteria and viruses, sediment/suspended solids, and metals.

II. BEST MANAGEMENT PRACTICE (BMP) DESIGN

A. Site Design Principal

Purpose – The intention of site design principles is to reduce stormwater runoff peak flows and volumes and other impacts associated with land development. The following site design principles have been considered for the project, based on Section 4.2 of the Low Impact Development Standards Manual.

Site Planning – The general concept is to help develop a more hydraulically-functional site, minimize the effectiveness of on-site retention, and integrate storm water management throughout the project site.

Based on the project-specific geotechnical investigation report, infiltration of runoff is feasible and the project proposes an underground retention system near the southeasterly area, provided that the proposed system is approximately 25 feet away from the proposed building's footing. Where feasible, runoff from the impervious surfaces are directed towards landscape area to help promote incidental infiltration/evaporation.

Protect and Restore Natural Areas – Conservation of natural areas, soils, and vegetation helps to retain numerous functions of pre-development hydrology, including rainfall interception, infiltration, and evapotranspiration. Each project site possesses unique topographic, hydrologic, and vegetated features, some of which are more suitable for development than others. Sensitive areas, such as streams and their buffers, floodplains, wetland, steep slopes, and highly-permeable soils, should be protected and/or restored. Slopes can be a major source of sediment and should be properly protected and stabilized. Locating development in less sensitive areas of a project site and conserving naturally vegetated areas can minimize environmental impacts from storm water runoff.

The existing site is already a developed site with very little vegetation and no natural areas to preserve.

Minimize Land Disturbance – The purpose is to protect water quality by preserving the natural hydrologic function of the project site to the maximum extent practicable. By designing a

project site layout to preserve natural hydrology and drainage ways at the project site, it reduces the need for grading and disturbance of native vegetation and soils. Siting buildings and impervious surfaces away from steep slopes, drainage ways, and floodplains limits the amount of grading and clearing necessary and reduces the hydrologic impact. This site design principle is most applicable in Greenfield settings, but opportunities to implement this principle may exist in redevelopment projects.

The project consists of self-storage facilities with no natural hydrologic function. Therefore, this would not be applicable for the project.

Minimize Impervious Area – The purpose is to protect water quality by preserving the natural hydrologic function of the project site to the maximum extent practicable. By designing a project site layout to preserve natural hydrology and drainage ways at the project site, it reduces the need for grading and disturbance of native vegetation and soils. Siting buildings and impervious surfaces away from steep slopes, drainage ways, and floodplains limits the amount of grading and clearing necessary and reduces the hydrologic impact. This site design principle is most applicable in Greenfield settings, but opportunities to implement this principle may exist in redevelopment projects.

Impervious areas are only used where necessary and have been minimized to the extent practicable. Parking spaces are minimized close to the required amount and the landscaped areas as well as self-treating areas have been maximized to the extent practicable.

B. Source Control Measures

Source control measures are designed to prevent pollutants from contacting storm water runoff or preventing discharge of contaminated storm water runoff to the storm drain system and/or receiving water. A list of the source control measures from Section 5 of the Low Impact Development Standards Manual and its applicability for the project are summarized below.

Storm Drain Message and Signage (S-1) – Proposed – Catch basins shall be stenciled with the words “Only Rain Down the Storm Drain,” “No Dumping – Drains to Ocean,” or similar.

Outdoor Material Storage Areas (S-2) – None proposed.

Outdoor Trash Storage/Waste Handling Areas (S-3) – Signs shall be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.

Outdoor Loading/Unloading Dock Area (S-4) – None proposed.

Outdoor Vehicle/Equipment Repair/Maintenance (S-5) – None proposed.

Outdoor Vehicle/Equipment/Accessory Wash Area (S-6) – None proposed.

Fuel and Maintenance Area (S-7) – None proposed.

Landscape Irrigation Practices (S-8) – Proposed – The proposed landscape areas are to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.

Building Materials (S-9) – None proposed.

Animal Care and Handling Facilities (S-10) – None proposed.

Outdoor Horticulture Areas (S-11) – None proposed.

C. Storm Water Quality Design Volume (SWQDv)

According to Section 6 of the Low Impact Development Standards Manual, the design storm, from which the SWQDv is calculated, is defined as the greater of:

- The 0.75-inch, 24-hour rain event; or

- The 85th percentile, 24-hour rain event as determine from the Los Angeles County 85th percentile precipitation isohyetal map.

The 85th percentile, 24-hour rain event for the project is approximately 1.0 inch and this is the governing value. The SWQDv values for the project were determined using the Los Angeles County HydroCalc Program (Version 1.0.3). The calculation summary is provided below:

DMA ID	Area (acres)	% Impervious	P_{85} (in)	Q_{BMP} (cfs)	SWQDv (C.F.)
DMA 1	1.97	91	1.05	0.46	6,166

Note:

- The remaining 0.28 acre of the site will consist of landscape/pervious areas and considered "self-treating landscape" areas.
- The 85th Percentile, 24-hour precipitation value (P85) was interpolated between the 1.0 and 1.1 inch contours from the map. Supporting material is included in Appendix C.

D. Storm Water Quality Control Measures

The project-specific treatment BMP was selected based on the guidelines of the MS4 Permit and Los Angeles County Low Impact Development Standards Manual, following the BMP hierarchy and feedback from the project-specific geotechnical engineer. Retention (infiltration) type BMP is the top of the BMP hierarchy. Based on the geotechnical investigation report and infiltration testing results, infiltration was deemed to be feasible. As a result, the project proposes an underground infiltration facility (i.e. – Contech 60-inch Perforated Infiltration System, or equivalent).

The proposed infiltration facility is expected to provide approximately 7,039 cubic feet (C.F.) of retention volume at the system depth of 6.0 feet. The approximate footprint of the underground infiltration facility is ~1,760 square feet (S.F.). With the design infiltration rate of 0.8 in/hr, the minimum SWQDv of 6,166 C.F. is expected to be drained in just over approximately 48 hours. The design infiltration rate used for the project is based on a more conservative approach and in reality, the rate is expected to be slightly more which would help with the system drawdown.

Additionally, in order to help with the long-term maintenance of the underground infiltration facility, the project also proposes a pre-treatment facility (i.e. – AquaSwirl hydrodynamic separator unit) upstream of the infiltration facility.

E. Hydromodification Management Requirements

The project is exempt from the hydromodification management requirements of the LID Plan, as the project discharges through a fully improved storm drain system that discharges to Big Dalton Wash, Walnut Creek, and San Gabriel River that is not susceptible to hydromodification impacts.

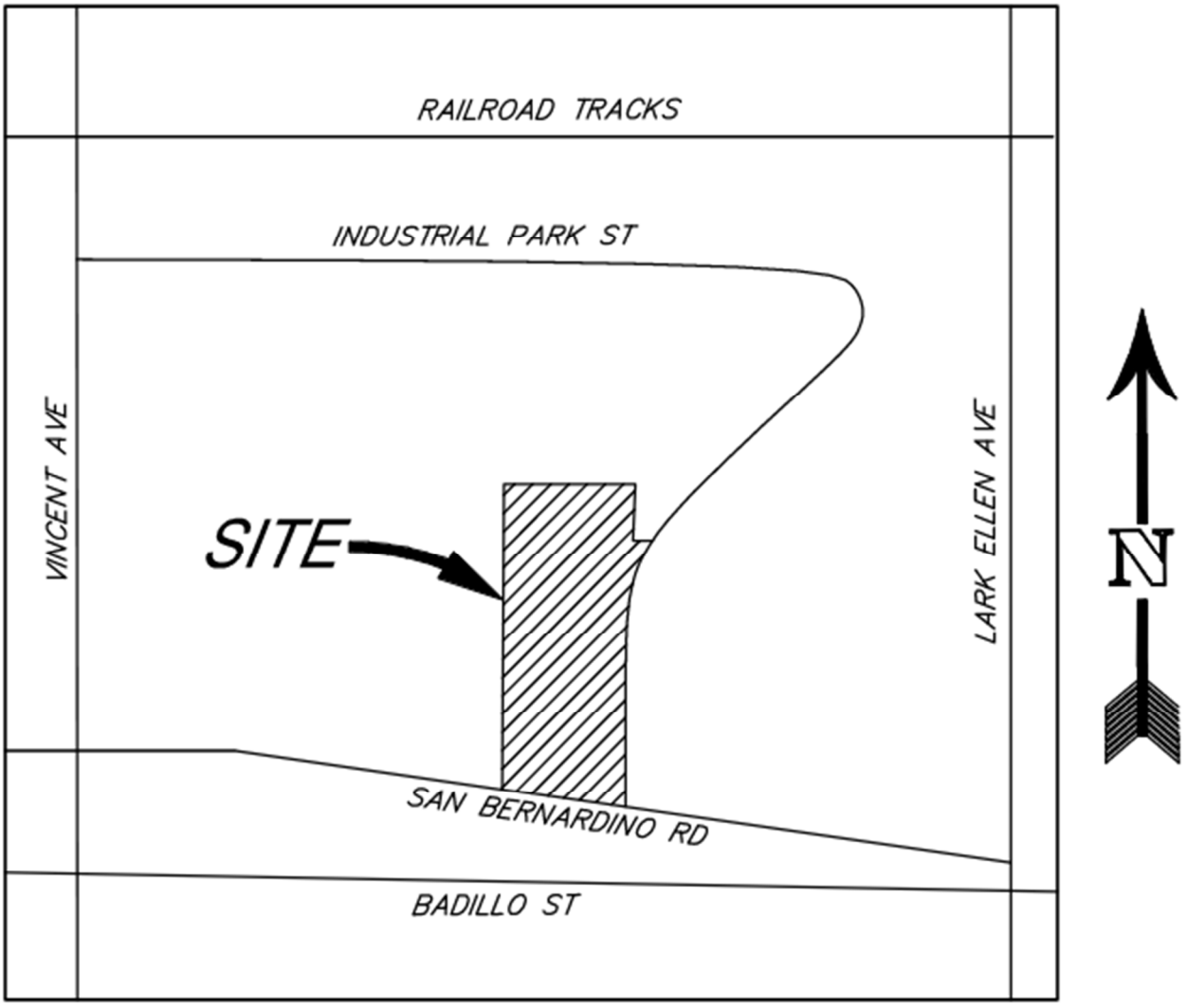
III. OPERATION, MAINTENANCE AND FUNDING

1. Inspection and maintenance activities for the project-specific post-construction BMPs (to be identified in the Operation and Maintenance Plan matrix) will be the responsibility of the property owner. The Operation and Maintenance Plan is to be developed and included as an attachment to this report at the time of final design.
2. The post-construction BMPs will be maintained and funded by:

   Westport Properties, Inc.
   660 Newport Center Dr. Suite 1450
   Newport Beach, CA 92660
   Phone: (949) 423-4207

3. The property owner shall employ self-inspections and record keeping for BMPs, as applicable. The property owner will need to retain all maintenance records for a period of five (5) years after the recorded inspection date for the lifetime of the project. The records shall be made available for review by all government agencies. Pending the type of BMP, minimum frequency of inspections may range from weekly, monthly, quarterly, or yearly.
4. A copy of the project-specific on-site BMP maintenance covenant is to be recorded at the County of Los Angeles. The maintenance covenant has been devised by the County of Los Angeles to legally assign responsibilities for maintenance of the project-specific post-construction BMPs such that they run with the land. The maintenance covenant will be signed by the owners and recorded in the Los Angeles County Recorder's Office.
5. If a transfer of ownership occurred, a notification will need to be filed with the County of Los Angeles confirming the change in responsibility and continued implementation of the project-specific LID Plan and operation and maintenance plan requirements.

Appendix A
Vicinity Map



VICINITY MAP

NOT TO SCALE

Appendix B
LID Site Plan and Details

POST-CONSTRUCTION BMP SITE PLAN
US STORAGE CENTER - 529 CUTTER WAY

GENERAL NOTES

1. THE EXISTING SITE CURRENTLY CONSISTS OF AN EXISTING RESIDENTIAL HOUSE AND ASSOCIATED SURFACE IMPROVEMENTS.
2. THE PROJECT AREA IS APPROXIMATELY 2.25 ACRES OVERALL AND WILL BE DEVELOPED INTO A SELF-STORAGE FACILITY WITH ASSOCIATE SURFACE IMPROVEMENTS.
3. IN THE EXISTING CONDITION, RUNOFF FROM THE SITE GENERALLY DRAINS IN SOUTHERLY DIRECTION TOWARDS W. SAN BERNARDINO ROAD TO AN EXISTING CATCH BASIN (CURB INLET). THERE IS A MINOR OFFSITE RUN-ON FROM THE SOUTHWESTERLY AREA OF THE SITE BASED ON THE PROJECT-SPECIFIC TOPOGRAPHY.
4. IN THE POST-PROJECT CONDITION, THE DRAINAGE CHARACTERISTICS WILL BE MAINTAINED AS SIMILAR TO THE EXISTING CONDITION. THE MINOR OFFSITE RUN-ON WILL MAINTAIN ITS PATH TO A VEGETATED SWALE ON THE SOUTHERLY EDGE OF THE SITE TO MAINTAIN THE EXISTING DRAINAGE PATTERN.
5. BASED ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL APPENDIX C (SOIL IDENTIFICATION TABLE), THE PROJECT PRIMARILY CONSISTS OF SOIL CLASSIFICATION NUMBER 6 (HANDFORD FINE SANDY LOAM, HF-1). BASED ON THE SITE-SPECIFIC GEOTECHNICAL ENGINEERING INVESTIGATION REPORT, PREPARED BY SOUTHERN CALIFORNIA GEOTECHNICAL, THE FIELD INFILTRATION RATES AT TWO LOCATIONS NEAR THE SOUTHEASTERLY AREA OF THE SITE WERE 3.1 IN/HR, AND 19.8 IN/HR (AT DEPTHS OF 9 TO 10 FEET BELOW THE EXISTING GRADES). THE GROUNDWATER WAS NOT ENCOUNTERED TO A DEPTH OF AT LEAST 50' BELOW THE EXISTING GRADES. BASED ON THE PROVIDED DATA AND ANTICIPATED BMP LOCATION, A FIELD INFILTRATION RATE OF 3.1 IN/HR (A MORE CONSERVATIVE VALUE) HAS BEEN APPLIED, ALONG WITH A FACTOR OF SAFETY OF 4. THE DESIGN INFILTRATION RATE OF 0.8 IN/HR WAS USED FOR DESIGN PURPOSE.
6. THE PROJECT IS SITUATED WITHIN THE FEMA ZONE X; THEREFORE, PROCESSING THROUGH FEMA IS NOT EXPECTED TO BE REQUIRED FOR THIS PROJECT.
7. DETAILS FOR TRASH ENCLOSURE WITH COVER, STENCIL, AND ROOF DRAIN OUTLET LOCATION ARE TO BE PROVIDED ON THIS EXHIBIT AND TYPICAL BMP SECTION DETAILS SHEET.

PERMANENT SOURCE CONTROL BMPs

① – MARK ALL INLETS WITH THE WORDS "ONLY RAIN DOWN THE STORM DRAIN" OR SIMILAR

② – ENCLOSED REFUSE AREA WITH SIGNS POSTED NEARBY STATING "DO NOT DUMP HAZARDOUS MATERIALS HERE" OR SIMILAR

– LANDSCAPING DESIGNED TO MINIMIZE IRRIGATION AND RUNOFF, TO PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND TO MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES THAT CAN CONTRIBUTE TO STORMWATER POLLUTION.

OPERATIONAL SOURCE CONTROL BMPs

- MAINTAIN LANDCAPING USING MINIMUM OR NO PESTICIDES
- PREVENT EROSION OF SLOPES BY PLANTING FAST-GROWING, DENSE GROUND COVERING PLANTS
- PLANT NATIVE VEGETATION TO REDUCE THE AMOUNT OF WATER, FERTILIZERS, AND PESTICIDES APPLIED TO THE LANDSCAPE
- DO NOT OVERWATER
- USE IRRIGATION PRACTICES SUCH AS DRIP IRRIGATION, SOAKER HOSES OR MICRO-SPRAY SYSTEMS
- PERIODICALLY INSPECT AND FIX LEAKS AND MISDIRECTED SPRINKLERS.
- DO NOT RAKE OR BLOW LEAVES, CLIPPINGS, OR PRUNING WASTE INTO THE STREET, GUTTER OR STORM DRAIN
- DISPOSE OF GREEN WASTE BY COMPOSTING, HAULING IT TO A PERMITTED LANDFILL, OR RECYCLING IT THROUGH YOUR CITY'S PROGRAM
- PROVIDE IPM INFORMATION TO NEW OWNERS, LESSEES AND OPERATORS
- PERIODIC INSPECTIONS FOR LEAKY, OVERFILLED, UNCOVERED, OR OTHER PROBLEMATIC CONDITIONS WILL OCCUR
- CORRECTIVE ACTION WILL BE MADE UPON DETECTION, AS CIRCUMSTANCES PERMIT
- DUMPING OF LIQUID OR HAZARDOUS WASTES WILL BE PROHIBITED
- SPILL CONTROL MATERIALS WILL BE AVAILABLE ON-SITE
- MOVE LOADED AND UNLOADED ITEMS INDOORS AS SOON AS POSSIBLE
- SWEEP PLAZAS, SIDEWALKS, AND PARKING LOTS REGULARLY TO PREVENT ACCUMULATION OF LITTER AND DEBRIS
- COLLECT DEBRIS FROM PRESSURE WASHING TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM
- COLLECT WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER AND DISCHARGE TO THE SANITARY SEWER (NOT TO THE STORM DRAIN)

LID OPPORTUNITIES

1. PRESERVE EXISTING PERVIOUS AREA WHERE POSSIBLE.
2. LANDSCAPED AREAS DESIGNED TO BE SELF-RETAINING WHERE FEASIBLE.

DRAINAGE MANAGEMENT AREAS (DMAs):

DMA 1

DMA 1-1 (ORNAMENTAL LANDSCAPING) – 7,404 S.F.

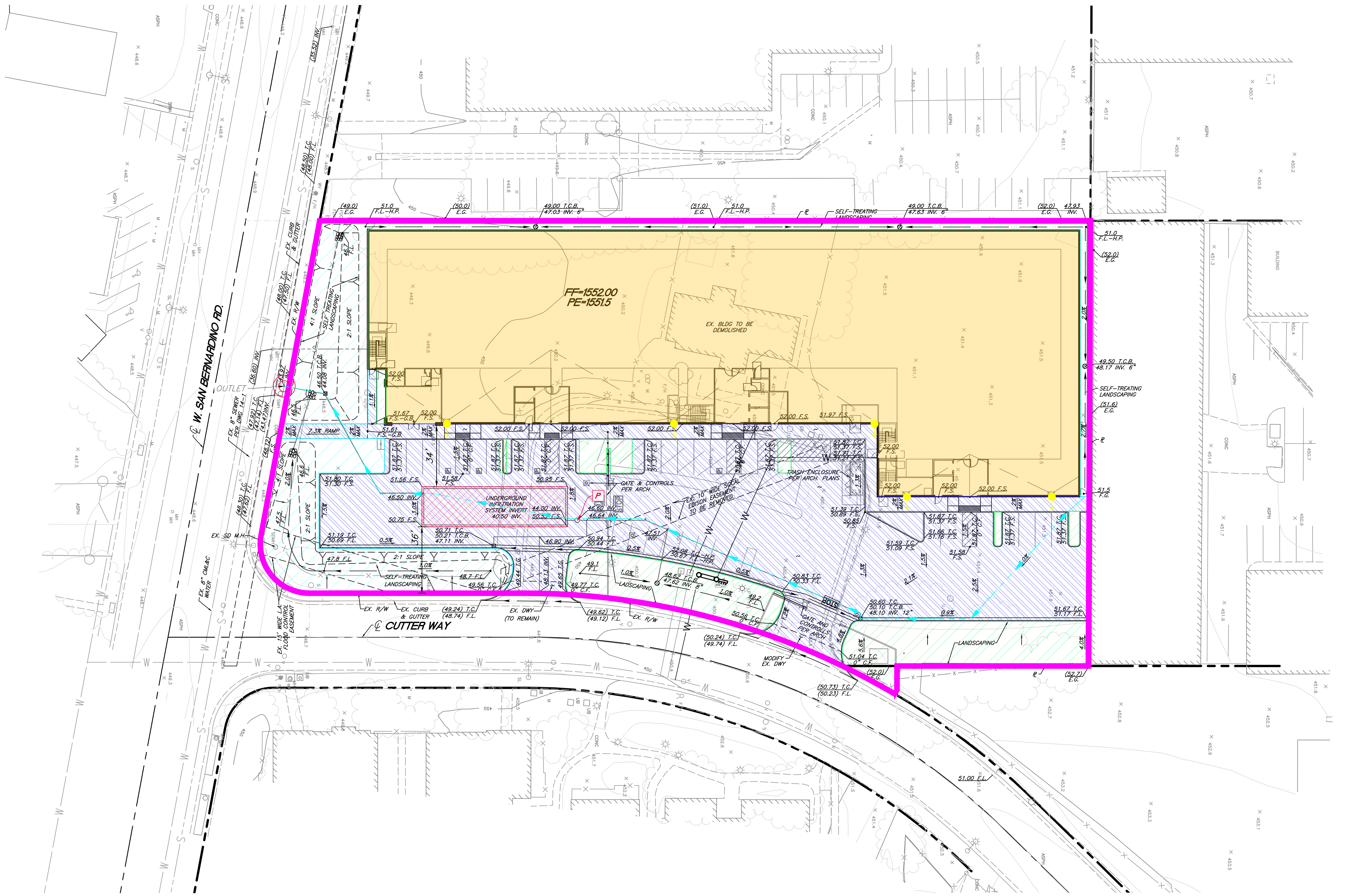
DMA 1-2 (CONCRETE OR ASPHALT) – 32,421 S.F.

DMA 1-3 (ROOFS) – 45,906 S.F.

TOTAL DRAINAGE MANAGEMENT AREA TO "BMP 1" = 85,731 S.F.

SELF-TREATING LANDSCAPE AREA (PERVIOUS) – 12,401 S.F.

OVERALL AREA = 98,132 S.F.



LEGEND

- DRAINAGE MANAGEMENT AREA
- TRACT BOUNDARY
- CENTERLINE
- CURB AND GUTTER
- 1280 EXISTING CONTOUR LINE
- SLOPE
- ROOF DRAIN LOCATION
- DISCHARGE LOCATION
- PROPOSED STORM DRAIN
- GENERAL SURFACE FLOW PATH

PERMANENT STRUCTURAL BMP

BMP 1 – PROPOSED UNDERGROUND INFILTRATION FACILITY:
CONTECH 60-INCH DIAMETER PERFORATED UNDERGROUND RETENTION SYSTEM
- APPROXIMATE SYSTEM FOOTPRINT: ~1,760 S.F
- RETENTION VOLUME REQUIRED: 6,166 C.F.
- RETENTION VOLUME PROVIDED: ~7,039 C.F. MIN. @ ~6.0 SYSTEM DEPTH (TO ADDRESS STORM WATER QUALITY DCV REQUIREMENTS)
- SYSTEM DEPTH=7.0'; SYSTEM INVERT=40.50 INV.; PIPE INVERT=41.50 INV.; OVERFLOW OUTLET INVERT=46.50 INV.; SYSTEM TOP=47.50'

PRE-TREATMENT BMP

PROPOSED HYDRODYNAMIC SEPARATOR (PRE-TREATMENT):
AQUA-SWIRL TRASH CAPTURE AS-2s BYP CW STR #16, BY AQUASHIELD
- SYSTEM FOOTPRINT: 30-INCH DIAMETER (PER TAPE-APPROVED 100 GAL/MIN/1 S.F.)
- REQUIRED TREATMENT FLOW RATE: 0.43 CFS
- PROVIDED TREATMENT FLOW RATE: 0.43 CFS
- INLET/OUTLET PIPE DIAMETER: 15-INCH
- INLET/OUTLET PIPE INVERT: 46.60 INV.

0 30 60 120 180 240
SCALE 1"=60'

FEBRUARY 2024

CITY OF COVINA POST-CONSTRUCTION BMP SITE PLAN US STORAGE CENTER 529 CUTTER WAY (CASE #: CUP 23-08 & SPR 23-268) (N/W OF CUTTER WAY & W. SAN BERNARDINO RD)	1 OF 2 SHEETS

NOT FOR CONSTRUCTION - THIS EXHIBIT IS FOR LID PLAN REVIEW PURPOSE

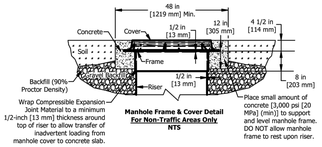
POST-CONSTRUCTION BMP SECTION DETAILS
US STORAGE CENTER - 529 CUTTER WAY

Aqua-Swirl® Polymer Coated Steel (PCS)
Stormwater Treatment System



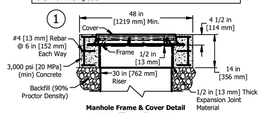
Projected View
SCALE 1:80

Unless other traffic barriers are present, bollards shall be placed around access riser(s) in non-traffic areas to prevent inadvertent loading by maintenance vehicles.



Manhole Frame & Cover Detail
For Non-Traffic Areas Only
NTS

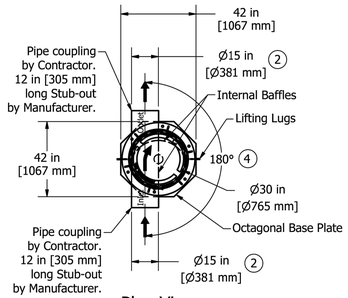
If traffic loading (HS-25) is required or anticipated, a 4-foot [1.22 m] diameter, 14-inch [356 mm] thick reinforced concrete pad must be placed over the Stormwater Treatment System Riser to support and level the manhole frame, as shown. The top of riser pipe must be wrapped with compressible expansion joint material to a minimum 1/2-inch [13 mm] thickness to allow transfer of wheel loads from manhole cover to concrete slab. Manhole cover shall bear on concrete slab and not on riser pipe. The concrete slab shall have a minimum strength of 3,000 psi [20 MPa] and be reinforced with #4 [13 mm] reinforcing steel as shown. Minimum cover over reinforcing steel shall be 1-inch [25 mm]. Top of manhole cover and concrete slab shall be level with finish grade.



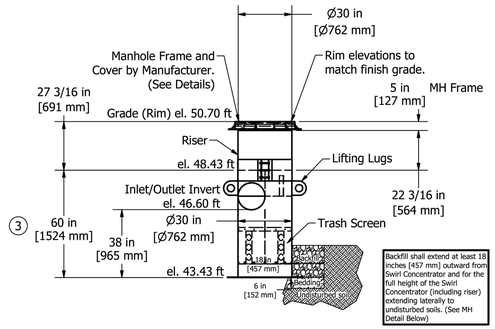
Manhole Frame & Cover Detail
For Traffic Loading Areas
NTS

Please see accompanied Aqua-Swirl® specification notes. See Site Plan for actual system orientation. Approximate dry (pick) weight: 1000 lbs [500 kg].

1. As an alternative, 42 in [1067 mm] diameter, HS-20/25 rated precast concrete rings may be substituted. 14 in [356 mm] thickness must be maintained.
2. AS-2s BYP inlet/outlet pipe size ranges from 8 in [203 mm] to 15 in [381 mm].
3. AS-2s chamber height may vary from 52 in [1321 mm] to 60 in [1524 mm], depending on inlet/outlet pipe size.
4. Orientation may vary from a minimum of 90° to a maximum of 180°.



Plan View
SCALE 1:40



Elevation View
SCALE 1:40

AquaShield STORMWATER TREATMENT SOLUTIONS™ 2733 Kanasita Drive, Suite 111, Chattanooga, TN 37343 Phone (888) 344-9044 Fax (423) 826-2112 www.aquashieldinc.com	Aqua-Swirl® Trash Capture AS-2s BYP CW STR #16	Structure #:	AS-2s DIM	Rvwed	Rvw. Date
		Drawn By:	OFlores		
	Westport - Covina	Scale:	As Shown		
	Covina, CA - Project #23262	Date:	2/9/2024		
		U.S. Patent No. 6524473			

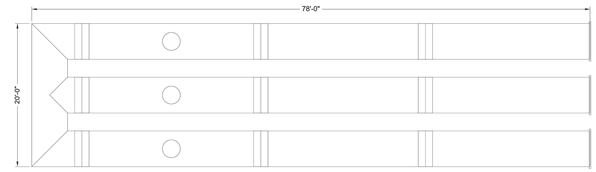
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 239 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = N/A
- PIPE STORAGE VOLUME = 4,693 CF
- BACKFILL STORAGE VOLUME = 3,051 CF
- TOTAL STORAGE PROVIDED = 7,744 CF

PIPE DETAILS
- DIAMETER = 60"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 30"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 12"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 12"



NOTES
- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 10'

C:\DOCPDETETEMPLATES\CMP_VA.DWG 10/18/2019 10:02 AM

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. The use of this drawing for bidding purposes and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered, the owner, engineer and contractor are requested to notify Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

DATE	REVISION DESCRIPTION	BY

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

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO41363 Westport-Covina
60"-DIA CMP PERFORATED RETENTION SYSTEM
Covina, CA

PROJECT No.:	SEQ. No.:	DATE:
28326	41363	11/29/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

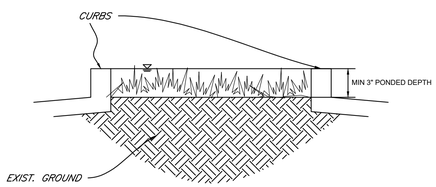
PRE-TREATMENT BMP: AQUA-SWIRL TRASH CAPTURE AS-2S BYP CW STR #16 BY AQUASHIELD
NOT TO SCALE

BMP 1: 60-INCH DIAMETER PERFORATED UNDERGROUND RETENTION SYSTEM BY CONTECH
NOT TO SCALE

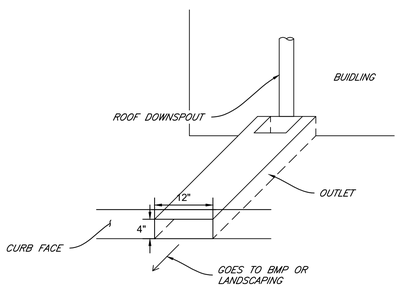


INLET PLACARD DETAIL (TYP.)
NOT TO SCALE

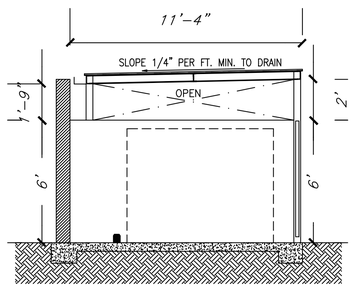
NOTE: THE ABOVE TYPICAL DETAIL FOR INLET PLACARD DETAIL IS PROVIDED AS A SAMPLE. FOR THIS PROJECT, THE "ALMETEK" METAL PLACARDS SHALL BE USED FOR THE PROJECT'S STORM DRAIN CATCH BASIN INLETS.



LANDSCAPED ISLAND DETAIL (TYP.)
NOT TO SCALE



ROOF DRAIN CURB OUTLET STRUCTURE DETAIL (TYP.)
NOT TO SCALE



TRASH ENCLOSURE STRUCTURE DETAIL (TYP.)
NOT TO SCALE

GENERAL NOTES

1. THE DETAIL (EXCERPT) FOR THE PROPOSED UNDERGROUND INFILTRATION FACILITY ("60-INCH DIAMETER PERFORATED UNDERGROUND RETENTION SYSTEM" BY CONTECH) IS PROVIDED ON THIS SHEET FOR REFERENCE. A COPY OF THE FULL DETAIL SHEETS ARE TO BE PROVIDED IN THE WQMP AND ULTIMATELY PROVIDED ON THE PRECISE GRADING PLAN AT THE CONSTRUCTION DOCUMENT STAGE.
2. A PRE-TREATMENT FACILITY IS PROPOSED UPSTREAM OF THE UNDERGROUND INFILTRATION FACILITY AND THE DETAIL IS SHOWN ON THIS SHEET.
3. THE PROPOSED LANDSCAPING/PLANTING (PLANT PALETTE) IS TO BE PROVIDED SEPARATELY BY THE PROJECT LANDSCAPE ARCHITECT.

FEBRUARY 2024

CITY OF COVINA	
POST-CONSTRUCTION BMP SECTION DETAILS	2 OF 2 SHEETS
US STORAGE CENTER 529 CUTTER WAY (CASE #: CUP 23-08 & SPR 23-268) (N/W OF CUTTER WAY & W. SAN BERNARDINO RD)	

NOT FOR CONSTRUCTION – THIS EXHIBIT IS FOR LID PLAN REVIEW PURPOSE ONLY

Appendix C
BMP Calculations

REQUIRED LID RETENTION VOLUME CALCULATION

Peak Flow Hydrologic Analysis

File location: S:/SDH OFFICE/2307 WESTPORT-COVINA/REPORTS/LID Plan/Calculations/Westport-Covina_SWQDv Rev.pdf
Version: HydroCalc 1.0.3

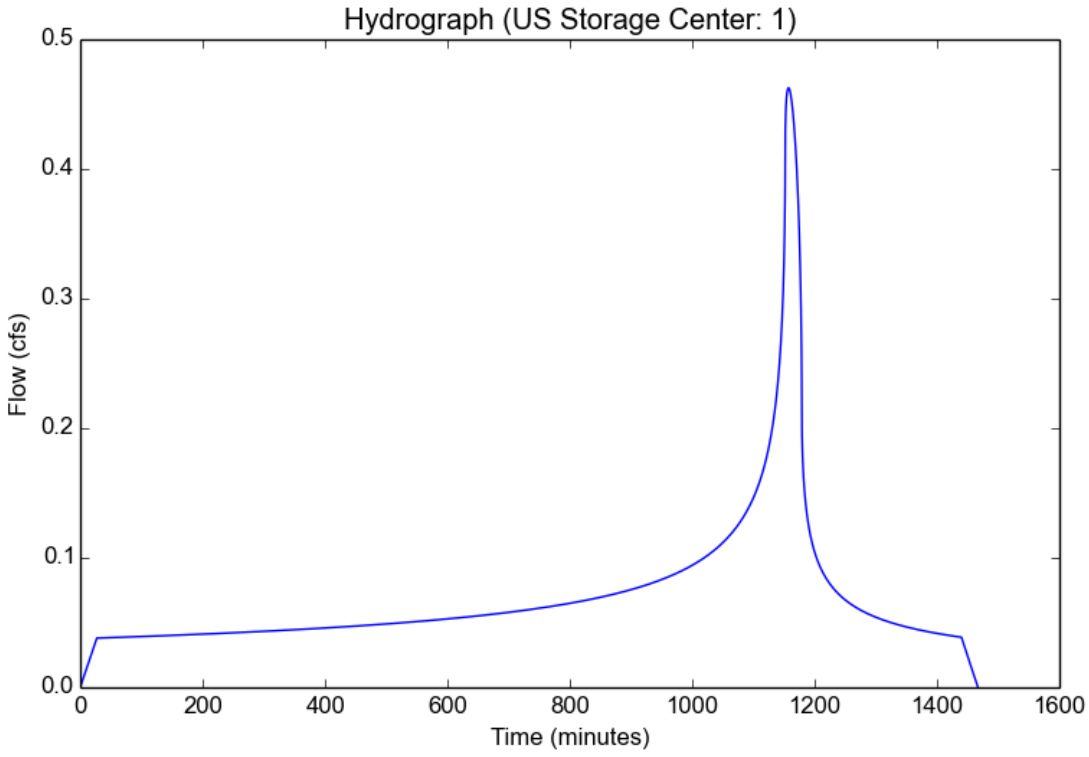
Input Parameters

Project Name	US Storage Center
Subarea ID	1
Area (ac)	1.97
Flow Path Length (ft)	563.0
Flow Path Slope (vft/hft)	0.008
85th Percentile Rainfall Depth (in)	1.05
Percent Impervious	0.91
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

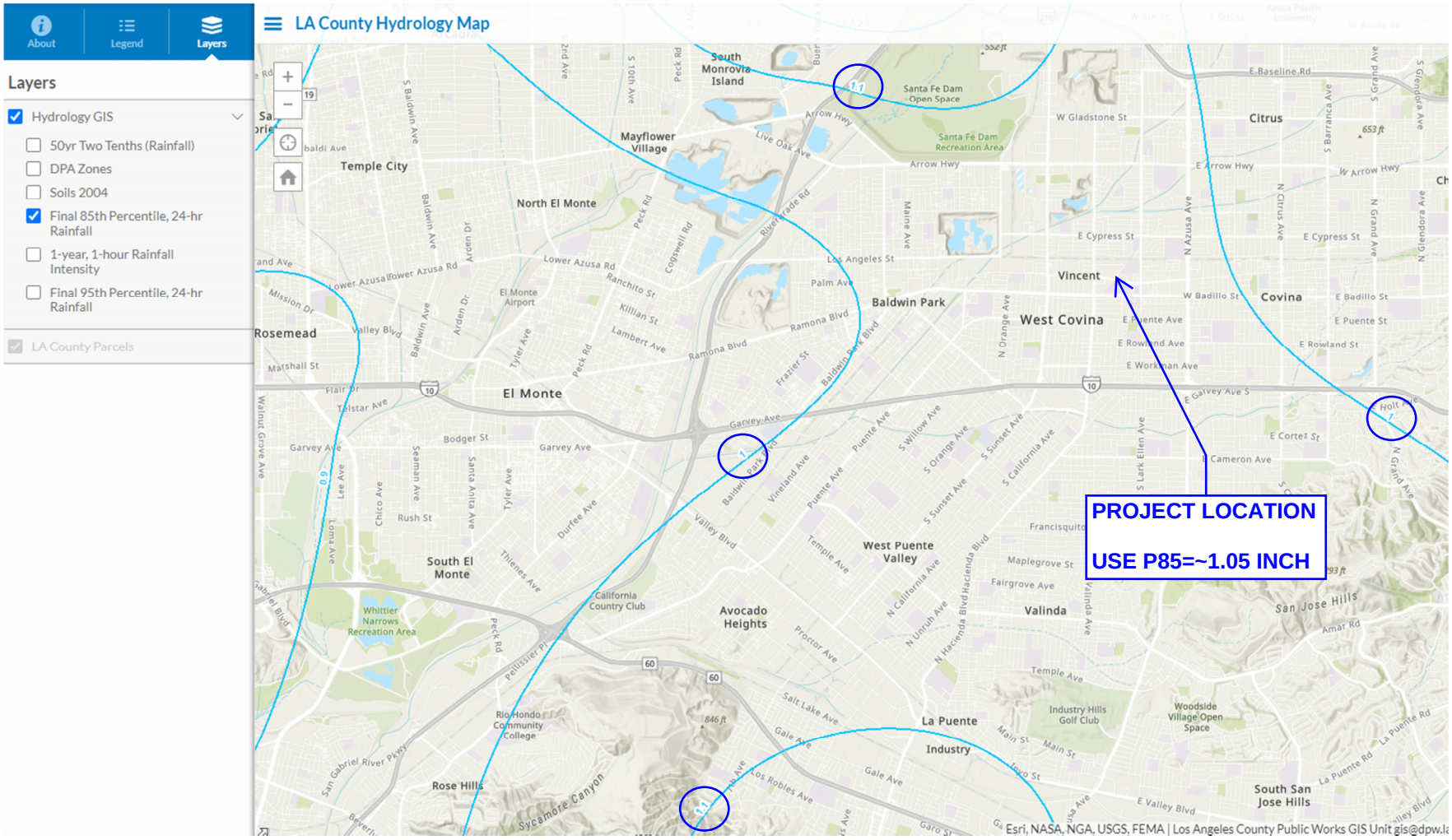
Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.05
Peak Intensity (in/hr)	0.2836
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	0.4626
Burned Peak Flow Rate (cfs)	0.4626
24-Hr Clear Runoff Volume (ac-ft)	0.1415
24-Hr Clear Runoff Volume (cu-ft)	6165.842

REQ'D VOLUME = ~6,166 C.F.

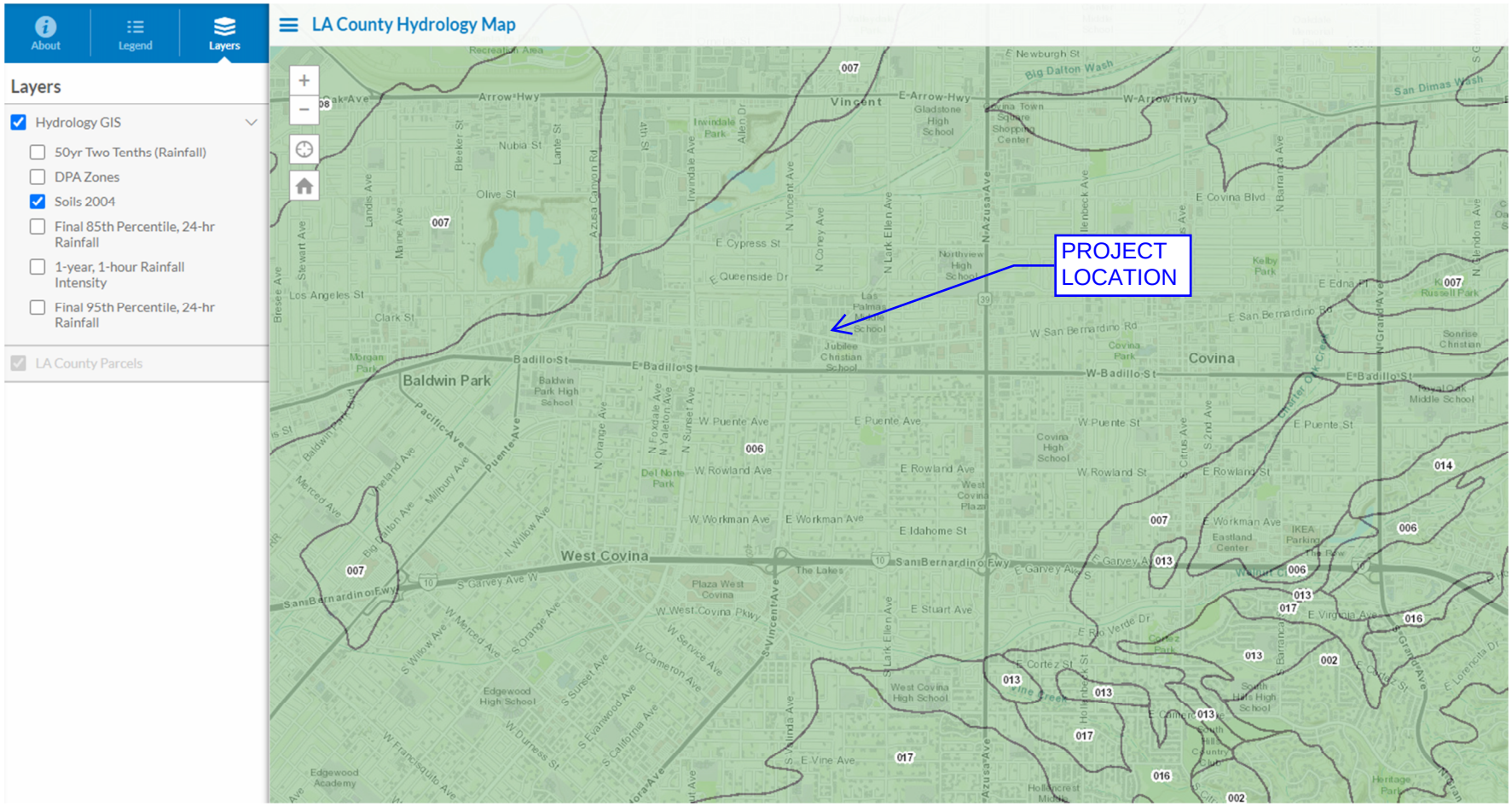


SUPPORTING PRECIPITATION DATA



NOTE: BASED ON THE MAP, THE PROJECT LOCATION FALLS IN BETWEEN THE 1.0 IN CONTOUR AND 1.1 IN CONTOUR FOR THE 85TH PERCENTILE, 24-HR RAINFALL VALUE. IT IS ESTIMATED TO BE APPROXIMATELY ~1.05 IN. THEREFORE, P85=1.05 IN IS BEING USED FOR DESIGN.

SUPPORTING SOILS DATA



Soil Identification Table

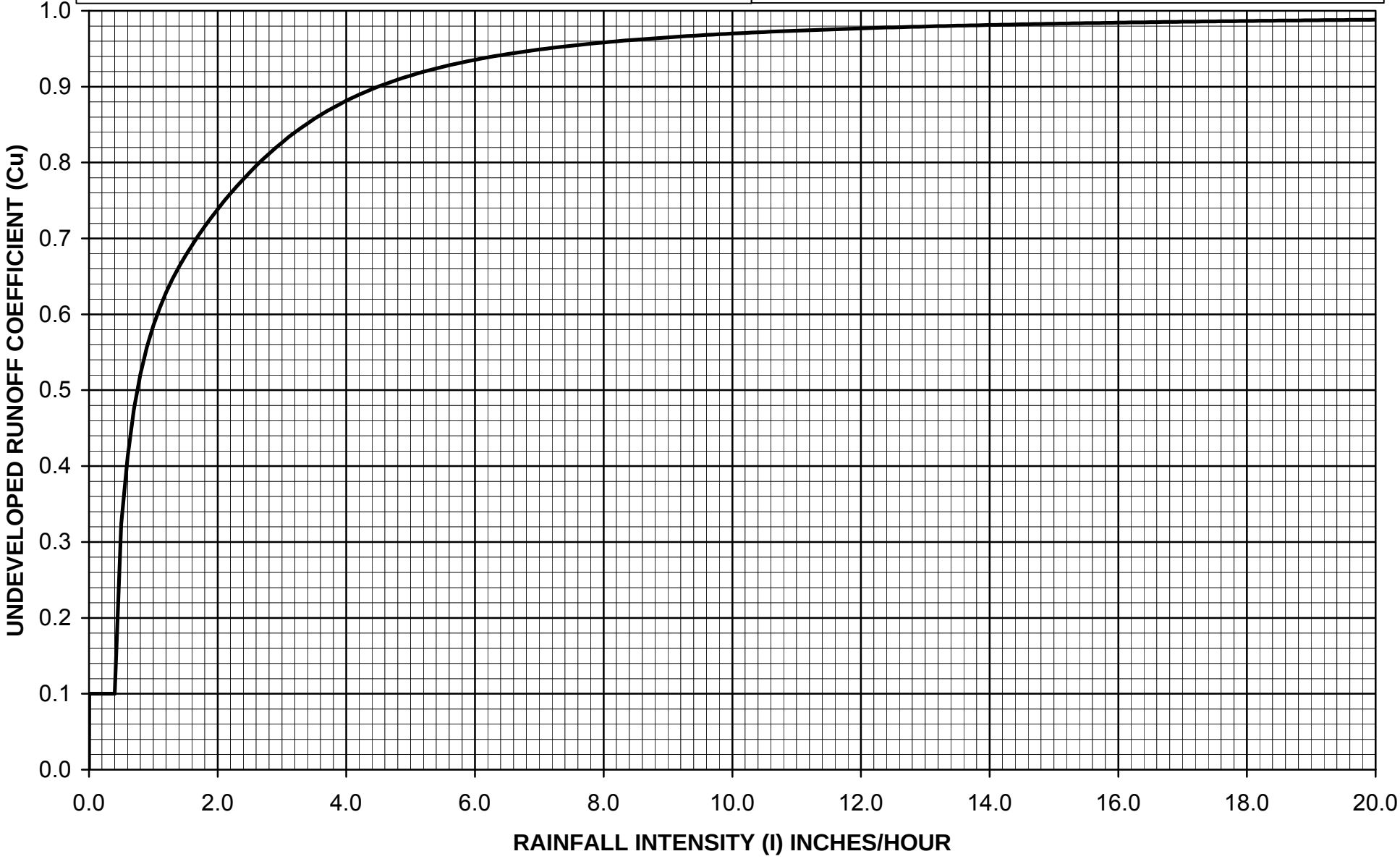
Number	Name	Original Name
2	ALTAMONT CLAY LOAM	A
3	CHINO SILT LOAM	CS-1
4	DIABLO CLAY LOAM	DY
5	HANFORD FINE SANDY LOAM	HF
6	HANFORD FINE SANDY LOAM	HF-1
7	HANFORD GRAVELLY SANDY LOAM	HG
8	HANFORD SILT LOAM	HN
9	MONTEZUMA CLAY ADOBE	M
10	OAKLEY FINE SAND	OS
11	PLACENTIA LOAM	PL
12	RAMONA CLAY LOAM	RC- 1
13	RAMONA LOAM	RO
14	RAMONA SANDY LOAM	RS
15	TUJUNGA FINE SANDY LOAM	TF
16	YOLO LOAM	Y
17	YOLO CLAY LOAM	YC
18	YOLO FINE SANDY LOAM	YF
19	YOLO GRAVELLY SANDY LOAM	YG
20	YOLO SANDY LOAM	YS
21	SANTA MONICA MOUNTAINS	SMM-1
22	SANTA MONICA MOUNTAINS	SMM-2
23	SANTA MONICA MOUNTAINS	SMM-3
24	SANTA MONICA MOUNTAINS	SMM-4
25	SANTA MONICA MOUNTAINS	SMM-5
26	SANTA MONICA MOUNTAINS	SMM-6
27	SANTA MONICA MOUNTAINS	SMM-7
28	SANTA MONICA MOUNTAINS	SMM-8
29	SANTA MONICA MOUNTAINS	SMM-9
30	SANTA MONICA MOUNTAINS	SMM-10
31	SANTA MONICA MOUNTAINS	SMM- 11
32	SANTA MONICA MOUNTAINS	SMM-12
33	SANTA MONICA MOUNTAINS	SMM-13
34	SANTA MONICA MOUNTAINS	SMM-14
35	SANTA MONICA MOUNTAINS	SMM-15
36	SANTA MONICA MOUNTAINS	SMM-16
37	SANTA MONICA MOUNTAINS	SMM- 17
38	SANTA MONICA MOUNTAINS	SMM- 18

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where: C_D = Developed Runoff Coefficient
IMP = Proportion Impervious
C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 006



CONTECH ENGINEERED SOLUTIONS

Date: 2/12/2024
Project Name: US Storage Center

City / County: Covina
State: CA

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	78.0	Backfill Porosity (%):	40%	System Diameter (in):	60
Out-to-out width (ft):	20.0	Depth Above Pipe (in):	12.0	Pipe Spacing (in):	30
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	12.0	Incremental Analysis (in):	6
Number of Barrels (ea):	3.0	Width At Ends (ft):	1.0	System Invert (Elevation):	40.5
		Width At Sides (ft):	1.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	40.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	704.0
0.50	41.00	0.0	0.0	352.0	352.0	352.0	352.0	0.0%	704.0
1.00	41.50	0.0	0.0	352.0	704.0	352.0	704.0	0.0%	704.0
1.50	42.00	244.2	244.2	254.3	958.3	498.5	1,202.5	20.3%	1,134.2
2.00	42.50	423.9	668.1	182.4	1,140.7	606.4	1,808.9	36.9%	1,277.6
2.50	43.00	515.9	1,184.1	145.6	1,286.4	661.5	2,470.4	47.9%	1,361.1
3.00	43.50	568.8	1,752.9	124.5	1,410.8	693.3	3,163.7	55.4%	1,406.5
3.50	44.00	593.5	2,346.4	114.6	1,525.4	708.1	3,871.8	60.6%	1,421.0
4.00	44.50	593.5	2,939.9	114.6	1,640.1	708.1	4,579.9	64.2%	1,406.5
4.50	45.00	568.8	3,508.7	124.5	1,764.5	693.3	5,273.2	66.5%	1,361.1
5.00	45.50	515.9	4,024.6	145.6	1,910.2	661.5	5,934.8	67.8%	1,277.6
5.50	46.00	423.9	4,448.5	182.4	2,092.6	606.4	6,541.1	68.0%	1,134.2
6.00	46.50	244.2	4,692.8	254.3	2,346.9	498.5	7,039.7	66.7%	704.0
6.50	47.00	0.0	4,692.8	352.0	2,698.9	352.0	7,391.7	63.5%	704.0
7.00	47.50	0.0	4,692.8	352.0	3,050.9	352.0	7,743.7	60.6%	704.0

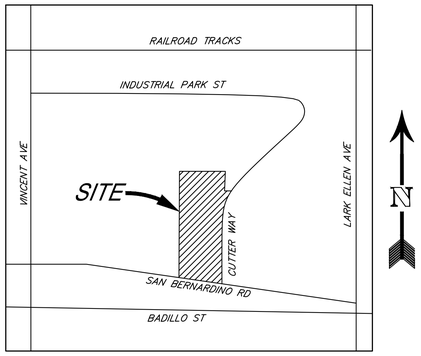
PROVIDED RETENTION VOLUME @ 6.0' = ~7,039 C.F. > 6,166 C.F. (REQ'D) - OK

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

Appendix D
Grading Plan (Reference)

IN THE CITY COVINA, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA.

PRELIMINARY GRADING PLAN
529 CUTTER WAY
FEBRUARY 2024



VICINITY MAP
NOT TO SCALE

OWNER/ DEVELOPER
WESTPORT PROPERTIES, INC.
660 NEWPORT CENTER DR. SUITE 1450
NEWPORT BEACH, CA 92660
PHONE: (949) 748-5900

ENGINEER
SDH & ASSOCIATES, INC
27363 VIA INDUSTRIA
TEMECULA, CA 92590
VOICE: (951) 683-3691
FAX: (951) 788-2314

SHEET INDEX
SHEET 1: TITLE SHEET
SHEET 2: PRECISE GRADING PLAN
SHEET 3: SECTIONS AND DETAILS

LEGEND
T.C.B. - TOP CATCH BASIN
F.G. - FINISHED GRADE
F.L. - FLOW LINE
H.P. - HIGH POINT
EXIST. - EXISTING
P.E. - PAD ELEVATION
G.B. - GRADE BREAK
T.C.B. - TOP OF CATCH BASIN
- POST INDICATOR VALVE
- FIRE HYDRANT
- SITE LIGHT
- STEM WALL HEIGHT
- TRACT BOUNDARY
- CENTERLINE
- CURB AND GUTTER
1280 - EXISTING CONTOUR
- LOT LINE
- SLOPE

ARCHITECT
KSP STUDIO
23 ORCHARD ROAD, SUITE 200
LAKE FOREST, CA. 92630
PHONE: (949) 380-3970

SOURCE OF TOPO
ARROWHEAD MAPPING CORP.
1887 BUSINESS
CENTER DR SUITE 5A
SAN BERNADINO CA. 92408
VOICE: (909) 889-2420
FLOWN: 11-16-19

ASSESSOR'S PARCEL NUMBERS
8434-013-010 & 8434-012-091

PROJECT DATA
GROSS SITE AREA:	10,995 S.F. (2.55 AC.)
NET SITE AREA:	98,133 S.F. (2.25 AC.)
BUILDING AREA:	183,584 S.F.

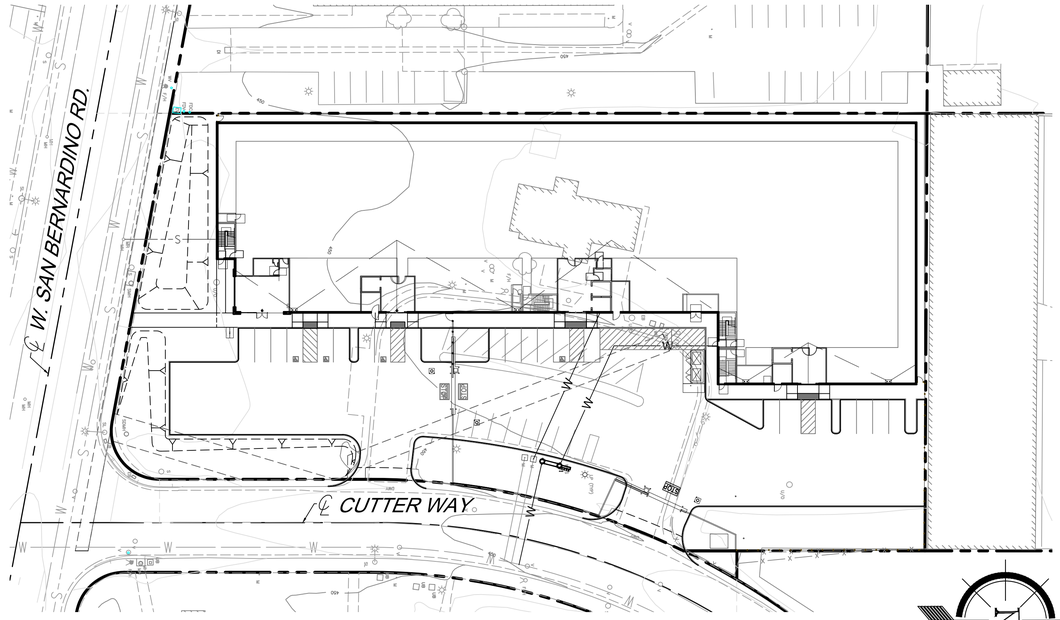
BASIS OF BEARINGS
THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF SAN BERNARDINO ROAD PER RECORD OF SURVEY 176/21
BEING: NORTH 79°20'30" WEST

SHEET INDEX
SHEET 1: TITLE SHEET
SHEET 2: PRELIMINARY GRADING PLAN
SHEET 3: SECTIONS AND DETAILS

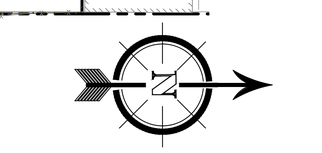
FEMA FLOOD ZONE DESIGNATION
ZONE X

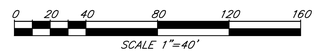
ZONING AND LAND USE
EXISTING ZONING.....M-1 (LIGHT MANUFACTURING ZONE)
EXISTING LAND USE.....CHURCH
PROPOSED LAND USE.....SELF STORAGE

WATER QUALITY
A PROJECT SPECIFIC WQMP WILL BE PREPARED FOR THIS PROJECT



INDEX MAP





SCALE 1"=40'

CONSTRUCTION NOTES :
1. CONSTRUCT 3" AC OVER 4" AB PAVEMENT
2. CONSTRUCT 6" PCC CONCRETE
3. CONSTRUCT 6" CURB AND GUTTER PER DETAIL ON SHEET 3
4. CONSTRUCT 6" CURB ONLY PER DETAIL ON SHEET 3
5. CONSTRUCT 4" PCC SIDEWALK
6. CONSTRUCT 18" ATRIUM GRATE AREA DRAIN
7. CONSTRUCT 24" TRAFFIC RATED CATCH BASIN BROOKS 2424CB OR APPROVED EQUAL
8. CONSTRUCT RIBBON GUTTER PER DETAIL ON SHEET 3
9. CONSTRUCT 6" HDPE STORM DRAIN
10. CONSTRUCT 12" HDPE STORM DRAIN
11. CONSTRUCT 8" HDPE STORM DRAIN
12. CONSTRUCT 5'X5' RIPRAP PAD, 6"-8" ANGULAR RIPRAP
13. CONSTRUCT 6" WIDE DURA SLOPE TRENCH DRAIN WITH TRAFFIC RATED GRATE
14. CONSTRUCT 18" HDPE STORM DRAIN
15. CONSTRUCT UNDERGROUND INFILTRATION SYSTEM (60"-DIA. PERFORATED UNDERGROUND RETENTION SYSTEM BY CONTECH)
16. CONSTRUCT PRE-TREATMENT BMP (AQUA-SWIRL TRASH CAPTURE AS-2s BYP CW STR #16, BY AQUASHIELD)
17. CONSTRUCT 15" HDPE STORM DRAIN
18. CONSTRUCT 12" HDPE STORM DRAIN (EQUALIZER PIPE WITH HDPE FLAILED ENDS)

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF COVINA, IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:
PARCEL 1:
THE EASTERLY 244.69 FEET, MEASURED ALONG THE NORTHERLY LINE OF THE FOLLOWING
DESCRIBED REAL PROPERTY:
THAT PORTION OF GOVERNMENT LOT 4 OF SECTION 15, TOWNSHIP 1 SOUTH, RANGE 10 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF COVINA, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND FILED IN THE DISTRICT LAND OFFICE APRIL 27,1877, DESCRIBED AS FOLLOWS:
BEGINNING AT THE INTERSECTION OF THE WESTERLY LINE OF SAID LOT 4, WITH THE NORTHERLY LINE OF SAN BERNARDINO ROAD, 66.00 FEET WIDE; THENCE NORTH 00° 08' 30" WEST ALONG SAID WESTERLY LINE 232.35 FEET; THENCE SOUTH 89° 54' 30" EAST, 600.00 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING SOUTH 89° 54' 30" EAST, 734.65 FEET, MORE OR LESS, TO THE EASTERLY LINE OF SAID LOT; THENCE ALONG SAID EASTERLY LINE, SOUTH 00° 08' 30" EAST TO THE SAID NORTHERLY LINE OF SAN BERNARDINO ROAD; THENCE ALONG THE SAID NORTHERLY LINE NORTH 79° 37' 35" WEST TO A LINE WHICH BEARS SOUTH 00° 08' 30" EAST FROM THE TRUE POINT OF BEGINNING; THENCE ALONG SAID LINE NORTH 00° 08' 30" WEST, 341.18 FEET TO THE TRUE POINT OF BEGINNING.
SAID LEGAL DESCRIPTION IS PURSUANT TO CERTIFICATE OF COMPLIANCE RECORDED MARCH 20, 2002, AS INSTRUMENT NO. 02-0662776, OF OFFICIAL RECORDS.
APN: 8434-013-010
PARCEL 2:
THAT PORTION OF LOT 3, SECTION 15, TOWNSHIP 1 SOUTH, RANGE 10 WEST, SAN BERNARDINO, IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND FILED IN THE DISTRICT LAND OFFICE APRIL 21, 1877 DESCRIBED AS FOLLOWS:
BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT; THENCE NORTHERLY ALONG THE WESTERLY LINE OF SAID LOT TO THE SOUTHWEST CORNER OF THE 2.80 ACRE PARCEL OF LAND SHOWN ON MAP FILED IN BOOK 60, PAGE 49 OF RECORD OF SURVEYS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, SAID CORNER BEING THE TRUE POINT OF BEGINNING; THENCE NORTHERLY ALONG SAID WESTERLY LINE, 204.04 FEET, TO THE NORTH LINE OF LAND DESCRIBED IN THE DEED TO DONALD R. WILKINSON AND WIFE, RECORDED ON JUNE 27, 1946, IN BOOK 23426, PAGE 1 OF OFFICIAL RECORDS IN THE OFFICE OF SAID COUNTY RECORDER; THENCE SOUTH 89°36' EAST ALONG SAID NORTH LINE, 77.54 FEET TO A POINT IN A NON-TANGENT CURVE, CONCAVE TO THE SOUTHEAST, HAVING A RADIUS OF 349.00 FEET, A RADIAL LINE TO SAID POINT IN SAID CURVE BEARS NORTH 54°11'20" WEST; THENCE SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL OF 35°41'04", AN ARC DISTANCE OF 217.36 TO ITS POINT OF TANGENCY WITH A LINE THAT IS PARALLEL WITH AND 12.00 FEET EASTERLY, MEASURED AT RIGHT ANGLES FROM SAID WESTERLY LINE; THENCE SOUTHERLY ALONG SAID PARALLEL LINE, A DISTANCE OF 0.13 FEET TO THE SOUTHERLY LINE OF SAID 2.80 ACRE PARCEL OF LAND; THENCE WESTERLY ALONG SAID SOUTHERLY LINE, TO THE TRUE POINT OF BEGINNING.
EXCEPT THEREFROM THAT PORTION OF SAID LAND LYING EASTERLY OF THE WESTERLY LINE OF CUTTER WAY NOW ESTABLISHED AND SHOWN ON THE L.A. COUNTY TAX'ES ASSESSOR'S MAP.
APN: 8434-012-902
NOTE: THIS COMPANY HAS PROVIDED SAID DESCRIPTION AS AN ACCOMMODATION FOR THE PURPOSE OF FACILITATING THIS REPORT. SAID DESCRIPTION IS NOT AN INSURABLE PARCEL PURSUANT TO THE SUBDIVISION MAP ACT OF THE STATE OF CALIFORNIA AND SHOULD NOT BE RELIED UPON TO CONVEY OR ENCUMBER SAID LAND, UNTIL APPROVED BY THE APPROPRIATE GOVERNING AGENCY.
APN: 8434-012-902 (OLD APN)
APN: 8434-012-091 (NEW APN)

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COUNTY	

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
DANE A. SOMMERS
No. 90433
Exp. 9-30-25
CIVIL
STATE OF CALIFORNIA

ENGINEERING COMPANY
SDH & ASSOCIATES INCORPORATED
SDH AND ASSOCIATES INC.
27363 VIA INDUSTRIA
TEMECULA, CA 92590
TEL: (951) 683-3691 FAX (951) 788-2314

PREPARED BY: DANE SOMMERS
R.C.E. NO. 90433
DATE 9-30-25

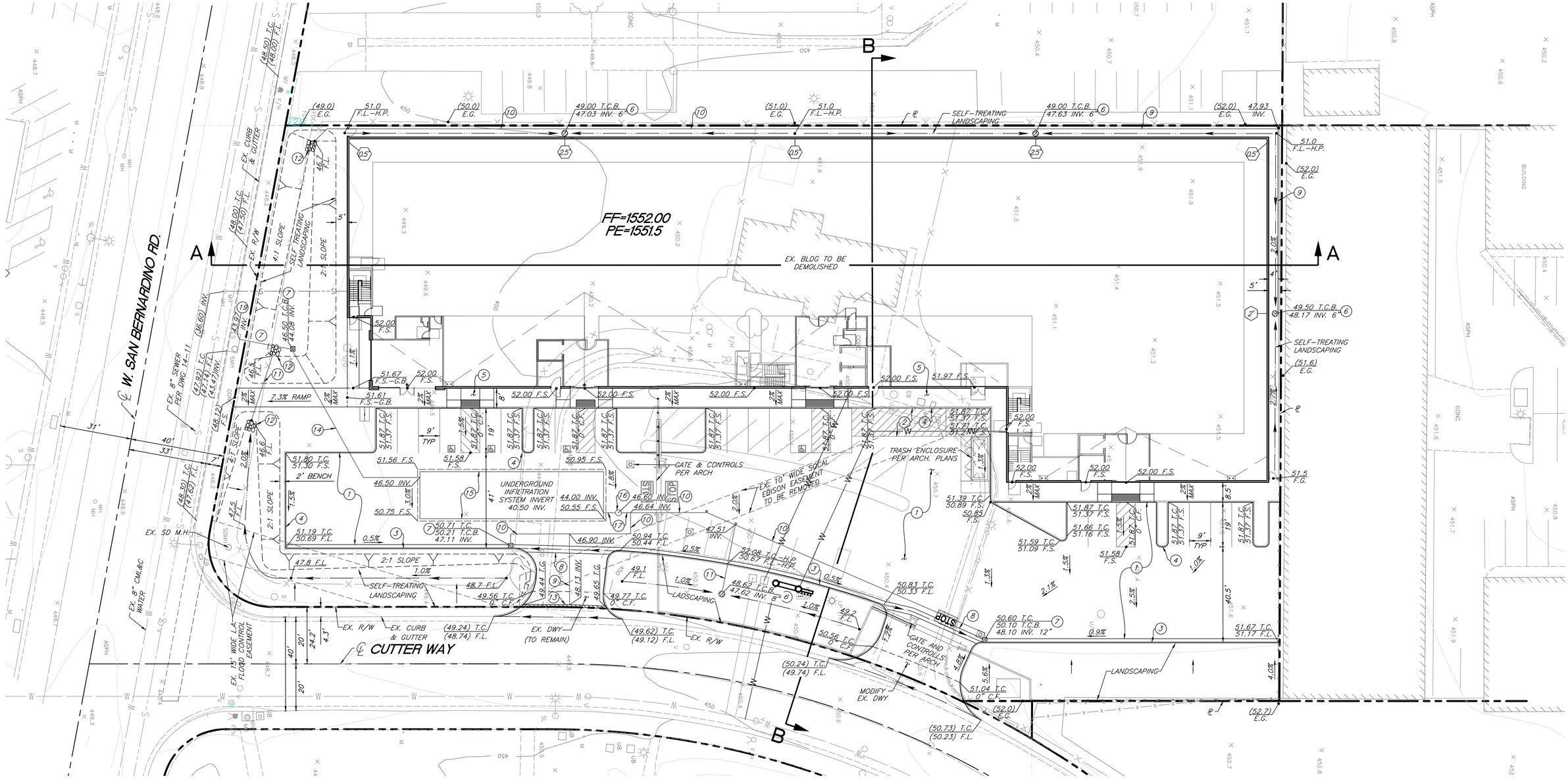
BENCHMARK
MWD BM DISK IN NORTH END CATCH BASIN 44.3 FEET NORTH OF BCR AT NORTHEAST CORNER BADILLO STREET & VINCENT AVENUE
EL=455.74'

SCALE: H: 1"=40' V: N/A

PRELIMINARY GRADING PLAN
529 CUTTER WAY
US STORAGE CENTER
TITLE SHEET

SHEET NO. 1
1 OF 3 SHTS

FOR:
W.O.



CONSTRUCTION NOTES :

1. CONSTRUCT 3" AC OVER 4" AB PAVEMENT
2. CONSTRUCT 6" PCC CONCRETE
3. CONSTRUCT 6" CURB AND GUTTER PER DETAIL ON SHEET 3
4. CONSTRUCT 6" CURB ONLY PER DETAIL ON SHEET 3
5. CONSTRUCT 4" PCC SIDEWALK
6. CONSTRUCT 18" ATRIUM GRATE AREA DRAIN
7. CONSTRUCT 24" TRAFFIC RATED CATCH BASIN BROOKS 2424CB OR APPROVED EQUAL
8. CONSTRUCT RIBBON GUTTER PER DETAIL ON SHEET 3
9. CONSTRUCT 6" HDPE STORM DRAIN
10. CONSTRUCT 12" HDPE STORM DRAIN
11. CONSTRUCT 8" HDPE STORM DRAIN
12. CONSTRUCT 5'X5' RIPRAP PAD, 6"-8" ANGULAR RIPRAP
13. CONSTRUCT 6" WIDE DURA SLOPE TRENCH DRAIN WITH TRAFFIC RATED GRATE
14. CONSTRUCT 18" HDPE STORM DRAIN
15. CONSTRUCT UNDERGROUND INFILTRATION SYSTEM (60" PERFORATED UNDERGROUND RETENTION SYSTEM BY CONTECH)
16. CONSTRUCT PRE-TREATMENT BMP (AQUA-SWIRL TRASH CAPTURE AS-2S BYP CW STR #16, BY AQUASHIELD)
17. CONSTRUCT 15" HDPE STORM DRAIN
18. CONSTRUCT 12" HDPE STORM DRAIN (EQUALIZER PIPE WITH HDPE FLAILED ENDS)

0 10 20 40 60 80

SCALE 1"=20'

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ENGINEER		

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APPR.	DATE
COUNTY	

SEAL—ENGINEER
REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

ENGINEERING COMPANY
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SDH AND ASSOCIATES INC.
27363 VIA INDUSTRIA
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TEL: (951) 683-3691 FAX (951) 788-2314

PREPARED BY: DANE SOMMERS
R.C.E. NO. 90433
DATE 9-30-25

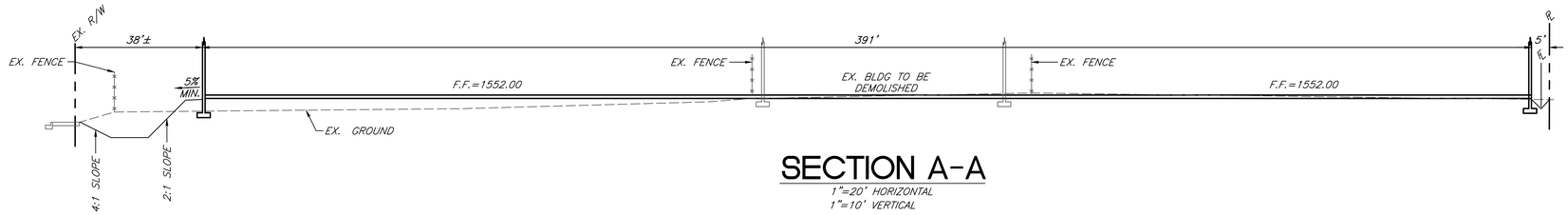
BENCHMARK
MWD BM DISK IN NORTH END CATCH BASIN 44.3 FEET NORTH OF BCR AT NORTHEAST CORNER BADILLO STREET & VINCENT AVENUE
EL=455.74'

SCALE: H: 1"=20' V: N/A

PRELIMINARY GRADING PLAN
529 CUTTER WAY
US STORAGE CENTER

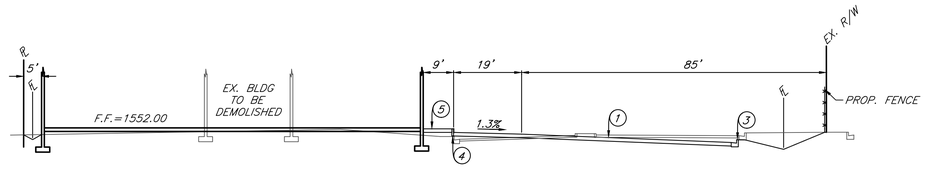
FOR:
W.O.

SHEET NO. 2
2 OF 3 SHTS



SECTION A-A

1"=20' HORIZONTAL
1"=10' VERTICAL

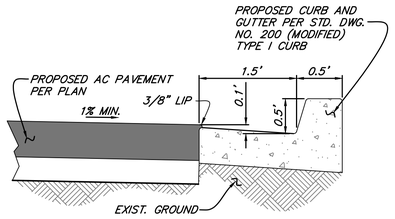


SECTION B-B

1"=20' HORIZONTAL
1"=10' VERTICAL

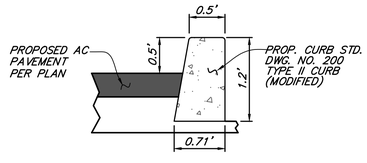
CONSTRUCTION NOTES :

1. CONSTRUCT 3" AC OVER 4" AB PAVEMENT
3. CONSTRUCT 6" CURB AND GUTTER PER DETAIL HEREON
4. CONSTRUCT 6" CURB ONLY PER DETAIL HEREON
5. CONSTRUCT 4" PCC SIDEWALK
8. CONSTRUCT RIBBON GUTTER PER DETAIL HEREON



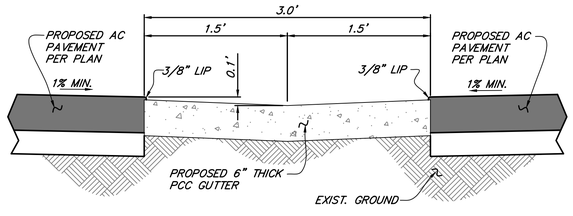
3 CURB & GUTTER DETAIL

NO SCALE



4 CURB ONLY DETAIL

NO SCALE



8 RIBBON GUTTER DETAIL

NO SCALE

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MARK	BY	DATE
ENGINEER		

REVISIONS	APPR.	DATE
	COUNTY	

SEAL—ENGINEER

REGISTERED PROFESSIONAL ENGINEER
DANE A. SOMMERS
No. 90433
Exp. 9-30-25
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SDH ASSOCIATES INCORPORATED
SDH AND ASSOCIATES INC.
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TEMECULA, CA 92590
TEL: (951) 683-3691 FAX (951) 788-2314

PREPARED BY: DANE SOMMERS
R.C.E. NO. 90433
DATE 9-30-25

BENCHMARK
MWD BM DISK IN NORTH END CATCH BASIN 44.3 FEET NORTH OF BCR AT NORTHEAST CORNER BADILLO STREET & VINCENT AVENUE
EL=455.74'

SCALE: H: 1"=20' V: 1"=10'

PRELIMINARY GRADING PLAN
529 CUTTER WAY
US STORAGE CENTER
SECTIONS

SHEET NO. 3
3 OF 3 SHTS

FOR:
W.O.

Appendix E
Soils Report

GEOTECHNICAL INVESTIGATION
PROPOSED SELF-STORAGE FACILITY

529 Cutter Way
Covina, California
For
Westport Properties, Inc.



SOUTHERN
CALIFORNIA
GEOTECHNICAL
A California Corporation

December 8, 2023

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Westport Properties, Inc.
660 Newport Center Drive, Suite 1450
Newport Beach, California 92660

Attention: Mr. David Kelly
Senior Vice President

Project No.: **23G207-1**

Subject: **Geotechnical Investigation**
Proposed Self-Storage Facility
529 Cutter Way
Covina, California

Ms. Kelly:

In accordance with your request, we have conducted a geotechnical investigation at the subject site. We are pleased to present this report summarizing the conclusions and recommendations developed from our investigation.

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Ricardo Frias, RCE 91772
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
RICARDO FRIAS
No. 91772
CIVIL
STATE OF CALIFORNIA

Robert G. Trazo, GE 2655
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
ROBERT TRAZO
No. 2655
GEOTECHNICAL
STATE OF CALIFORNIA

Distribution: (1) Addressee

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Plate 2: Boring Location Plan
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C Laboratory Test Results
D Grading Guide Specifications
E Seismic Design Parameters

1.0 EXECUTIVE SUMMARY

Presented below is a brief summary of the conclusions and recommendations of this investigation. Since this summary is not all inclusive, it should be read in complete context with the entire report.

Geotechnical Design Considerations

- The proposed development will consist of a four-story structure and will exert relatively high foundation loads.
- Existing undocumented fill soils were encountered at all of the boring locations, extending to depths of 2½ to 3± feet from the ground surface. The fill soils are underlain by native alluvium which possesses varying strengths.
- The results of laboratory testing indicate that some of the near-surface soils possess variable strengths and are moderately compressible when loaded. The native soils at depths of 20 to 30± feet possess high strengths and favorable consolidation characteristics.
- The proposed structure is expected to exert column loads of 400 to 600 kips. Based on the presence of low strength alluvium and fill soils at this site, these foundations would cause excessive settlements if supported on the presently existing soils. Overexcavation of the low strength alluvium is recommended. Alternatively, ground improvement consisting of rammed aggregate columns (RACs) is considered to be a feasible alternative to support the proposed building. RACs consist of pre-augured cavities that are backfilled with compacted aggregate that creates relatively stiff columns of compacted stone surrounded by a stiffened soil matrix. Installation of the RACs will significantly reduce settlements as well as increase the allowable bearing capacity of the soils.
- Accessory structures such as retaining walls, site walls, trash enclosures, etc., may be supported on conventional spread footings underlain by a newly placed layer of compacted structural fill.

Site Preparation

- Initial site preparation should include demolition of the existing structures, pavements, and associated improvements. The existing foundations, floor slabs, and any underground improvements that will not be reused with the new development should also be demolished. All vegetation and organic materials (including grass, tree root masses, shrubs, and organic soils) should be stripped from the site.
- **OPTION 1-**Remedial grading is recommended to be performed within the new building pad area. Preliminarily, the existing soils within the building pad area should be overexcavated to a depth of 12 feet below existing grades. The depth of overexcavation should also extend to a depth of at least 1½ times the footing width below the foundation bearing grade for spread footings and to a depth of at least 2 times the footing width below the foundation bearing grade for continuous foundations. In non-foundation areas of the proposed building pad area, the existing soils should be overexcavated to a depth of at least 5 feet below proposed pad grades.
- The overexcavation areas should extend at least 5 feet beyond the building and foundation perimeters and to an extent equal to the depth of fill below the foundation, whichever is greater. If the proposed structures incorporate any exterior columns (such as for a canopy or overhang) the overexcavation should also encompass these areas.

- **Option 2-**Installation of the RAC system will improve the soils beneath the foundations. However, it will be necessary to improve the soils that will support the new ground level floor slab. The proposed building areas should be overexcavated to a depth of at least 5 feet below existing grade and to a depth of 5 feet below proposed building pad subgrade elevation. The overexcavation should extend horizontally at least 5 feet beyond the building perimeter.
- After overexcavation has been completed, the subgrade soils should be evaluated by the geotechnical engineer to identify any additional soils that should be overexcavated. The resulting subgrade should then be scarified to a depth of 12 inches, moisture conditioned or air dried to 0 to 4 percent above optimum, and recompacted to at least 95 percent of the ASTM D-1557 maximum dry density. The previously excavated soils may then be replaced as compacted structural fill.
- RACs should be installed within the area of the proposed building foundations. The RACs will be designed and constructed by an independent design-build firm. Installation of the RACs should be monitored by a representative of the geotechnical engineer.
- Conventional shallow foundations used to support accessory structures such as retaining walls, site walls, trash enclosures, etc., should be overexcavated to a depth of at least 3 feet below proposed foundation bearing grade. These excavations should then be backfilled with structural fill soils and compacted to at least 90 percent relative compaction.
- The new pavement and flatwork subgrade soils are recommended to be scarified to a depth of 12± inches, moisture conditioned and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density.

Foundation Design Recommendations-Option 1
- Conventional shallow foundations, supported in newly placed compacted fill.
- 3,500 lbs/ft^2 maximum allowable soil bearing pressure.
- Reinforcement consisting of at least four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

Foundation Design Recommendations-Option 2
- The new building foundations can be supported on the RACs that will be installed at the foundation locations.
- 7,000 lbs/ft^2 maximum allowable soil bearing pressure.
- Reinforcement consisting of at least four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

Accessory Structure Foundations
- Accessory structures can be supported on conventional shallow foundations supported on newly placced engineered fill soils.
- 2,500 lbs/ft^2 maximum allowable soil bearing pressure.
- Reinforcement consisting of at least four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

Building Floor Slab
- Conventional Slab-on-Grade: minimum 6 inches thick.
- Modulus of Subgrade Reaction: k = 150 psi/in.
- Minimum slab reinforcement: Not required for geotechnical considerations. The actual floor slab reinforcement should be determined by the structural engineer, based upon the imposed loading.

Pavement Design Recommendations

ASPHALT PAVEMENTS (R = 40)					
Materials	**Thickness (inches)**				
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Truck Traffic		
			(TI = 6.0)	(TI = 7.0)	(TI = 8.0)
Asphalt Concrete	3	3	3½	4	5
Aggregate Base	3	4	6	7	8
Compacted Subgrade	12	12	12	12	12

PORTLAND CEMENT CONCRETE PAVEMENTS (R = 40)				
Materials	**Thickness (inches)**			
	Auto Parking & Drives (TI = 5.0)	Truck Traffic		
		(TI = 6.0)	(TI = 7.0)	(TI = 8.0)
PCC	5	5	5½	6½
Compacted Subgrade (95% Relative Compaction)	12	12	12	12

2.0 SCOPE OF SERVICES

The scope of services performed for this project was in general accordance with our Proposal No. 23P395, dated November 2, 2023. The scope of services included a visual site reconnaissance, subsurface exploration, field and laboratory testing, and geotechnical engineering analysis to provide criteria for preparing the design of the building foundations, building floor slab, and parking lot pavements along with site preparation recommendations and construction considerations for the proposed development. The evaluation of the environmental aspects of this site was beyond the scope of services for this geotechnical investigation.

3.0 SITE AND PROJECT DESCRIPTION

3.1 Site Conditions

The subject site is located at the northwest corner of West San Bernardino Road and Cutter Way in Covina, California. The site is also referenced by the street address 529 Cutter Way. The site is bounded to the west and north by existing commercial/industrial developments, to the east by Cutter Way, and to the south by West San Bernardino Road. The general location of the subject site is illustrated on the Site Location Map, included as Plate 1 in Appendix A of this report.

The site consists of an irregular-shaped parcel, 2.55± acres in size. The site is presently developed with a single-family residence (SFR) and attached garage with a total footprint of 2,149± ft², located in the west-central area of the site. The SFR is a two-story structure of wood frame and stucco construction. An asphaltic concrete (AC) parking lot is located in the east-central area of the site and a concrete driveway connects the parking lot with the garage structure. The AC pavements are in fair condition with minor cracking throughout. The ground surface cover for the rest of the site consists of exposed soil with moderate native grass and weed growth and occasional trees.

Historic aerial photographs were obtained from the Netronline website, https://www.historicaerials.com/viewer#. The earliest available photos are from 1948, 1952 and 1953 and indicate that the site was previously used for agricultural purposes. A channel previously transected the southeast corner of the site. The site remained vacant and unused until the existing SFR was constructed sometime between 1987 and 1992.

Detailed topographic was not available at the time of this report. Based on elevations obtained from Google Earth and visual observations made at the time of drilling, the site slopes to the south at a gradient of 1± percent. The maximum elevation differential across the site is 5± feet.

3.2 Proposed Development

SCG was provided with a conceptual site plan for the proposed development, prepared by KSP Studio. Based on this conceptual site plan, the site will be developed with one (1) new self-storage building. The building will be a four-story, Type II-B structure with a footprint of 45,896± ft^2, located in the western area of the site. The building will be surrounded by asphaltic concrete pavements in the parking and drive lane areas. We expect the new development will also include landscape planters.

Detailed structural information has not been provided. We assume that the new building will be a four-story structure. Based on previous experience with similar structures, we assume that the proposed structure will be a reinforced CMU structure incorporating several interior columns and bearing walls. The interior partition walls will be supported directly on a thickened structural slab. Based on the assumed construction, maximum column and wall loads are expected to be on the order of 400 to 600 kips and 8 to 12 kips per linear foot, respectively.

No significant amounts of below grade construction, such as crawl spaces or new basements, are expected to be included in the proposed development. Based on the existing topography, cuts and fills of up to 2 to 3± feet are expected to be necessary to achieve the proposed site grades.

4.0 SUBSURFACE EXPLORATION

4.1 Scope of Exploration/Sampling Methods

The subsurface exploration conducted for this project consisted of five (5) borings (identified as Boring Nos. B-1 through B-5) advanced to depths of 10 to 50± feet below the existing site grades. The borings were logged during drilling by a member of our staff.

The borings were advanced with hollow-stem augers, by a conventional truck-mounted drilling rig and a track-mounted limited access drill rig. Representative bulk and relatively undisturbed soil samples were taken during drilling. Relatively undisturbed soil samples were taken with a split barrel "California Sampler" containing a series of one-inch-long, 2.416± inch diameter brass rings. This sampling method is described in ASTM Test Method D-3550. Samples were also taken using a 1.4±-inch inside diameter split spoon sampler, in general accordance with ASTM D-1586. Both of these samplers are driven into the ground with successive blows of a 140-pound weight falling 30 inches. The blow counts obtained during driving are recorded for further analysis. Bulk samples were collected in plastic bags to retain their original moisture content. The relatively undisturbed ring samples were placed in molded plastic sleeves that were then sealed and transported to our laboratory.

The approximate locations of the borings are indicated on the Boring Location Plan, included as Plate 2 in Appendix A of this report. The Boring Logs, which illustrate the conditions encountered at the boring locations, as well as the results of some of the laboratory testing, are included in Appendix B.

4.2 Geotechnical Conditions

Pavements

Asphaltic concrete (AC) pavements were encountered at the ground surface at Boring No. B-5. The pavements section consists of 4± inches of AC, underlain by 7± inches of aggregate base.

Artificial Fill

Artificial fill soils were encountered beneath the pavement at Boring No. B-5, and at the ground surface of all the remaining boring locations, extending to depths of 2½ to 3± feet below ground surface. The fill soils generally consist of loose to medium dense silty fine sands and fine sands with varying medium to coarse sand and fine gravel content. The fill soils possess a disturbed appearance, resulting in their classification as artificial fill.

Alluvium

Native alluvium was encountered beneath the fill at all boring locations, extending to at least the maximum depth explored of 50± feet below ground surface. The alluvial soils generally consist of loose to dense silty fine sands and fine sands with varying medium to coarse sand and fine gravel content. Occasional layers of loose to very dense fine sandy silts, fine to medium sands, gravelly fine to coarse sands, and stiff to very stiff clayey silts, were encountered.

Groundwater

Free water was not encountered during the drilling of the borings. Based on the lack of water in the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth greater than 50± feet mean sea level at the time of the subsurface exploration.

As part of our research, we reviewed available groundwater data in order to determine the historic high groundwater level for the site. The primary reference used to determine the historic groundwater depths in this area is the CGS Open-File Report 98-13, the Seismic Hazard Zone Report for the Baldwin Park 7.5-Minute Quadrangle, which indicates that the historic high groundwater level for the site is 150± feet below the ground surface.

Recent water level data was obtained from the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. One monitoring wells on record is located 1.15± miles northeast of the site. Water level readings within this monitoring well indicates a high groundwater level of 257± feet below the ground surface in July 2020.

5.0 LABORATORY TESTING

The soil samples recovered from the subsurface exploration were returned to our laboratory for further testing to determine selected physical and engineering properties of the soils. The tests are briefly discussed below. It should be noted that the test results are specific to the actual samples tested, and variations could be expected at other locations and depths.

Classification

All recovered soil samples were classified using the Unified Soil Classification System (USCS), in accordance with ASTM D-2488. The field identifications were then supplemented with additional visual classifications and/or by laboratory testing. The USCS classifications are shown on the Boring Logs and are periodically referenced throughout this report.

Dry Density and Moisture Content

The density has been determined for selected relatively undisturbed ring samples. These densities were determined in general accordance with the method presented in ASTM D-2937. The results are recorded as dry unit weight in pounds per cubic foot. The moisture contents are determined in accordance with ASTM D-2216, and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Consolidation

Selected soil samples have been tested to determine their consolidation potential, in accordance with ASTM D-2435. The testing apparatus is designed to accept either natural or remolded samples in a one-inch-high ring, approximately 2.416 inches in diameter. Each sample is then loaded incrementally in a geometric progression and the resulting deflection is recorded at selected time intervals. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The samples are typically inundated with water at an intermediate load to determine their potential for collapse or heave. The results of the consolidation testing are plotted on Plates C-1 through C-8 in Appendix C of this report.

Maximum Dry Density and Optimum Moisture Content

A representative bulk sample was tested for its maximum dry density and optimum moisture content. The results have been obtained using the Modified Proctor procedure, per ASTM D-1557. These tests are generally used to compare the in-situ densities of undisturbed field samples, and for later compaction testing. Additional testing of other soil type or soil mixes may be necessary at a later date. The results of the testing are plotted on Plate C-9 in Appendix C of this report.

Direct Shear (Remolded)

Direct shear testing was performed on a selected soil sample to determine its shear strength parameters. The test was performed in accordance with ASTM D-3080. The testing apparatus is designed to accept either natural or remolded samples in a one-inch-high ring, approximately 2.416 inches in diameter. Three samples of the same soil are prepared by remolding them to 90±

percent compaction and near optimum moisture. Each of the three samples are then loaded with different normal loads and the resulting shear strength is determined for that particular normal load. The shearing of the samples is performed at a rate slow enough to permit the dissipation of excess pore water pressure. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The results of the direct shear test is presented on Plate C-10.

Soluble Sulfates

Representative samples of the near-surface soil were submitted to a subcontracted analytical laboratory for determination of soluble sulfate content. Soluble sulfates are naturally present in soils, and if the concentration is high enough, can result in degradation of concrete which comes into contact with these soils. The results of the soluble sulfate testing are presented below, and are discussed further in a subsequent section of this report.

Sample Identification	Soluble Sulfates (%)	Sulfate Classification
B-1 @ 1 to 5 feet	0.018	Not Applicable (S0)
B-4 @ 1 to 5 feet	0.013	Not Applicable (S0)

Expansion Index

The expansion potential of the on-site soils was determined in general accordance with ASTM D-4829 as required by the California Building Code (CBC). The testing apparatus is designed to accept a 4-inch-diameter, 1-inch high, remolded sample. The sample is initially remolded to 50± 1 percent saturation and then loaded with a surcharge equivalent to 144 pounds per square foot. The sample is then inundated with water and allowed to swell against the surcharge. The resultant swell or consolidation is recorded after a 24-hour period. The result of the EI testing is as follows:

Sample Identification	Expansion Index	Expansive Potential
B-4 @ 0 to 5 feet	0	Non-Expansive

Corrosivity Testing

Representative bulk samples of the near-surface soils were submitted to a subcontracted corrosion engineering laboratory to identify potentially corrosive characteristics with respect to common construction materials. The corrosivity testing included a determination of the electrical resistivity, pH, and chloride and nitrate concentrations of the soils, as well as other tests. The results of some of these tests are presented below.

Sample Identification	Saturated Resistivity (ohm-cm)	pH	Chlorides (mg/kg)	Nitrates (mg/kg)	Sulfides (mg/kg)	Redox Potential (mV)
B-1 @ 1 to 5 feet	10,050	8.7	117.9	1.2	0.1	151
B-4 @ 1 to 5 feet	8,710	8.1	84.0	12.8	0.2	127

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our review of the two potential development schemes for the site, field exploration, laboratory testing and geotechnical analysis, the proposed development is considered feasible from a geotechnical standpoint. The recommendations contained in this report should be taken into the design, construction, and grading considerations.

The recommendations are contingent upon all grading and foundation construction activities being monitored by the geotechnical engineer of record. The recommendations are provided with the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to verify compliance with these recommendations. Maintaining Southern California Geotechnical, Inc., (SCG) as the geotechnical consultant from the beginning to the end of the project will provide continuity of services. The geotechnical engineering firm providing testing and observation services shall assume the responsibility of Geotechnical Engineer of Record.

The Grading Guide Specifications, included as Appendix D, should be considered part of this report, and should be incorporated into the project specifications. The contractor and/or owner of the development should bring to the attention of the geotechnical engineer any conditions that differ from those stated in this report, or which may be detrimental for the development.

6.1 Seismic Design Considerations

The subject site is located in an area which is subject to strong ground motions due to earthquakes. The performance of a site-specific seismic hazards analysis was beyond the scope of this investigation. However, numerous faults capable of producing significant ground motions are located near the subject site. Due to economic considerations, it is not generally considered reasonable to design a structure that is not susceptible to earthquake damage. Therefore, significant damage to structures may be unavoidable during large earthquakes. The proposed structures should, however, be designed to resist structural collapse and thereby provide reasonable protection from serious injury, catastrophic property damage and loss of life.

Faulting and Seismicity

Research of available maps indicates that the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Furthermore, Southern California Geotechnical (SCG) did not identify any evidence of faulting during the geotechnical investigation. Therefore, the possibility of significant fault rupture on the site is considered to be low.

The potential for other geologic hazards such as seismically induced settlement, lateral spreading, tsunamis, inundation, seiches, flooding, and subsidence affecting the site is considered low.

Seismic Design Parameters

The 2022 California Building Code (CBC) provides procedures for earthquake resistant structural design that include considerations for on-site soil conditions, occupancy, and the configuration of

the structure including the structural system and height. The seismic design parameters presented below are based on the soil profile and the proximity of known faults with respect to the subject site.

The 2022 CBC Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool, a web-based software application available at the website www.seismicmaps.org. This software application calculates seismic design parameters in accordance with several building code reference documents, including ASCE 7-16, upon which the 2022 CBC is based. The application utilizes a database of risk-targeted maximum considered earthquake (MCE_R) site accelerations at 0.01-degree intervals for each of the code documents. The table below was created using data obtained from the application. The output generated from this program is enclosed as Plate E-1 in Appendix E of this report.

The 2022 CBC states that for Site Class D sites with a mapped S_1 value greater than 0.2, a site-specific ground motion analysis may be required in accordance with Section 11.4.8 of ASCE 7-16. Supplement 3 to ASCE 7-16 modifies Section 11.4.8 of ASCE 7-16 and states that "a ground motion hazard analysis is not required where the value of the parameter S_{M1} determined by Eq. (11.4-2) is increased by 50% for all applications of S_{M1} in this Standard. The resulting value of the parameter S_{D1} determined by Eq. (11.4-4) shall be used for all applications of S_{D1} in this Standard."

The seismic design parameters presented in the table below were calculated using the site coefficients (F_a and F_v) from Tables 1613.2.3(1) and 1613.2.3(2) presented in Section 16.4.4 of the 2022 CBC. It should be noted that the site coefficient F_v and the parameters S_{M1} and S_{D1} were not included in the SEAOC/OSHPD Seismic Design Maps Tool output for the ASCE 7-16 standard. We calculated these parameters-based on Table 1613.2.3(2) in Section 16.4.4 of the 2022 CBC using the value of S_1 obtained from the Seismic Design Maps Tool. **The values of S_{M1} and S_{D1} tabulated below** were evaluated using equations 11.4-2 and 11.4-4 of ASCE 7-16 (Equations 16-20 and 16-23, respectively, of the 2022 CBC) and **do not include a 50 percent increase.** As discussed above, if a ground motion hazard analysis has not been performed, S_{M1} and S_{D1} must be increased by 50 percent for all applications with respect to ASCE 7-16.

2022 CBC SEISMIC DESIGN PARAMETERS

Parameter		Value
Mapped Spectral Acceleration at 0.2 sec Period	S_S	1.654
Mapped Spectral Acceleration at 1.0 sec Period	S_1	0.612
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	S_{MS}	1.654
Site Modified Spectral Acceleration at 1.0 sec Period	S_{M1}	1.040[1]
Design Spectral Acceleration at 0.2 sec Period	S_{DS}	1.103
Design Spectral Acceleration at 1.0 sec Period	S_{D1}	0.694[1]

[1]Note: These values must be increased by 50 percent if a site-specific ground motion hazard analysis has not been performed

Liquefaction

Liquefaction is the loss of strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and grain size characteristics, relative density of the soil, initial confining pressure, and intensity and duration of ground shaking. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Liquefaction potential is greater in saturated, loose, poorly graded fine sands with a mean (d_{50}) grain size in the range of 0.075 to 0.2 mm (Seed and Idriss, 1971). Clayey (cohesive) soils or soils which possess clay particles (d<0.005mm) in excess of 20 percent (Seed and Idriss, 1982) are generally not considered to be susceptible to liquefaction, nor are those soils which are above the historic static groundwater table.

The Seismic Hazards Map for the Baldwin Park, California 7.5 Minute Quadrangle, published by the California Geological Survey (CGS) indicates that the subject site is not located within a designated liquefaction hazard zone. In addition, the subsurface conditions encountered at the site are not considered to be conducive to liquefaction. Based on the mapping performed by CGS and the conditions encountered at the trench locations, liquefaction is not considered to be a significant design concern for this project.

6.2 Geotechnical Design Considerations

General

The new structure at this site is expected to four-stories in height and will exert relatively high foundation loads.

Artificial fill soils were encountered at all of the boring locations, extending to depths of 2 to 3½± feet below the existing site grades. These soils consist of variable-strength, loose to medium dense silty fine sands and fine sands. Additionally, no documentation regarding the placement and compaction of these soils has been provided to our office. The fill soils are therefore considered to be undocumented fill. The fill soils are underlain by native alluvium which possesses variable strengths and composition. The results of laboratory testing indicate that the some of the native alluvial soils within the upper 5 to 15± feet exhibit loose densities and slightly unfavorable compressibility characteristics. Based on these conditions, the artificial fill materials and the upper portion of the near-surface alluvium, in their present condition, are not considered suitable for the support of new foundations and floor slabs of the proposed structures.

Ground improvements will be required to support the proposed four-story structure on conventional shallow foundations. We have provided two ground improvement options below. Please note that if conventional shallow foundations are not to be used as the main support system for the proposed four-story structure, SCG should be contacted to provide design recommendations for the proposed foundation system.

- **Option 1 –** Conventional Remedial grading: this option will require the removal and recompaction of the existing soils to a depth sufficient enough to reduce total and dynamic settlements to within tolerable limits.
- **Option 2 –** Rammed Aggregate Columns (RACs): RACs utilize pre-augared holes that are backfilled with aggregate that is compacted in-place using static crowd pressure augmented with a high frequency, low amplitude vibratory hammer. The impact hammer densifies the aggregate vertically while the tamper foot forces aggregate laterally into the cavity sidewalls, resulting in stiff RAC elements and a stiffened matrix soil between the RAPs.

Conventional foundations and grading techniques are recommended for structures located outside the proposed building area, such as retaining walls, trash enclosures, property line walls, etc.

Demolition of the existing buildings, pavements and associated improvements is expected to cause extensive disturbance to the near-surface soils. Any soils disturbed during demolition of the existing structures and site improvements should also be removed and recompacted as structural fill.

Settlement

The recommended remedial grading will remove the undocumented fill soils and a portion of the near-surface native alluvium from within the foundation influence zones, and replace these materials as compacted structural fill. The native soils that will remain in place below the recommended depth of overexcavation will not be subject to significant load increases from the foundations of the new structures. Provided that the recommended remedial grading is completed, the post-construction static settlements of the proposed structures are expected to be within tolerable limits.

Installation of the proposed RAC system will result in a significant decrease in the static and seismic settlements. The RAC system should be designed to reduce the static total settlements to approximately 1 inch and differential static settlements will be less than 0.5 inch over a 30-foot span. These settlements are considered to be within the settlement tolerances of the proposed structures, but this assumption should be verified by the project structural engineer.

Soluble Sulfates

The results of the soluble sulfate testing indicated sulfate concentrations of approximately 0.013 to 0.018 percent for the selected samples of the near-surface soils. These concentrations are considered to be "not applicable" (S0) with respect to the American Concrete Institute (ACI) Publication 318-14 Building Code Requirements for Structural Concrete and Commentary, Section 4.3. Therefore, specialized concrete mix designs are not considered to be necessary, with regard to sulfate protection purposes. It is, however, recommended that additional soluble sulfate testing be conducted at the completion of rough grading to verify the soluble sulfate concentrations of the soils which are present at pad grade within the building area.

Corrosion Potential

The results of laboratory testing indicate that the tested samples of the on-site soils possess saturated resistivity values ranging from 8,710 to 10,050 ohm-cm, and pH values ranging from 8.1 to 8.7. These soils possess redox potentials of 127 to 151 mV and a sulfide concentration ranging between 0.1 to 0.2 mg/kg was detected in the tested sample. These test results have been evaluated in accordance with guidelines published by the Ductile Iron Pipe Research Association (DIPRA). The DIPRA guidelines consist of a point system by which characteristics of the soils are used to quantify the corrosivity characteristics of the site. Resistivity, pH, sulfide concentration, redox potential, and moisture content are the five factors that are included in the evaluation procedure. Based on these factors, the on-site soils are considered to not be corrosive to ferrous pipes. Therefore, corrosion protection may not be required for cast iron or ductile iron pipes.

Relatively low concentrations of chlorides (84.0 to 117.9 mg/kg) were detected in the samples submitted for corrosivity testing. In general, soils possessing chloride concentrations in excess of 500 parts per million (ppm) are considered to be corrosive with respect to steel reinforcement within reinforced concrete. Based on the lack of any significant chlorides in the tested sample, the site is considered to have a C1 chloride exposure in accordance with the American Concrete Institute (ACI) Publication 318 Building Code Requirements for Structural Concrete and Commentary. Therefore, a specialized concrete mix design for reinforced concrete for protection against chloride exposure is not considered warranted.

Nitrates present in soil can be corrosive to copper tubing at concentrations greater than 50 mg/kg. The tested samples possess nitrate concentrations of 1.2 to 12.8 mg/kg. Based on these test results, the on-site soils are not considered to be corrosive to copper pipe with respect to their nitrate concentrations.

SCG does not practice in the area of corrosion engineering. Therefore, the client may wish to contact a corrosion engineer to provide a more thorough evaluation of the corrosion test results.

Expansion

Laboratory testing performed on a representative sample of the near surface soils indicates that these materials are non-expansive (EI = 0). Based on this test result, no special design considerations for expansive soils are considered warranted. However, it is recommended that additional expansion index testing be conducted at the completion of rough grading to verify the expansion potential of the as-graded building pads.

Shrinkage/Subsidence

Removal and recompaction of the artificial fill and near-surface native soils is estimated to result in an average shrinkage of 5 to 18 percent. Shrinkage estimates for the individual samples range between 2 and 20+ percent based on the results of density testing and the assumption that the on-site soils will be compacted to about 92 percent of the ASTM D-1557 maximum dry density. It should be noted that the shrinkage estimate is based on the results of dry density testing performed on small-diameter samples of the existing soils taken at the boring locations. If a more accurate and precise shrinkage estimate is desired, SCG can perform a shrinkage study involving

several excavated test-pits where in-place densities are determined using in-situ testing methods instead of laboratory density testing on small-diameter samples. Please contact SCG for details and a cost estimate regarding a shrinkage study, if desired.

Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be 0.1 feet. This estimate may be used for grading in areas that are underlain by native alluvial soils.

These estimates are based on previous experience and the subsurface conditions encountered at the boring locations. The actual amount of subsidence is expected to be variable and will be dependent on the type of machinery used, repetitions of use, and dynamic effects, all of which are difficult to assess precisely.

Grading and Foundation Plan Review

It is recommended that we be provided with copies of the grading and foundation plans, when they become available, for review with regard to the conclusions, recommendations, and assumptions contained within this report.

6.3 Site Grading Recommendations

The grading recommendations presented below are based on the subsurface conditions encountered at the boring locations and our understanding of the proposed development. We recommend that all grading activities be completed in accordance with the Grading Guide Specifications included as Appendix D of this report, unless superseded by site-specific recommendations presented below.

Site Stripping and Demolition

The proposed development will require demolition of the existing buildings and other improvements including pavements. Any existing improvements that will not remain in place for use with the new development should be removed in their entirety. This should include all foundations, floor slabs, utilities, trees and associated root masses, and any other above-ground and subsurface improvements associated with the existing structures. The existing pavements are not expected to be reused with the new development. Debris resultant from demolition should be disposed of off-site. Asphaltic concrete and Portland cement concrete debris may be crushed and made into miscellaneous base for use in the proposed pavement areas or crushed to a particle size less than 1-inch and blended with the on-site sands for use in structural fills. All organic materials should be disposed of off-site.

Detailed structural information regarding the existing buildings has not been provided to our office. Therefore, the foundation systems supporting the existing buildings are presently unknown by SCG. If any of the existing buildings are supported on deep foundation systems, the deep foundation elements located within the proposed structure areas should be cut off at a depth of at least 3 feet below the bottom of the planned overexcavation. Where deep foundations are encountered within proposed pavement areas, they should be cut off at a depth of at least 2 feet below the proposed pavement subgrade or at a depth of at least 1 foot below the bottom of any planned utilities.

Treatment of Existing Soils: Building Pad-Option 1

Remedial grading should be performed within the proposed building pad area in order to remove the existing undocumented fill soils and a portion of the compressible near-surface native alluvium. Additionally, the necessary demolition at this site will result in significant disturbance of the near-surface soils. Any soils disturbed during demolition should also be overexcavated. At a minimum, we recommend that the existing soils within the proposed building pad area be overexcavated to a depth of at least 12 feet below existing grades. The depth of overexcavation should also extend to a depth of at least 1½ times the footing width below the foundation bearing grade for spread footings and to a depth of at least 2 times the footing width below the foundation bearing grade for continuous foundations. In non-foundation areas of the proposed building pad area, the existing soils should be overexcavated to a depth of at least 5 feet below proposed pad grades.

The overexcavation areas should extend at least 5 feet beyond the building perimeters, and to an extent equal to the depth of fill below the new foundations. If the proposed structures incorporate any exterior columns (such as for a canopy or overhang) the area of overexcavation should also encompass these areas.

Following completion of the overexcavation, the subgrade soils within the overexcavation areas should be evaluated by the geotechnical engineer to verify their suitability to serve as the structural fill subgrade, as well as to support the foundation loads of the new structure. This evaluation should include proofrolling and probing to identify any soft, loose or otherwise unstable soils that must be removed. Some localized areas of deeper excavation may be required if undocumented fill materials or loose, porous, overly moist, or low-density native soils are encountered at the base of the overexcavation.

After a suitable overexcavation subgrade has been achieved, the exposed soils should be scarified to a depth of at least 12 inches and moisture conditioned or air dried to achieve a moisture content of 0 to 4 percent above optimum moisture content. The subgrade soils should then be recompacted to at least 95 percent of the ASTM D-1557 maximum dry density. The building pad areas may then be raised to grade with previously excavated soils or imported, structural fill. **All structural fill soils within the proposed building areas should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density.**

Treatment of Existing Soils: New Foundation Areas-Option 2

It is recommended that the existing soils in the area of the building foundations be improved through the installation of RACs. The RACs will be installed throughout the foundation areas. Based on the existing conditions, the RACs will likely extend to depths of at least approximately 20 to 25± feet below foundation bearing grade. However, the actual design of the RACs should be determined by the design-build contractor.

The RAC construction process consists of utilizing pre-augured holes that are backfilled with aggregate that is compacted in place using static crowd pressure augmented with a high frequency, low amplitude, vibratory hammer. The impact hammer densifies the aggregate vertically while the tamper foot forces aggregate laterally into the cavity sidewalls, resulting in stiff RAC elements and a stiffened matrix soil between the RACs. The actual diameter of the RACs

will be determined by a specialty contractor, but typically range from 24 to 30 inches. The RAC design and installation should be in accordance with CBC Section 1813.

The RAC installation process should be observed and documented by a representative of the geotechnical engineer. This documentation should include RAC spacing, diameter, and depth.

Treatment of Existing Soils: Retaining Walls and Site Walls

It is expected that shallow foundations will also be required for support of appurtenances located outside the building area, such as retaining walls, site walls, trash enclosures, etc. The existing soils within the foundation areas of these accessory structures should be overexcavated to a depth of at least 3 feet below foundation bearing grade and replaced as compacted structural fill. Any undocumented fill soils should also be removed from the retaining wall areas. The overexcavation subgrade soils should be evaluated by the geotechnical engineer prior to scarifying, moisture conditioning and recompacting the upper 12 inches of exposed subgrade soils. The previously excavated soils may then be replaced as compacted structural fill.

If the full lateral extent of overexcavation cannot be completed during grading of the proposed retaining walls and site walls located along property lines, the foundations for those walls should be designed using a reduced allowable bearing pressure. Furthermore, the contractor should take necessary precautions to protect the adjacent improvements during rough grading. Specialized grading techniques, such as A-B-C slot cuts, will likely be required during remedial grading. The geotechnical engineer of record should be contacted if additional recommendations, such as shoring design recommendations, are required during grading.

Treatment of Existing Soils: Flatwork, Parking and Drive Areas

Based on economic considerations, overexcavation of the existing near-surface existing soils in the new flatwork, parking and drive areas is not considered warranted, with the exception of areas where lower strength or unstable soils are identified by the geotechnical engineer during grading. Subgrade preparation in the new flatwork, parking and drive areas should initially consist of removal of all soils disturbed during stripping and demolition operations.

The geotechnical engineer should then evaluate the subgrade to identify any areas of additional unsuitable soils. Any such materials should be removed to a level of firm and unyielding soil. The exposed subgrade soils should then be scarified to a depth of 12± inches, moisture conditioned to 0 to 4 percent above the optimum moisture content, and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. Based on the presence of variable strength surficial soils throughout the site, it is expected that some isolated areas of additional overexcavation may be required to remove zones of lower strength, unsuitable soils.

The grading recommendations presented above for the proposed flatwork, parking and drive areas assume that the owner and/or developer can tolerate minor amounts of settlement within these areas. The grading recommendations presented above do not mitigate the extent of undocumented artificial fill soils in the flatwork, parking and drive areas. As such, some settlement and associated pavement distress could occur. Typically, repair of such distressed areas involves significantly lower costs than completely mitigating these soils at the time of construction. If the owner cannot tolerate the risk of such settlements, the flatwork, parking and drive areas should

be overexcavated to a depth of 2 feet below proposed pavement subgrade elevation, with the resulting soils replaced as compacted structural fill.

Fill Placement

- Fill soils should be placed in thin (6± inches), near-horizontal lifts, moisture conditioned to 0 to 4 percent above the optimum moisture content, and compacted.
- On-site soils may be used for fill provided they are cleaned of any debris to the satisfaction of the geotechnical engineer.
- All grading and fill placement activities should be completed in accordance with the requirements of the 2022 CBC and the grading code of the City of Covina.
- All fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Fill soils should be well mixed.
- Compaction tests should be performed periodically by the geotechnical engineer as random verification of compaction and moisture content. These tests are intended to aid the contractor. Since the tests are taken at discrete locations and depths, they may not be indicative of the entire fill and therefore should not relieve the contractor of his responsibility to meet the job specifications.

Imported Structural Fill

Imported structural fill should consist of very low expansive (EI < 20), well graded soils possessing at least 10 percent fines (that portion of the sample passing the No. 200 sieve). Additional specifications for structural fill are presented in the Grading Guide Specifications, included as Appendix D.

Utility Trench Backfill

In general, utility trench backfill should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. As an alternative, a clean sand (minimum Sand Equivalent of 30) may be placed within trenches and compacted in place (jetting or flooding is not recommended). Compacted trench backfill should conform to the requirements of the local grading code, and more restrictive requirements may be indicated by the City of Covina. Utility trench backfills should be witnessed by the geotechnical engineer. The trench backfill soils should be compaction tested where possible; probed and visually evaluated elsewhere.

Utility trenches which parallel a footing, and extending below a 1h:1v (horizontal to vertical) plane projected from the outside edge of the footing should be backfilled with structural fill soils, compacted to at least 90 percent of the ASTM D-1557 standard. Pea gravel backfill should not be used for these trenches.

Soils used to backfill voids around subsurface utility structures, such as manholes or vaults, should be placed as compacted structural fill. If it is not practical to place compacted fill in these areas, then such void spaces may be backfilled with lean concrete slurry. Uncompacted pea gravel or sand is not recommended for backfilling these voids since these materials have a potential to settle and thereby cause distress of pavements placed around these subterranean structures.

6.4 Construction Considerations

Excavation Considerations

The near-surface soils generally consist of gravelly sands, sands, and silty sands. These materials will be subject to moderate caving within shallow excavations. Where caving does occur, flattened excavation slopes may be sufficient to provide excavation stability. On a preliminary basis, the inclination of temporary slopes should not exceed 2h:1v. Deeper excavations may require some form of external stabilization such as shoring or bracing. Maintaining adequate moisture content within the near-surface soils will improve excavation stability. All excavation activities on this site should be conducted in accordance with Cal-OSHA regulations.

Moisture Sensitive Subgrade Soils

Some of the near-surface soils possess appreciable silt content and will become unstable if exposed to significant moisture infiltration or disturbance by construction traffic. In addition, based on their granular content, some of the on-site soils will be susceptible to erosion. Therefore, the site should be graded to prevent ponding of surface water and to prevent water from running into excavations.

Groundwater

The static groundwater table at this site is considered to exist at a depth greater than 50± feet. Therefore, groundwater is not expected to impact the grading or foundation construction activities.

6.5 Foundation Design and Construction

Based on the preceding grading recommendations, it is assumed that the new building foundations will either be underlain by structural fill soils used to replace the undocumented fill soils and near-surface alluvial soils or by existing soils which have been improved by the placement of a system of RACs. Furthermore, it is expected that any new foundations for appurtenances, such as retaining walls, site walls, trash enclosures, etc., will be underlain by newly placed structural fill soils, extending to depths of at least 3 feet below proposed foundation bearing grade. Based on this subsurface profile, the proposed structures may be designed as follows:

Foundation Design Parameters (Option 1 Conventional Grading)

New square and rectangular footings used to support building foundation if remedial grading/overexcavation recommendations have been performed and new fill soils have been compacted to at least 95 percent of the ASTM D-1557 maximum dry density may be designed as follows:

- Maximum, net allowable soil bearing pressure: 3,500 lbs/ft^2.
- Maximum, net allowable soil bearing pressure: 2,000 lbs/ft^2 if the full recommended lateral

extent of remedial grading cannot be achieved, typically for new footings along the property lines.

- Minimum wall/column footing width: 14 inches/24 inches.

- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom).

- Minimum foundation embedment: 12 inches into suitable structural fill soils, and at least 18 inches below adjacent exterior grade. Interior column footings may be placed immediately beneath the floor slab.

- It is recommended that the perimeter building foundations be continuous across all exterior doorways. Any flatwork adjacent to the exterior doors should be doweled into the perimeter foundations in a manner determined by the structural engineer.

The allowable bearing pressures presented above may be increased by 1/3 when considering short duration wind or seismic loads. The minimum steel reinforcement recommended above is based on standard geotechnical practice. Additional rigidity may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer.

Foundation Design Parameters (Option 2 New Building Foundations)

New square and rectangular footings may be designed as follows:

- Maximum, net allowable soil bearing pressure: 7,000 lbs/ft^2.

- Minimum wall/column footing width: 14 inches/24 inches.

- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom).

- Minimum foundation embedment: 12 inches into suitable structural fill soils, and at least 24 inches below adjacent exterior grade. Interior column footings may be placed immediately beneath the floor slab. The building foundations should be directly supported on the RACs.

- It is recommended that the perimeter building foundations be continuous across all exterior doorways. Any flatwork adjacent to the exterior doors should be doweled into the perimeter foundations in a manner determined by the structural engineer.

The allowable bearing pressures presented above may be increased by 1/3 when considering short duration wind or seismic loads. The minimum steel reinforcement recommended above is based on standard geotechnical practice. Additional rigidity may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer. The maximum allowable bearing pressure presented above is preliminary; the actual bearing pressure should be determined by the RAC designer based on both bearing capacity and

settlement considerations. The bearing pressure is also contingent upon our review of the final site plan and completion of any necessary supplemental geotechnical investigation at the site.

Foundation Design Parameters (Accessory Structures)

New square and rectangular footings used to support accessory structure foundations, such as retaining walls, screen walls, and trash enclosures, if remedial grading/overexcavation recommendations have been performed may be designed as follows:

- Maximum, net allowable soil bearing pressure: 2,500 lbs/ft^2.
- Maximum, net allowable soil bearing pressure: 1,500 lbs/ft^2 if the full recommended lateral extent of remedial grading cannot be achieved, typically for new footings along the property lines.
- Minimum wall/column footing width: 14 inches/24 inches.
- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom).
- Minimum foundation embedment: 12 inches into suitable structural fill soils, and at least 18 inches below adjacent exterior grade. Interior column footings may be placed immediately beneath the floor slab.
- It is recommended that the perimeter building foundations be continuous across all exterior doorways. Any flatwork adjacent to the exterior doors should be doweled into the perimeter foundations in a manner determined by the structural engineer.

The allowable bearing pressures presented above may be increased by 1/3 when considering short duration wind or seismic loads. The minimum steel reinforcement recommended above is based on standard geotechnical practice. Additional rigidity may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer.

Foundation Construction

The foundation subgrade soils should be evaluated at the time of site grading, as discussed in Section 6.3 of this report. It is further recommended that the foundation subgrade soils be evaluated by the geotechnical engineer immediately prior to steel or concrete placement. Soils suitable for support of the new building foundations should consist of either newly placed structural fill compacted at least 90 percent of the ASTM D-1557 maximum dry density or existing soils that have been improved through the placement of the RACs. Soils suitable for direct foundation support in the accessory structure areas should consist of newly placed structural fill, compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Any unsuitable materials should be removed to a depth of suitable bearing compacted structural fill, with the resulting excavations backfilled with compacted fill soils. As an alternative, lean concrete slurry (500 to 1,500 psi) may be used to backfill such isolated overexcavations.

The foundation subgrade soils should also be properly moisture conditioned to 0 to 4 percent above the Modified Proctor optimum, to a depth of at least 12 inches below bearing grade. Since it is typically not feasible to increase the moisture content of the floor slab and foundation subgrade soils once rough grading has been completed, care should be taken to maintain the moisture content of the building pad subgrade soils throughout the construction process.

Estimated Foundation Settlements

Post-construction total and differential static settlements of shallow foundations designed and constructed in accordance with the previously presented recommendations are estimated to be less than 1.0 and 0.5 inches, respectively. Differential movements are expected to occur over a 30-foot span, thereby resulting in an angular distortion of less than 0.002 inches per inch.

Lateral Load Resistance

Lateral load resistance will be developed by a combination of friction acting at the base of foundations and slabs and the passive earth pressure developed by footings below grade. The following friction and passive pressure may be used to resist lateral forces:

- Passive Earth Pressure: 300 lbs/ft^3
- Friction Coefficient: 0.30
- Friction Coefficient: 0.45 for foundations supported directly on RACs.

These are allowable values, and include a factor of safety. When combining friction and passive resistance, the passive pressure component should be reduced by one-third. These values assume that footings will be poured directly against compacted structural fill soils. The maximum allowable passive pressure is 3,000 lbs/ft^2.

6.6 Floor Slab Design and Construction

Subgrades which will support new floor slab should be prepared in accordance with the recommendations contained in the ***Site Grading Recommendations*** section of this report. Based on the anticipated grading which will occur at this site, the floor of the proposed structure may be constructed as conventional slab-on-grade supported on newly placed structural fill (95% compaction), extending to a depth of at least 5 feet below finished pad grade. Based on geotechnical considerations, the floor slab may be designed as follows:

- Minimum slab thickness: 6 inches.

- Modulus of Subgrade Reaction: 150 psi/in.

- Minimum slab reinforcement: Not required for geotechnical considerations. The actual floor slab reinforcement should be determined by the structural engineer, based upon the imposed loading.

- Slab underlayment: If moisture sensitive floor coverings will be used then minimum slab underlayment should consist of a moisture vapor barrier constructed below the entire slab area where such moisture sensitive floor coverings are expected. The moisture vapor

barrier should meet or exceed the Class A rating as defined by ASTM E 1745-97 and have a permeance rating less than 0.01 perms as described in ASTM E 96-95 and ASTM E 154-88. A polyolefin material such as Stego® Wrap Vapor Barrier or equivalent will meet these specifications. The moisture vapor barrier should be properly constructed in accordance with all applicable manufacturer specifications. Given that a rock free subgrade is anticipated and that a capillary break is not required, sand below the barrier is not required. The need for sand and/or the amount of sand above the moisture vapor barrier should be specified by the structural engineer or concrete contractor. The selection of sand above the barrier is not a geotechnical engineering issue and hence outside our purview. Where moisture sensitive floor coverings are not anticipated, the vapor barrier may be eliminated.

- Moisture condition the floor slab subgrade soils to 0 to 4 percent above the Modified Proctor optimum moisture content, to a depth of 12 inches. The moisture content of the floor slab subgrade soils should be verified by the geotechnical engineer within 24 hours prior to concrete placement.

- Proper concrete curing techniques should be utilized to reduce the potential for slab curling or the formation of excessive shrinkage cracks.

The actual design of the floor slab should be completed by the structural engineer to verify adequate thickness and reinforcement.

6.7 Retaining Wall Design and Construction

Although not indicated on the site plan, some small (less than 6 feet in height) retaining walls may be required to facilitate the new site grades. The parameters recommended for use in the design of these walls are presented below.

Retaining Wall Design Parameters

Based on the soil conditions encountered at the boring locations, the following parameters may be used for preliminary design of new retaining walls for this site. The following parameters assume that only the on-site sands, silty sands, gravelly sands, and sandy silts should be utilized for retaining wall backfill. These materials are expected to possess a friction angle of at least 30 degrees when compacted to 90 percent relative compaction.

If desired, SCG could provide design parameters for an alternative select backfill material behind the retaining walls. The use of select backfill material could result in lower lateral earth pressures. In order to use the design parameters for the imported select fill, this material must be placed within the entire active failure wedge. This wedge is defined as extending from the heel of the retaining wall upwards at an angle of approximately 60° from horizontal. If select backfill material behind the retaining wall is desired, SCG should be contacted for supplementary recommendations.

RETAINING WALL DESIGN PARAMETERS

Design Parameter		Soil Type
		On-Site Sands, Silty Sands and Sandy Silts
Internal Friction Angle (ϕ)		30°
Unit Weight		125 lbs/ft^3
Equivalent Fluid Pressure:	Active Condition (level backfill)	42 lbs/ft^3
	Active Condition (2h:1v backfill)	67 lbs/ft^3
	At-Rest Condition (level backfill)	63 lbs/ft^3

The walls should be designed using a soil-footing coefficient of friction of 0.30 and an equivalent passive pressure of 300 lbs/ft^3. The structural engineer should incorporate appropriate factors of safety in the design of the retaining walls.

The active earth pressure may be used for the design of retaining walls that do not directly support structures or support soils that in turn support structures and which will be allowed to deflect. The at-rest earth pressure should be used for walls that will not be allowed to deflect such as those which will support foundation bearing soils, or which will support foundation loads directly.

Where the soils on the toe side of the retaining wall are not covered by a "hard" surface such as a structure or pavement, the upper 1 foot of soil should be neglected when calculating passive resistance due to the potential for the material to become disturbed or degraded during the life of the structure.

Seismic Lateral Earth Pressures

In accordance with the 2022 CBC, any retaining walls more than 6 feet in height must be designed for seismic lateral earth pressures. If walls 6 feet or more are required for this site, the geotechnical engineer should be contacted for supplementary seismic lateral earth pressure recommendations.

Retaining Wall Foundation Design

The retaining wall foundations should be supported within newly placed compacted structural fill, extending to a depth of at least 3 feet below proposed foundation bearing grade. Foundations to support new retaining walls should be designed in accordance with the general Foundation Design Parameters presented in a previous section of this report.

Backfill Material

With the exception of fine sandy clays and silty clays, the on-site soils may be used to backfill the retaining walls. However, all backfill material placed within 3 feet of the back wall-face should

have a particle size no greater than 3 inches. The retaining wall backfill materials should be well graded.

It is recommended that a minimum 1 foot thick layer of free-draining granular material (less than 5 percent passing the No. 200 sieve) be placed against the face of the retaining walls. This material should extend from the top of the retaining wall footing to within 1 foot of the ground surface on the back side of the retaining wall. This material should be approved by the geotechnical engineer. In lieu of the 1-foot-thick layer of free-draining material, a properly installed prefabricated drainage composite such as the MiraDRAIN 6000XL (or approved equivalent), which is specifically designed for use behind retaining walls, may be used. If the layer of free-draining material is not covered by an impermeable surface, such as a structure or pavement, a 12-inch-thick layer of a low permeability soil should be placed over the backfill to reduce surface water migration to the underlying soils. The layer of free draining granular material should be separated from the backfill soils by a suitable geotextile, approved by the geotechnical engineer.

All retaining wall backfill should be placed and compacted under engineering-controlled conditions in the necessary layer thicknesses to ensure an in-place density between 90 and 93 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D1557). Care should be taken to avoid over-compaction of the soils behind the retaining walls, and the use of heavy compaction equipment should be avoided.

Subsurface Drainage

As previously indicated, the retaining wall design parameters are based upon drained backfill conditions. Consequently, some form of permanent drainage system will be necessary in conjunction with the appropriate backfill material. Subsurface drainage may consist of either:

- A weep hole drainage system typically consisting of a series of 2-inch diameter holes in the wall situated slightly above the ground surface elevation on the exposed side of the wall and at an approximate 10-foot on-center spacing. Alternatively, 4-inch diameter holes at an approximate 20-foot on-center spacing can be used for this type of drainage system. In addition, the weep holes should include a 2 cubic foot pocket of open graded gravel, surrounded by an approved geotextile fabric, at each weep hole location.

- A 4-inch-diameter perforated pipe surrounded by 2 cubic feet of gravel per linear foot of drain placed behind the wall, above the retaining wall footing. The gravel layer should be wrapped in a suitable geotextile fabric to reduce the potential for migration of fines. The footing drain should be extended to daylight or tied into a storm drainage system.

Weep holes or a footing drain will not be required on the inside of building stem walls.

6.8 Pavement Design Parameters

Site preparation in the pavement area should be completed as previously recommended in the ***Site Grading Recommendations*** section of this report. The subsequent pavement recommendations assume proper drainage and construction monitoring, and are based on either PCA or CALTRANS design parameters for a twenty (20) year design period. However, these

designs also assume a routine pavement maintenance program to obtain the anticipated 20-year pavement service life.

Pavement Subgrades

It is anticipated that the new pavements will be primarily supported on a layer of compacted structural fill, consisting of scarified, thoroughly moisture conditioned and recompacted existing soils. The near-surface soils generally consist of sands, silty sands, and sandy silts. These soils are expected to provide good pavement support characteristics. R-value testing was outside the scope of work for this project. Based on their classification, these soils are assumed to possess an R-value of at least 40. Any fill material imported to the site should have support characteristics equal to or greater than that of the on-site soils and be placed and compacted under engineering-controlled conditions. It is recommended that R-value testing be performed as part of a supplementary geotechnical investigation or after completion of rough grading. Depending upon the results of the R-value testing, it may be feasible to use thinner pavement sections in some areas of the site.

Asphaltic Concrete

Presented below are the recommended thicknesses for new flexible pavement structures consisting of asphaltic concrete over a granular base. The pavement designs are based on the traffic indices (TI's) indicated. The client and/or civil engineer should verify that these TI's are representative of the anticipated traffic volumes. If the client and/or civil engineer determine that the expected traffic volume will exceed the applicable traffic index, we should be contacted for supplementary recommendations. The design traffic indices equate to the following approximate daily traffic volumes over a 20-year design life, assuming six operational traffic days per week.

Traffic Index	No. of Heavy Trucks per Day
4.0	0
5.0	1
6.0	3
7.0	11
8.0	35

For the purpose of the traffic volumes indicated above, a truck is defined as a 5-axle tractor trailer unit with one 8-kip axle and two 32-kip tandem axles. All of the traffic indices allow for 1,000 automobiles per day.

ASPHALT PAVEMENTS (R = 40)					
Materials	**Thickness (inches)**				
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Truck Traffic		
			(TI = 6.0)	(TI = 7.0)	(TI = 8.0)
Asphalt Concrete	3	3	3½	4	5
Aggregate Base	3	4	6	7	8
Compacted Subgrade	12	12	12	12	12

The aggregate base course should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density. The asphaltic concrete should be compacted to at least 95 percent of the batch plant-reported maximum density. The aggregate base course may consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB), which is a recycled gravel, asphalt and concrete material. The gradation, R-Value, Sand Equivalent, and Percentage Wear of the CAB or CMB should comply with appropriate specifications contained in the current edition of the "Greenbook" Standard Specifications for Public Works Construction.

Portland Cement Concrete

The preparation of the subgrade soils within concrete pavement areas should be performed as previously described for proposed asphalt pavement areas. The minimum recommended thicknesses for the Portland Cement Concrete pavement sections are as follows:

PORTLAND CEMENT CONCRETE PAVEMENTS (R = 40)				
Materials	**Thickness (inches)**			
	Auto Parking & Drives (TI = 5.0)	Truck Traffic		
		(TI = 6.0)	(TI = 7.0)	(TI = 8.0)
PCC	5	5	5½	6½
Compacted Subgrade (95% Relative Compaction)	12	12	12	12

The concrete should have a 28-day compressive strength of at least 3,000 psi. Reinforcing within all pavements should be designed by the structural engineer. The maximum joint spacing within all of the PCC pavements is recommended to be equal to or less than 30 times the pavement thickness. The actual joint spacing and reinforcing of the Portland cement concrete pavements should be determined by the structural engineer.

7.0 GENERAL COMMENTS

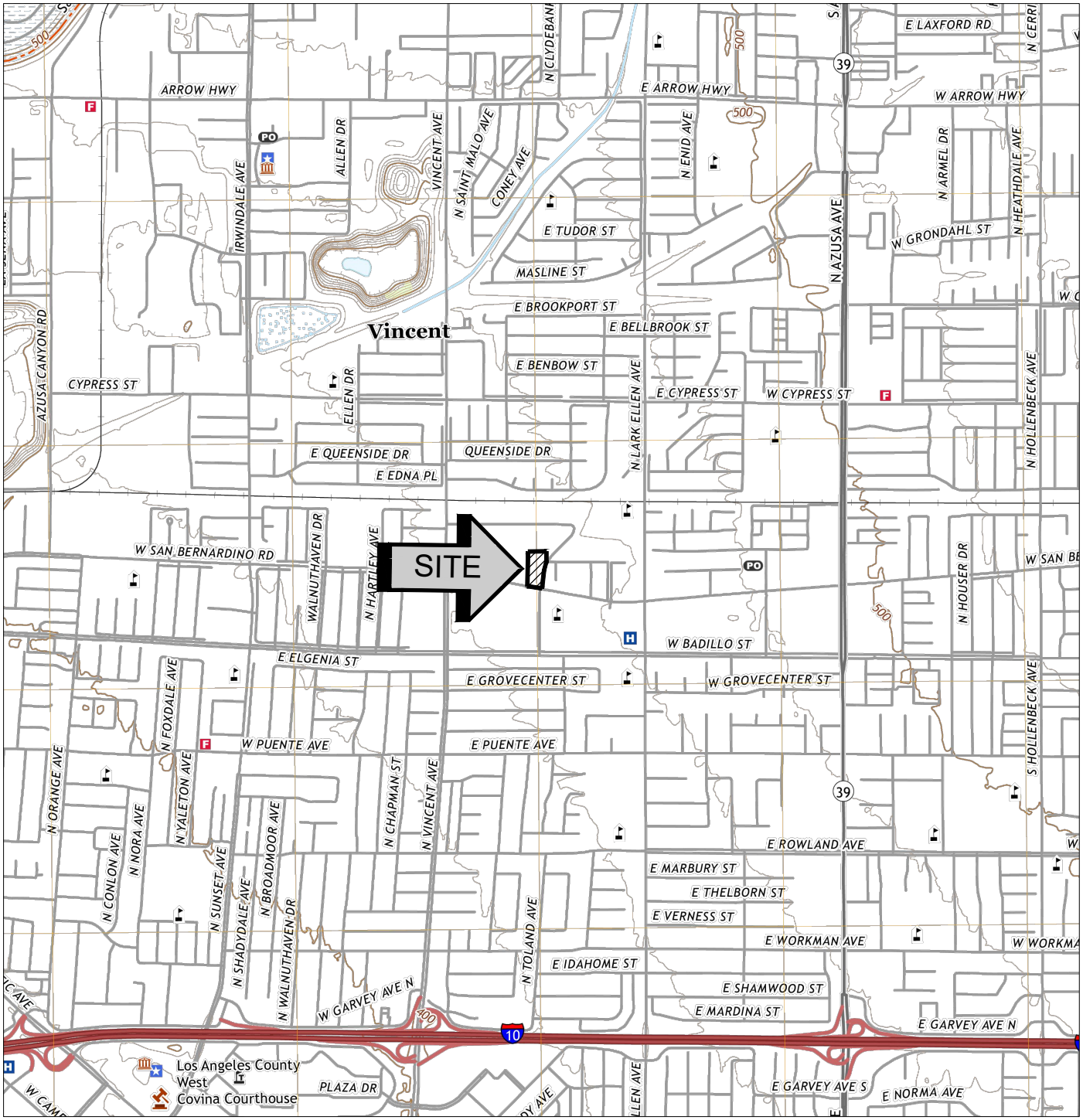
This report has been prepared as an instrument of service for use by the client, in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, civil engineer, and/or structural engineer. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The client(s)' reliance upon this report is subject to the Engineering Services Agreement, incorporated into our proposal for this project.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and sample depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted.

The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

APPENDIX A



SOURCE: USGS TOPOGRAPHIC MAP OF THE BALDWIN PARK QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA, 2021.

SITE LOCATION MAP

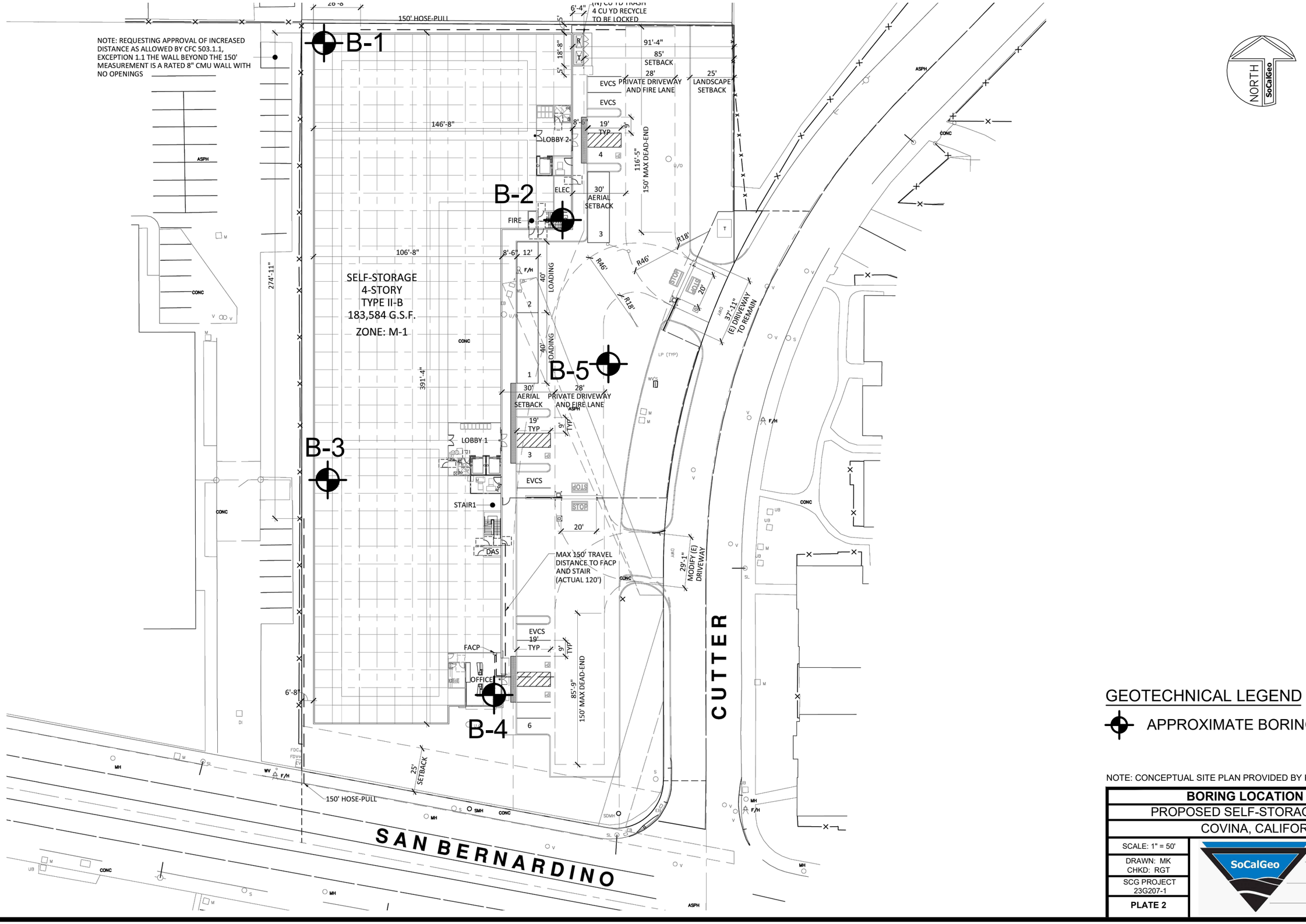
PROPOSED SELF-STORAGE FACILITY

COVINA, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: MK CHKD: RGT	
SCG PROJECT 23G207-1	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

APPROXIMATE BORING LOCATION

NOTE: CONCEPTUAL SITE PLAN PROVIDED BY KSP STUDIO.

BORING LOCATION PLAN

PROPOSED SELF-STORAGE FACILITY

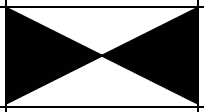
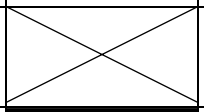
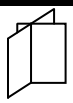
COVINA, CALIFORNIA

SCALE: 1" = 50'	
DRAWN: MK CHKD: RGT	
SCG PROJECT 23G207-1	
PLATE 2	

SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX B

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

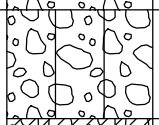
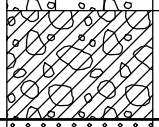
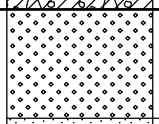
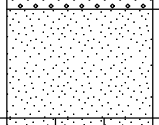
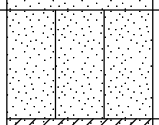
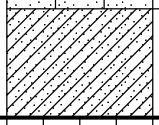
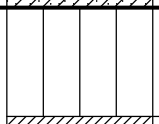
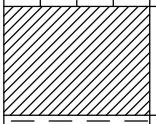
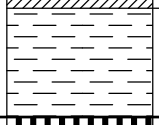
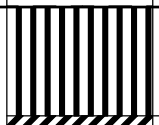
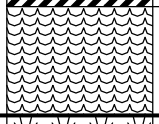
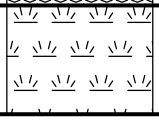
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 23 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		11			FILL: Light Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, trace fine Gravel, trace fine root fibers, loose-dry to damp	106	2					
		28			ALLUVIUM: Light Gray fine to coarse Sand, little fine Gravel, medium dense-dry to damp		2					Disturbed Sample
5		23			Brown Silty fine Sand, trace medium to coarse Sand, medium dense-very moist	98	16					
		14			Brown fine Sand, little Silt, trace medium Sand, loose-damp	101	6					
10		7			Brown Silty fine Sand, trace medium Sand, loose-very moist	82	25					
		6			Dark Brown Interbedded fine Sandy Silt and Clayey Silt, trace fine root fibers, loose-moist to very moist		18					
15												
		18			Brown fine Sand, little medium Sand, trace coarse Sand, trace fine Gravel, medium dense to dense-dry to damp	100	3					
20												
		31					2					
25												
		50/2"			Gray Gravelly fine to coarse Sand, trace Silt, occasional Cobbles, dense to very dense-dry to damp	116	2					
30												
		41					2					

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-1a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 23 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Gray Gravelly fine to coarse Sand, trace Silt, occasional Cobbles, dense to very dense-dry to damp							
		17				122	3					
40					Brown fine Sandy Silt, medium dense-damp							
					@ 43½ feet, little Clay, very moist							
		27					19					
45												
					Dark Brown Silty fine Sand, trace medium Sand, medium dense-moist							
		33				110	14					
50					Boring Terminated at 50 feet							

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-1b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 19 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		7			FILL: Light Gray Brown fine Sand, trace Silt, trace medium to coarse Sand, trace fine Gravel, loose-damp		3					
		4			ALLUVIUM: Dark Gray Brown Silty fine Sand, trace medium to coarse Sand, loose-damp to moist		9					
5		9			Gray Brown fine Sand, trace Silt, loose-damp		6					
		7			Dark Brown Interbedded Silty fine Sand and Clayey Silt, loose-very moist		22					
10												
		14			Brown Silty fine Sand to fine Sandy Silt, trace medium Sand, medium dense-damp to moist		8					
15												
		10			Light Gray Brown fine Sand, trace Silt, trace medium Sand, medium dense-damp		4					
20												
		29			Light Gray fine to medium Sand, trace coarse Sand, trace fine to coarse Gravel, occasional Cobbles, medium dense to very dense-dry to damp		2					
25												
		50/3"			@ 28½ feet, little fine to coarse Gravel		2					
30												
					Boring Terminated at 30 feet							

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 18 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					FILL: Gray Brown fine Sand, little Silt, trace medium to coarse Sand, loose-damp							
		6					3					
		11			ALLUVIUM: Gray Brown Silty fine Sand, trace fine root fibers, loose to medium dense-damp to moist		5					
5		7					4					
		10					6					
10												
		11					4					
15							8					
					Gray Brown fine Sand, trace Silt, medium dense-damp							
		13					4					
20												
					Brown fine Sand, trace Silt, trace medium to coarse Sand, trace fine to coarse Gravel, medium dense-damp							
		24					3					
25												
					Light Gray Gravelly fine to coarse Sand, dense to very dense-dry to damp							
		37					2					
30												
		50/3"					2					

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-3a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 18 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Light Gray Gravelly fine to coarse Sand, dense to very dense-dry to damp							
					Dark Brown Clayey Silt, little fine Sand, stiff to very stiff-very moist							
	X	14	3.0				24					
40					Boring Terminated at 40 feet							

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-3b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 32 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					FILL: Brown Silty fine Sand, little medium to coarse Sand, little fine Gravel, loose-dry to damp							
		8				106	2					EI = 0 @ 1 to 5 feet
		21			ALLUVIUM: Light Gray fine to medium Sand, trace coarse Sand, trace fine Gravel, loose to medium dense-dry to damp	101	2					
5		11				102	4					
					Brown Silty fine Sand, loose-damp to very moist							
		9				84	22					
		11				83	22					
10												
					Brown fine Sand, trace medium Sand, medium dense-moist							
		15				98	6					
15												
					Brown Silty fine Sand, trace medium Sand, loose-moist							
		7					11					
20												
					Light Gray fine to medium Sand, trace coarse Sand, medium dense-damp							
		40				109	3					
25												
					Brown fine to coarse Sand, trace Silt, little fine to coarse Gravel, very dense-moist							
		50/1"					6					
30												
					Light Gray Gravelly fine to coarse Sand, occasional Cobbles, very dense-damp							
		50/3"				124	4					

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-4a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 32 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Light Gray Gravelly fine to coarse Sand, occasional Cobbles, very dense-damp							
					Dark Brown Interbedded fine Sandy Silt and Clayey Silt, medium dense-moist to very moist							
40		12					16					
					Brown Silty fine Sand, medium dense-moist							
45		30				112	14					
					Brown fine Sand, little Silt, medium dense-moist							
		12					13					
50					Boring Terminated at 50 feet							

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-4b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-5

JOB NO.: 23G207-1
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/9/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 6.5 feet
READING TAKEN: At Completion

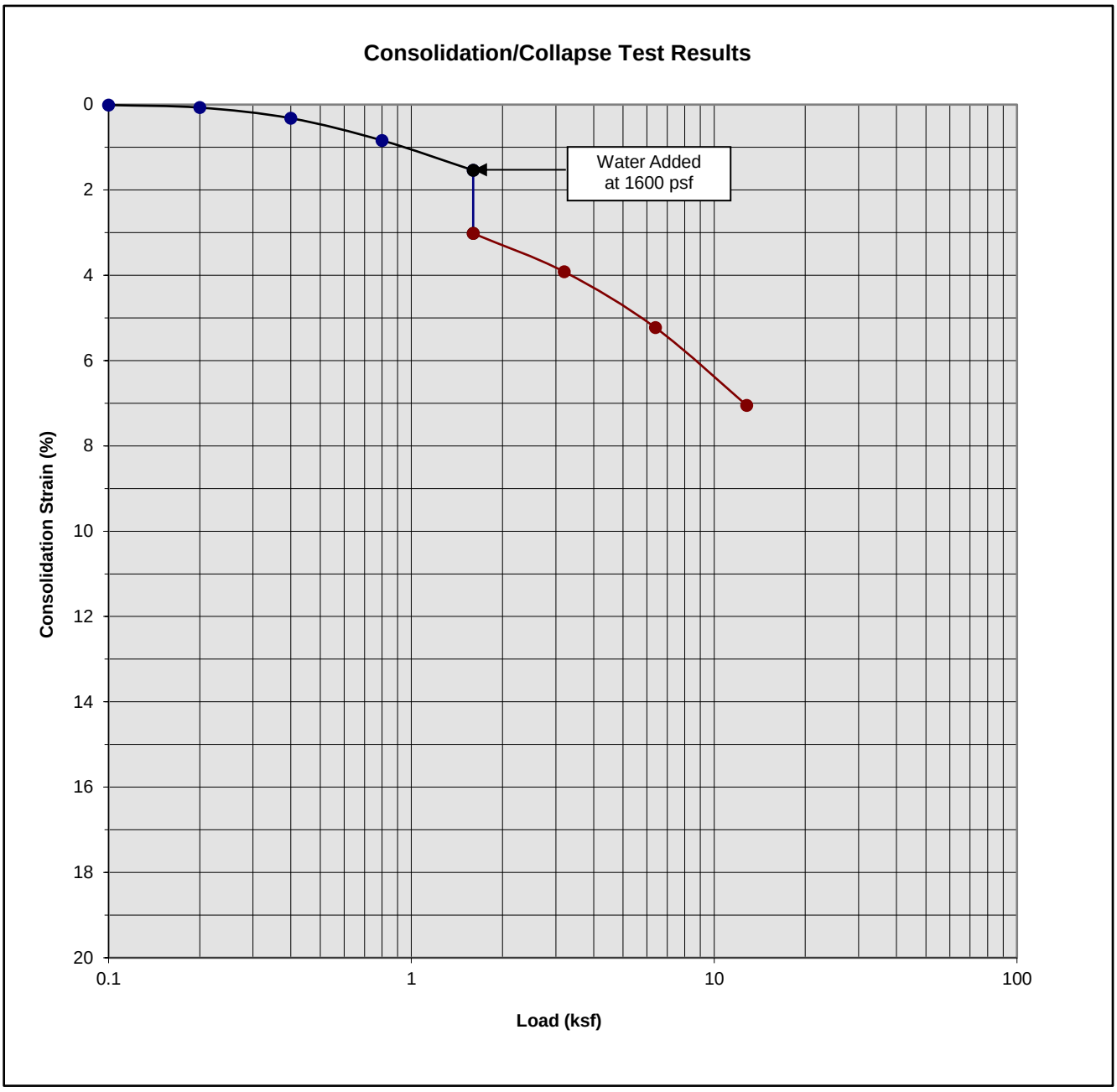
FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					4± inches Asphaltic Concrete, 7± inches Aggregate Base							
		11			FILL: Brown fine Sand, trace Asphaltic Concrete fragments, medium dense-damp		3					
		10			ALLUVIUM: Brown Silty fine Sand, trace medium Sand, medium dense-damp		6					
5												
		8			Brown fine Sand, trace to little Silt, trace fine root fibers, loose to medium dense-damp		3					
		10					4					
10					Boring Terminated at 10 feet							

TBL 23G207-1.GPJ SOCALGEO.GDT 12/8/23

TEST BORING LOG

PLATE B-5

APPENDIX C



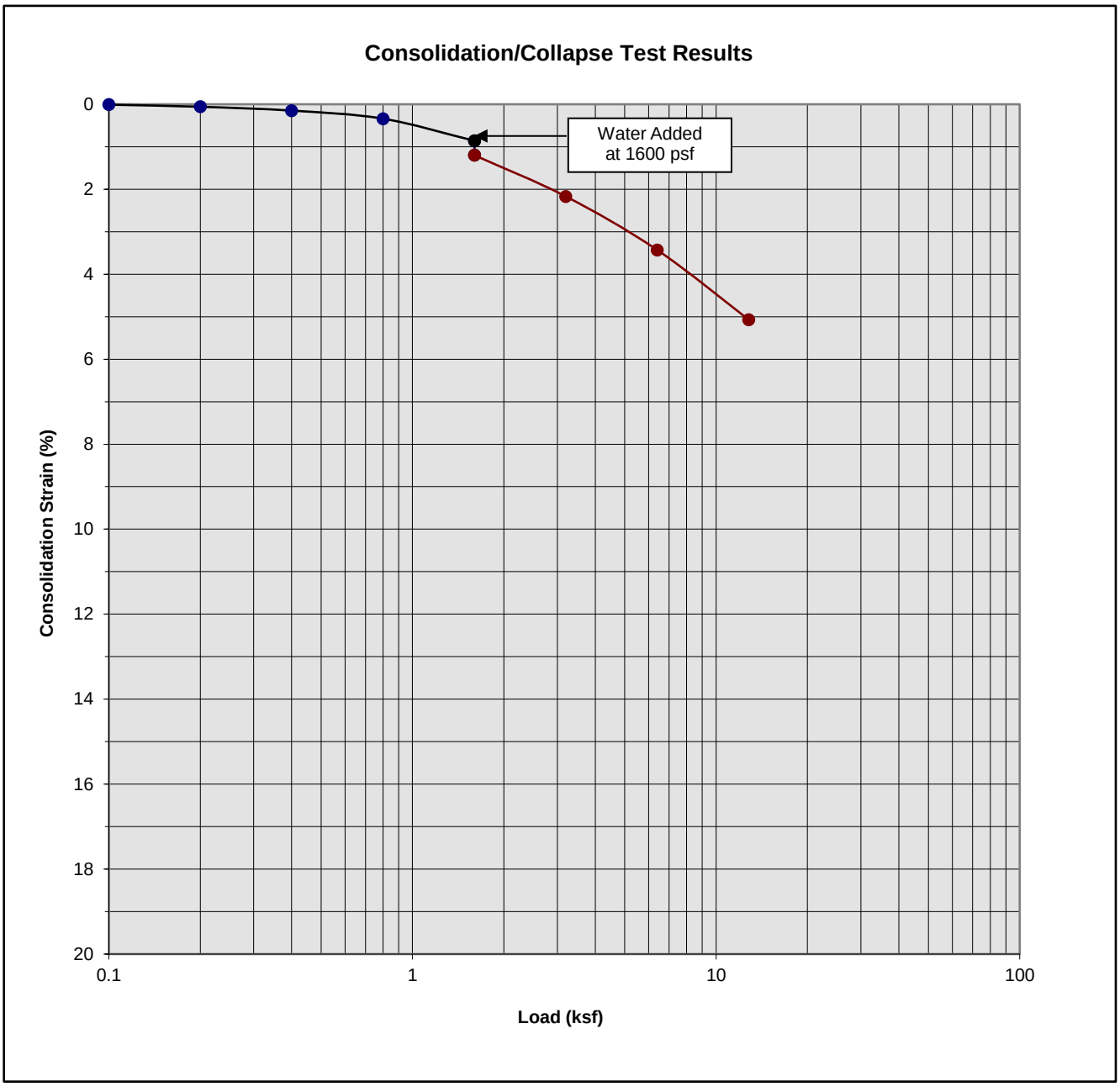
Classification: Brown Silty fine Sand, trace medium to coarse Sand

Boring Number:	B-1	Initial Moisture Content (%)	16
Sample Number:	---	Final Moisture Content (%)	22
Depth (ft)	5 to 6	Initial Dry Density (pcf)	98.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	105.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.48

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation



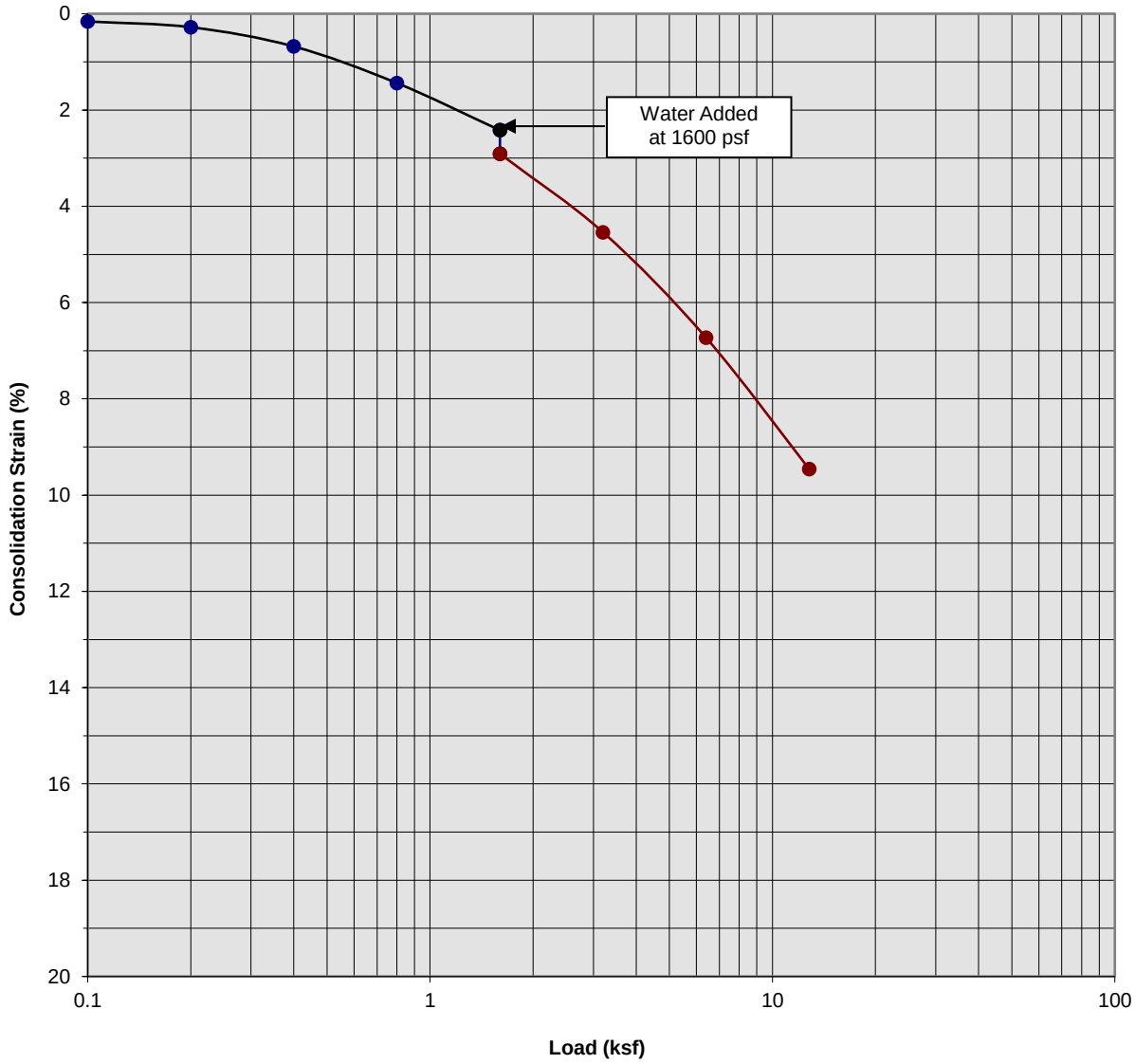
Classification: Brown fine Sand, little Silt, trace medium Sand

Boring Number:	B-1	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	21
Depth (ft)	7 to 8	Initial Dry Density (pcf)	101.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	106.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.34

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown Silty fine Sand, trace medium Sand

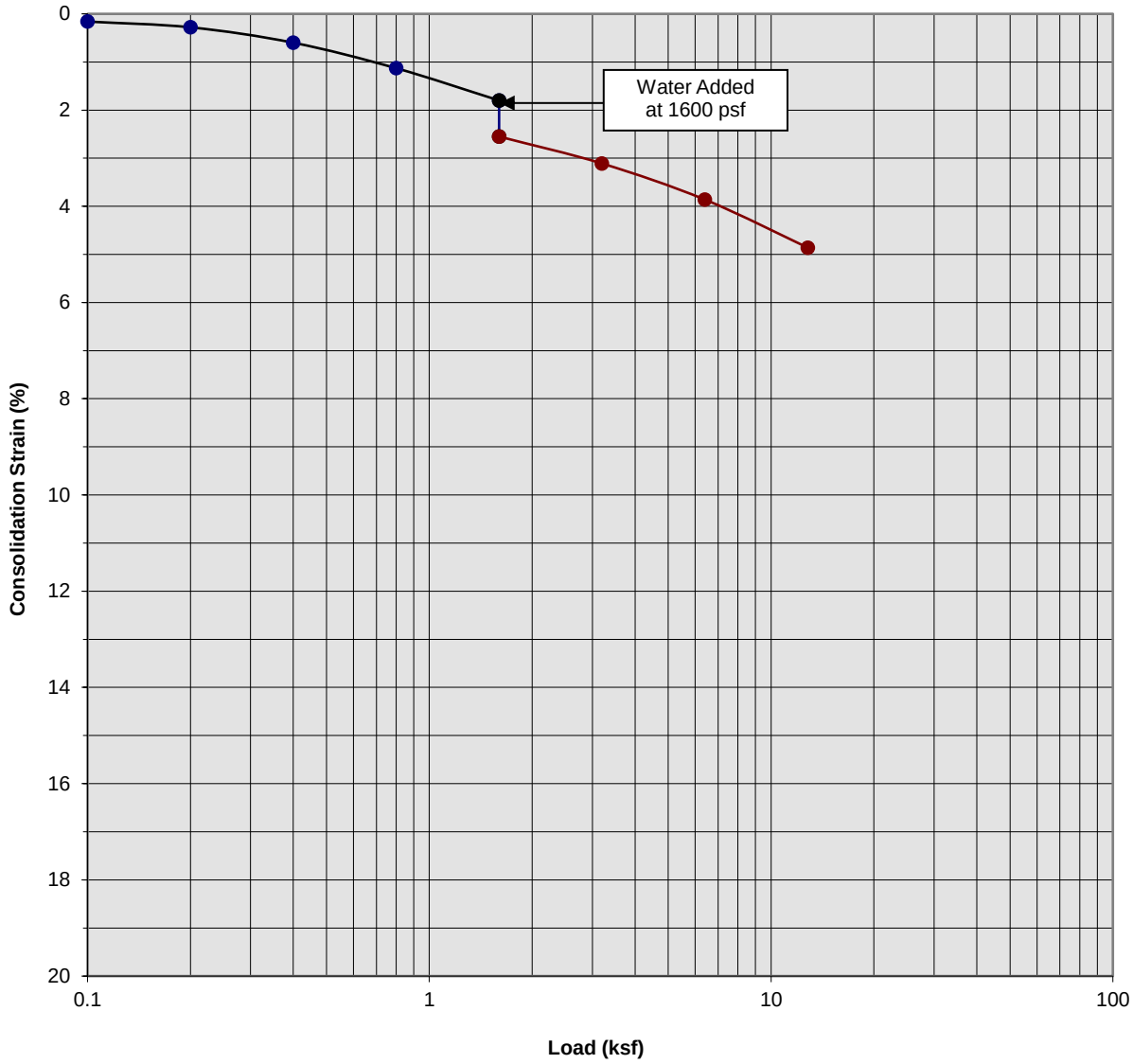
Boring Number:	B-1	Initial Moisture Content (%)	25
Sample Number:	---	Final Moisture Content (%)	30
Depth (ft)	9 to 10	Initial Dry Density (pcf)	82.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	90.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.49

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown fine Sand, little medium Sand, trace coarse Sand, trace fine Gravel

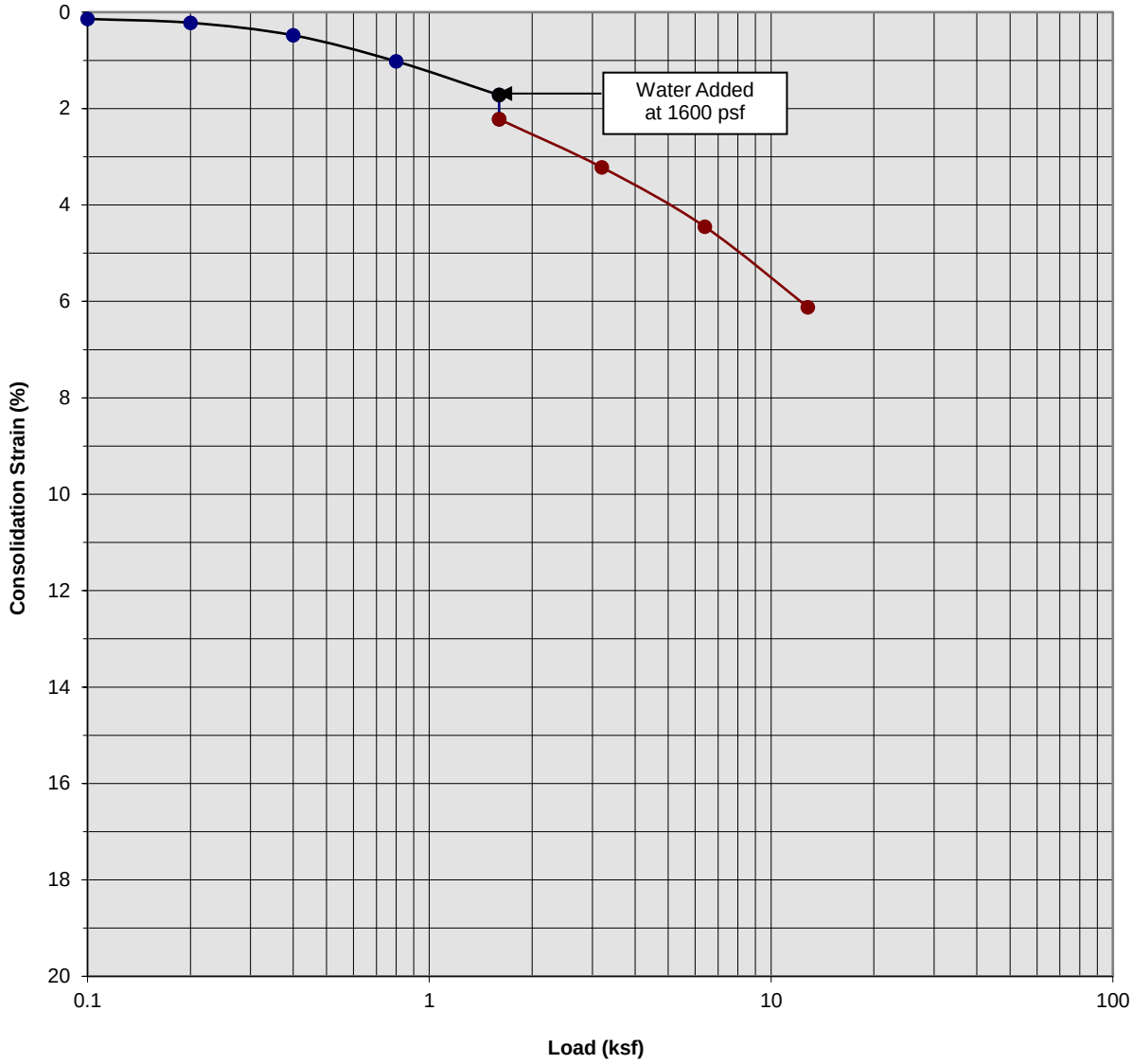
Boring Number:	B-1	Initial Moisture Content (%)	3
Sample Number:	---	Final Moisture Content (%)	22
Depth (ft)	19 to 20	Initial Dry Density (pcf)	100.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	105.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.75

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Light Gray fine to medium Sand, trace coarse Sand, trace fine Gravel

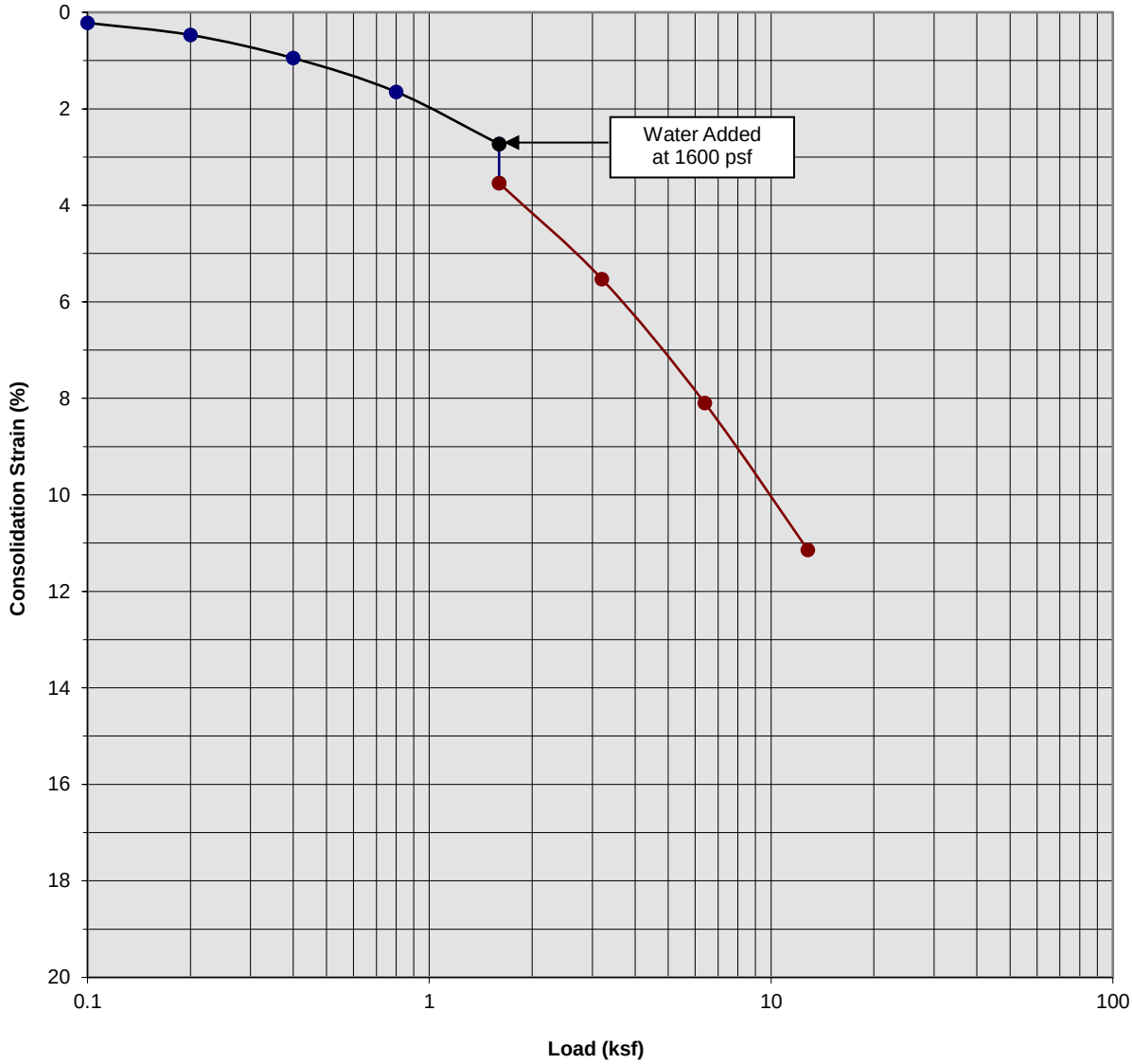
Boring Number:	B-4	Initial Moisture Content (%)	2
Sample Number:	---	Final Moisture Content (%)	25
Depth (ft)	5 to 5½	Initial Dry Density (pcf)	101.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	101.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.50

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown Silty fine Sand

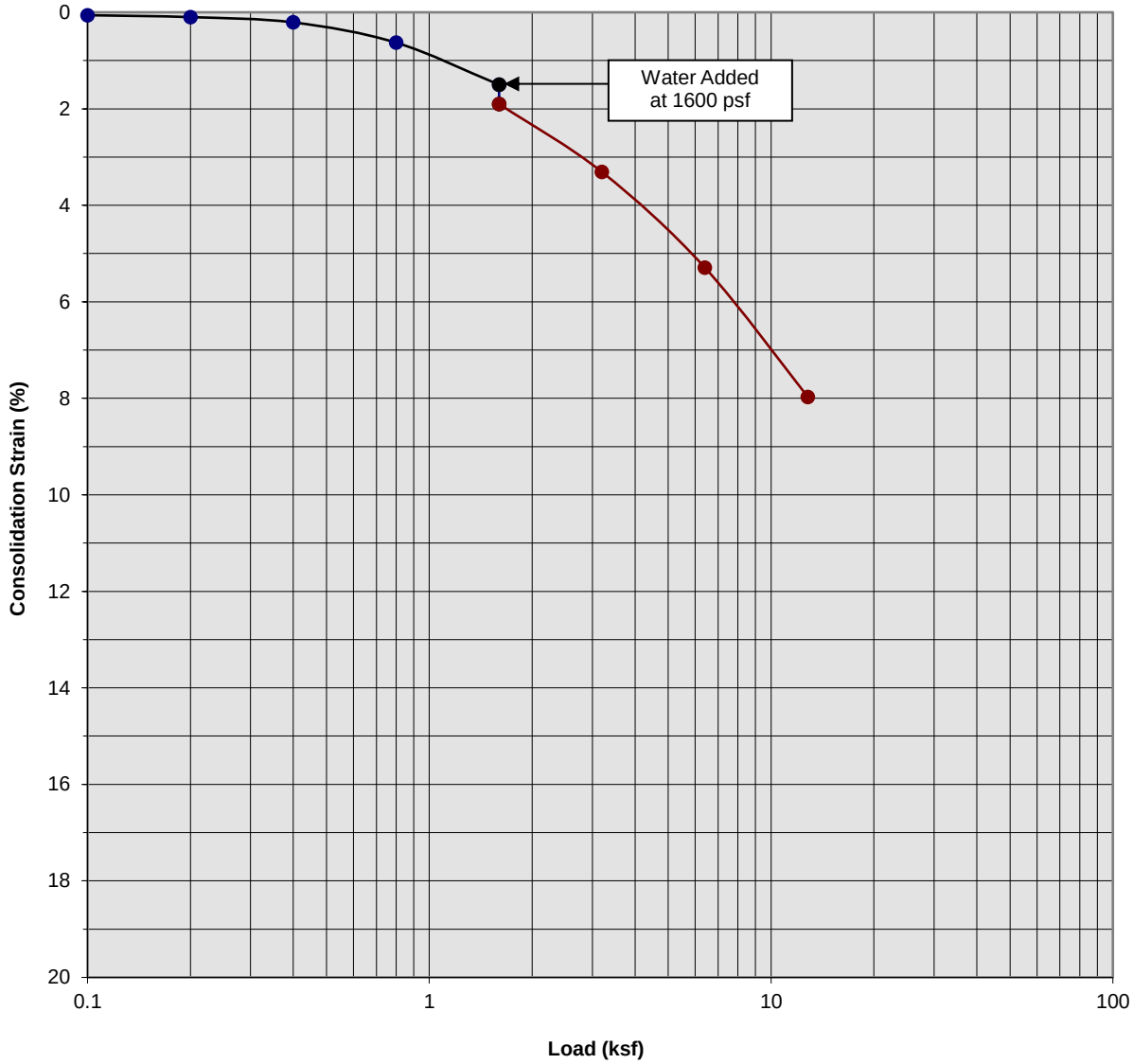
Boring Number:	B-4	Initial Moisture Content (%)	22
Sample Number:	---	Final Moisture Content (%)	26
Depth (ft)	7 to 8	Initial Dry Density (pcf)	84.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	94.7
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.81

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



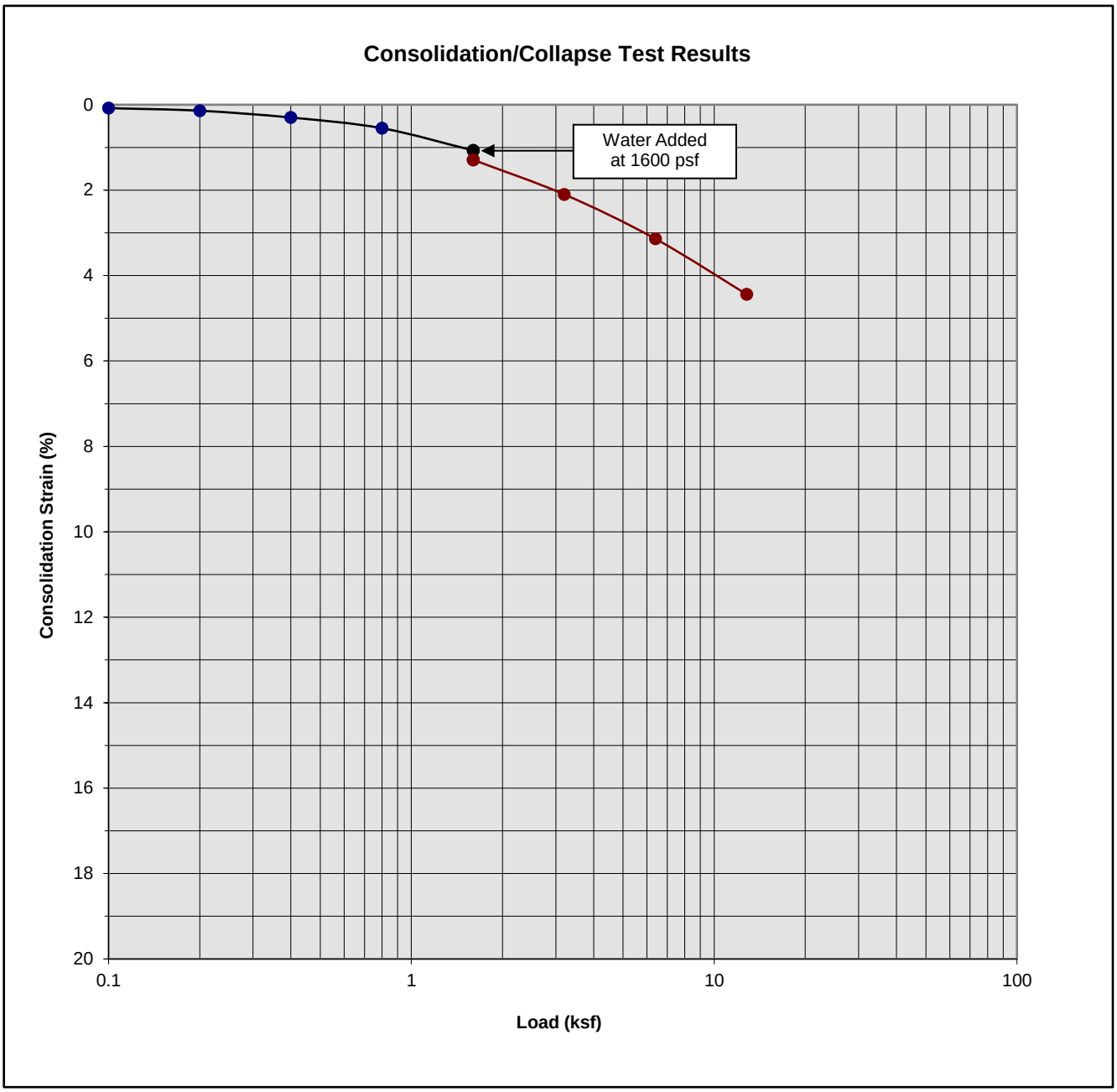
Classification: Brown Silty fine Sand

Boring Number:	B-4	Initial Moisture Content (%)	22
Sample Number:	---	Final Moisture Content (%)	29
Depth (ft)	9 to 10	Initial Dry Density (pcf)	83.0
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	90.4
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.40

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 7

SoCalGeo
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A California Corporation



Classification: Brown fine Sand, trace medium Sand

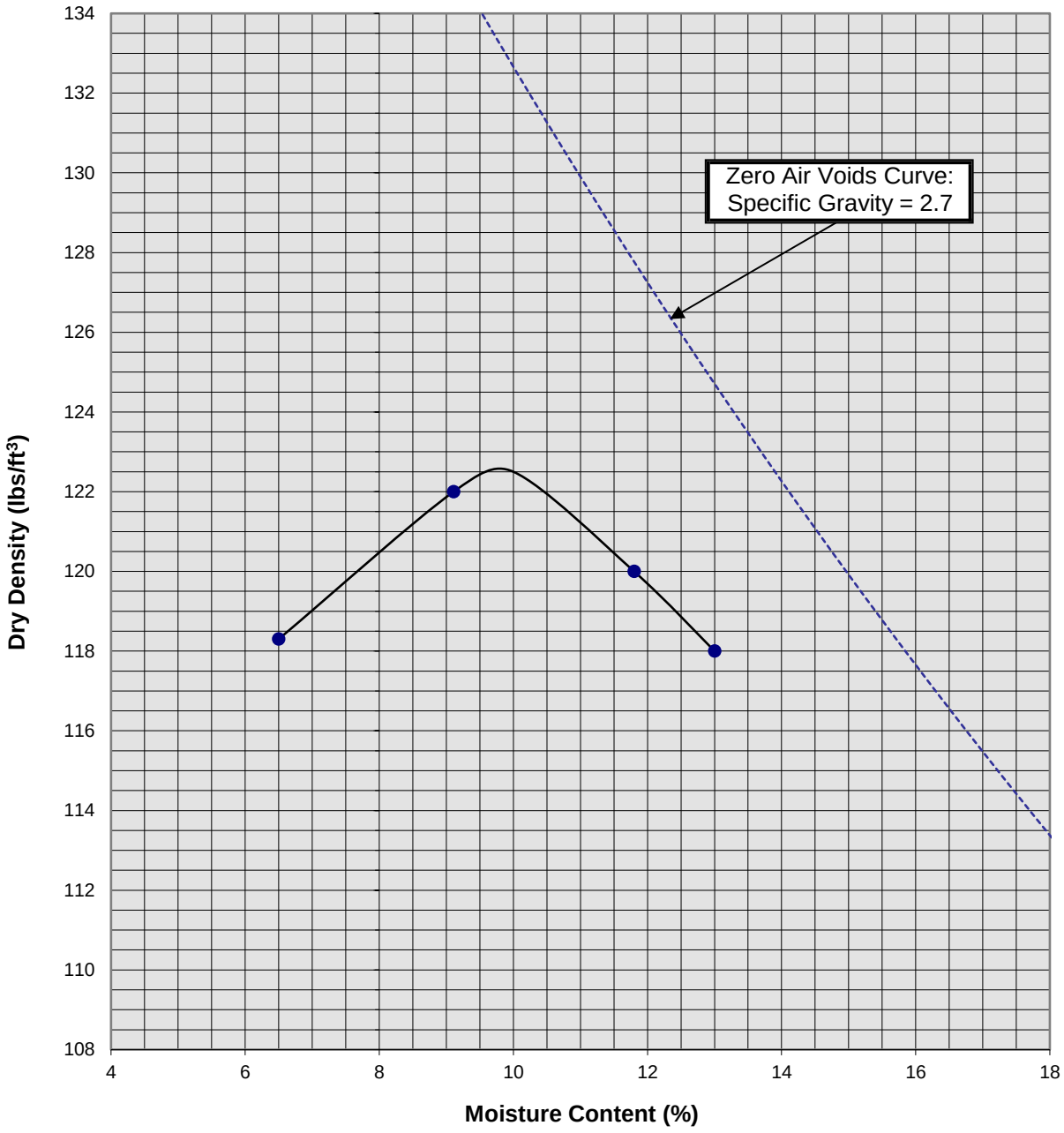
Boring Number:	B-4	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	24
Depth (ft)	14 to 15	Initial Dry Density (pcf)	98.0
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	102.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.22

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C- 8

SoCalGeo
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A California Corporation

Moisture/Density Relationship
ASTM D-1557



Soil ID Number	B-3 @ 1-5'
Optimum Moisture (%)	10
Maximum Dry Density (pcf)	122.5
Soil Classification	Gray Brown Silty fine Sand, trace medium to coarse Sand

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C-9

SoCalGeo
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A California Corporation



Sample Description: Gray Brown fine Sand, trace Silt, trace medium to coarse Sand

Classification: B-3 @ 1 to 5 feet

Sample Data	
Remolded Moisture Content	11.8
Final Moisture Content	17.0
Remolded Dry Density	110.3
Percent Compaction	90.0
Final Dry Density	----
Specimen Diameter (in)	2.4
Specimen Thickness (in)	1.0

Test Results		
	Peak	Ultimate
ϕ (°)	33.0	31.0
C (psf)	300	200

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-1

PLATE C-10

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX D

GRADING GUIDE SPECIFICATIONS

These grading guide specifications are intended to provide typical procedures for grading operations. They are intended to supplement the recommendations contained in the geotechnical investigation report for this project. Should the recommendations in the geotechnical investigation report conflict with the grading guide specifications, the more site specific recommendations in the geotechnical investigation report will govern.

General

- The Earthwork Contractor is responsible for the satisfactory completion of all earthwork in accordance with the plans and geotechnical reports, and in accordance with city, county, and applicable building codes.

- The Geotechnical Engineer is the representative of the Owner/Builder for the purpose of implementing the report recommendations and guidelines. These duties are not intended to relieve the Earthwork Contractor of any responsibility to perform in a workman-like manner, nor is the Geotechnical Engineer to direct the grading equipment or personnel employed by the Contractor.

- The Earthwork Contractor is required to notify the Geotechnical Engineer of the anticipated work and schedule so that testing and inspections can be provided. If necessary, work may be stopped and redone if personnel have not been scheduled in advance.

- The Earthwork Contractor is required to have suitable and sufficient equipment on the job-site to process, moisture condition, mix and compact the amount of fill being placed to the approved compaction. In addition, suitable support equipment should be available to conform with recommendations and guidelines in this report.

- Canyon cleanouts, overexcavation areas, processed ground to receive fill, key excavations, subdrains and benches should be observed by the Geotechnical Engineer prior to placement of any fill. It is the Earthwork Contractor's responsibility to notify the Geotechnical Engineer of areas that are ready for inspection.

- Excavation, filling, and subgrade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs, and seepage water encountered shall be pumped or drained to provide a suitable working surface. The Geotechnical Engineer must be informed of springs or water seepage encountered during grading or foundation construction for possible revision to the recommended construction procedures and/or installation of subdrains.

Site Preparation

- The Earthwork Contractor is responsible for all clearing, grubbing, stripping and site preparation for the project in accordance with the recommendations of the Geotechnical Engineer.

- If any materials or areas are encountered by the Earthwork Contractor which are suspected of having toxic or environmentally sensitive contamination, the Geotechnical Engineer and Owner/Builder should be notified immediately.

- Major vegetation should be stripped and disposed of off-site. This includes trees, brush, heavy grasses and any materials considered unsuitable by the Geotechnical Engineer.

- Underground structures such as basements, cesspools or septic disposal systems, mining shafts, tunnels, wells and pipelines should be removed under the inspection of the Geotechnical Engineer and recommendations provided by the Geotechnical Engineer and/or city, county or state agencies. If such structures are known or found, the Geotechnical Engineer should be notified as soon as possible so that recommendations can be formulated.

- Any topsoil, slopewash, colluvium, alluvium and rock materials which are considered unsuitable by the Geotechnical Engineer should be removed prior to fill placement.

- Remaining voids created during site clearing caused by removal of trees, foundations basements, irrigation facilities, etc., should be excavated and filled with compacted fill.

- Subsequent to clearing and removals, areas to receive fill should be scarified to a depth of 10 to 12 inches, moisture conditioned and compacted

- The moisture condition of the processed ground should be at or slightly above the optimum moisture content as determined by the Geotechnical Engineer. Depending upon field conditions, this may require air drying or watering together with mixing and/or discing.

Compacted Fills

- Soil materials imported to or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable in the opinion of the Geotechnical Engineer. Unless otherwise approved by the Geotechnical Engineer, all fill materials shall be free of deleterious, organic, or frozen matter, shall contain no chemicals that may result in the material being classified as “contaminated,” and shall be very low to non-expansive with a maximum expansion index (EI) of 50. The top 12 inches of the compacted fill should have a maximum particle size of 3 inches, and all underlying compacted fill material a maximum 6-inch particle size, except as noted below.

- All soils should be evaluated and tested by the Geotechnical Engineer. Materials with high expansion potential, low strength, poor gradation or containing organic materials may require removal from the site or selective placement and/or mixing to the satisfaction of the Geotechnical Engineer.

- Rock fragments or rocks less than 6 inches in their largest dimensions, or as otherwise determined by the Geotechnical Engineer, may be used in compacted fill, provided the distribution and placement is satisfactory in the opinion of the Geotechnical Engineer.

- Rock fragments or rocks greater than 12 inches should be taken off-site or placed in accordance with recommendations and in areas designated as suitable by the Geotechnical Engineer. These materials should be placed in accordance with Plate D-8 of these Grading Guide Specifications and in accordance with the following recommendations:

    - Rocks 12 inches or more in diameter should be placed in rows at least 15 feet apart, 15 feet from the edge of the fill, and 10 feet or more below subgrade. Spaces should be left between each rock fragment to provide for placement and compaction of soil around the fragments.

    - Fill materials consisting of soil meeting the minimum moisture content requirements and free of oversize material should be placed between and over the rows of rock or

concrete. Ample water and compactive effort should be applied to the fill materials as they are placed in order that all of the voids between each of the fragments are filled and compacted to the specified density.

- Subsequent rows of rocks should be placed such that they are not directly above a row placed in the previous lift of fill. A minimum 5-foot offset between rows is recommended.

- To facilitate future trenching, oversized material should not be placed within the range of foundation excavations, future utilities or other underground construction unless specifically approved by the soil engineer and the developer/owner representative.

- Fill materials approved by the Geotechnical Engineer should be placed in areas previously prepared to receive fill and in evenly placed, near horizontal layers at about 6 to 8 inches in loose thickness, or as otherwise determined by the Geotechnical Engineer for the project.

- Each layer should be moisture conditioned to optimum moisture content, or slightly above, as directed by the Geotechnical Engineer. After proper mixing and/or drying, to evenly distribute the moisture, the layers should be compacted to at least 90 percent of the maximum dry density in compliance with ASTM D-1557-78 unless otherwise indicated.

- Density and moisture content testing should be performed by the Geotechnical Engineer at random intervals and locations as determined by the Geotechnical Engineer. These tests are intended as an aid to the Earthwork Contractor, so he can evaluate his workmanship, equipment effectiveness and site conditions. The Earthwork Contractor is responsible for compaction as required by the Geotechnical Report(s) and governmental agencies.

- Fill areas unused for a period of time may require moisture conditioning, processing and recompaction prior to the start of additional filling. The Earthwork Contractor should notify the Geotechnical Engineer of his intent so that an evaluation can be made.

- Fill placed on ground sloping at a 5-to-1 inclination (horizontal-to-vertical) or steeper should be benched into bedrock or other suitable materials, as directed by the Geotechnical Engineer. Typical details of benching are illustrated on Plates D-2, D-4, and D-5.

- Cut/fill transition lots should have the cut portion overexcavated to a depth of at least 3 feet and rebuilt with fill (see Plate D-1), as determined by the Geotechnical Engineer.

- All cut lots should be inspected by the Geotechnical Engineer for fracturing and other bedrock conditions. If necessary, the pads should be overexcavated to a depth of 3 feet and rebuilt with a uniform, more cohesive soil type to impede moisture penetration.

- Cut portions of pad areas above buttresses or stabilizations should be overexcavated to a depth of 3 feet and rebuilt with uniform, more cohesive compacted fill to impede moisture penetration.

- Non-structural fill adjacent to structural fill should typically be placed in unison to provide lateral support. Backfill along walls must be placed and compacted with care to ensure that excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below grade walls must be properly tested and approved by the Geotechnical Engineer with consideration of the lateral earth pressure used in the design.

Foundations

- The foundation influence zone is defined as extending one foot horizontally from the outside edge of a footing, and proceeding downward at a ½ horizontal to 1 vertical (0.5:1) inclination.

- Where overexcavation beneath a footing subgrade is necessary, it should be conducted so as to encompass the entire foundation influence zone, as described above.

- Compacted fill adjacent to exterior footings should extend at least 12 inches above foundation bearing grade. Compacted fill within the interior of structures should extend to the floor subgrade elevation.

Fill Slopes

- The placement and compaction of fill described above applies to all fill slopes. Slope compaction should be accomplished by overfilling the slope, adequately compacting the fill in even layers, including the overfilled zone and cutting the slope back to expose the compacted core

- Slope compaction may also be achieved by backrolling the slope adequately every 2 to 4 vertical feet during the filling process as well as requiring the earth moving and compaction equipment to work close to the top of the slope. Upon completion of slope construction, the slope face should be compacted with a sheepsfoot connected to a sideboom and then grid rolled. This method of slope compaction should only be used if approved by the Geotechnical Engineer.

- Sandy soils lacking in adequate cohesion may be unstable for a finished slope condition and therefore should not be placed within 15 horizontal feet of the slope face.

- All fill slopes should be keyed into bedrock or other suitable material. Fill keys should be at least 15 feet wide and inclined at 2 percent into the slope. For slopes higher than 30 feet, the fill key width should be equal to one-half the height of the slope (see Plate D-5).

- All fill keys should be cleared of loose slough material prior to geotechnical inspection and should be approved by the Geotechnical Engineer and governmental agencies prior to filling.

- The cut portion of fill over cut slopes should be made first and inspected by the Geotechnical Engineer for possible stabilization requirements. The fill portion should be adequately keyed through all surficial soils and into bedrock or suitable material. Soils should be removed from the transition zone between the cut and fill portions (see Plate D-2).

Cut Slopes

- All cut slopes should be inspected by the Geotechnical Engineer to determine the need for stabilization. The Earthwork Contractor should notify the Geotechnical Engineer when slope cutting is in progress at intervals of 10 vertical feet. Failure to notify may result in a delay in recommendations.

- Cut slopes exposing loose, cohesionless sands should be reported to the Geotechnical Engineer for possible stabilization recommendations.

- All stabilization excavations should be cleared of loose slough material prior to geotechnical inspection. Stakes should be provided by the Civil Engineer to verify the location and dimensions of the key. A typical stabilization fill detail is shown on Plate D-5.

- Stabilization key excavations should be provided with subdrains. Typical subdrain details are shown on Plates D-6.

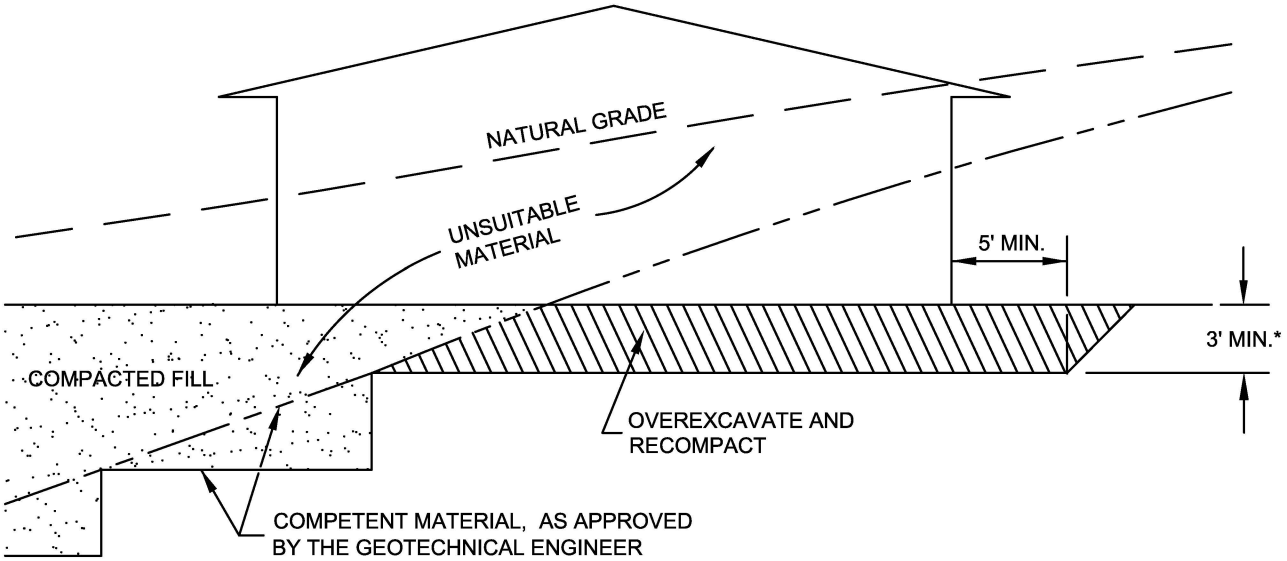
Subdrains

- Subdrains may be required in canyons and swales where fill placement is proposed. Typical subdrain details for canyons are shown on Plate D-3. Subdrains should be installed after approval of removals and before filling, as determined by the Soils Engineer.

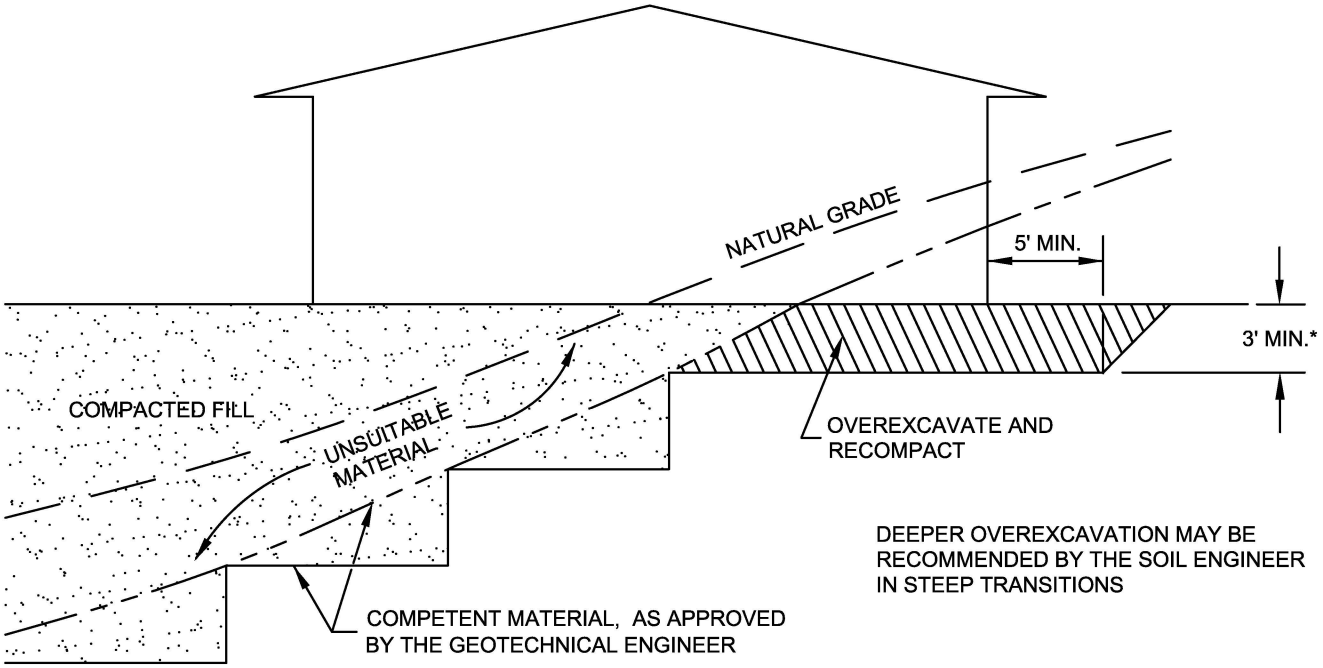
- Plastic pipe may be used for subdrains provided it is Schedule 40 or SDR 35 or equivalent. Pipe should be protected against breakage, typically by placement in a square-cut (backhoe) trench or as recommended by the manufacturer.

- Filter material for subdrains should conform to CALTRANS Specification 68-1.025 or as approved by the Geotechnical Engineer for the specific site conditions. Clean ¾-inch crushed rock may be used provided it is wrapped in an acceptable filter cloth and approved by the Geotechnical Engineer. Pipe diameters should be 6 inches for runs up to 500 feet and 8 inches for the downstream continuations of longer runs. Four-inch diameter pipe may be used in buttress and stabilization fills.

CUT LOT



CUT/FILL LOT (TRANSITION)



*SEE TEXT OF REPORT FOR SPECIFIC RECOMMENDATION. ACTUAL DEPTH OF OVEREXCAVATION MAY BE GREATER.

TRANSITION LOT DETAIL

GRADING GUIDE SPECIFICATIONS

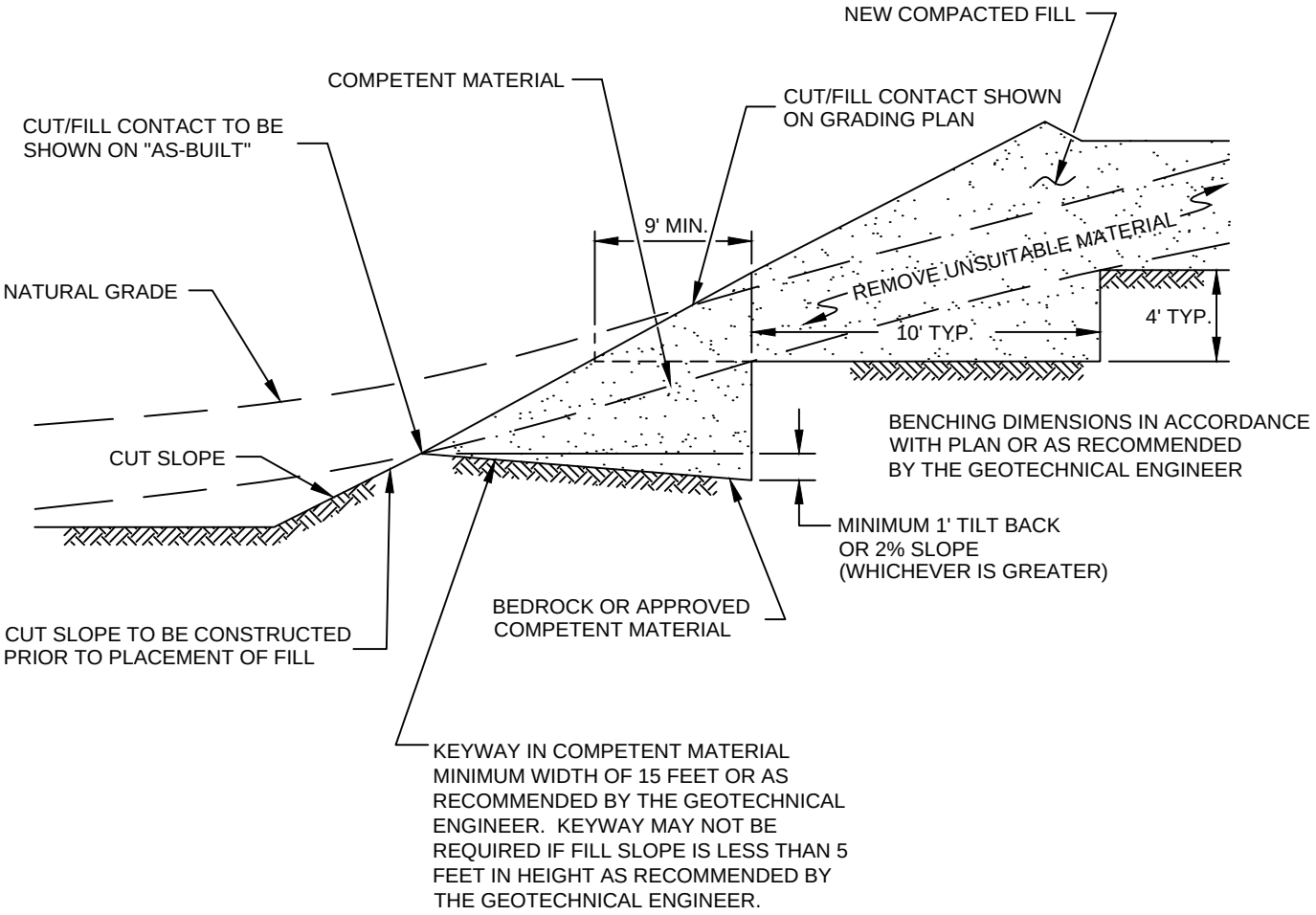
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-1

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



FILL ABOVE CUT SLOPE DETAIL

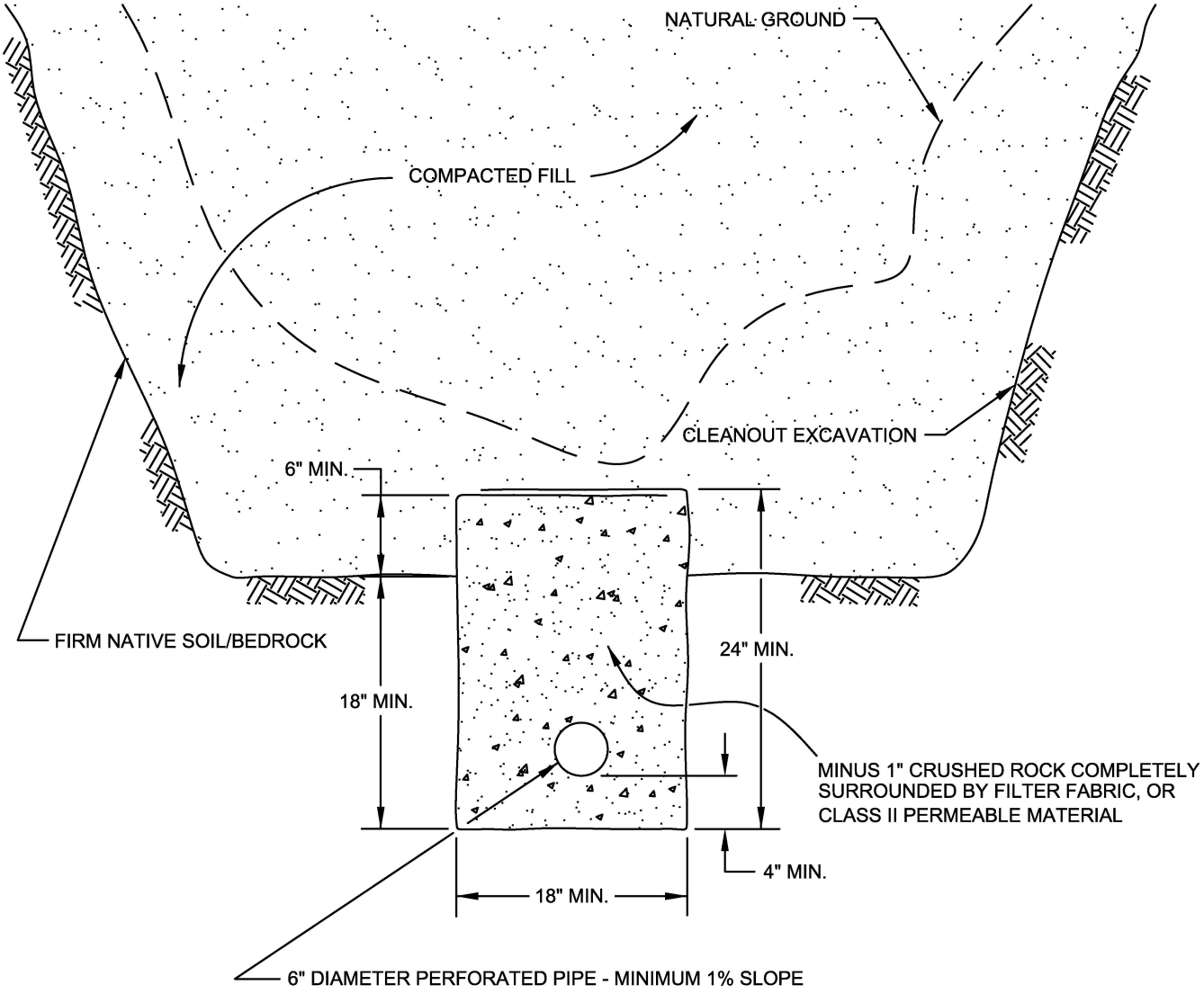
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



PIPE MATERIAL	DEPTH OF FILL OVER SUBDRAIN
ADS (CORRUGATED POLETHYLENE)	8
TRANSITE UNDERDRAIN	20
PVC OR ABS: SDR 35	35
SDR 21	100

SCHEMATIC ONLY
NOT TO SCALE

CANYON SUBDRAIN DETAIL

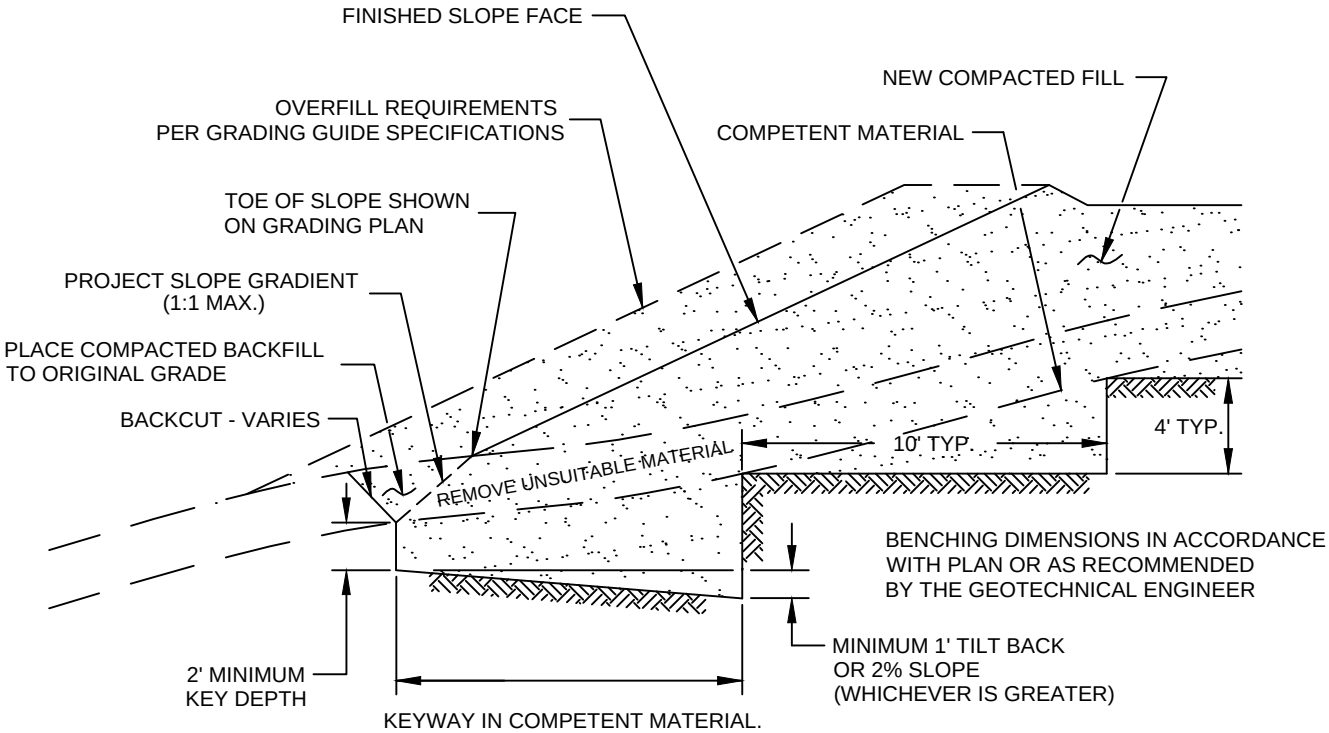
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

FILL ABOVE NATURAL SLOPE DETAIL

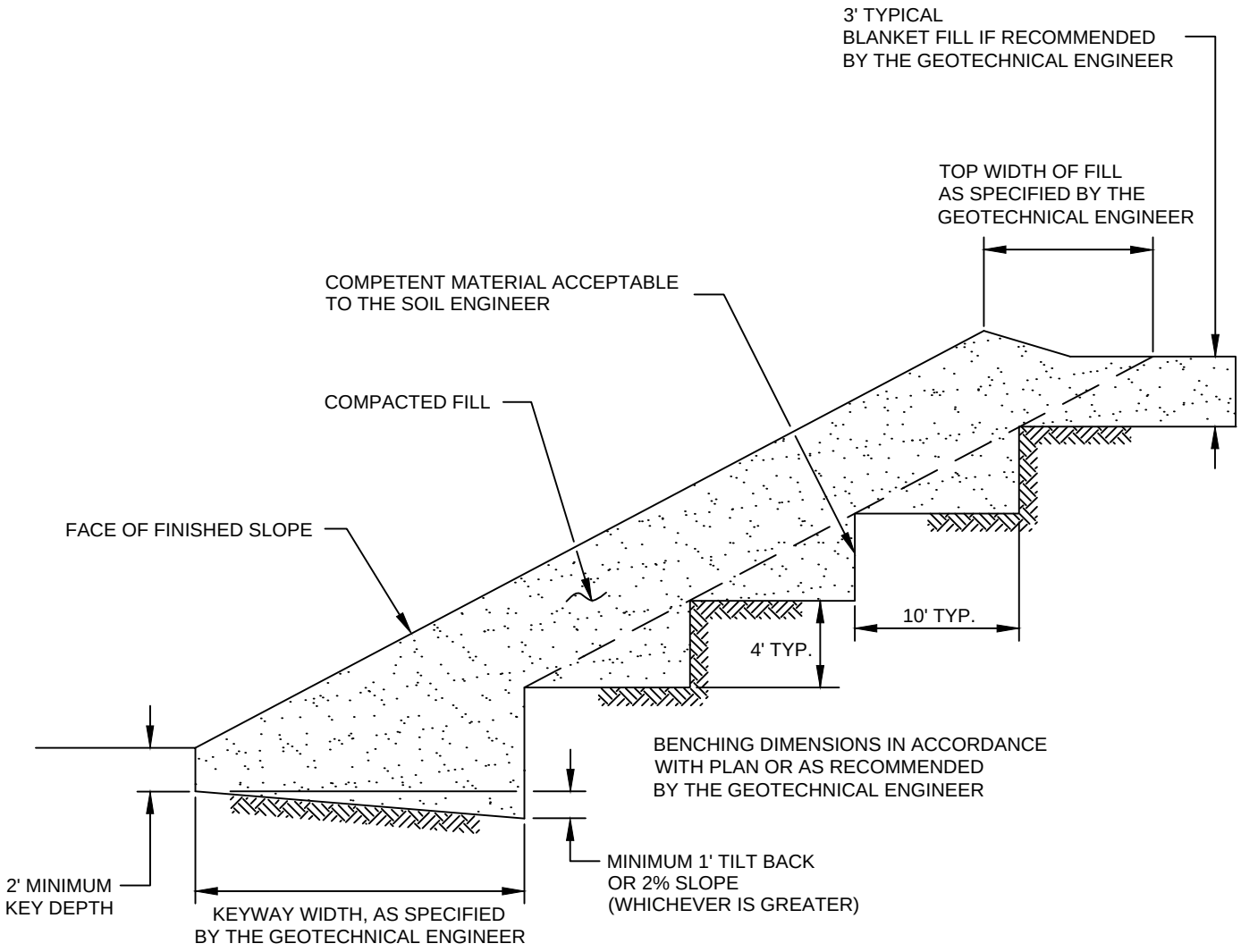
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



STABILIZATION FILL DETAIL

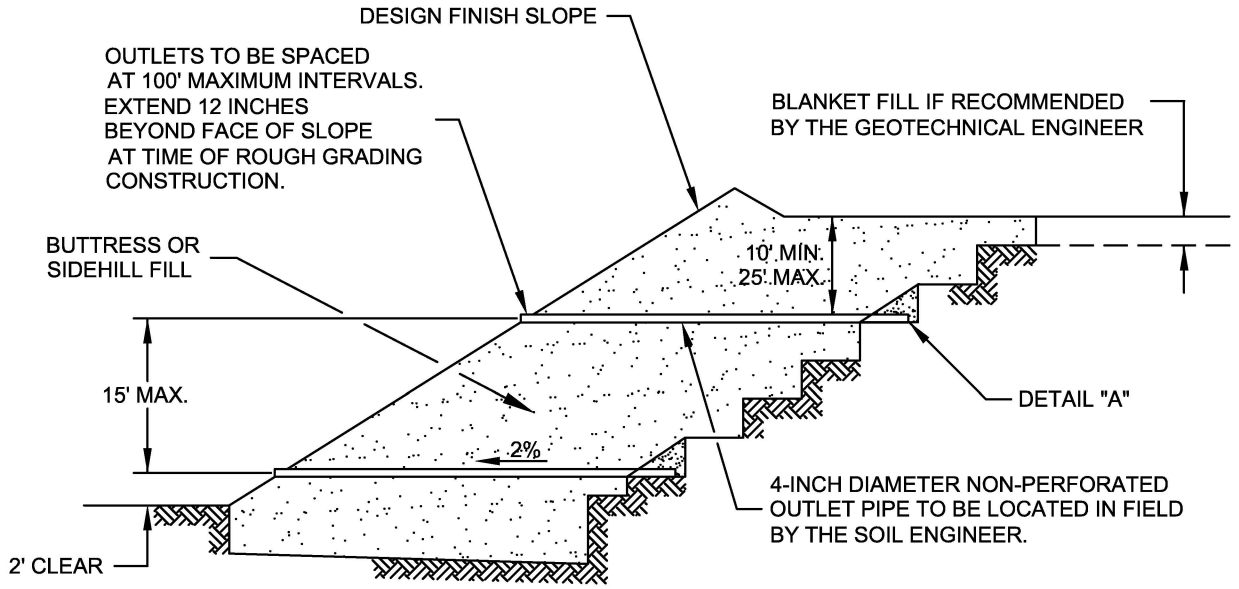
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



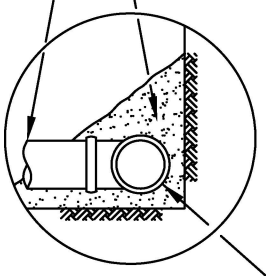
"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50



DETAIL "A"

NOTES:
1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

SLOPE FILL SUBDRAINS

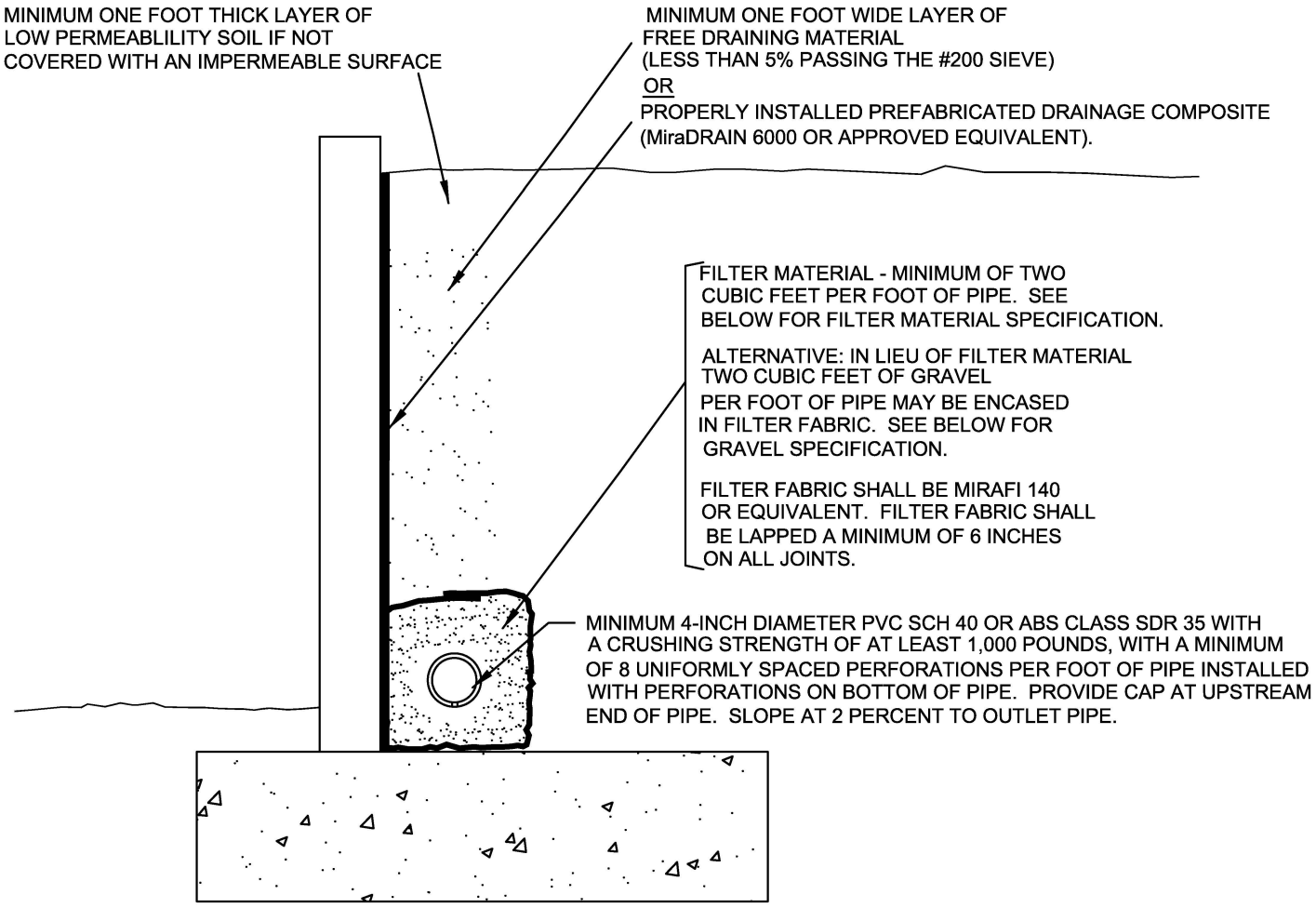
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50

RETAINING WALL BACKDRAINS

GRADING GUIDE SPECIFICATIONS

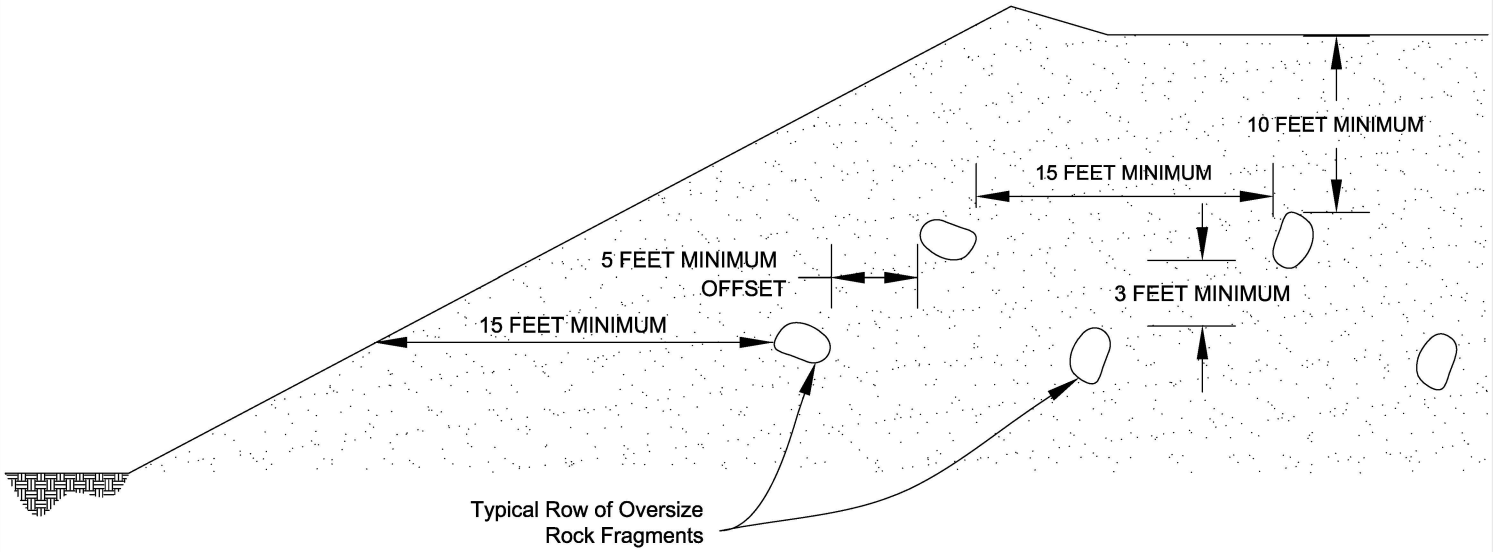
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

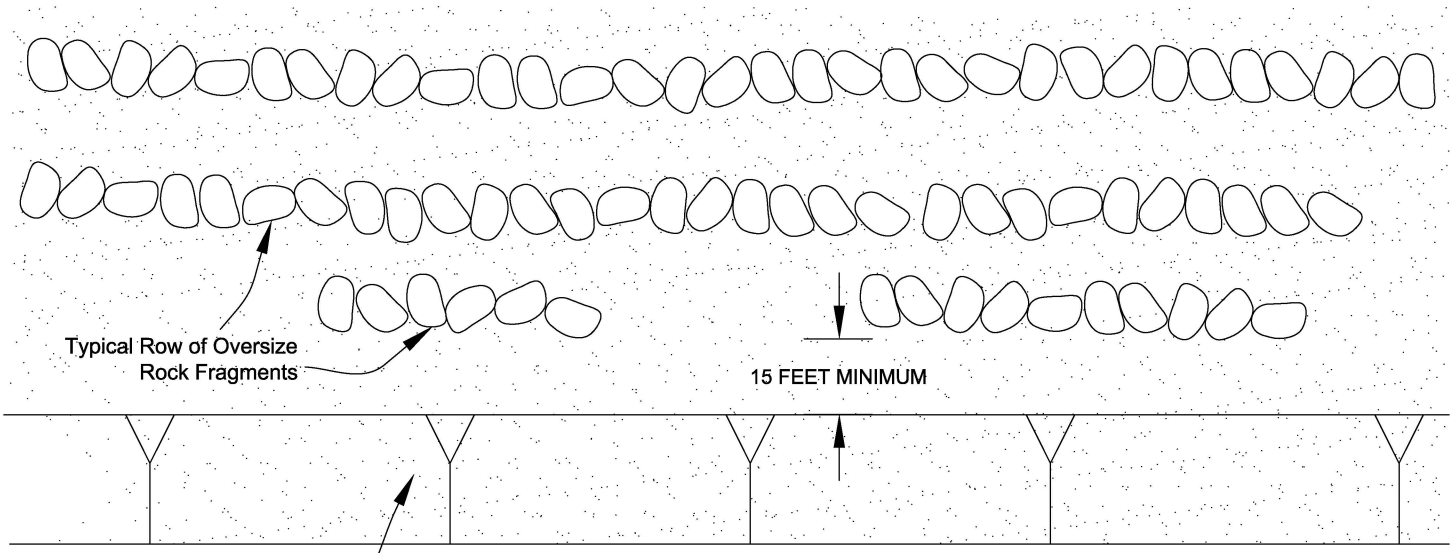
PLATE D-7

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



Section View



Plan View

PLACEMENT OF OVERSIZED MATERIAL

GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: PM
CHKD: GKM

PLATE D-8

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX E

529 Cutter Way, Covina, CA 91722, USA

Latitude, Longitude: 34.0897192, -117.9216277



Date	11/14/2023, 6:01:48 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.654	MCE_R ground motion. (for 0.2 second period)
S_1	0.612	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.654	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.103	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.701	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.771	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.654	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.806	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.019	Factored deterministic acceleration value. (0.2 second)
S1RT	0.612	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.676	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.632	Factored deterministic acceleration value. (1.0 second)
PGAd	0.809	Factored deterministic acceleration value. (Peak Ground Acceleration)

SOURCE: SEAOC/OSHPD Seismic Design Maps Tool
<https://seismicmaps.org/>

SEISMIC DESIGN PARAMETERS - 2022 CBC
PROPOSED SELF-STORAGE FACILITY
COVINA, CALIFORNIA

DRAWN: MK
CHKD: RGT
SCG PROJECT 23G207-1
PLATE E-1

SOUTHERN CALIFORNIA GEOTECHNICAL

December 4, 2023

Westport Properties, Inc.
660 Newport Center Drive, Suite 1450
Newport Beach, California 92660

Attention: Mr. David Kelly
Senior Vice President

Project No.: **23G207-2**

Subject: **Results of Infiltration Testing**
Proposed Self-Storage Facility
529 Cutter Way
Covina, California

Reference: Geotechnical Investigation, Proposed Self-Storage Facility, 529 Cutter Way, Covina, California, prepared by Southern California Geotechnical, Inc. (SCG), prepared for Westport Properties, Inc., SCG Project No. 23G207-1.

Mr. Kelly:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with our Proposal No. 23P395, dated November 2, 2023. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The infiltration testing was performed in general accordance with ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Site and Project Description

The subject site is located at the northwest corner of West San Bernardino Road and Cutter Way in Covina, California. The site is also referenced by the street address 529 Cutter Way. The site is bounded to the west and north by existing commercial/industrial developments, to the east by Cutter Way, and to the south by West San Bernardino Road. The general location of the subject site is illustrated on the Site Location Map, included as Plate 1 of this report.

The site consists of an irregular-shaped parcel, 2.55± acres in size. The site is presently developed with a single-family residence (SFR) and attached garage with a total footprint of 2,149± ft², located in the west-central area of the site. The SFR is a two-story structure of wood frame and stucco construction. An asphaltic concrete (AC) parking lot is located in the east-central area of the site and a concrete driveway connects the parking lot with the garage structure. The AC pavements are in fair condition with minor cracking throughout. The ground surface cover in the

rest of the site consists of exposed soil with moderate native grass and weed growth and occasional trees.

Historic aerial photographs were obtained from the Netronline website, https://www.historicaerials.com/viewer#. The earliest available photos from 1948, 1952 and 1953 indicate that the site was previously used for agricultural purposes. A channel previously transected the southeast corner of the site. The site remained vacant and unused until the existing SFR was constructed sometime between 1987 and 1992.

Detailed topographic was not available at the time of this report. Based on elevations obtained from Google Earth and visual observations made at the time of drilling, the site slopes to the south at a gradient of 1± percent. The maximum elevation differential across the site is 5± feet.

Proposed Development

SCG was provided with a conceptual site plan for the proposed development, prepared by KSP Studio. Based on this conceptual site plan, the site will be developed with one (1) new self-storage building. The building will be a 4-story, Type II-B structure with a footprint of 45,896± ft^2, located in the western area of the site. The building will be surrounded by asphaltic concrete pavements in the parking and drive lane areas. We expect the new development will also include areas of landscape planters.

Based on information provided by representative of SDH & Associates, the project civil engineer, the site will utilize an infiltration system to dispose of stormwater. The infiltration system will likely consist of a below-grade chamber system located in the southeastern area of the site. The bottom elevation of the infiltration system will extend to depths of 9 to 10± feet below the existing site grades.

Concurrent Study

SCG concurrently conducted a geotechnical investigation at the subject site, referenced above. As a part of this study, five (5) borings (identified as Boring Nos. B-1 through B-5) were advanced to depths of 10 to 50± feet below the existing site grades. Asphaltic concrete pavements were encountered at the ground surface at Boring No. B-5. The pavement section consists of 4± inches of asphaltic concrete underlain by 7± inches of aggregate base. Artificial fill soils were encountered beneath the pavement at Boring No. B-5, and at the ground surface of all the remaining boring locations, extending to depths of 2½ to 3± feet below ground surface. The fill soils generally consist of loose silty fine sands and fine sands with varying medium to coarse sand and fine gravel content. Native alluvium was encountered beneath the fill at all boring locations, extending to at least the maximum depth explored of 50± feet below ground surface. The alluvial soils generally consist of loose to dense silty fine sands and fine sands with varying medium to coarse sand and fine gravel content. Occasional layers of loose to very dense fine sandy silts, fine to medium sands, gravelly fine to coarse sands, and stiff to very stiff clayey silts, were encountered.

Free water was not encountered during the drilling of the borings. Based on the lack of water in the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth greater than 50± feet mean sea level at the time of the subsurface exploration.

Subsurface Exploration

Scope of Exploration

The subsurface exploration for the infiltration testing consisted of two (2) trenches (identified as Infiltration Trench Nos. I-1 and I-2), excavated by a backhoe. The trenches were excavated to depths of 9 to 10± feet below existing site grades. The trenches were logged during excavation by a member of our staff. The approximate locations of the infiltration trenches are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Geotechnical Conditions

Artificial fill soils were encountered at the ground surface at both of the infiltration trench locations, extending to depths of 3 to 4½± feet below existing site grades. The fill soils generally consist of medium dense gravelly fine to coarse sands and silty fine sands. At Infiltration Test No. I-2, cobble-sized concrete blocks were encountered within the fill soils. Occasional cobbles were encountered in the fill soils at both of the trench locations. Native alluvial soils were encountered beneath the fill soils at both of the trench locations, extending to at least the maximum explored depth of 10± feet below existing site grades. The alluvium consisted of medium dense fine sands, fine sandy silts, and fine to medium sands with variable quantities of coarse sands.

Free water was not encountered within any of the trenches of this study or borings during our concurrent investigation. Based on the lack of any water within the trenches and borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 50± feet at the time of these investigations.

Recent water level data was obtained from the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. One monitoring well with readily available water level data is located 6,300± feet north to northeast of the site. Water level data from this monitoring well indicates a recent groundwater level of 257± feet below the ground surface in July 2020.

Infiltration Testing

We understand that the results of the testing will be used to prepare a preliminary design for the storm water infiltration system that will be used at the subject site. As previously mentioned, the infiltration testing was performed in general accordance with ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Two stainless steel infiltration rings were used for the infiltration testing. The outer infiltration ring is 2 feet in diameter and 20 inches in height. The inner infiltration ring is 1 foot in diameter and 20 inches in height. At the test locations, the outer ring was driven 3± inches into the soil at the base of each trench. The inner ring was centered inside the outer ring and subsequently driven 3± inches into the soil at the base of the trench. The rings were driven into the soil using a ten-pound sledge hammer. The soil surrounding the wall of the infiltration rings was only slightly disturbed during the driving process.

Infiltration Testing Procedure

The infiltration testing consisted of filling the inner ring and the annular space (the space between the inner and outer rings) with water, approximately 3 to 4 inches above the soil. To prevent the flow of water from one ring to the other, the water level in both the inner ring and the annular space between the rings was maintained using constant-head float valves. The volume of water that was added to maintain a constant head in the inner ring and the annular space during each time interval was determined and recorded. A cap was placed over the rings to minimize the evaporation of water during the tests.

The schedule for readings was determined based on the observed soil type at the base of each backhoe-excavated trench. Based on the existing soils at the trench locations, the volumetric measurements were made at either 5-minute or 15-minute increments. The water volume measurements are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on these spreadsheets.

The infiltration rates for the tests are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used for design. These rates are summarized below:

Infiltration Test No.	Depth (feet)	Soil Description	Measured Infiltration Rate (inches/hour)
I-1	10	Brown fine Sandy Silt	3.1
I-2	9	Gray fine to medium Sand, little Silt, trace coarse Sand	19.8

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the trenches were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Trench Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test trench has been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 and C-2 of this report. The percentage passing the No. 200 sieve is also reported on the Infiltration Trench Logs.

Design Recommendations

Two (2) infiltration tests were performed at the subject site. As noted above, the measured infiltration rates at the infiltration test locations vary from 3.1 to 19.8 inches per hour. The Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS200.1 prepared by the County of Los Angeles, Department of Public Works, Geotechnical and Materials Division (GMED) on June 30, 2021, dictate that a reduction factor be utilized in the design infiltration rate. The following reduction factors are considered in the design assumed infiltration rate:

Reduction Factor	
Double-ring Infiltrometer	$RF_t = 1$
Site Variability, number of tests, and thoroughness of subsurface investigation	$RF_v = 2$
Long-term siltation plugging and maintenance	$RF_s = 1$
Total Reduction Factor, RF= $RF_t + RF_v + RF_s$	RF = 4
Design Infiltration Rate (DIR) = Measured Infiltration Rate (MIR)/RF	**DIR = 0.8**

Based on the results of the infiltration testing, a design infiltration rate of 0.8 inches per hour should be utilized in the design of the proposed below-grade chamber system.

Additional Recommendations

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each system. It should be confirmed that the soils at the base of the proposed infiltration systems correspond with those presented in this report to ensure that the performance of the systems will be consistent with the rates reported herein.

The design of the proposed chamber infiltration system should be performed by the project civil engineer, in accordance with the City of Covina and/or Los Angeles County guidelines. However, it is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the systems. The presence of such materials would decrease the effective infiltration rates. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rates recommended above are based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rates.** It should be noted that the recommended infiltration rates are based on infiltration testing at two (2) discrete locations and the overall infiltration rates of the infiltration systems could vary considerably.

Infiltration Rate Considerations

The infiltration rates presented herein were determined in accordance with the Los Angeles County guidelines and are considered valid only for the time and place of the actual tests. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rates presented above. The infiltration rates will decline over time between maintenance cycles as silt or clay particles accumulate on the BMP surface. The infiltration rate

is highly dependent upon a number of factors, including density, silt and clay content, grainsize distribution throughout the range of particle sizes, and particle shape. Small changes in these factors can cause large changes in the infiltration rates. Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Construction Considerations

The infiltration rates presented in this report are specific to the tested locations and tested depths. Infiltration rates can be significantly reduced if the soils are exposed to excessive disturbance or compaction during construction. Compaction of the soils at the bottom of the infiltration systems can significantly reduce the infiltration ability of the systems. Therefore, the subgrade soils within proposed infiltration system areas should not be over-excavated, undercut or compacted in any significant manner. It is recommended that a note to this effect be added to the project plans and/or specifications. We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each infiltration system. The infiltration rate of the system will likely vary significantly if the composition of the soil located beneath the system is not consistent with the tested soils. We recommend that scrapers and other rubber-tired heavy equipment not be operated on the system bottom, or at levels lower than 2 feet above the bottom of the system, particularly within basins. As such, the bottom 24 inches of the infiltration systems should be excavated with non-rubber-tired equipment, such as excavators.

Infiltration Chamber

The proposed project may include infiltration chambers. Water flowing into these chambers will carry some level of sediment. This layer has the potential to significantly reduce the infiltration rate of the chamber subgrade soils. Therefore, a formal chamber maintenance program should be established to ensure that these silt and clay deposits are removed from the chamber on a regular basis.

Location of Infiltration Systems

The use of on-site storm water infiltration systems carries a risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Overlying structures and pavements in the infiltration area could potentially be damaged due to saturation of the subgrade soils. **The proposed infiltration systems for this site should be located at least 25 feet away from any structures, including retaining walls.** Even with this provision of locating the infiltration system at least 25 feet from the building(s), it is possible that infiltrating water into the subsurface soils could have an adverse

effect on the proposed or existing structures. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure, depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration systems. The infiltration system designer should also give special consideration to the effect that the proposed infiltration systems may have on nearby subterranean structures, open excavations, or descending slopes. In particular, infiltration systems should not be located near the crest of descending slopes, particularly where the slopes are comprised of granular soils. Such systems will require specialized design and analysis to evaluate the potential for slope instability, piping failures and other phenomena that typically apply to earthen dam design. This type of analysis is beyond the scope of this infiltration test report, but these factors should be considered by the infiltration system designer when locating the infiltration systems.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rates contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between trench locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

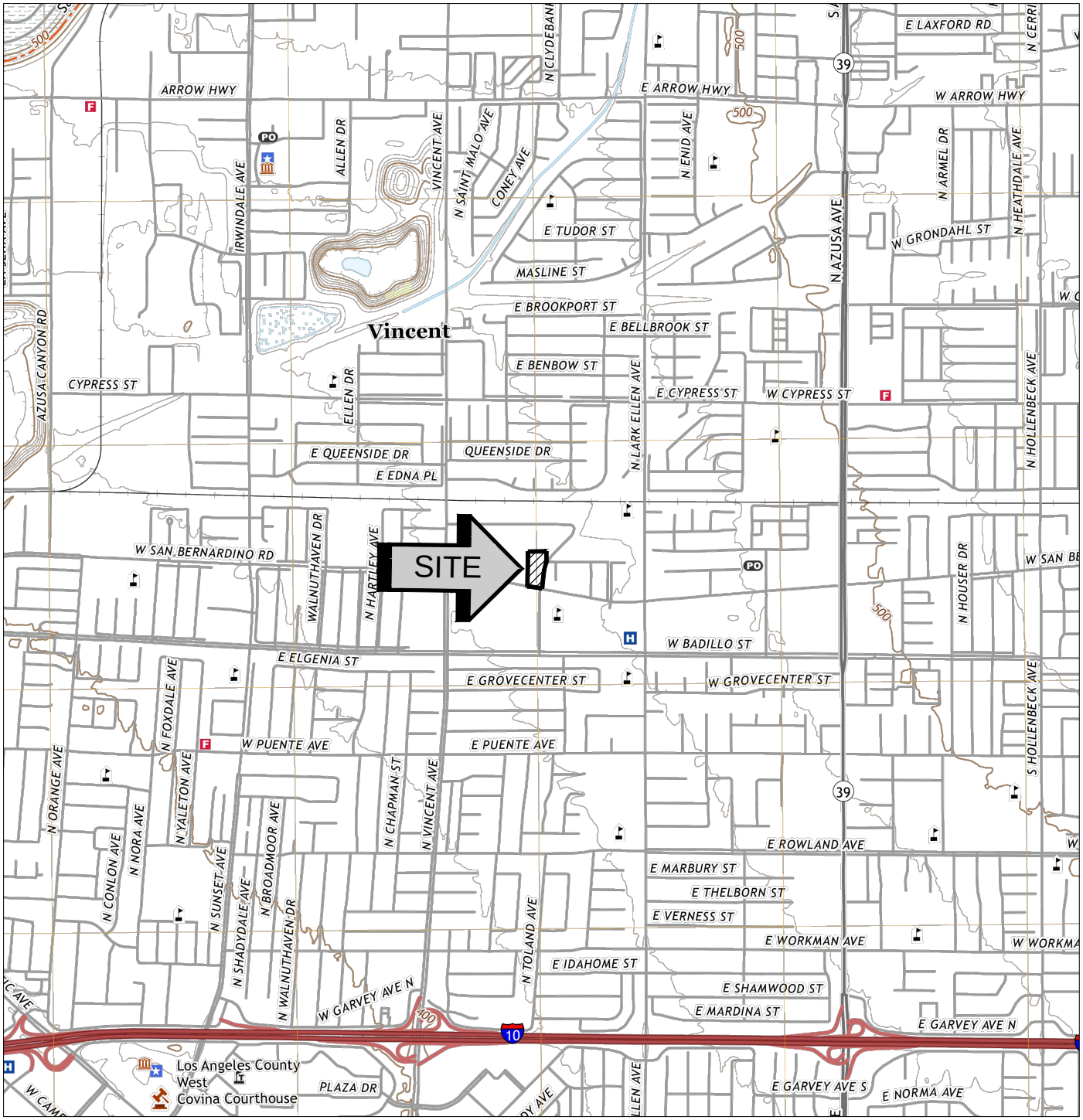
Jamie Hayward
Staff Geologist



Robert G. Trazo, GE 2655
Principal Engineer

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Infiltration Trench Logs (4 pages)
Infiltration Test Results Spreadsheets (2 pages)
Grainsize Distribution Graphs (2 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE BALDWIN PARK QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA, 2021.

SITE LOCATION MAP

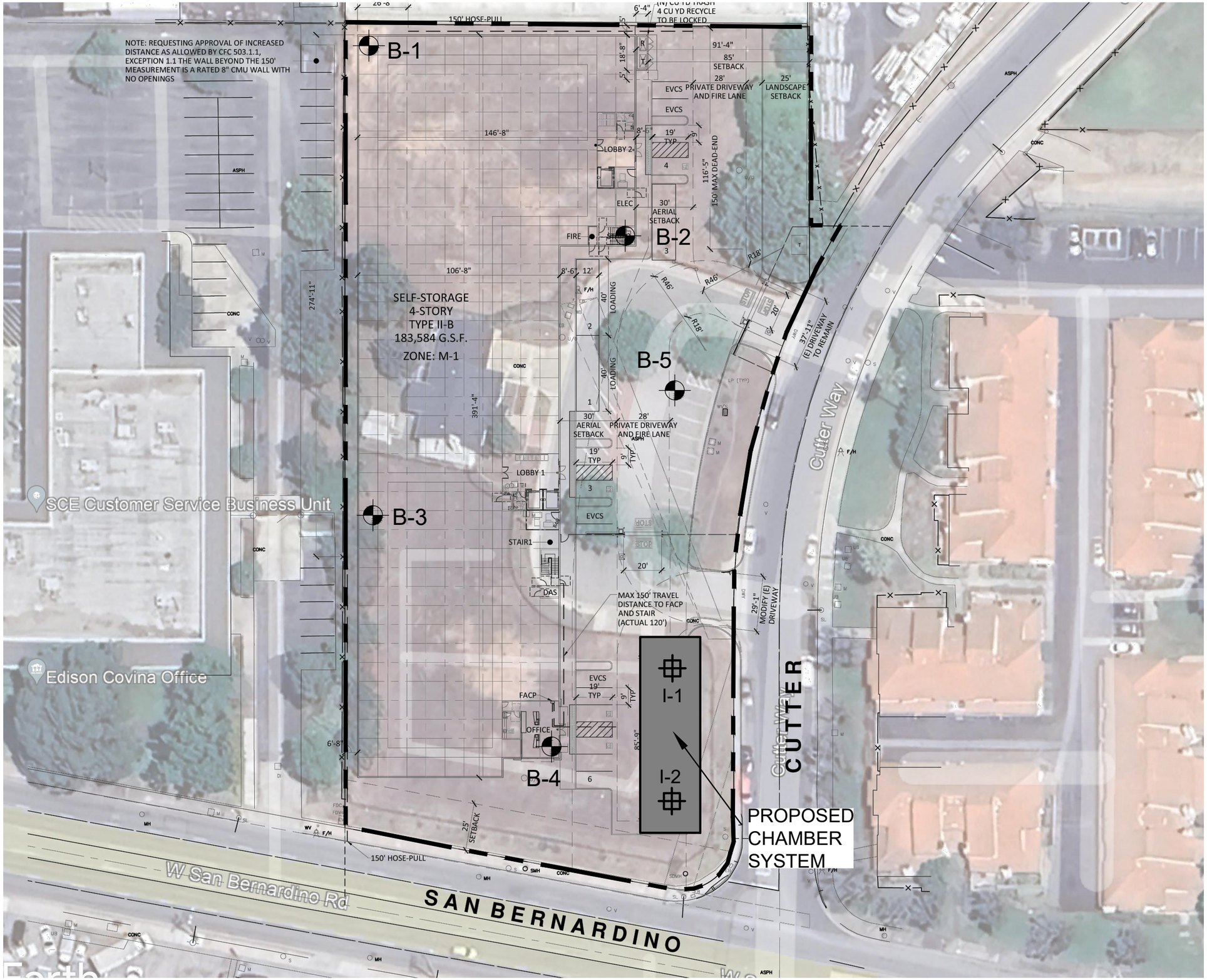
PROPOSED SELF-STORAGE FACILITY

COVINA, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: RB CHKD: RGT	
SCG PROJECT 23G207-2	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



NORTH

SoCalGeo

GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION TEST LOCATION
- APPROXIMATE BORING LOCATION (SCG PROJECT NO. 23G207-1)

NOTE: CONCEPTUAL SITE PLAN PROVIDED BY KSP STUDIO.
AIR PHOTO OBTAINED FROM GOOGLE EARTH.

INFILTRATION TEST LOCATION PLAN

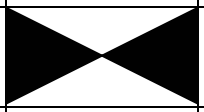
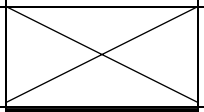
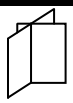
PROPOSED SELF-STORAGE FACILITY

COVINA, CALIFORNIA

SCALE: 1" = 50'	
DRAWN: RB CHKD: RGT	
SCG PROJECT 23G207-2	
PLATE 2	

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

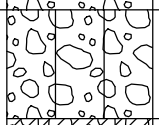
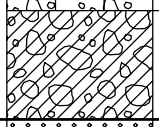
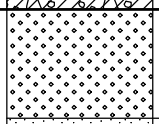
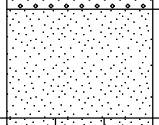
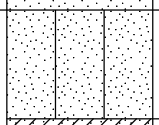
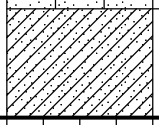
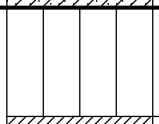
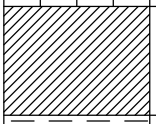
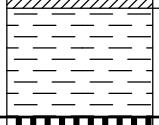
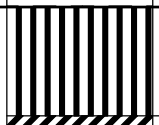
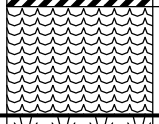
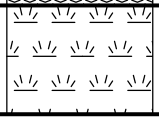
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-1

JOB NO.: 23G207-2
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/13/23
DRILLING METHOD: Backhoe
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					FILL: Brown Silty fine Sand, trace medium to coarse Sand, trace fine to coarse Gravel, occasional Cobbles, medium dense-damp							
5					ALLUVIUM: Gray to Brown fine Sand, trace medium to coarse Sand, medium dense-damp Brown fine Sandy Silt, trace medium Sand, medium dense-moist							
							24			75		
10					Trench Terminated @ 10 feet							

TBL 23G207-2.GPJ SOCALGEO.GDT 11/21/23

TEST BORING LOG

PLATE B-1

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 23G207-2
PROJECT: Proposed Self-Storage Facility
LOCATION: Covina, California

DRILLING DATE: 11/13/23
DRILLING METHOD: Backhoe
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					FILL: Brown Gravelly fine to coarse Sand, trace trash debris and PCC blocks, trace Silt, occasional Cobbles, medium dense-damp							
5					ALLUVIUM: Gray fine to medium Sand, trace to little coarse Sand, medium dense-damp		7			12		
					Trench Terminated @ 9 feet							

TBL 23G207-2.GPJ SOCALGEO.GDT 11/21/23

TEST BORING LOG **PLATE B-2**

INFILTRATION CALCULATIONS

Project Name	Proposed Self-Storage Facility
Project Location	Covina, California
Project Number	23G207-2
Engineer	RB

Infiltration Test No: I-1

Constants

	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.785	730
Anlr. Spac	2	2.356	2189

*Note: The infiltration rate was calculated based on current time interval

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	8:37 AM	15	0	1750	0	5000	9.59	9.14	3.78	3.60
	Final	8:52 AM	**15**	1750		5000					
2	Initial	8:54 AM	15	0	1600	0	3500	8.77	6.40	3.45	2.52
	Final	9:09 AM	**30**	1600		3500					
3	Initial	9:10 AM	15	0	1550	0	4100	8.50	7.49	3.35	2.95
	Final	9:25 AM	**45**	1550		4100					
4	Initial	9:27 AM	15	0	1550	0	5500	8.50	10.05	3.35	3.96
	Final	9:42 AM	**60**	1550		5500					
5	Initial	9:44 AM	15	0	1500	0	4900	8.22	8.95	3.24	3.53
	Final	9:59 AM	**75**	1500		4900					
6	Initial	10:01 AM	15	0	1450	0	4800	7.95	8.77	3.13	3.45
	Final	10:16 AM	**90**	1450		4800					

INFILTRATION CALCULATIONS

Project Name	Proposed Self-Storage Facility
Project Location	Covina, California
Project Number	23G207-2
Engineer	RB

Infiltration Test No: I-2

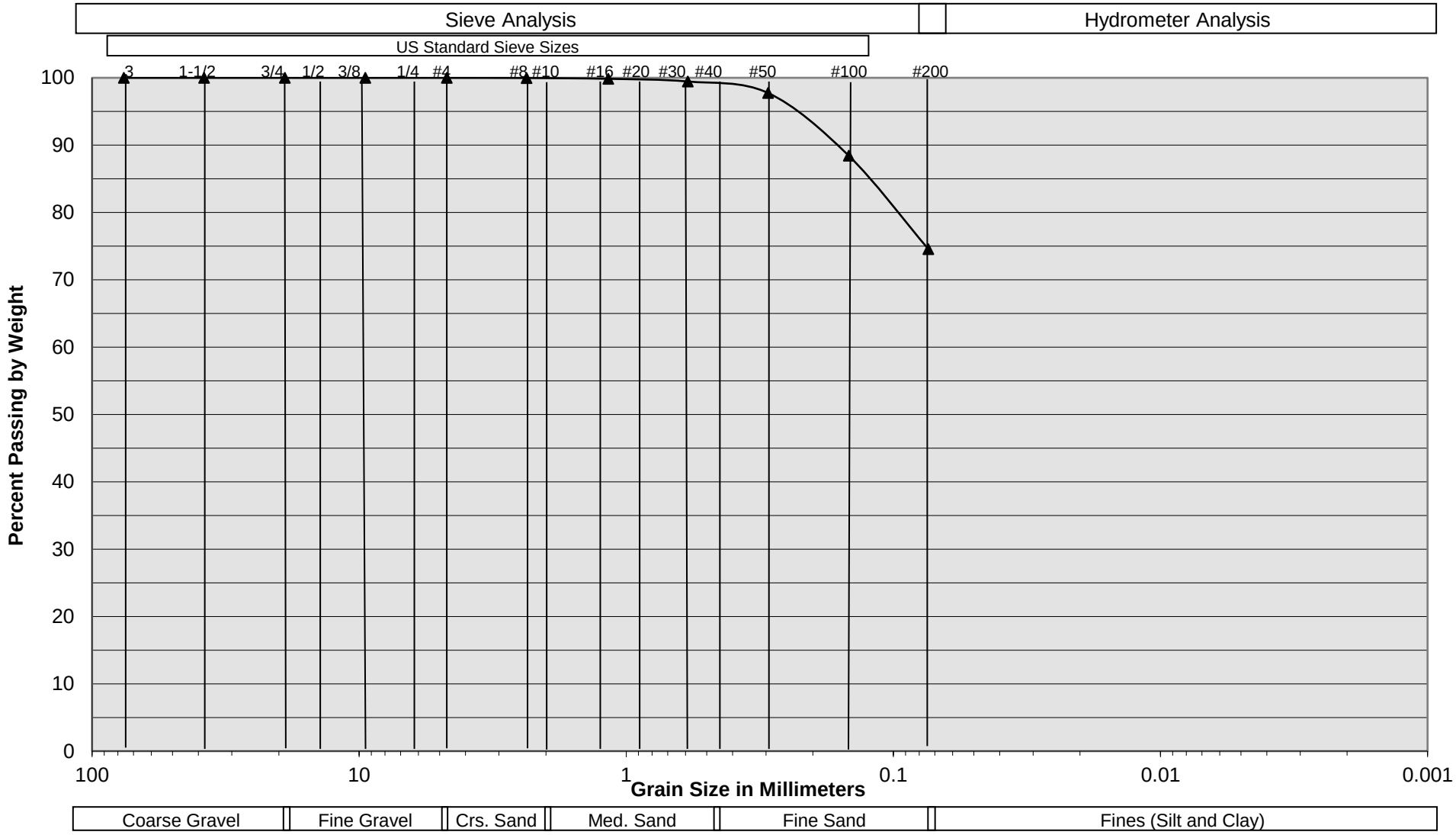
Constants

	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.785	730
Anlr. Spac	2	2.356	2189

*Note: The infiltration rate was calculated based on current time interval

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Ring Flow (cm^3)	Annular Ring (ml)	Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Annular Space* (cm/hr)	Inner Ring* (in/hr)	Annular Space* (in/hr)
1	Initial	10:44 AM	5	0	3800	0	6000	62.50	32.89	24.61	12.95
	Final	10:49 AM	**5**	3800		6000					
2	Initial	10:51 AM	5	0	3800	0	6400	62.50	35.09	24.61	13.81
	Final	10:56 AM	**10**	3800		6400					
3	Initial	10:59 AM	5	0	3500	0	6900	57.56	37.83	22.66	14.89
	Final	11:04 AM	**15**	3500		6900					
4	Initial	11:08 AM	5	0	3500	0	6700	57.56	36.73	22.66	14.46
	Final	11:13 AM	**20**	3500		6700					
5	Initial	11:15 AM	5	0	3350	0	6100	55.10	33.44	21.69	13.17
	Final	11:20 AM	**25**	3350		6100					
6	Initial	11:22 AM	5	0	3300	0	6400	54.27	35.09	21.37	13.81
	Final	11:27 AM	**30**	3300		6400					
7	Initial	11:29 AM	5	0	3250	0	6000	53.45	32.89	21.04	12.95
	Final	11:34 AM	**35**	3250		6000					
8	Initial	11:35 AM	5	0	3200	0	6500	52.63	35.63	20.72	14.03
	Final	11:40 AM	**40**	3200		6500					
9	Initial	11:43 AM	5	0	3100	0	6900	50.98	37.83	20.07	14.89
	Final	11:48 AM	**45**	3100		6900					
10	Initial	10:51 AM	5	0	3100	0	7100	50.98	38.92	20.07	15.32
	Final	10:56 AM	**50**	3100		7100					
11	Initial	10:57 AM	5	0	3050	0	7000	50.16	38.38	19.75	15.11
	Final	11:02 AM	**55**	3050		7000					
12	Initial	11:04 AM	5	0	3050	0	7300	50.16	40.02	19.75	15.76
	Final	11:09 AM	**60**	3050		7300					

Grain Size Distribution

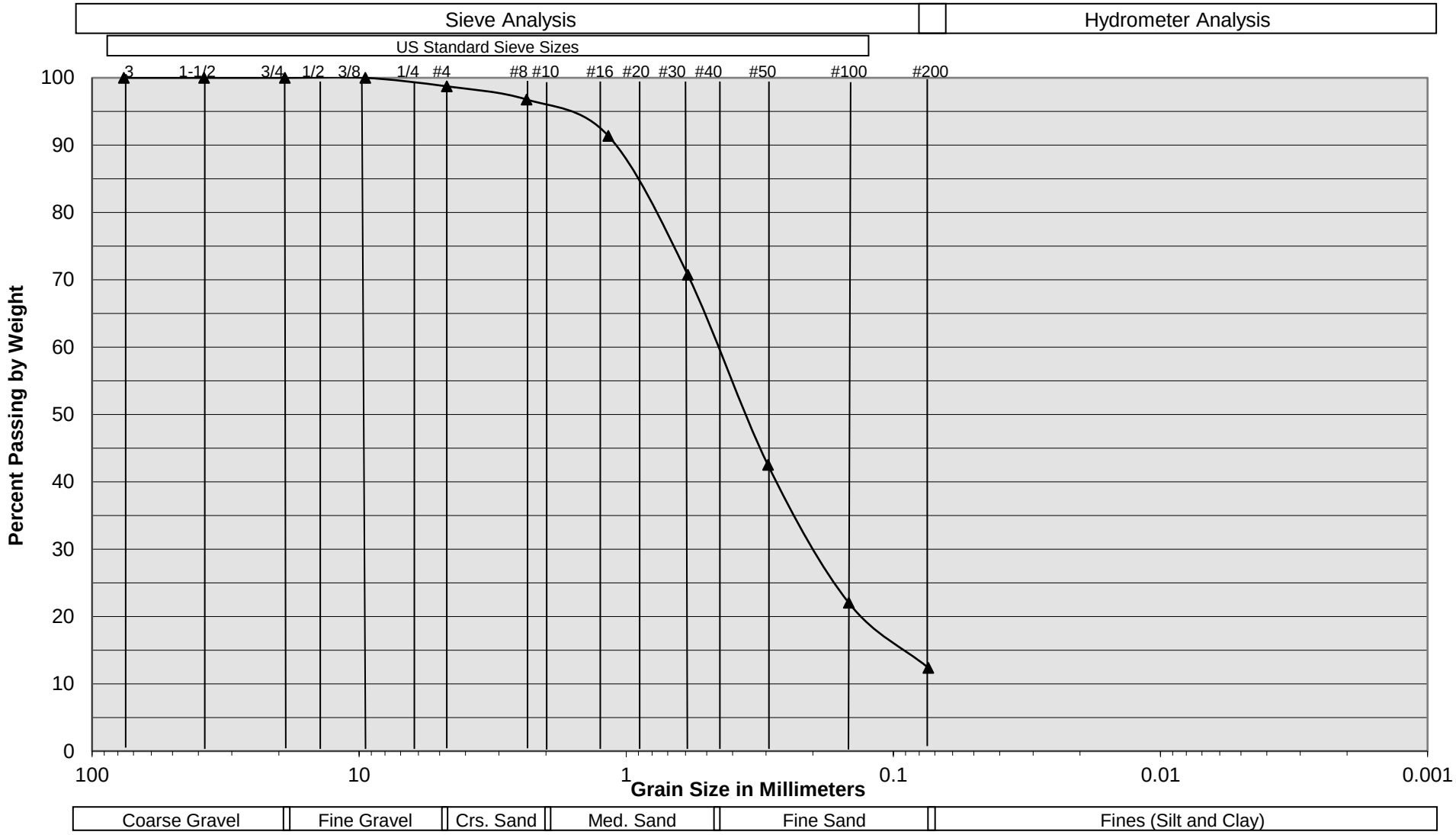


Sample Description	I-1 @ 9 to 10 feet
Soil Classification	Brown fine Sandy Silt

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-2
PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



Sample Description	I-2 @ 8 to 9 feet
Soil Classification	Gray fine to medium Sand, little Silt, trace coarse Sand

Proposed Self-Storage Facility
Covina, California
Project No. 23G207-2
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Appendix F
Operation & Maintenance Plan

Note: This document is to be developed at the time of final design.

Appendix G
BMP Maintenance Covenant (Agreement)

Note: This document is to be developed and executed at the time of final design.

Appendix H
Education Materials

Note: The BMP education reference materials will be included at the time of final design.