DOCKETED	
Docket Number:	25-OPT-02
Project Title:	Prairie Song Reliability Project
TN #:	264390
Document Title:	App 3-15A Water Quality Management Plan Part 1
Description:	N/A
Filer:	Erin Phillips
Organization:	Dudek
Submitter Role:	Applicant Consultant
Submission Date:	6/20/2025 1:49:08 PM
Docketed Date:	6/20/2025

Appendix 3.15A

Water Quality Management Plan

1 of 6

ISSUE SUMMARY AND APPROVAL PAGE
WATER QUALITY MANAGEMENT PLAN
FOR
PRAIRIE SONG RELIABLITY PROJECT

Revision	Purpose of Issue	Date
C	Review	05/16/2025

This is to confirm that this report has been prepared, reviewed and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, Miscellaneous Engineering and Design Deliverables, which is part of our Quality Management System.

Revision	Prepared By	Reviewed By	Approved By
C	Crispin Flores	James Perry	—
	Crispin Flores Digitally signed by Crispin Flores DN: C=US, E=crispin.flores@sargentlundy.com, O=Sargent & Lundy, CN=Crispin Flores Date: 2025.05.21 11:27:15-05'00'	James T Perry Digitally signed by James T Perry DN: CN=James T Perry, 0.9.2342.19200300.100.1.1=10010000001BCB99B2310100170147, O=SARGENT AND LUNDY, C=US Date: 2025.05.21 11:56:58-05'00'	

Water Quality Management Plan (WQMP)

Project Name:

PRAIRIE SONG RELIABILITY PROJECT

Prepared for:

Prairie Song Reliability Project LLC

Near 800 Soledad Canyon Road

Acton, California, 93510

Prepared by:

Sargent & Lundy

Engineer: Joshua Bickett

Registration No. 95825

55 E. Monroe St.

Chicago, IL 60603

312-269-2000

Engineer's Seal

Prepared on:

05-16-2025

Project Owner's Certification

Permit/Application No.		Grading Permit No.	
Tract/Parcel Map No.		Building Permit No.	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			APN: 3056-019-013, 3056-015-023, 3056-019-037, 3056-019-040, 3056-015-008, 3056-017-022, 3056-017-904, 3056-017-905, 3056-017-906, 3056-017-907, 3056-017-027, 3056-017-028, 3056-017-026, 3056-017-007, 3056-017-020, 3056-017-021

This Water Quality Management Plan (WQMP) has been prepared for Prairie Song Reliability Project LLC by Sargent & Lundy (S&L). The WQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current the Los Angeles County Low Impact Development (LID) Standards Manual and the applicable provisions of the Municipal Separate Storm Sewer System (MS4) Permit, the Construction General Permit, and any other relevant Waste Discharge Requirements issued by the California Regional Water Quality Control Board, Los Angeles Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Prairie Song Reliability Project LLC			
Title	Director		
Company	Prairie Song Reliability Project LLC		
Address	[redacted]		
Email	[redacted]		
Telephone #	541-325-1157		
Signature		Date	05-16-2025

Contents

Page No.

Attachment H: ADS Chambers for Underground Detention Basin

Attachment I: Percolation Test Results

Attachment J: Hydrology Report

Attachment K: Stormwater Report

Section 1 Discretionary Permit(s) and Water Quality Conditions

Project Infomation			
Permit/Application No.		Site Address or Tract/Parcel Map No.	Near 800 Soledad Canyon Road Acton, California, 93510
Additional Information/ Comments:			
Water Quality Conditions			
Water Quality Conditions from prior approvals or applicable watershed-based plans	There were no prior approvals for this project.		

Section 2 Project Description

The proposed Battery Storage project is located approximately 3 miles northeast of the city of Acton, California The project is located in Los Angeles County and will be approximately 66.18 acres. The site is located north of Southern Pacific railroad. The final land cover of the site will be primarily gravel for the roads and the substation area, while the batteries shown within Attachment E will be supported by mat foundations. The existing site primarily consists of shrubland. There will be a minimum 8-ft height security wall surrounding the site. The side slopes grading to the existing surfaces will be seeded, as shown on Attachment D. The existing site is of Hydrologic Soil Group (HSG) A as shown in Attachment I. Any of material or waste collected onsite will be hauled offsite. The proposed project will take place within the site boundaries except for the improvement of the access roads leading to the site. The site will be owned by Prairie Song Reliability Project LLC. The site is located within the Arrastre Canyon-Santa Clara River watershed and is located directly north of the Santa Clara River.

Due to the existing topography of the site and area constraints, underground storm water detention areas and infiltration trenches are used throughout the site. The underground storm water detention areas are located in the western portion of the site for each of the battery areas.

2.1 General Description

Description of Proposed Project		
Site Location	Approximately 3 miles northeast of Acton, California within Los Angeles County, as shown on Exhibit C.	
Project Area (ft^2): 2,882,801	Number of Dwelling Units: 0	SIC Code: 3691 & 5063
Narrative Project Description:	The proposed Battery Storage project will be approximately 66.18 acres. The final land cover of the site will be primarily asphalt for the roads and gravel for the substation area, while the battery storage area will be a pad with stone surfacing. There will be a vegetative buffer surrounding the site. The side slopes grading to the existing surfaces will be seeded. The existing site is primarily shrubland belonging to Hydrologic Soil Group (HSG) A . Any of material or waste collected onsite will be hauled offsite. This development is considered a Priority Project because the project creates over 10,000 square feet of impervious surfacing.	

Project Area	Pervious (Sand and Dirt)		Impervious (Gravel, Asphalt and Concrete)	
	Area (acres)	Percentage	Area (acres)	Percentage
Pre-Project Conditions	62.73	94.8%	3.45	5.2%
Post-Project Conditions	3.91	5.9%	62.27	94.1%

2.2 Post Development Drainage Characteristics

Onsite Drainage Area

The proposed site modifications will utilize the existing 66.18 acres within the proposed limits of the Battery Storage project that currently drains to the southwest of the site. The proposed site consists of all gravel and impervious surfacing, which can be seen in Attachment E. To convey stormwater runoff into the underground detention basin, an infiltration trench system and storm sewer system are designed using gravity flow.

The underground detention chambers will be provided within the western portion of each of the battery sites. The buried underground detention chambers are being provided in accordance with the County of Los Angeles Department of Public Works (LADPW) Guidelines, to meet the stormwater management requirements for stormwater detention. Stormwater runoff from the Gen-Tie pad areas will drain to infiltration ponds located at each pad. The new roads leading to the Gen-Tie pads will be gravel-surfaced and drain through perforated underdrains to the infiltration basin located at each of the Gen-Tie pads. The infiltration basins are sized for the 100-year storm event.

2.3 Property Ownership/Management

The project substation is owned by Prairie Song Reliability Project LLC. The different property lines can be shown on Attachment C.

Section 3 Site & Watershed Characterization

3.1 Site Conditions

3.1.1 Existing Site Conditions

The existing 66.18 acre area of the site is located approximately 3 miles northeast of the city of Acton, California in Los Angeles County, California. The current site is located on moderate terrain ranging from 2% to greater than 10%, with steeper slopes near the southwest of the site, as shown on Attachment D. The overall drainage pattern is southwest, draining towards the Santa Clara River to the southwest of the site.

Existing Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Dirt	12.48	0.00	12.48	0%
Sand	33.77	0.00	33.77	0%
Gravel	3.45	3.45	0.00	100%
Brush	16.48	0.00	16.48	0%
Total	66.18	3.45	62.73	5.21%

3.1.2 Infiltration-Related Characteristics

3.1.2.1 Hydrogeologic Conditions

During geotechnical exploration at the site (Attachment F), groundwater was not encountered in borings while drilling and the recorded historical groundwater depth is more 100 feet below ground surface. As such, groundwater is not anticipated to occur within the depth of excavations or foundation installations at the site. Infiltration is proposed at all areas of the project, including the BESS pads, Gen-Tie pads, and new access roads.

3.1.2.2 Soil and Geologic Infiltration Characteristics

The existing site is primarily shrubland belonging to Hydrologic Soil Group (HSG) A. The existing site is covered by gravel, sand, and brush. This can be seen in Attachment I. Curve numbers are taken from the NRCS TR-55 (Reference 5.3). Below is a table outlining these calculations. The subsurface investigation completed by Terracon in December 2024 shows that the lowest infiltration rate between P-1, P-2, P-3, and P-4 was 1.3 in/hr. The Infiltration Report can be seen in Attachment I.

Pre-Existing Composite Curve Number

HSG	Total Area	Shrub		Gravel	
	Acres	CN	Acres	CN	Acres
A	66.18	55	62.73	76	3.45

Post-Construction Composite Curve Number

HSG	Total Area	Impervious		Gravel		Grass	
	Acres	CN	Acres	CN	Acres	CN	Acres
A	66.18	98	7.94	76	54.33	49	3.91

3.1.2.4 Summary of Infiltration Opportunities and Constraints of Existing Site

Four locations were used for percolation testing. The results ranged from 1.3 inches/hour at P-3 to 4.6 inches/hour at P-1. The infiltration report is located within Attachment I.

Infiltration is proposed at all areas of the project, including the BESS pads, Gen-Tie pads, and new access roads. The BESS pads will utilize a combination of ADS Stormtech chambers and infiltration trenches, while the Gen-Tie pads and access roads will utilize at-grade infiltration ponds.

3.2 Proposed Site Development Activities

3.2.1 Overview of Site Development Activities

The development will be a battery storage site with an adjacent substation. The site will be occupied and will only require periodic maintenance activities. Activities to be conducted periodically will be maintenance of the underground basin and landscaping of the site, as well as any maintenance required for the battery facilities. The site is changing from mostly pervious surfacing like sand and dirt to mostly gravel and impervious surfacing. The overall drainage pattern of the site is still from east to southwest. This can be seen on Attachment E.

3.2.2 Project Attributes Influencing Stormwater Management

The proposed Prairie Song Reliability Project (Project) will be composed of lithium-ion batteries, inverters, medium-voltage (MV) transformers, a switchyard, a collector substation, and other associated equipment to interconnect into the substation (Point of Interconnection). The batteries will be installed in non-habitable enclosures.

Electric energy will be transferred from the existing power grid to the Project batteries for storage and from the Project batteries to the power grid when additional electricity is needed.

During operation there will be minimal waste generated on site and there will be minimum traffic to the area except to maintain the underground detention basin and landscaping, or battery facilities. There will be no discharge to any environmentally sensitive features.

The proposed land surfacing of the site will consist of mat foundations for the batteries and inverters. Drilled piers will be used within the substation for steel structures and the control house, and mat foundations will be used for the O&M building and GSU transformers. The roads within the battery areas will be asphalt paved, and the areas between the battery areas and asphalt roads will be gravel surfaced. The substation perimeter roads and the area between foundations and equipment will be surfaced with gravel.

The Gen-Tie pads consist of a monopole and its foundation, and some underground communication lines. The pad areas and their access roads will be gravel surfaced.

The runoff from within the project boundary will be contained within the underground detention areas on site which is sized for the two drainage areas of the battery yards. Upstream offsite runoff will be diverted both around and through the project site using culverts. The culverts have been sized for the 100-year, 24-hour rain event. Large outfall velocities for the culverts routed through and around the BESS and substation site will be minimized using energy dissipators and riprap.

Offsite runoff impacting the Gen-Tie pads will be managed by small diversion ditches along the pad edges and access roads as well as at grade infiltration ponds on the pads. Access roads for the North 3/South 8 and North 4 Gen-Tie pads are located within a flood plain. To maintain pre and post development conditions to the greatest extend possible, the access roads to these sites will be constructed to follow existing grade and use native material. Occasional maintenance will be needed following large storm events.

Proposed Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Gravel Surfacing	54.33	54.33	0	100%
Impervious Surfacing	7.94	7.94	0	100%
Shrub	3.91	0	3.91	0%
Total	66.18	62.27	3.91	94%

3.2.3 Effects on Infiltration and Harvest and Use Feasibility

Infiltration is proposed at all areas of the project, including the BESS pads, Gen-Tie pads, and new access roads. Infiltration rates are provided in Attachment I.

3.3 Receiving Waterbodies

The stormwater collected at the project site will be infiltrated through the subgrade. No direct stormwater runoff discharges are anticipated for storm events up to the design storm event as indicated within Westwood's Hydrology and Stormwater reports attached in Attachments J and K.

3.4 Stormwater Pollutants or Conditions of Concern

Pollutants or Conditions of Concern				
Pollutant	Expected from Proposed Land Uses/Activities (Yes or No)	Receiving Waterbody Impaired (Yes or No)	Priority Pollutant from WQIP or other Water Quality Condition? (Yes or No)	**Pollutant of Concern (Primary, Other, or No)**
Suspended-Solids	Yes	No	No	No
Nutrients	No	No	No	No
Heavy Metals	No	N/A	N/A	No
Bacteria/Virus/Pathogens	No	N/A	Yes	Primary
Pesticides	No	N/A	N/A	No
Oil and Grease	No	No	No	No
Toxic Organic Compounds	No	N/A	N/A	No
Trash and Debris	No	N/A	N/A	No
Dry Weather Runoff	No	N/A	Yes	Primary

3.5 Hydrologic Conditions of Concern

Does a hydrologic condition of concern exist for this project?

☒ No – An HCOC does not exist for this receiving water because:

☐ Project discharges directly to a protected conveyance (bed and bank are concrete lined the entire way from the point(s) of discharge to a receiving lake, reservoir, embayment, or the Ocean

☒ Project discharges directly to storm drains which discharge directly to a reservoir, lake, embayment, ocean or protected conveyance (as described above)

☐ The project discharges to an area identified in the WMAA as exempt from hydromodification concerns

☐ Yes – An HCOC does exist for this receiving water because none of the above are applicable.

Section 4 Site Plan and Drainage Plan

4.1 Drainage Management Area Delineation

The site has two drainage management areas that are composed of different surfacing types. The two DMAs were made up of the gravel surfacing and the impervious surfacing. The BMPs selected for the project site are underground infiltration chambers and infiltration trenches.

4.2 Overall Site Design BMPs

Minimize Impervious Area – Impervious areas will be minimized where possible. Runoff will be detained onsite in underground detention chambers. Impervious surfacing is required due to the site's intended use for operation and safety.

Maximize Natural Infiltration Capacity- The geotechnical report and hydrology report are attached in Attachments F and J.

Preserve Existing Drainage Patterns and Time of Concentration- The existing drainage pattern would be northeast to southwest and then ultimately will flow into Santa Clara River. The site will capture runoff from the site area and will ultimately drain southward into the underground detention areas. Runoff onsite will not be discharged into Santa Clara River and will instead be infiltrated through the subgrade.

Disconnect Impervious Areas- Disconnected impervious areas will not be used in order to be able to access the battery storage and substation areas, which requires convenient access for maintenance and emergencies.

Protect Existing Vegetation and Sensitive Areas- There are no discharges to sensitive areas from either onsite or offsite. A vegetative buffer will be provided surrounding the project site.

Revegetate Disturbed Areas – Side slopes will be vegetated once the site is constructed.

Soil Stockpiling and Site Generated Organics – Soil stockpiling will not occur during regular site activities within the project site. The site will be inhabited and maintenance activities will be conducted for the underground detention basin chambers and equipment and periodic landscaping activities as necessary.

Firescaping- Plants will be selected to minimize the risks of fire. Vegetation will be selected in accordance to the zone of the battery storage area.

Water Efficient Landscaping- Water efficient landscaping will be incorporated into the landscape design and plant selection, as well as in the landscaping plan.

Slopes and Channel Buffers- Slope and channel buffers will be maintained to decrease the potential for erosion of slopes

4.3 DMA Characteristics and Site Design BMPs

4.3.1 Project Area (Onsite)

The gravel surfacing onsite is located as shown on Attachment E. The total area of the gravel surfacing is 54.33 acres. The gravel surfacing is 100% impervious. The site drains to an infiltration trench which will then allow the runoff to flow into the underground detention chambers.

The impervious surfacing onsite is located as shown on Attachment E. This area will be composed of the internal access roads within the BESS portion of the project. The access roads within the BESS area will be paved with asphalt. The total area of the impervious surfacing is 7.94 acres. The surfacing is 100% impervious.

The site drains to catch chambers located throughout the facility and an infiltration trench which will then allow the runoff to flow into the underground detention chambers.

4.3.2 DMA Summary

Drainage Management Areas				
DMA (Number/Description)	Total Area (acres)	Imperviousness (%)	Infiltration Feasibility Category (Full, Partial, or No Infiltration)	Hydrologic Source Controls Used
DA1	23.65	83%	Full Infiltration	Underground Detention Chambers
DA2	47.21	83%	Full Infiltration	Underground Detention Chambers

4.4 Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	**Name**	**Check One**		**Reason Source Control is Not Applicable**
		Included	**Not Applicable**	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	

N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	
N6	Local Industrial Permit Compliance	☒	☐	The generators will require refueling.
N7	Spill Contingency Plan	☒	☐	
N8	Underground Storage Tank Compliance	☐	☒	There will be no underground structures except the detention pond, which will only hold water.
N9	Hazardous Materials Disclosure Compliance	☒	☐	Transformer oil and BESS classify as hazardous.
N10	Uniform Fire Code Implementation	☒	☐	
N11	Common Area Litter Control	☒	☐	The battery storage area will be staffed.
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	No loading docks will be onsite.
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☐	☒	There will be minimum traffic.
N16	Retail Gasoline Outlets	☐	☒	There will be no gasoline outlets

BMP maintenance will be provided per the O&M manual to make sure the underground detention basin is functioning as required. A spill contingency plan will be provided for the substation and battery equipment. The batteries will be LFP batteries. These batteries are made with a lithium iron phosphate ($LiFePO_4$) cathode. The materials are non-toxic. Lithium iron phosphate is thermally and structurally stable meaning that it won't fluctuate during overcharge or short circuit conditions, or if handled incorrectly. LFP batteries are also incombustible, which makes these particular batteries the safest lithium chemistry to use in energy projects. LFP batteries contain no toxic or rare earth materials. Unlike other types of lithium batteries, the internal chemicals found within LFP batteries will not cause leakage that harms the environment.

The Los Angeles fire code will be followed and the site will be in compliance with Article 80 of the Uniform Fire Code. Employee training will be provided to any employee coming onto the site for maintenance or landscaping activities. As a part of the maintenance requirements for the site, catch basins will be inspected for build up of sediment or debris.

Structural Source Control BMPs

Identifier	Name	Check One		Reason Source Control is Not Applicable
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☐	☒	Site does not drain directly to the ocean.
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage areas will be onsite. All material will be hauled offsite.
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	Regular trash pick-up will occur.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☒	☐	
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☐	
S6	Dock areas	☐	☒	No dock areas onsite.
S7	Maintenance bays	☐	☒	No maintenance bays onsite.
S8	Vehicle wash areas	☐	☒	No wash areas onsite.
S9	Outdoor processing areas	☐	☒	No processing areas onsite.
S10	Equipment wash areas	☐	☒	
S11	Fueling areas	☒	☐	Generators will require refueling.
S12	Hillside landscaping	☒	☐	
S13	Wash water control for food preparation areas	☐	☒	No food preparation onsite.
S14	Community car wash racks	☐	☒	No community car wash racks.

Section 5 BMP

5.1 BMPs in DMA 1 and 2

The onsite underground detention chambers will be used for the DMA onsite. The underground chambers will be lined with woven geotextile fabric between the foundation stone and chambers. This will allow infiltration into the groundwater. The post-development site plan can be found in Attachment E.

5.1.1 Structural LID BMP for DMA 1 and 2

The BMP is an underground detention chamber supplied by ADS. It is made up of several chambers within perimeter stone. The chambers are wrapped in a woven geotextile and have a layer of stone under the chambers. The ADS chambers can be seen in Attachment H.

The BMP selected at the site is an underground detention basin. The approximate area required for each drainage area for the chambers was determined by first calculating the area of one chamber. Using ADS' product drawings and dividing the system area by number of chambers, the total required area per drainage area was determined by multiplying the unit area by the number of adjusted required ADS chambers calculated earlier.

5.1.2 Structural LID BMP for Gen-Tie Pad Locations

Each Gen-Tie pad will manage stormwater runoff using shallow infiltration basins. The approximate area required for the infiltration basins was determined by taking the storage volume required for Drainage Area 1 and linearly scaling it down for a single pad. The calculations for the BESS pads were performed by Westwood, as seen in Attachment K. The provided area for each Gen-Tie pad location infiltration basin provides sufficient infiltration volume storage.

5.1.3 BESS Area Offsite Stormwater Management

Culverts will manage upstream offsite stormwater runoff throughout the overall project site. There are various culverts running beneath access driveways to the BESS, substation, and Gen-Tie pads. One existing 36" culvert allows runoff to flow south underneath Soledad Canyon Road towards the southern BESS. A manhole with an open grate will collect stormwater runoff at the downstream point of the existing 36" culvert. A new 60" storm sewer will be placed from the manhole to the downstream end of the site to convey upstream stormwater runoff from the BESS facilities. A hydraulic dissipator with riprap will be placed at the downstream site of the BESS facility. This can be seen on drawings ANG-CS-004 S011 and ANG-CS-004 S012.

A 72" culvert will also be placed to route stormwater runoff. A manhole with an open grate will collect stormwater runoff and be conveyed downstream to the south of the substation site. A hydraulic dissipator with riprap will be placed at the downstream site of the substation. Sizing of the culverts was calculated by Westwood. Calculations and figures with the locations of the structures can be seen in Westwood's Stormwater Management Report found in Appendix K.

5.2 Summary of LID BMPs

This data is a summary of the above discussion, as well as the calculation on Attachment H.

Preliminary Stormwater sizing	**DA1**	**DA2**
Req. Infiltration Volume (ac-ft)	8.52	4.64
Req. Infiltration Volume (cu. ft)	371,131	202,118
Installed Storage/MC-3500 Chamber (cu. ft)	175	175
Approx. req. Number of MC-3500 Chambers	2,121	1,155

This table summarizes the calculation performed to linearly scale down the storage volume of drainage area 1 for an infiltration basin for a single Gen-Tie pad.

DA1 Area (Ac)	24 Ac
Vol. Calculated by Westwood (Ac-ft)	4.65 Ac-ft
Ratio of Area/Infiltration Volume	5.2
Gen-Tie Pad Size (Ac)	0.28 Ac
Gen-Tie Pad Infiltration Volume Required (ft^3)	2,325 ft^3
Depth of Infiltration Basin (ft)	2 ft
Area of Infiltration Basin (ft^2)	~1,200 ft^2

Section 7 Educational Materials Index

Educational Materials			
Residential Material (http://www.ocwatersheds.com)	**Check If Applicable**	**Business Material (http://www.ocwatersheds.com)**	**Check If Applicable**
The Ocean Begins at Your Front Door	☐	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☒
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☐
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☒
Household Tips	☐	Compliance BMPs for Mobile Businesses	☐
Proper Disposal of Household Hazardous Waste	☐	**Other Material**	**Check If Attached**
Recycle at Your Local Used Oil Collection Center (North County)	☐		
Recycle at Your Local Used Oil Collection Center (Central County)	☐		☐
Recycle at Your Local Used Oil Collection Center (South County)	☐		☐
Tips for Maintaining a Septic Tank System	☐		☐
Responsible Pest Control	☐		☐
Sewer Spill	☐		☐
Tips for the Home Improvement Projects	☐		☐
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☐		☐
Tips for Pet Care	☐		☐
Tips for Projects Using Paint	☐		☐

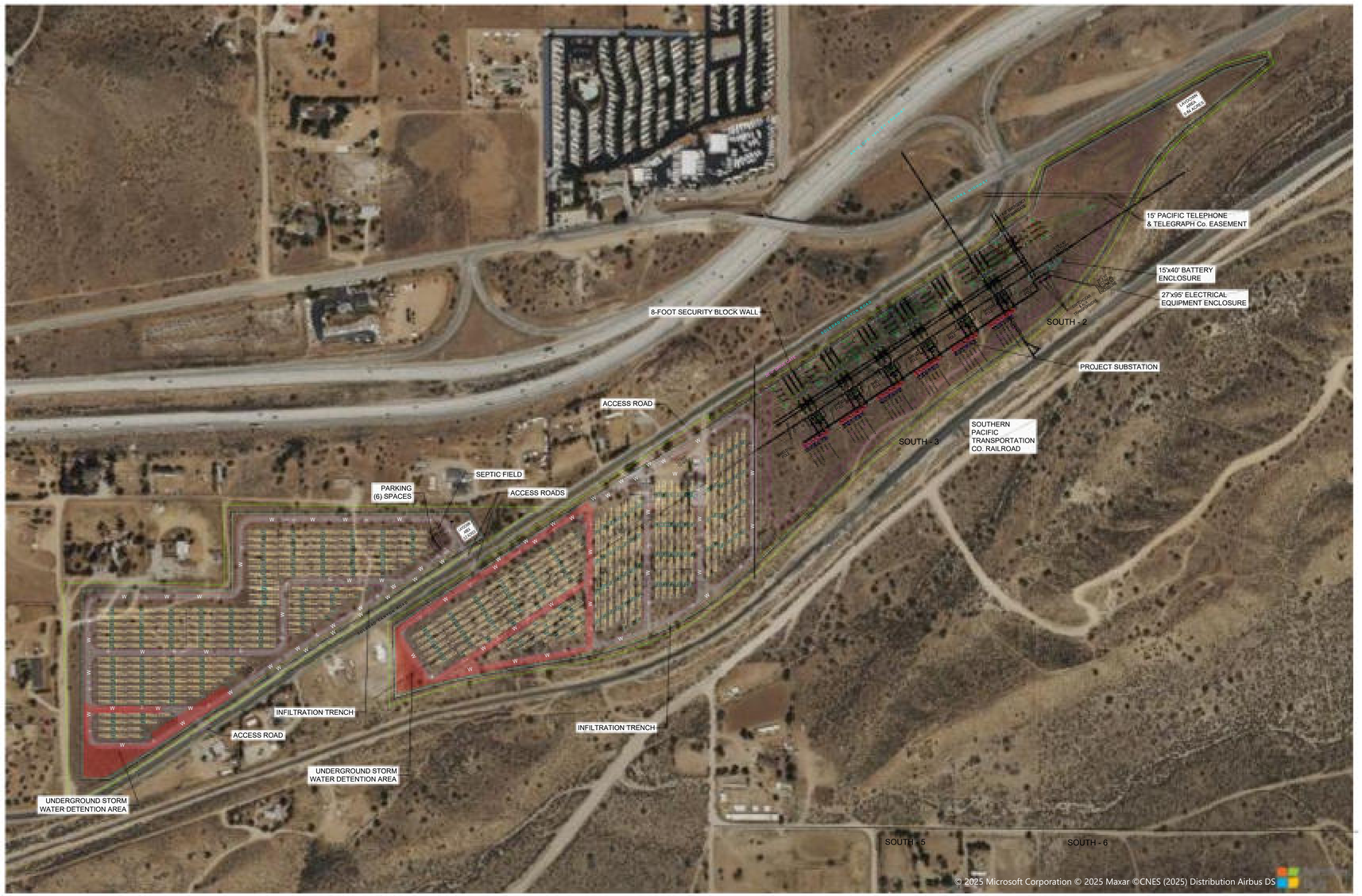
Attachment A: Educational Materials

LATER

Attachment B: Operations and Maintenance Plan

LATER

Attachment C: Site Overview



NOTES:

1. PROJECT OWNER: PRAIRIE SONG RELIABILITY PROJECT, LLC
2. PROJECT ADDRESS: 1222 SOLEDAD CANYON RD
   ACTON, CA 93510-2402
3. OWNER'S ENGINEER: SARGENT AND LUNDY
   55 E MONROE STREET
   CHICAGO, IL 60603
4. UTILITIES SERVING PROJECT:
   ELECTRIC - SOUTHERN CALIFORNIA EDISON
   WATER - ON-SITE WELL
   SEWAGE - ON-SITE SEPTIC
   TELEPHONE AND CABLE - PACIFIC TELEPHONE & TELEGRAPH
5. LAND USE:

WITHIN 100'	PLAN USE	ZONING
NORTH	RL2 - RURAL LAND 2	A-1-2 LIGHT AGRICULTURAL
SOUTH	RL5 - RURAL LAND 5	A-2-2 HEAVY AGRICULTURAL
EAST	RL2 - RURAL LAND 2	A-1-2 LIGHT AGRICULTURAL
WEST	RL2 - RURAL LAND 2	A-1-2 LIGHT AGRICULTURAL

6. AREAS OF PROPOSED FACILITIES:
   BESS YARD AND PROJECT SUBSTATION - 2,056,142 SQFT
   ACCESS ROADS - 6,121 SQFT
   LAYDOWN AREAS - 45,302 SQFT
   ALL DRIVE AREAS IN BESS YARDS TO BE PAVED
   ALL EQUIPMENT AREAS IN BESS YARDS TO BE GRAVEL
   SWITCHYARD TO BE CRUSHED ROCK THROUGHOUT

PRELIMINARY

TRUE NORTH

PROJECT NORTH
33.0°

0 125' 250' 500' 750'
GRAPHIC SCALE

DRAWING SCALE
1" = 250'-0"

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/ INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0A	2/24/2025	ISSUED FOR 30%
0B	3/31/2025	ISSUED FOR PERMIT
0C	4/4/2025	ISSUED FOR PERMIT
0D	5/2/2025	ISSUED FOR PERMIT
0E	5/16/2025	ISSUED FOR PERMIT

ISSUE PURPOSE:	ISSUED FOR PERMIT
SPECIFICATION:	-
PROJECT NO.:	15474.001

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ISSUED FOR PRELIMINARY PURPOSES
GREG MAGSAYSAY, P.E.
LICENSE #E17455

CERT OF AUTHORIZATION (WHEN REQ'D)

CAD FILE NAME:	ANG-SE-101_S002.DWG
PREPARED BY:	LG
REVIEWED BY:	EC/GM
APPROVED BY:	APPD

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PROJECT

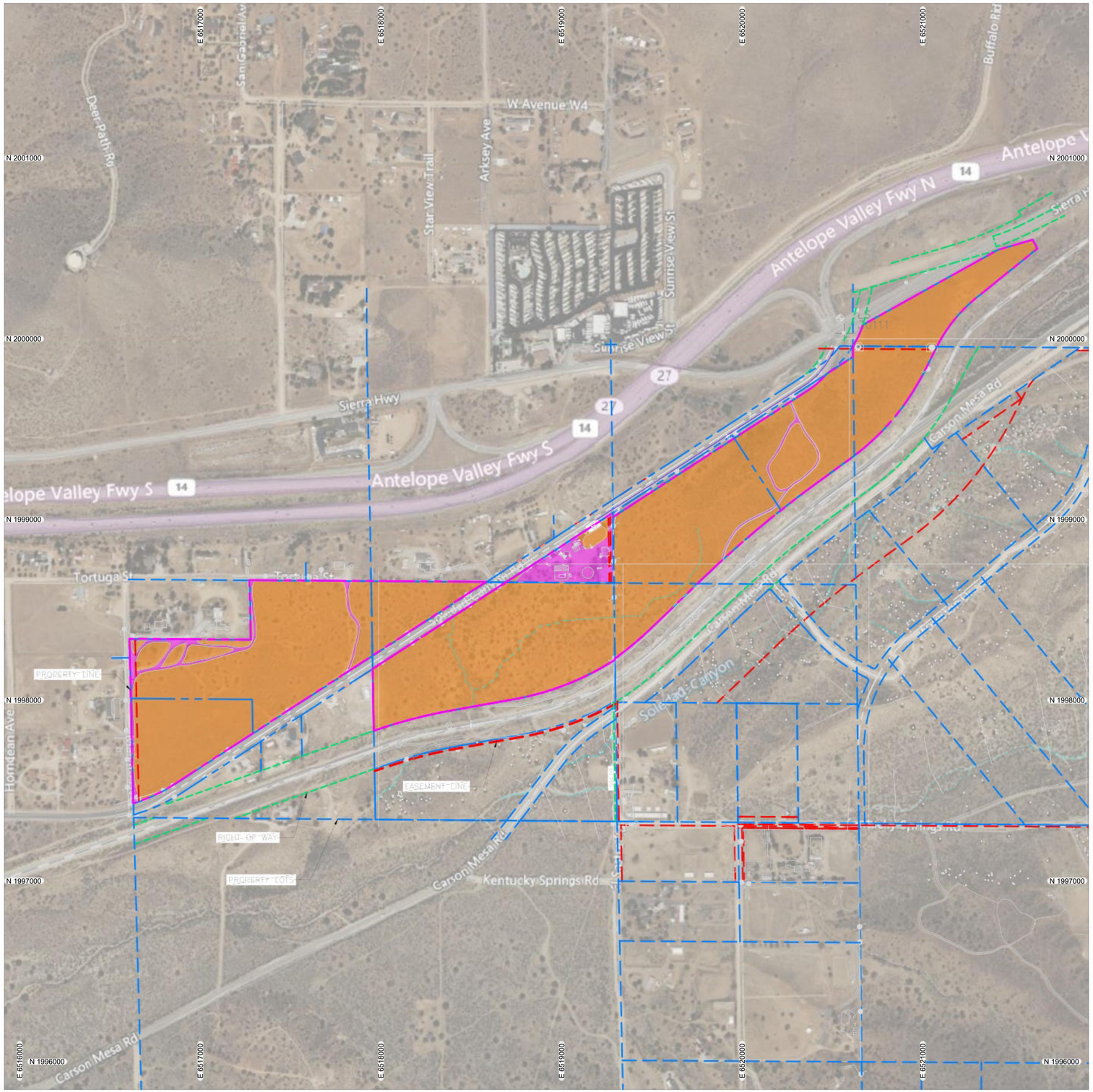
PRAIRIE SONG
RELIABILITY PROJECT

DRAWING TITLE

PROJECT SITE PLAN

DRAWING NUMBER	REVISION
PSR-SE-101	0E
SHEET 2 OF 2	

Attachment D: Pre-Development Site Conditions



PERMIT ONLY
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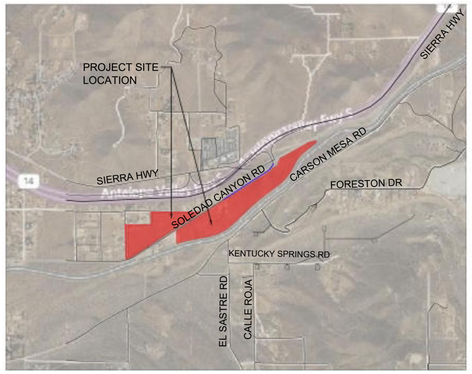

KEY PLAN
1" = 2,000'

NORTH

300' 0' 300' 600'
GRAPHIC SCALE
1" = 300'

LEGEND

- RIGHT OF WAY
- PROPERTY LINE
- PROPERTY LOTS
- EASEMENT
- IMPERVIOUS SURFACING
- DIRT SURFACING

NOTES

1. GEOTECHNICAL ENGINEERING REPORT PREPARED BY: TERRACON, PROJECT NO. LA245085, DATED 05-14-2025.
2. FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND SEE DRAWING PSR-CS-002.

REFERENCE DRAWINGS

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HOLD INFORMATION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0A	3/31/2025	ISSUED FOR PERMIT
0B	5/16/2025	ISSUED FOR PERMIT

ISSUE PURPOSE:	ISSUED FOR PERMIT
SPECIFICATION:	-
PROJECT NO.:	15474.001

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P.E. LICENSE #95825

CAD FILE NAME:	EXHIBIT-PSR-001.DWG
PREPARED BY:	MP/CAF
REVIEWED BY:	JTP
APPROVED BY:	--

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PROJECT

PRAIRIE SONG RELIABILITY PROJECT

DRAWING TITLE

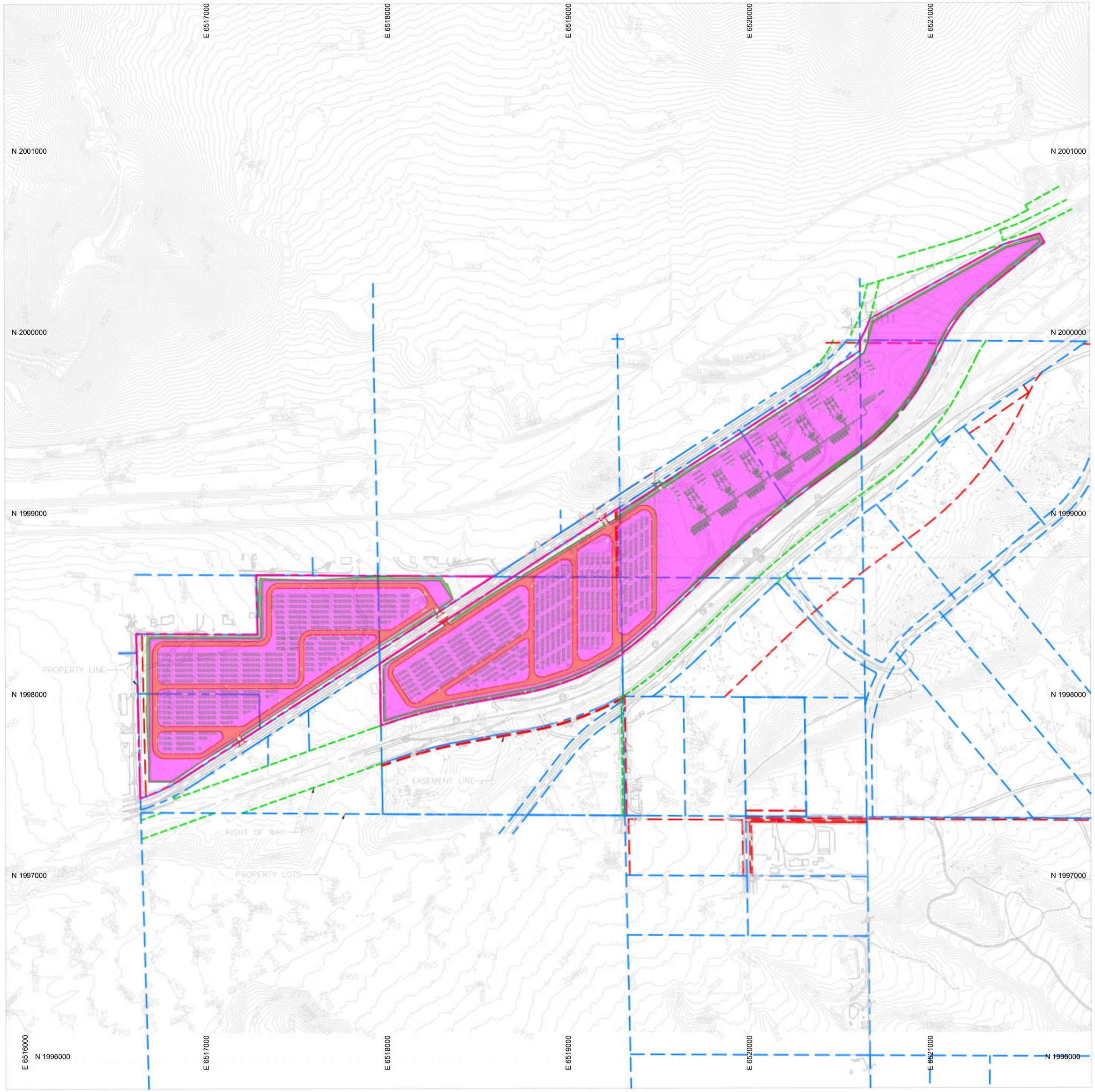
BESS
PRE-DEVELOPED PLAN

DRAWING NUMBER	REVISION
EXHIBIT-PSR-001	0B
SHEET 1 OF 1	

$PINFO1$
Form GDG-0401-01-09, ANSI (Imperial) MicroStation Border - Size D - 22 x 34
Revision 11A, Revision Date: 04-30-2010

$FILEABBREV$ $TIMES$ $DATE$

Attachment E: Post Development Site Conditions



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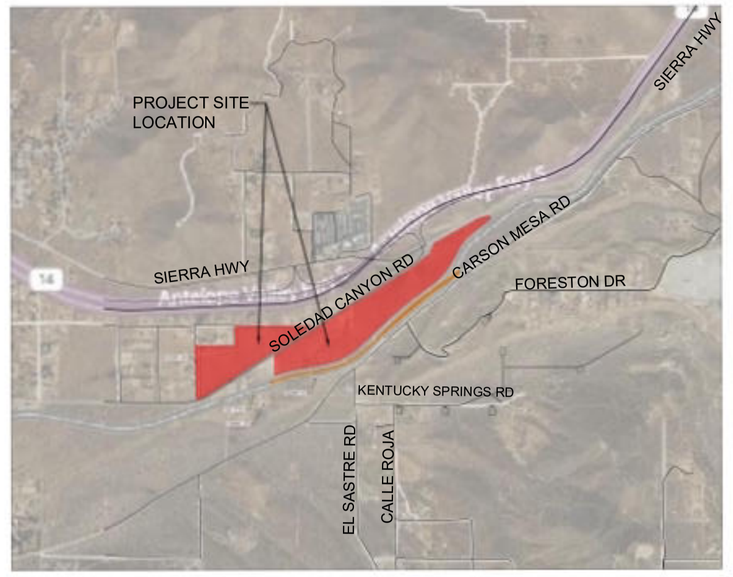

KEY PLAN
1" = 2,000'

NORTH

300' 0' 300' 600'
GRAPHIC SCALE
1" = 300'

LEGEND

- RIGHT OF WAY
- PROPERTY LINE
- PROPERTY LOTS
- EASEMENT
- IMPERVIOUS SURFACING
- GOOD GRASS CONDITION SURFACING
- ASPHALT SURFACING

NOTES

1. GEOTECHNICAL ENGINEERING REPORT PREPARED BY: TERRACON, PROJECT NO. LA245085, DATED 05-14-2025.
2. FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND SEE DRAWING PSR-CS-002.

REFERENCE DRAWINGS

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THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0A	3/31/2025	ISSUED FOR PERMIT
0B	5/16/2025	ISSUED FOR PERMIT

ISSUE PURPOSE:	ISSUED FOR PERMIT
SPECIFICATION:	-
PROJECT NO.:	15474.001

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JOSHUA BICKETT
P.E. LICENSE #95825

CAD FILE NAME:	EXHIBIT-PSR-002.DWG
PREPARED BY:	MP/CAF
REVIEWED BY:	JTP
APPROVED BY:	--

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CHICAGO, ILLINOIS 60603-5780

PROJECT

PRAIRIE SONG RELIABILITY PROJECT

DRAWING TITLE

BESS
POST DEVELOPED PLAN

DRAWING NUMBER	REVISION
EXHIBIT-PSR-002	0B

SHEET 1 OF 1

$PINFO1$
Form GDG-0401-01-09, ANSI (Imperial) MicroStation Border - Size D - 22 x 34
Revision 11A, Revision Date: 04-30-2010

$FILEABBREV$
$TIME$
$DATE$

Attachment F: Geotechnical Report

Prairie Song Reliability Project

Geotechnical Engineering Report

May 14, 2025 | Terracon Project No. LA245085

Prepared for:

Prairie Song Reliability Project, LLC

[redacted]

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March 25, 2025, revised April 11, 2025, May 14, 2025

Prairie Song Reliability, LLC
[redacted]

Attn: Mr. [redacted]
E: [redacted]

Re: Geotechnical Engineering Report
Prairie Song Reliability Project
Acton, Los Angeles County, California
Terracon Project No. LA245085

Dear Mr. Lehman:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PLA245085 dated May 15, 2024, between Prairie Song Reliability, LLC and Terracon Consultants, Inc. (Terracon). This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of pavements and foundations for the proposed Battery Energy Storage Systems (BESS) and substation facility.

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

Sincerely,

Terracon

REGISTERED PROFESSIONAL ENGINEER
JOSHUA R. MORGAN
C 86032
CIVIL
STATE OF CALIFORNIA

Janna Valdez, E.I.T.
Senior Staff Engineer

Joshua R. Morgan, P.E.
Department Regional Manager

Table of Contents

Figures

Attachments

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

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed Battery Energy Storage System (BESS) and Substation facility to be located north and south of Soledad Canyon Road in Acton, Los Angeles County, California. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per CBC
- Site preparation and earthwork
- Foundation design and construction
- Access roadway design and construction
- Infiltration design rates

The geotechnical engineering Scope of Services for this project included the advancement of test borings, electrical resistivity testing, laboratory testing, engineering analysis, and preparation of this report. The geotechnical engineering Scope of Services for our current scope of work included the following:

- Fifteen (15) soil test borings to approximately 21 to 51.5 below ground surface (bgs) in the proposed BESS areas
- Two (2) soil test borings to approximately 51.5 feet bgs in the proposed substation area
- Two (2) soil test borings to approximately 21.5 feet bgs in the proposed Operations and Maintenance (O&M) building area
- Seven (7) soil test borings to approximately 51.5 feet bgs along the transmission line
- Four (4) percolation tests at approximately 3 and 5 feet bgs in the proposed basin area
- Corrosion testing on soil samples obtained from seven (7) locations
- Field electrical resistivity tests at seven (7) locations
- Lab thermal resistivity testing on soil samples obtained from four (4) locations.

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

Project Description

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

Item	Description
Previous Submittals	A letter titled "Geotechnical Percolation Test Letter Prairie Song Reliability Project " was provided to Prairie Song Reliability Project, LLC by Terracon on January 22, 2025. The letter describes the percolation test procedures and results that was conducted by Terracon for the design of the proposed basin. Recommendations and limitations for stormwater management provided in the referenced letter remain valid and applicable for the proposed project except where superseded or identified herein.
Information Provided	An email request for proposal was provided by Matt McCaffrey on March 29, 2024. A site boundary Google Earth file and a conceptual site plan for the proposed BESS and substation was provided at the time of the request. Subsequently, a Google Earth file of the proposed overhead transmission line was provided on November 22, 2024.
Project Description	The project consists of a proposed BESS, substation, stormwater basin, O&M Building, two 40k gal water tanks (estimated to be 16 feet tall by 33 feet in diameter), and transmission line. Based on our review of the conceptual site plan, the project parcel will encompass an approximate footprint of 65 acres. The BESS and substation facility will encompass an approximate footprint of 35 and 6 acres, respectively. Furthermore, an approximately 2 miles overhead 500 kV transmission line will connect with the proposed substation.
Proposed Foundation Structure	We anticipate that the proposed BESS will consist of battery storage units supported by mat foundations, driven piles, or drilled shafts. We anticipate the substation will include control room building, self-contained structures, and other substation elements to be supported on shallow spread footings, equipment slabs-on-grade/mat foundations, and/or drilled shafts. We anticipate that the proposed O&M building and water tanks will be supported by a spread footing foundation system with concrete slabs on grade. We anticipate that the overhead transmission line will be supported on drilled shaft foundations.

Item	Description
Maximum Loads	Structural loads for the BESS, substation, and O&M structures were provided and are listed below: <u>BESS:</u> ▪ BESS enclosure pads: 1000 to 1200 psf contact pressure ▪ BESS Axial Load: 94 kips ▪ BESS Shear Load: 79 kips <u>Substation:</u> ▪ GSU Foundation: 2,000 to 2,500 psf ▪ Control Room: 1 to 3 kips per linear foot (klf) ▪ Tubular steel (A-frames) – drilled piers: ○ Substation Axial Load: 120 kips ○ Substation Shear Load: 30 kips ▪ Other steel – drilled piers: ○ Substation Axial Load: 15 kips ○ Substation Shear Load: 5 kips <u>O&M Building:</u> ▪ O&M Building Walls: 1 to 3 kips klf ▪ O&M columns: 30 to 60 kips Structural loads for the transmission line and water tank structures were not provided and have been estimated below: <u>Transmission Line:</u> ▪ Axial: less than 10 kips ▪ Shear: less than 5 kips <u>Water tanks:</u> ▪ 1,000 psf contact pressure

Item	Description
Grading/Slopes	The site has a slight slope, on the order of 5%. We assume that the site will be terraced, and minimal grading will be used to level the site. ▪ We anticipate that the battery containers, water tanks, and O&M building will generally follow the existing site grades with cut/fill on the order of 1 to 2 feet to bring the site to finished grades. ▪ We anticipate cut/fill on the order of 3 to 4 feet to bring the substation area to finish grade Furthermore, a 3H:1V to 5H:1V slope is located south of the southern perimeter of the site descending towards the existing train tracks and W Carson Mesa Road. We assume that the proposed structures will have a set setback distance, sufficient enough that slope stability analysis is not required for the site. Details of required setbacks are included in this report.
Infiltration System	We understand that an infiltration system consisting of an underground retention/detention basin will be planned on-site. A percolation test letter was provided previously.
Access Roadways	We understand that access road cross sections used for construction of the project will be the responsibility of Prairie Song Reliability Project. We anticipate low-volume access roads will have a maximum vehicle load of 10,000 lbs. and will travel over the access roads only once per week during operation. Moreover, we anticipate all-weather access roads will be required to access the project substation. Such roads should be designed to support a firetruck weighing approximately 75,000 lbs. Furthermore, based on input from the client, approximately 80,000 to 90,000 lbs trucks and cranes will travel through the access roads every 5 years.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

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

Item	Description
Parcel Information	The project is located north and south of Soledad Canyon Road in Acton, Los Angeles County, California. The project site encompasses a total area of approximately 65 acres. The coordinates of the approximate center of the site are 34.4858° N, 118.1383° W.
Existing Improvements	The site is primarily in an undeveloped state, with several residential properties dispersed across the area. Located approximately 100 feet from the proposed BESS development, an existing railroad traverses parallel to the southern perimeter of the property.
Current Ground Cover	The majority of the surface of the site is covered by exposed soils with dense desert vegetation.
Existing Topography	The parcels north and south of Soledad Canyon Rd have an approximately 4% slope increasing from the southwest to the northeast direction. The approximate elevations of the site range from 2,980 to 3,140. The proposed transmission line will traverse flat terrains and rolling hill topographies and the elevation at the proposed towers ranges from 3010 to 3125 feet.

Geotechnical Characterization

Subsurface Conditions

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	Consistency/Density
1	**Sand with varying amounts of silt, clay, and gravel**	loose to medium dense
2	**Sand with varying amounts of silt, clay, and gravel**	medium dense to very dense

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

Lab Results

Laboratory tests were conducted on selected soil samples and the test results are presented in the **Exploration Results** section and on the boring logs. Atterberg limit test results indicate that the on-site soils generally have low plasticity or are non-plastic. Consolidation tests indicated that the silty sand soils encountered at an approximate depth of 5 feet bgs have a moderate collapse potential when saturated under normal footing loads of 2,000 psf. Maximum density/optimum moisture content testing conducted in accordance with ASTM D1557 (Modified Proctor) indicate that near surface soils tested have maximum dry densities ranging from 133.3 to 136.3 pounds per cubic feet (pcf) and optimum water contents ranging from 7.8 to 8.4 percent. California Bearing Ratio (CBR) testing of the near surface soils indicated a CBR value of 10. Direct shear testing results on sandy samples are tabulated below:

Boring ID	Depth (feet)	Description	Peak Friction Angle (°)	Peak Cohesion (psf)
BESS-4	5	Silty Sand	32°	130
BESS-8	10	Silty Sand	27°	600
BESS-14	5	Poorly Graded Sand with Silt	27°	260
TL-2	10	Silty Sand	42°	0
TL-3	2.5	Silty Sand	27°	350
TL-5	7.5	Silty Sand	35°	220
TL-6	5	Silty Sand	31°	240

Groundwater

The borings were advanced using a hollow-stem-auger technique that allowed short term groundwater observations to be made while drilling. Groundwater seepage was not encountered during drilling or for the short duration the boring remained open. These observations represent groundwater conditions at the time of field exploration and may not be indicative of other times, or at other locations.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than expected.

According to data collected from the Water Data Library for the State of California from a nearby well, located approximately 0.5 miles north of the site in State Well Number 05N12W28F001S, historic groundwater levels around November 30, 1965, were recorded at greater than 100 feet bgs.[1] Recent publicly available data (within the last 20 years) is not available within a 1-mile radius from the site boundary. As such, groundwater is not anticipated to occur within the depth of excavations or foundation installations at the site.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7.

Description	Value
BESS Area	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4834
Site Longitude (°W)	118.1383
S_s Spectral Acceleration for a 0.2-Second Period	1.689

[1] California Department of Water Resources. (https://wdl.water.ca.gov/WaterDataLibrary/GroundWaterLevel.aspx?StateWellNumber=05N12W28F001S&SiteCode=344881N1181435W001)

Description	Value
S_1 Spectral Acceleration for a 1-Second Period	0.698
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-1	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4818
Site Longitude (°W)	118.1378
S_s Spectral Acceleration for a 0.2-Second Period	1.677
S_1 Spectral Acceleration for a 1-Second Period	0.692
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-2	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4808
Site Longitude (°W)	118.1379
S_s Spectral Acceleration for a 0.2-Second Period	1.668
S_1 Spectral Acceleration for a 1-Second Period	0.688
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-3	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4802
Site Longitude (°W)	118.1350
S_s Spectral Acceleration for a 0.2-Second Period	1.672
S_1 Spectral Acceleration for a 1-Second Period	0.69
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-4	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4802
Site Longitude (°W)	118.1328
S_s Spectral Acceleration for a 0.2-Second Period	1.681

Description	Value
S_1 Spectral Acceleration for a 1-Second Period	0.694
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-5	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4832
Site Longitude (°W)	118.1322
S_s Spectral Acceleration for a 0.2-Second Period	1.71
S_1 Spectral Acceleration for a 1-Second Period	0.707
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-6	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4823
Site Longitude (°W)	118.1278
S_s Spectral Acceleration for a 0.2-Second Period	1.719
S_1 Spectral Acceleration for a 1-Second Period	0.711
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
TL-7	
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.4846
Site Longitude (°W)	118.1332
S_s Spectral Acceleration for a 0.2-Second Period	1.719
S_1 Spectral Acceleration for a 1-Second Period	0.711
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4

1. Seismic site classification in general accordance with the *2022 California Building Code*.
2. The 2022 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the 100-foot soil profile determination. Borings were extended to a maximum depth of 51½ feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. It is an acceptable practice in Southern California to analyze the upper 50 feet and assume the lower 50 feet to be similar. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.

Faulting and Estimated Ground Motions

The site is located in Southern California, which is a seismically active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. As calculated using the USGS Unified Hazard Tool, the fault which is considered to have the most significant effect at the site from a design standpoint and its maximum credible earthquake and proximity to the site are tabulated below:

Location	Fault	Magnitude	Distance (kilometers)
BESS and substation areas	San Andreas (Mojave S)	7.82	8.71
TL-1A		7.92	7.96
TL-2			
TL-3		7.94	8.02
TL-4		7.93	7.60
TL-5		7.93	8.60
TL-6		7.93	7.50
TL-7		7.93	7.51

Based on the USGS Design Maps Summary Report, using the American Society of Civil Engineers (ASCE 7-16) standard, the peak ground acceleration (PGA_M) at the project site is shown in the table below. In addition, based on the USGS Unified Hazard Tool, the mean magnitude at the project is also shown in the table below. Furthermore, the site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.[2]

[2] California Geological Survey. https://maps.conservation.ca.gov/cgs/informationwarehouse.

Location	PGA_M	Mean Magnitude
BESS and substation areas	0.883	7.81
TL-1A	0.877	7.76
TL-2	0.873	7.76
TL-3	0.875	7.81
TL-4	0.879	7.9
TL-5	0.893	7.82
TL-6	0.898	7.82
TL-7	0.898	7.82

Liquefaction

Liquefaction is a mode of ground failure that results when a saturated soil loses substantial strength in response to earthquake shaking. Liquefaction is typically a hazard where loose sand or non-plastic silt soils exist below groundwater but may also occur with sensitive plastic silt or clay below groundwater. The California Geological Survey (CGS) has designated certain areas within the state as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of relatively shallow groundwater.

The proposed BESS and substation are not located within a liquefaction hazard zone as designated by the CGS. However, a portion of the proposed transmission line is located within a liquefaction hazard zone. In particular, borings TL-1, TL-2, TL-3, TL-4 and TL-6 are located within a liquefaction hazard zone. As such liquefaction hazard analysis is included for the proposed T-line locations in the following section.

Liquefaction Analysis

Our explorations indicate the native soils encountered in exploratory borings generally consisted of loose to very dense sand to the maximum exploration depth of 51½ feet bgs. Groundwater was not encountered in borings while drilling and the recorded historical groundwater depth is more than 100 feet bgs.

To evaluate the presence of liquefiable soils and determine the amount of settlement of saturated/unsaturated soils during seismic shaking, we performed liquefaction analysis in accordance with the DMG Special Publication 117.

We utilized the software "LiquefyPro" by CivilTech Software, using soil from boring TL-2. A Peak Ground Acceleration (PGAM) of 0.873g and assumed a magnitude of 7.76 were used. Settlement analysis used the Tokimatsu, M-correction method. The fines percentage were corrected for liquefaction using the Idriss/Seed method. For this analysis a groundwater depth of 100 feet has been utilized.

Based on the depth to groundwater liquefaction hazard risk is considered low. Results and calculations for the liquefaction analysis are included in the **Supporting Documents** section of this report.

Seismic Settlement

Based on the calculation results, the seismically induced settlement of dry sands which typically occurred in the upper 5 to 10 feet is estimated to be on the order of 1¼ inch. Differential seismic settlement can be taken as one-half of the total seismic settlement.

Corrosivity

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Boring	Sample Depth (feet)	Soluble Sulfate (mg/kg)	Sulfides (mg/kg)	Chloride (mg/kg)	Red-Ox Potential (mV)	Electrical Resistivity (Ω-cm)	pH
BESS-2	0-2	1.6	Nil	5.8	+278	10,250	7.1
BESS-8	0-2.5	9.7	Nil	7.7	+290	8,140	7.4
BESS-14	0-2.5	6.5	Nil	6.2	+282	5,230	7.7
SUB-2	0-2.5	4.1	Nil	6.6	+291	6,840	7.3
TL-1	0-5	9.2	Nil	6.5	+288	18,100	7.7
TL-3	0-5	2.4	Nil	6.5	+288	13,070	7.1
TL-6	0-5	0.2	Nil	5.4	+293	21,110	7.0

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 19.3.1.1 of the ACI Design Manual. Concrete should be designed in accordance with the exposure class S0 provisions of the ACI Design Manual, Section 318, Chapter 19.

Electrical Resistivity Testing

Terracon performed field measurements of soil electrical resistivity for the support of grounding design. Soil resistivity data was obtained from two test arrays at three (3)

locations each in the proposed BESS, one (1) location in the substation area, and at three (3) locations along the proposed transmission line for a total of seven (7) locations. At one of the test locations, ER-7, Terracon attempted to collect soil electrical resistivity readings, but the soil was too loose for electrode contact, and no repeatable readings were collected. The client was notified that no testing was obtained at this location. The approximate locations of the test arrays are shown in the **Exploration Plan**. Each testing was performed in general accordance with Wenner Array (4-pin) method per ASTM G57. This method was performed in with IEEE Standard 81, IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Ground System. The test in the proposed locations included perpendicular arrays, North-South and East-West, with "a" spacings 2, 4, 6, 8, 12, 20, 30, 50, 70, 100, and 150 feet. For test locations in the BESS and substation areas, soil resistivity readings were also collected at 300 feet "a" spacing. The "a" spacing is generally considered to be the depth of influence of the test. The electrical resistivity test results are presented in **Exploration Results**.

Thermal Resistivity Testing

Terracon subcontracted Geotherm USA to perform laboratory thermal resistivity testing. Testing was conducted on four (4) bulk samples at the project site from a depth of 0 to 5 feet bgs. Three (3) samples were collected from the proposed BESS and one (1) sample was collected from the substation area. The tests were conducted on soil samples remolded to 90% (as determined by ASTM D1557) of the material's maximum dry density. Dry out curves targeted the higher of either the in-situ moisture content of the optimum moisture content as determined by ASTM D1557, totally dry condition, and two intermediate points. The thermal resistivity test results are presented in **Exploration Results**.

Geotechnical Overview

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

We anticipate that the proposed BESS will consist of battery storage units supported by driven steel piles or mat foundations and other appurtenant electrical equipment supported on mat or drilled shaft foundations. We anticipate the substation structures will be supported on drilled piers or mat foundations. We anticipate that the proposed O&M building and water tanks will be supported on shallow concrete foundations.

We anticipate that the proposed transmission line will be supported by drilled shaft foundations.

To create a uniform bearing stratum, shallow concrete footings should bear on engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater within the BESS, substation, and water tank areas. Grading should incorporate the limits of the overexcavation plus a lateral distance of 1 feet beyond the outside edge of perimeter footings.

The majority of the site indicates medium dense to very dense soils near the surface. However, potentially compressible soils, which show significant tendency for hydro-compaction when elevated in moisture content, will require particular attention in the design and construction near the O&M Building location. Within the O&M area we recommend engineered fill extend to a minimum depth of 3 feet below bottom of foundations or 5 feet below existing site grades.

Overexcavation and replacement is not required for support of drilled shaft or driven pile foundations.

Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained. Exposed ground, extending at least 10 feet from the perimeter, should be sloped a minimum of 5% away from the building to provide positive drainage away from the structure. Grades around the structure should be periodically inspected and adjusted as part of the structure's maintenance program.

Based on the findings summarized in this report, it is our professional opinion that the proposed construction will not be subjected to a hazard from settlement, slippage, or landslide, provided the recommendations of our report are incorporated into the proposed construction. It is also our opinion that the proposed construction will not adversely affect the geologic stability of the site or adjacent properties provided the recommendations contained in our report are incorporated into the proposed construction.

Geotechnical engineering recommendations for foundation systems and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation, and placement of engineered fills on the project. The recommendations presented for the design and construction of foundations are contingent upon following the recommendations outlined in this section.

Earthwork on the project should be observed and evaluated by a geotechnical engineer. If a geotechnical engineer other than Terracon is selected to perform the observations and testing during construction, they will assume the role of Geotechnical Engineer of Record. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation of bearing soils, and other geotechnical conditions exposed during construction of the project.

An on-site, pre-job meeting with the owner, the contractor and the Geotechnical Engineer should occur prior to all grading-related operations. Observation, testing, documentation, and reporting of the grading operation should be performed by the Geotechnical Engineer of Record. A final compaction report should be issued by the Geotechnical Engineer of Record at the completion of the grading operation. Interim reports may be issued according to project requirements. Operations undertaken at the site without the Geotechnical Engineer present may result in exclusions of affected areas from compaction reports for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the current version of CBC. The following recommendations are presented for your assistance in establishing proper grading criteria.

Site Preparation

Prior to placing fill, existing vegetation, debris, and other deleterious materials should be removed from proposed foundation and roadway areas. Exposed surfaces within these areas should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed structures.

We recommend stripping topsoil to depths that expose soils with less than 3 percent organics and no roots having a diameter greater than 1/8 inch. While the depth of the unsuitable soils should be expected to vary, the thickness of the top soil layer may be estimated to range between 6 and 12 inches for construction budgeting purposes. The thickness of the top soil layer was not determined during our field exploration. Therefore, the actual depth of stripping should be verified by engineering observations made during the grading operations at the project. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

Stripped materials consisting of vegetation and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations. If it is necessary to dispose of organic materials on site, they should be placed in non-structural areas, and in fill sections not exceeding 5 feet in height.

Although no evidence of fills, utilities, or underground facilities such as septic tanks, cesspools, or basements was observed during the site reconnaissance, such features could

be encountered during construction. If unexpected fills, utilities, or underground facilities are encountered, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

The proposed structures may be supported by a shallow concrete foundation system bearing on engineered fill, driven piles, or drilled shafts foundation.

To create a uniform bearing stratum, shallow concrete footings should bear on engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater within the BESS, substation, and water tank areas . Grading should incorporate the limits of the overexcavation plus a lateral distance of 1 feet beyond the outside edge of perimeter footings.

The majority of the site indicates medium dense to very dense soils near the surface. However, potentially compressible soils, which show significant tendency for hydro-compaction when elevated in moisture content, will require particular attention in the design and construction near the O&M Building location. Within the O&M area we recommend engineered fill extend to a minimum depth of 3 feet below bottom of foundations or 5 feet below existing site grades.

Overexcavation and replacement is not required for support of drilled shaft or driven pile foundations.

Large gravels and cobble materials may be encountered at proposed excavation depths. If such conditions are encountered, any cobbles or boulders should be removed and be replaced a minimum of 12 inches below foundation bearing depths with engineered fill.

Subgrade soils beneath proposed exterior slabs and roadways should be scarified to a minimum depth of 12 inches, moisture conditioned, and compacted. The moisture content and compaction of subgrade soils should be maintained until slab or roadway construction.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned as necessary, and compacted per the compaction requirements in this report. Compacted structural fill soils should then be placed to the proposed design grade and the moisture content and compaction of subgrade soils should be maintained until foundation or pavement construction.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable; however, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

We anticipate that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. However, as excavations extend deeper into very dense soils additional excavation effort and larger equipment may be required. Very dense and gravelly soils was encountered in multiple borings. The owner should consider obtaining unit pricing for difficult excavations prior to the start of the project

The subgrade soils exposed during construction are expected to be relatively stable. However, the stability of the subgrade may also be affected by precipitation, repetitive construction traffic or other factors.

The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

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

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Site Slopes

Based on the existing site grades, we expect that up to 10 feet of cut:fill with 2H:1V (horizontal:vertical) slopes will be placed around the site interior and boundary.

These new fill materials should possess a minimum friction angle of 32 degrees and cohesion of 100 psf from slope stability standpoint. For permanent slopes in compacted fill areas, recommended maximum configurations for on-site materials are as follows.

Maximum Slope Configuration (Height equal or less than 10 feet)	
Inclination (horizontal:vertical)	**Slope Treatment**
5:1 to 2:1	Re-vegetate
More steep than 2:1	Stability analysis or structural retaining wall required

We expect slopes with this configuration to be resistant to erosion and stable against circular failure. The face of all slopes should be compacted to the minimum specification for fill embankments. No tracking of fill material on the slope is allowed. Fill slopes can be over-built with compacted material and trimmed to final configurations. If any slope in

fill will exceed 20 feet in height, the grading design should include mid-height benches to intercept surface drainage and divert flow from the face of the embankment.

The Geotechnical Engineer of Record should be provided with proposed grading plans and cross sections and the anticipated height of fills and cuts for review prior to the start of construction. Based on preliminary analysis, placing up to 10 feet of new fill above the existing site soils to construct the BESS/Substation pads will result in estimated settlements of less than 1/2 inch. The majority of this settlement is expected to occur over a short period of time during the construction.

If fill is placed in areas of the site where existing slopes are steeper than 5H:1V, the area should be benched to reduce the potential for slippage between existing slopes and fills. Benches should be wide enough to accommodate compaction and earth moving equipment, and to allow placement of horizontal lifts of fill.

If foundations are determined to be setback a distance less than H/2 or 15 feet (whichever is less for structures located below slope) or H/3 or 40 feet (whichever is less for structures located atop slopes), then the Geotechnical Engineer of Record should be notified as additional evaluations may be required.

Fill Material and Placement

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

Clean on-site soils (provided they are screened for oversized particles with dimensions larger than 3 inches) or approved imported materials may be used as fill materials for the following:

- general site grading
- foundation areas
- exterior slab areas
- foundation backfill
- roadway areas

Imported soils for use as fill material within proposed structure areas should conform to low volume change materials as indicated in the following specifications:

Gradation	**Percent Finer by Weight (ASTM C 136)**
3"	100
No. 4 Sieve	50-100
No. 200 Sieve	40(max)

- Liquid Limit ..... 30 (max)

- Plasticity Index ..... 10 (max)
- Maximum Expansion Index* ..... 20 (max)

*ASTM D4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

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

Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
Approved on-site or imported fill soils:			
Beneath foundations[1]:	90%	0%	+3%
Utility trenches (structural areas)[1]:	90%	0%	+3%
Utility trenches (landscape areas):	90%	0%	+3%
Fill greater than 5 feet in depth	95%	0%	+3%
Exterior Slabs:	90%	0%	+3%
Miscellaneous backfill:	90%	0%	+3%
Aggregate base:	95%	0%	+3%

1. Upper 12 inches should be compacted to 95% beneath foundation, pavement, and structural areas. Low-volume change imported soils should be used in lightly loaded equipment areas.

Utility Trench Backfill

We anticipate that the on-site soils will provide suitable support for underground utilities and piping that may be installed. Any soft and/or unsuitable material encountered at the bottom of excavations should be removed and be replaced with an adequate bedding material.

Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

A non-expansive granular material with a sand equivalent greater than 30 should be used for bedding and shading of utilities, unless allowed or specified otherwise by the utility manufacturer.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances. Imported low volume change soils should be used for trench backfill in structural areas.

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

Grading and Drainage

All grades must provide effective drainage away from the proposed structures during and after construction and should be maintained throughout the life of the structure. Water retained next to the structures result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential foundation movements causing cracked slabs and walls.

We recommend a minimum horizontal setback distance of 10 feet from the perimeter of any structure and the high-water elevation of the nearest storm-water retention basin.

Exterior Slab Design and Construction

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

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

Earthwork Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of roadways. Construction traffic over the completed subgrades should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to roadway construction.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Should unstable subgrade conditions develop stabilization measures will need to be employed. Stabilization measures may include placement of aggregate base and multi-axial geogrid. Use of lime, fly ash, kiln dust or cement could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

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

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

Construction Observation and Testing

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

The exposed subgrade and each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the structure areas and 5,000 square feet in roadway areas. Where not specified by local ordinance, one density and water content test should be performed for every 50 linear feet of compacted utility trench backfill. This testing frequency criteria may be adjusted during construction as specified by the geotechnical engineer of record.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

We anticipate that the proposed BESS and substation equipment, water tanks, and O&M building may be supported on either spread footings, slab-on grade, or mat foundations.

Recommendations for foundation for the proposed structures and related structural elements are presented in the following paragraphs.

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

Shallow Foundation Design Recommendations

Item	Description
Foundation System	Spread footings, slab on grade, mat foundation
Maximum Net Allowable Bearing Pressure	3,000 psf up to 8 feet wide 2,000 psf up to 14 feet wide

Item	Description
(1-inch settlement)[1, 2]	1,500 psf up to 22 feet wide 1,250 psf up to 32 feet wide 1,200 psf up to 35 feet wide
Required Bearing Stratum [3]	▪ Engineered fill extending to a minimum of 1 foot below the bottom of foundations, or 3 feet below existing grade, whichever is greater for the BESS, substation, and water tank areas. ▪ Engineered fill extending to a minimum of 3 feet below the bottom of foundations, or 5 feet below existing grade, whichever is greater for the O&M building area.
Design Modulus of Subgrade Reaction, k[3]	200 pounds per square inch per inch (psi/in) The modulus was obtained on estimates obtained from NAVFAC 7.1 design charts. This value is for a small-loaded area (1 sq.ft. or less) such as for forklift wheel loads or point loads and should be adjusted for larger loaded areas.
Modulus Correction Factor[3]	$k_c = k\,[(B+1)/2B)]^2$
Minimum Embedment Below Finished Grade	18 inches
Minimum Dimensions	Square footings and mats: 24 inches Strip footings: 18 inches
Ultimate Passive Resistance[4]	360 pcf
Ultimate Coefficient of Sliding Friction[5]	0.4
Estimated Total Settlement from Structural Loads	About 1 inch
Estimated Differential Settlement	About 1/2 of total settlement over a horizontal distance of 40 feet

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions.
2. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in **Earthwork**.
3. k values should be reduced to account for dimensional effects of largely loaded areas. Where k_c is the corrected or design modulus value and B is the mat width in feet.

Item	Description

4. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.

Settlement calculations were performed utilizing Westergaard and Hough's methods[3] to estimate the static settlement for various foundations widths with an allowable settlement of 1-inch.

Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings.

The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of foundation concrete below grade may be neglected in dead load computations.

Foundation should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendation will be required.

Lateral Earth Pressures

Design Parameters

For engineered fill comprised of on-site soils or imported low volume change materials above any free water surface, recommended equivalent fluid pressure of unrestrained foundation elements are:

Item	Recommended Value
Active Case	31 psf/ft
Passive Case	390 psf/ft
At-Rest Case	47 psf/ft

[3] *FHWA Geotechnical Engineering Circular No. 6 – Shallow Foundations, FHWA – SA-02-054*

Coefficient of Friction	0.35

1. The values are based on engineered fill materials used as backfill.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density, rendering a maximum unit weight of 125 pcf.
3. Use of passive earth pressures require the sides of the excavation for the foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the foundation forms be removed and compacted engineered fill be placed against the vertical foundation face.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
5. Passive pressure and sliding friction may be combined to resist sliding provided that either the passive pressure or frictional resistance (adhesion) is reduced by 50 percent.

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

Fill against foundation walls should be compacted to densities specified in the **Earthwork** section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers of other lightweight compactors.

Deep Foundations

Drilled Shaft Design Recommendations

Proposed substation and BESS electrical equipment and transmission line poles may be supported on drilled shaft piers. Total required embedment of the drilled shaft should be determined by the structural engineer based on structural loading and parameters provided in this report.

It should be noted that the transmission line borings were located in accessible areas, however there are rolling hills between the test locations. Subsurface conditions in these hills are anticipated to be more dense than what was encountered in the lower flat areas and may contain cobbles or shallow bedrock outcrops. The owner should consider getting unit rates for rock coring or difficult drilling costs associated with tower locations sited in the hills.

Drilled Shaft Axial Loading

Allowable skin friction and total capacity charts are attached to our **Supporting Information** section at the end of this report. The values presented for allowable side friction and end bearing include a factor of safety of 2.5.

Drilled piers should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of

individual piers in a group versus the capacity calculated using the perimeter and base of the pier group acting as a unit. The lesser of the two capacities should be used in design.

The allowable uplift capacities should only be based on the side friction of the shaft; however, the weight of the foundation should be added to these values to obtain the actual allowable uplift capacities for drilled shafts. Tensile reinforcement should extend to the bottom of shafts subjected to uplift loading.

Drilled Shaft Lateral Loading – LPILE Parameters

Based on our review of the subsurface conditions in the area of the substation, BESS and transmission line, our laboratory testing, and the Standard Penetration Test (SPT) results, engineering properties have been estimated for the soils conditions as shown in the following table. A depth of neglect based on anticipated disturbance, shrinkage, or scour during the design life off the piers should be considered due to utilities construction and grading around the piers. Due to potential for disturbance within the upper soils around the shaft, lateral and axial capacity of soils within the upper 2 feet should be neglected. This depth of neglect should be provided by the designer and verified by the civil engineer.

Recommended geotechnical parameters for lateral load analyses by others of drilled shaft foundations have been developed for use in the LPILE computer program. The following table summarizes input values for use in LPILE analyses. LPILE estimated values of k_h and ε_{50} may be used. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

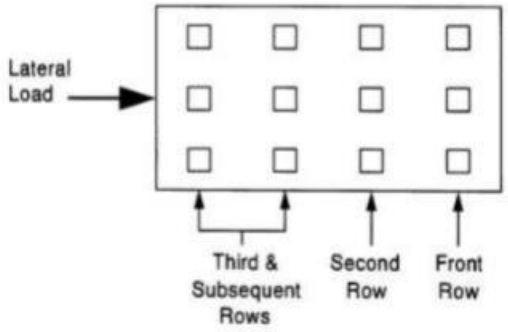
Stratigraphy[1]		L-Pile Soil Model	ϕ (°)[2]	MFAD Modulus of Deformation (ksi)	γ' (pcf)[2]
Layer	Depth Below Finished Grade (feet)				
1	2	Sand	32	1.35	120
	10				
2	10	Sand	34	1.98	110
	20				
3	20	Sand	40	3.60	120
	50				

1. See Subsurface Profile in Geotechnical Characterization for more details on Stratigraphy.
2. Definition of terms:
   ϕ: Internal friction angle
   γ': Effective unit weight

The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts/piles should be checked to assure they can safely

accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts/piles should be evaluated using an appropriate analysis method, and will depend upon the pile's diameter, length, configuration, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions upon request. The load-carrying capacity of shafts/piles may be increased by increasing the diameter and/or length.

When piers are used in groups, the lateral capacities of the piers in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pier. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pier foundations within a pier group are as follows:



1. Front row: Pm = 0.8
2. Second row: Pm = 0.4
3. Third and subsequent row: Pm= 0.3

For the case of a single row of piers supporting a laterally loaded grade beam, group action for lateral resistance of piers would need to be considered when spacing is less than five pier diameters (measured center-to-center). However, spacing closer than 3D (where D is the diameter of the pier) is not recommended due to the potential for the installation of a new pier disturbing an adjacent installed pier, likely resulting in axial capacity reduction.

Drilled Shaft Construction Considerations

Due to presence of sandy soils, caving of soils within the drilled shaft excavations should be anticipated. We do not anticipate drilled shafts to extend below the depth of groundwater. However, if foundation concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Temporary steel casing will likely be required to properly drill and clean shafts prior to concrete placement. Gravelly soils were encountered in multiple borings on-site. Therefore, as drilled shafts extend below 10 feet, heavy duty rock bit or coring may be required to advance drilled shafts

The drilling speed should be reduced as necessary to minimize vibration and caving of the silty sand materials. The contractor should be prepared to use casing or other approved means to prevent caving. The contractor should review the boring logs to make sure they are familiar with the anticipated subsurface conditions prior to beginning construction of the deep foundations.

In the event drilled hole walls slough during drilling, temporary steel casing may be required to properly drilled shafts prior to concrete placement. We recommend the use of slurry drilling methods with polymers method to keep the solids in suspension during the drilling. Drilled shaft foundation concrete should be placed within 6 inches of the shaft base of the slurry-filled excavation immediately after completion of drilling and cleaning. The tremie should remain inserted several feet into the fresh concrete as it displaces the slurry upward and until placement is complete. The slurry should have a sand content no greater than 1% at the time concrete placement commences. The maximum unit weight of the slurry should be established in consultation with the Geotechnical Engineer.

As an alternative to temporary casing, the shaft excavation may be backfilled with a slurry mix in order to help stabilize sloughing sidewalls of the excavation, allowed to dry, and re-drilled through the backfill. The slurry mix design should be submitted to the Geotechnical Engineer for review and approval.

Drilled shaft foundation concrete should be placed immediately after completion of drilling and cleaning. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for drilled shaft construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in shaft concrete. Shaft concrete should have a relatively high fluidity when placed in cased shaft holes or through a tremie. Shaft concrete with slump in the range of 6 to 8 inches is recommended.

Foundation concrete should be placed immediately after completion of drilling and cleaning. Closely spaced shafts should be drilled and filled alternatively, allowing the concrete to set at least eight hours before drilling the adjacent shaft. All excavations should be filled with concrete as soon after drilling as possible. In no event should shaft holes be left open overnight.

We recommend that all drilled shaft installations be observed on a full-time basis by an experienced geotechnical engineer in order to evaluate that the soils encountered are consistent with the recommended design parameters. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required. The Geotechnical Engineer should observe the installation of drilled piers to verify the soil conditions and the diameter and depth of piers. Drilled piers should be constructed true and plumb.

Free-fall concrete placement in drilled piers will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an "elephant's trunk" discharging near the bottom of the hole where concrete segregation will be minimized, is recommended.

Drilled pier end bearing surfaces must be thoroughly cleaned prior to concrete placement. A representative of the Geotechnical Engineer should inspect the bearing surface and foundation pier configuration. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

The contractor should check for gas and/or oxygen deficiency before any workers enter the excavation for observation and manual cleanup. All necessary monitoring and safety precautions as required by OSHA, State or local codes should be strictly enforced.

Driven Pile Design Parameters

Proposed battery storage units can be supported on driven steel W-section foundations (assumed to be W6x9 or similar) in general accordance with the following sections.

The design capacity of a single-driven pile is a function of several factors including:

- Size and type of pile;
- Type and capacity of pile installation equipment;
- Pile integrity after installation; and
- Engineering properties of the subsurface soils.

Based on specific conditions encountered on site, the soils are generally considered drivable for pile installation. The most effective means of verifying pile drivability and capacities for either tension or lateral loads is through pile load tests. Pile foundation design parameters have been based upon correlated capacities utilizing soil strength criteria determined from the soil borings and laboratory testing.

The tables below neglect a depth of 2 feet for axial and lateral resistance. This neglect is estimated based on our experience and accounts for depth of scour and/or disturbance from utilities near the piles. Depth of neglect should be verified and adjusted by the design engineer based on the scour analysis. Allowable capacities were based on a minimum factor-of-safety (FOS) of 2.0 for skin friction and 3.0 for end bearing

Description	Top Depth Bottom Depth	Total Unit Weight (pcf)	Allowable Compression Unit Skin friction (psf)[1]	Allowable Bearing Pressure (psf)[2]
Stratum 1	2 10	120	90	8,000

Description	Top Depth Bottom Depth	Total Unit Weight (pcf)	Allowable Compression Unit Skin friction (psf)[1]	Allowable Bearing Pressure (psf)[2]
Stratum 2	10	110	300	25,000
	20			

1. Allowable uplift capacity is on the order of 70% of the compression capacity values in the table. The values provided should be multiplied by the box perimeter of the pile times the depth. The box perimeter is considered two times the width of the flange plus two times the depth of the web.
2. The values provided should be multiplied by the box area of the pile and be used for compression resistance only.

Recommended soil parameters for lateral load analysis of driven pile foundations have been developed for use in LPILE computer programs. Engineering properties have been estimated as outlined below:

Description	Top Depth Bottom Depth	Effective Unit Weight (pcf)	L-PILE/ GROUP Soil Type	ϕ (°)
Stratum 1	1	120	Sand	32
	10			
Stratum 2	10	110	Sand	34
	20			

Driven Piles Construction Considerations

Based on the field exploration and laboratory testing, it is our opinion that the soils on the site are suitable for pile installation into native soils.

A geotechnical engineer should be engaged to make periodic observations of pile driving operations during construction. Each pile should be observed and checked for buckling, crimping and alignment in addition to recording penetration resistance, depth of embedment, and general pile driving operations.

As part of the overall quality control program, the time rate of installation (seconds per foot of embedment) should be recorded during production post driving. As a direct extension of the design process, additional "proof" testing should be performed on a representative number of production posts that do not meet the minimum installation rate criteria outlined in this report.

Gravel-Surfaced Drives and Parking

Roadway designs are provided for the traffic conditions and pavement life conditions as noted in the **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Roadway sections noted in this section are contingent upon the site being adequately prepared. Additionally, our recommendations are based on Chapter 4 Low-Volume Road Design found in AASHTO 1993.

Roadway Subgrades

For this analysis, the laboratory CBR value result of 10 was used.

Design Parameters

We understand unpaved access roads are planned throughout the site. The unpaved road sections for post-construction use have been developed under the following assumptions:

Aggregate Roadway Design Parameters		
Parameter	**Design Value**	**Comments**
Traffic Loading	5,000 ESALs [1]	Assumed
Design Life	40 years	Assumed
Design CBR	10	Assumed
Resilient Modulus	11,150 psi (all-weather)	Based on CBR of 10
Aggregate Base Elastic Modulus	36,000 psi	Assumed
Allowable Rut Depth	2.0 inches	Assumed
Design Serviceability Loss	2.5	Assumed
Vehicle Tire Pressure	80 psi	Assumed

1. ESAL = 18 kips Equivalent Single Axle Load

Access Road Sections

As a minimum, we recommend the following options for unpaved access roads:

Typical Unpaved Road Section – Post Construction Traffic	
Base Course Thickness (inches)	**Traffic (ESALs)**
5[1, 2]	5,000

1. Minimum section thickness is anticipated to support fire trucks and pick-up trucks associated with on-going maintenance. Trucks containing heavy equipment may require localized repairs.
2. Base materials shall consist of Class II Base meeting requirements of the Caltrans Standard Specifications.

Roadway section should be constructed over a minimum of 12 inches of scarified, moisture conditioned, and compacted native soils to 95% of the maximum dry density using ASTM D1557. The recommended thicknesses should be measured after full compaction. The width of the roadway should extend a minimum distance of 1 foot on each side of the desired surface width.

Aggregate materials should conform to the specifications of Class II aggregate base in accordance with the requirements and specifications of the State of California Department of Transportation (Caltrans), or other approved local governing specifications.

Positive drainage should be provided during construction and maintained throughout the life of the roadways. Proposed roadway design should maintain the integrity of the road and eliminate ponding.

Roadway Design and Construction Considerations

Regardless of the design, un-surfaced roadways will display varying levels of wear and deterioration. We recommend an implementation of a site inspection program at a frequency of at least once per year to verify the adequacy of the roadways. Preventative measures should be applied as needed for erosion control and re-grading. An initial site inspection should be completed approximately three months following construction.

Preventative maintenance should be planned and provided for through an on-going management program to enhance future roadway performance. Preventative maintenance activities are intended to slow the rate of deterioration, and to preserve the roadway investment.

Surfacing materials should not be placed when the surface is wet. Surface drainage should be provided away from the edge of roadways to reduce lateral moisture transmission into the subgrade.

If rut depths become excessive as construction work progresses, re-grading and re-compaction should be performed as necessary. Care should be taken to reduce or eliminate trafficking of the unpaved access road when the subgrade is wet as this will result in accelerated rutting conditions. Scarification, moisture treatment as necessary, and re-compaction of the roadways will likely be necessary as the roadways deteriorate.

Materials and construction of roadways for the project should be in accordance with the requirements and specifications of the California Department of Transportation or the applicable local governing body.

Pavements

General Pavement Comments

Based on input from the design team, the entrance to the substation will be paved with asphalt. Asphalt pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

A sample was tested for CBR at the site and resulted in a CBR value of 10. An equivalent R-value of 48 was considered and used to calculate the asphalt concrete pavement thickness sections. R-value testing should be completed prior to pavement construction to verify the design R-value.

The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soil preparation as prescribed by in **Earthwork**, with the upper 12 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D 1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

Assuming the pavement subgrades will be prepared as recommended within this report, the following pavement sections should be considered minimums for this project for the traffic indices assumed in the table below. As more specific traffic information becomes available, we should be contacted to reevaluate the pavement calculations.

Pavement Section Thicknesses

The following table provides our opinion of minimum thickness for AC sections:

Pavement Type	Recommended Pavement Section Thickness [1] (inches)	
	TI = 5	TI = 7
Asphaltic Concrete[2]	3 inches	4 inches
	3 inches Class II Aggregate Base	5 inches Class II Aggregate Base

1. The individual and total material thickness values presented herein represent minimum thickness values, not averages.
2. All materials should meet the Caltrans Standard Specifications for Highway Construction.

These pavement sections are considered minimal sections based upon the expected traffic and the existing subgrade conditions. However, they are expected to function with periodic maintenance and overlays if good drainage is provided and maintained.

Subsequent to clearing, grubbing, and removal of topsoil, subgrade soils beneath all pavements should be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. All materials should meet the CALTRANS Standard Specifications for Highway Construction. Aggregate base materials should meet the gradation and quality requirement of Class 2 Aggregate Base (¾ inch maximum) in Caltrans Standard Specifications, latest edition, Sections 25 through 29.

Parking areas for heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and

patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install pavement drainage systems surrounding areas anticipated for frequent wetting.
- Seal cracks immediately.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Geotechnical contractor should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials, or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for

third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

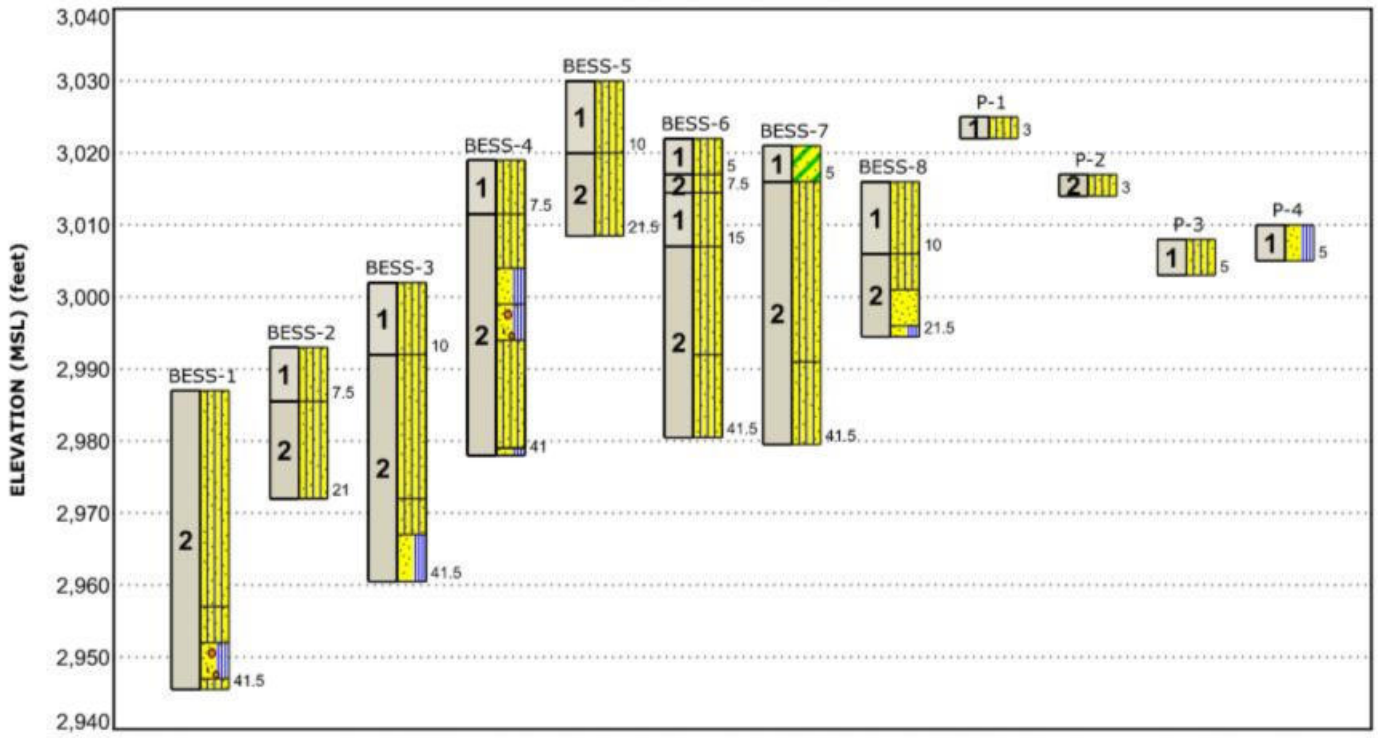
Figures

Contents:

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Sand	Sand with varying amounts of silt, clay, and gravel; loose to medium dense
2	Sand	Sand with varying amount of silt, clay, and gravel; medium dense to very dense

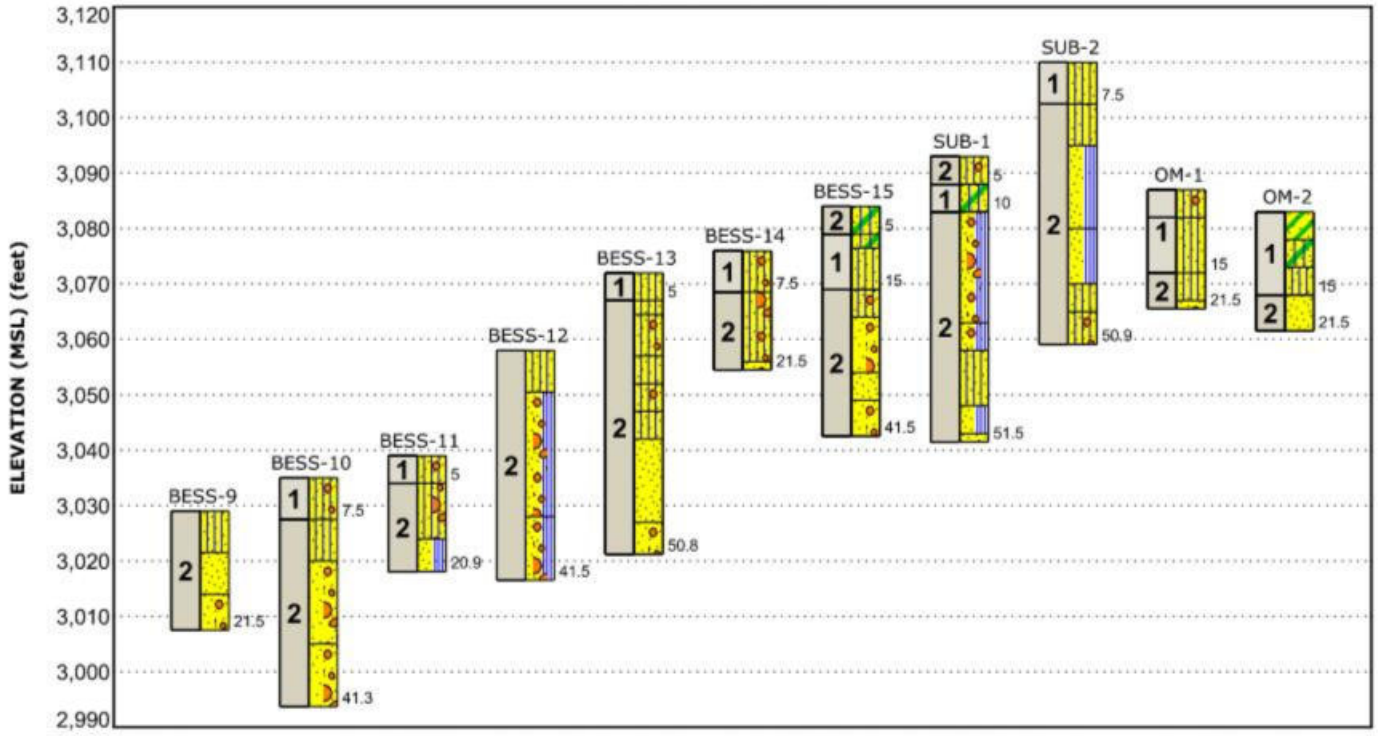
Legend

- Silty Sand
- Poorly-graded Sand with Silt and Gravel
- Poorly-graded Sand with Silt
- Clayey Sand
- Poorly-graded Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Terracon
145 W Walnut St
Carson, CA

GeoModel



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- Poorly-graded Sand with Gravel
- Silty Sand with Gravel
- Poorly-graded Sand with Silt
- Poorly-graded Sand with Silt and Gravel
- Silty Clayey Sand
- Clayey Sand

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Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
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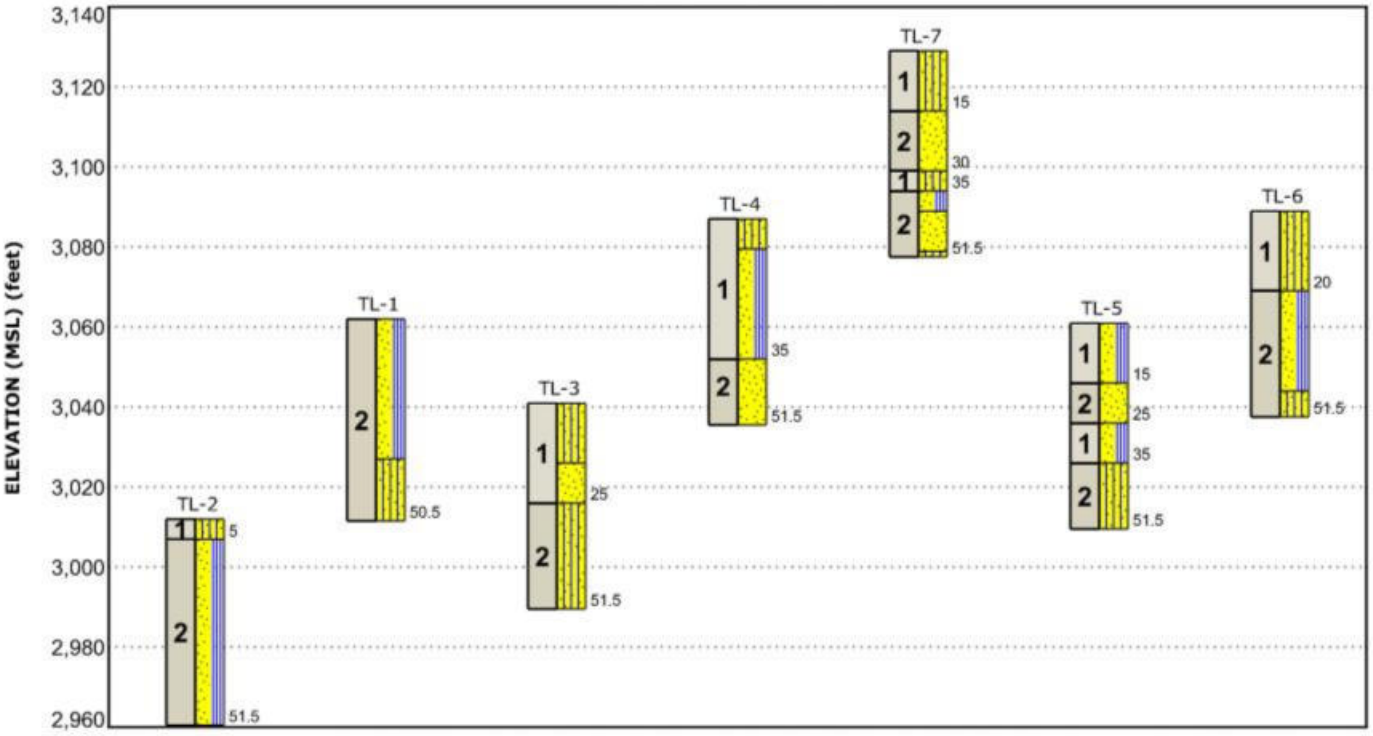
Carson, CA

GeoModel



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Model Layer	Layer Name	General Description	Legend
1	Sand	Sand with varying amounts of silt, clay, and gravel; loose to medium dense	Poorly-graded Sand with Silt; Silty Sand; Poorly-graded Sand
2	Sand	Sand with varying amount of silt, clay, and gravel; medium dense to very dense	

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
15	21 to 51.5	Proposed BESS Area
2	51.5	Proposed Substation Area
2	21.5	Proposed O&M Building Area
4	3 and 5	Proposed Infiltration Area
7	50.5 and 51.5	Proposed Transmission Line

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were estimated using Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted drill rig using continuous hollow stem flight. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. Test samples were collected during drilling in general accordance with the appropriate ASTM methods using Standard Penetration Testing (SPT) and sampling using either standard split-spoon or Modified California samplers. A sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration was recorded as the Standard Penetration Test (SPT) resistance value, also referred to as N-values. The N-values are indicated on the boring logs at the test depths. The samples were placed in appropriate containers, taken to our soil laboratory for testing, and classified by a geotechnical engineer.

For safety purposes and as required by Los Angeles County, all borings were backfilled with grout after their completion.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not encountered at the time of drilling.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our

exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Electrical Resistivity Testing: Soil electrical resistivity data was be obtained in accordance with ASTM G57 Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method. At the test location, two near perpendicular lines was tested. Electrode "a" spacings are summarized in the following table. Electrode spacing was adjusted to conform to site conditions.

No. of Test Locations	Electrode "a" Spacing (feet)	Planned Location
7	2, 4, 6, 8, 12, 20, 30, 50, 70, 100, 150 and 300 feet	Proposed BESS and Substation Areas

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight
- Atterberg Limits
- Compaction
- Swell Consolidation Test
- Direct Shear
- Corrosivity
- Thermal Resistivity
- California Bearing Ratio

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Site Location

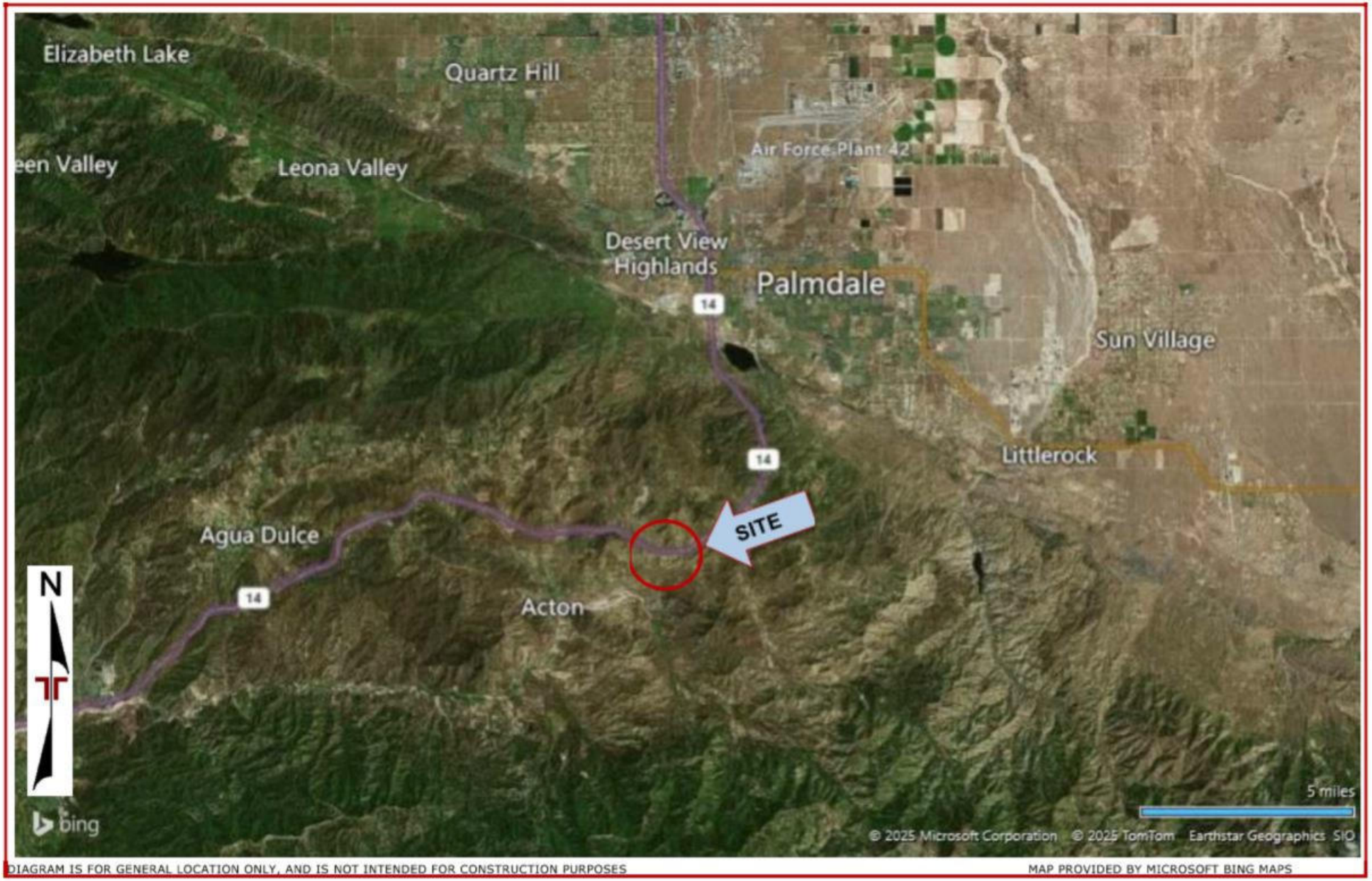

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

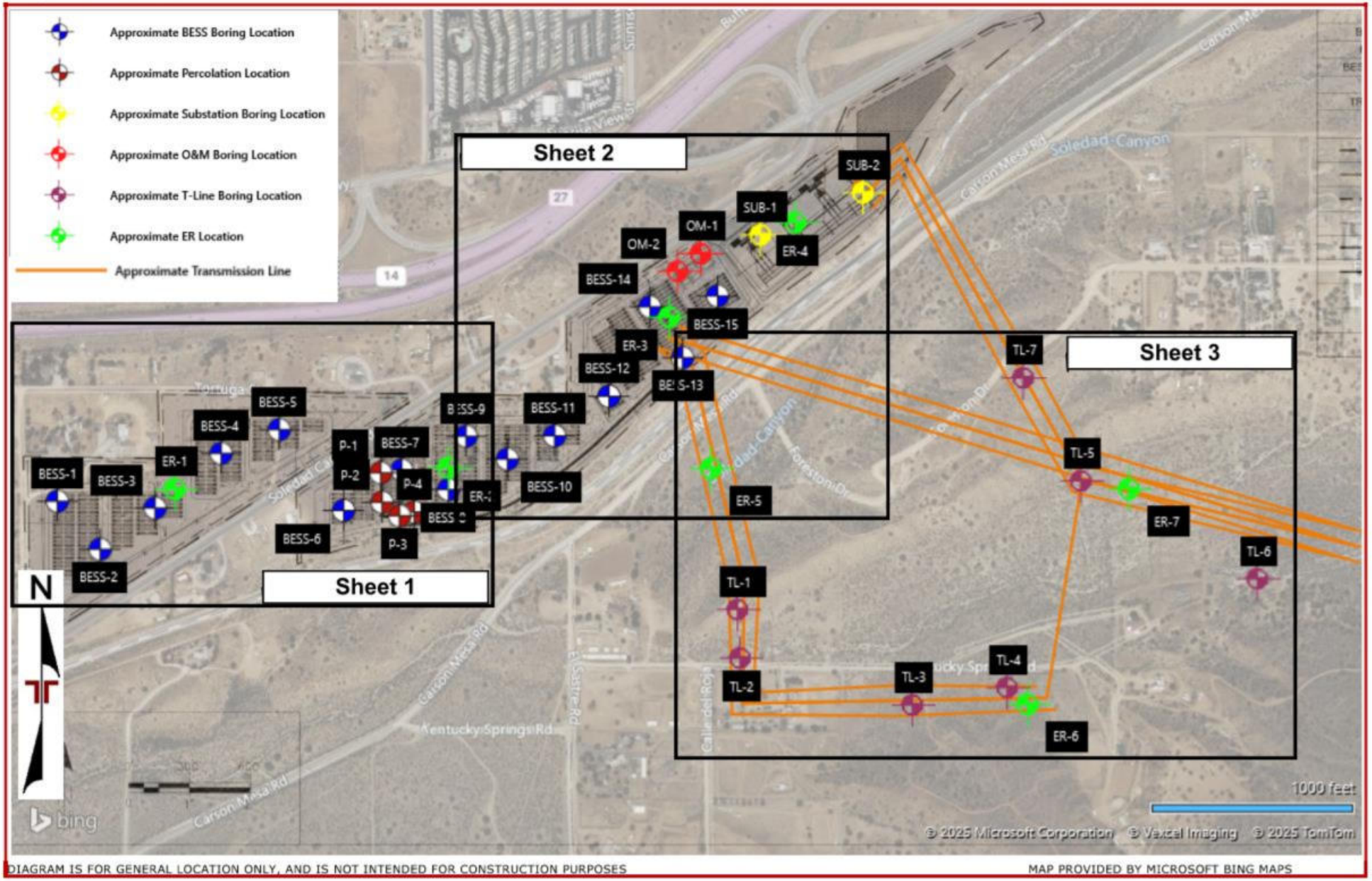

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Sheet 1 Exploration Plan - BESS and Substation Locations

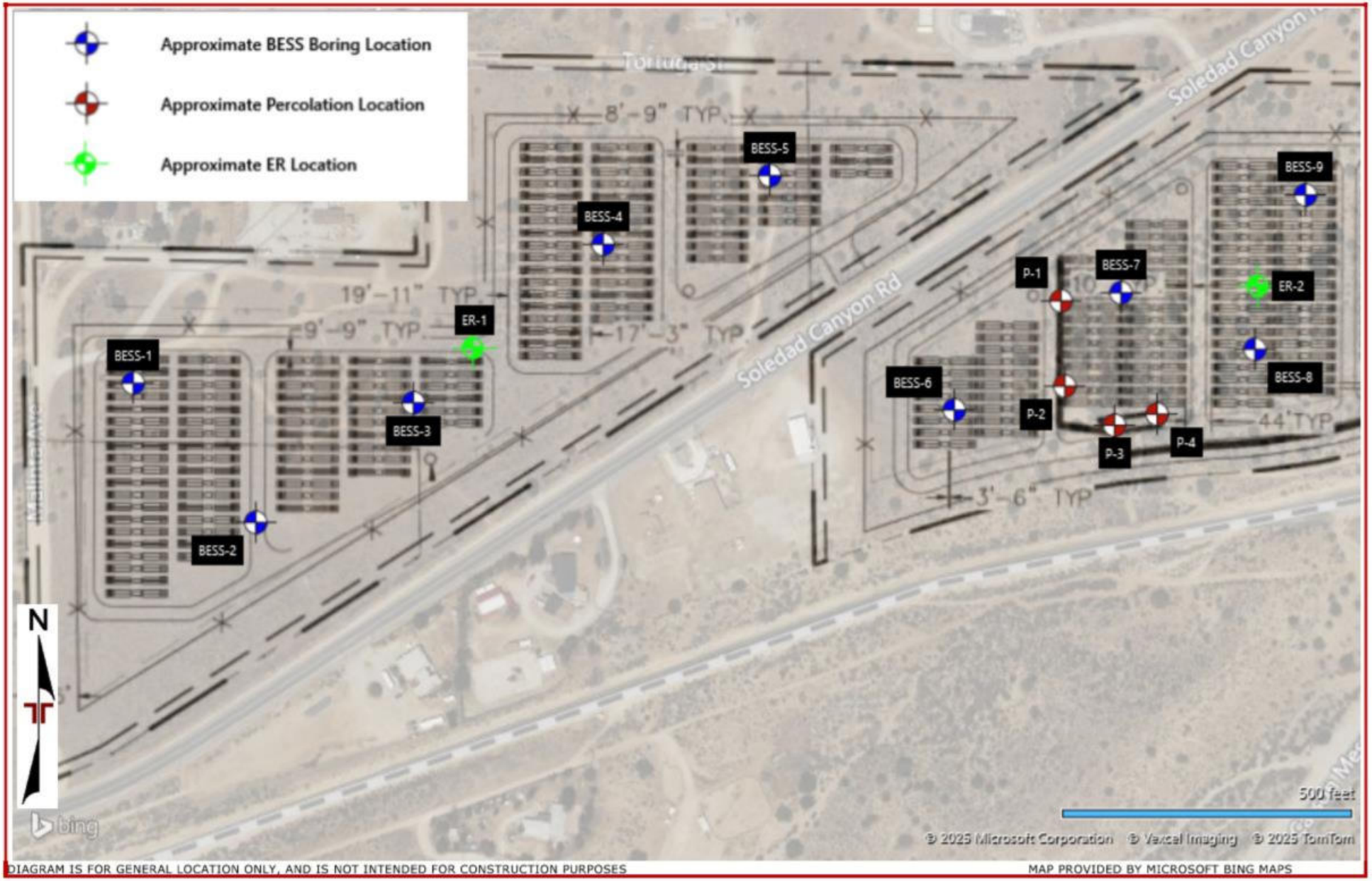

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Sheet 2 Exploration Plan - BESS and Substation Locations

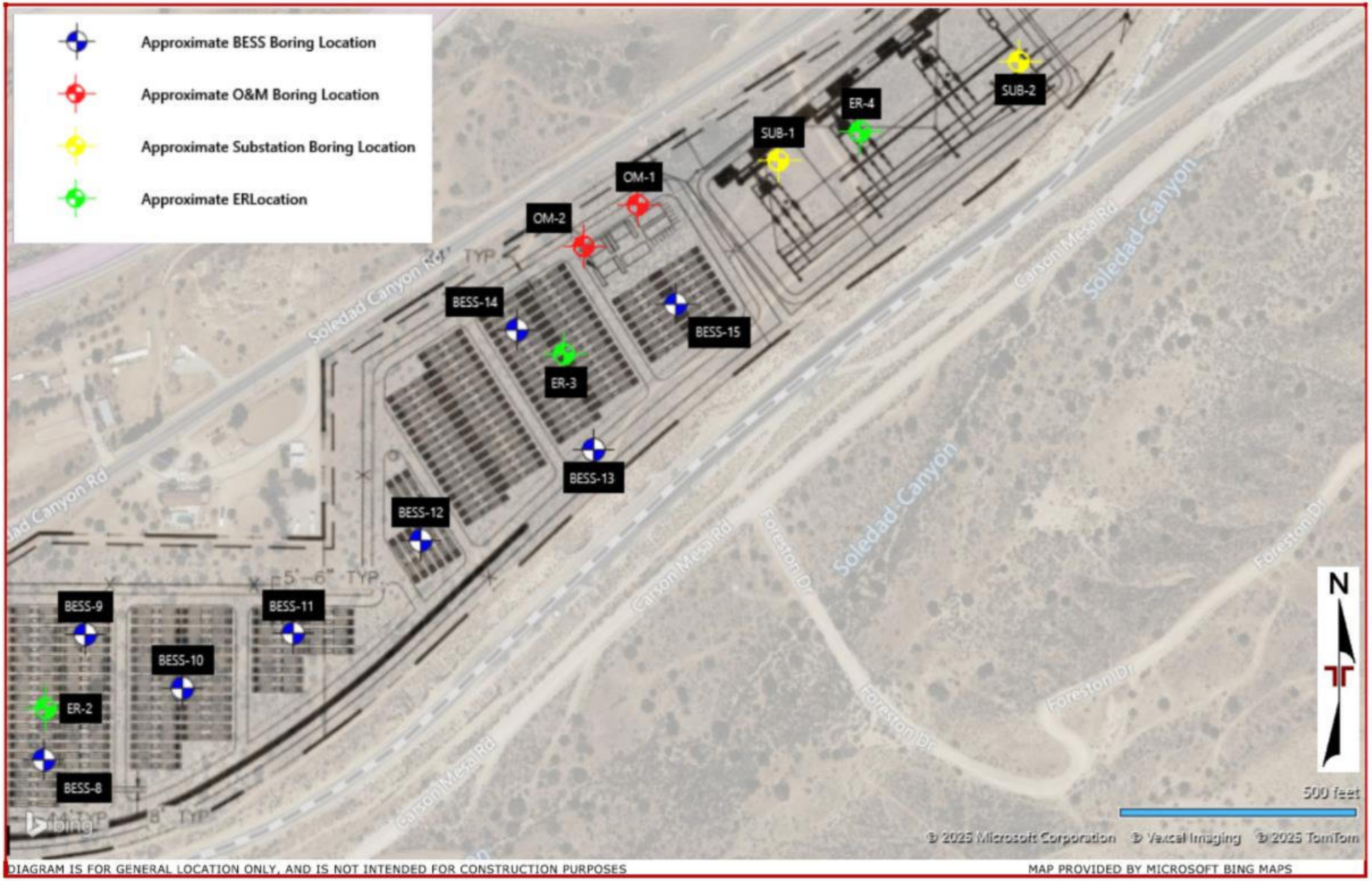

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Sheet 3 - Exploration Plan - T-Line Exploration Locations

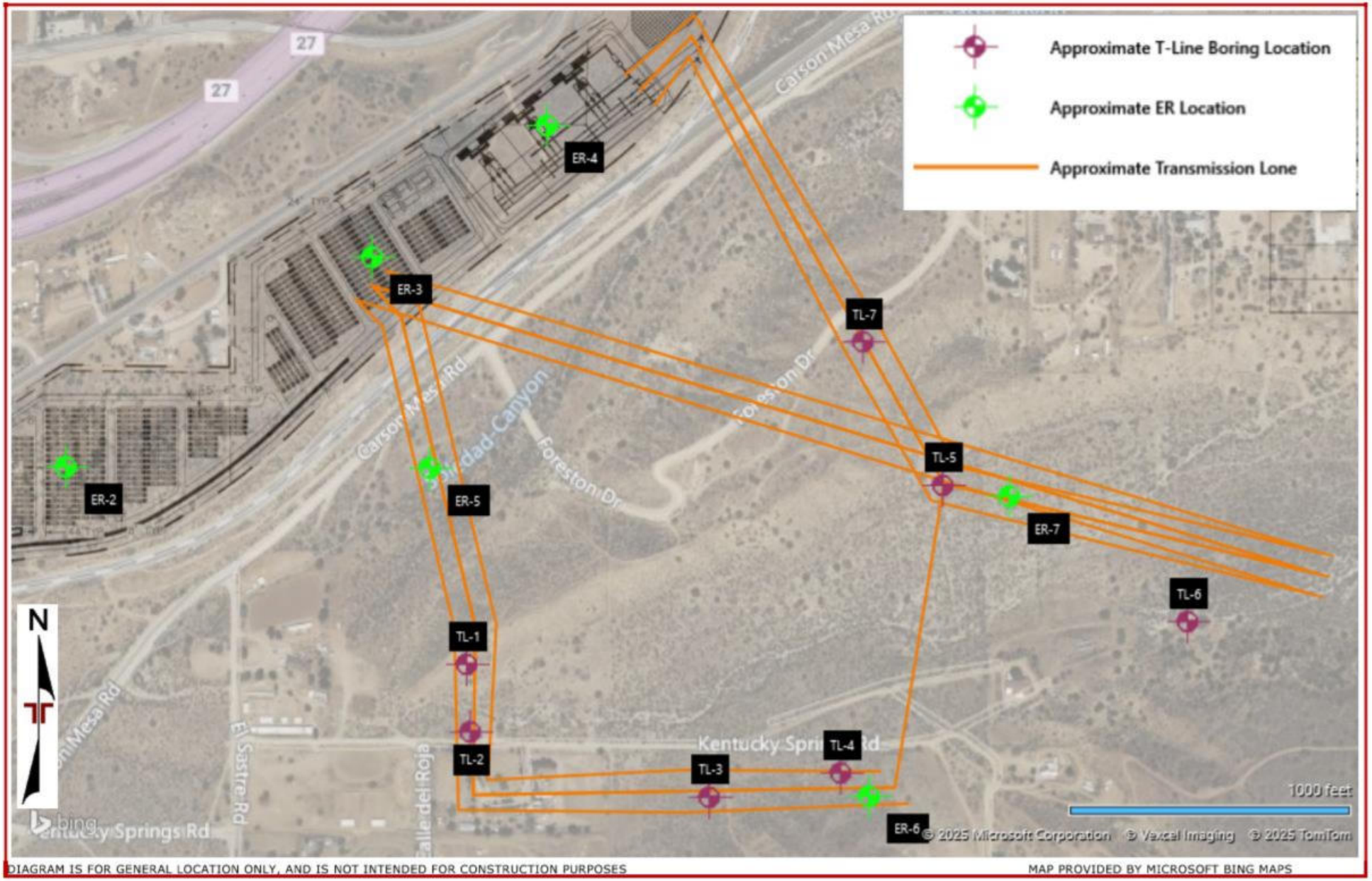

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-1

Location: See Exploration Plan
Latitude: 34.4829° Longitude: -118.1491°

Model Layer	Depth (Ft.)	Material Description	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2	0	**SILTY SAND (SM)**, trace gravel, light brown						
		very dense		15-50/4"	2.3 3.3	119		32
	5			15-39-30 N=69				
		dense		16-28-31	2.0	123		
	10	very dense		16-23-30 N=53			20-17-3	25
	15	medium dense		10-21-33	0.9	109		
	20	very dense		14-25-26 N=51				
	25	brown		17-29-35 N=64				
	30.0							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-24-2024

Boring Completed
12-24-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4829° Longitude: -118.1491° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		SILTY SAND (SM), brown, very dense				23-27-33 N=60				
		35.0	35							
2		**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel and clay, light brown, very dense				22-29-36 N=65				
		40.0	40							
		SILTY SAND (SM), trace gravel, brown, very dense				20-25-26 N=51				
		41.5								
		Boring Terminated at 41.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-24-2024

Boring Completed
12-24-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-2

Location: See Exploration Plan

Latitude: 34.4823° Longitude: -118.1484°

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.0 **SILTY SAND (SM)**, reddish brown medium dense			6-8-8 N=16				
		brown			11-17-20	2.1	119		
2		7.5 dense			9-14-18 N=32				26
					28-38-42	0.7	118		
					9-15-17 N=32				
		very dense			34-50/6"	1.8	106		
		21.0 ***Boring Terminated at 21 Feet***							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
JB

Boring Started
01-08-2025

Boring Completed
01-08-2025

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-3

Location: See Exploration Plan
Latitude: 34.4828° Longitude: -118.1475°

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0							
		SILTY SAND (SM), trace gravel, light brown							
		medium dense			11-15-18	2.7	122		
		5			10-11-12 N=23				
					11-11-17	1.6	117		
		10.0							
2		dense			15-16-23 N=39				
		very dense			23-38-50/5"	1.2	122		
		20			14-16-19 N=35				
		dense							
		25			16-20-27 N=47				
		30.0							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-24-2024

Boring Completed
12-24-2024

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-3

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4828° Longitude: -118.1475° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		SILTY SAND (SM), brown, very dense				19-28-38 N=66				
		35.0	35							
2		**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel, brown, very dense				23-25-27 N=52				
		light brown	40			26-36-46 N=82				
		41.5								
		Boring Terminated at 41.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-24-2024

Boring Completed
12-24-2024

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-4

Location: See Exploration Plan
Latitude: 34.4836° Longitude: -118.1464°

Model Layer	Depth (Ft.)	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.0	**SILTY SAND (SM)**, reddish brown							18-15-3	18
		medium dense				8-9-9 N=18				
			5			11-18-17	2.5	121		
	7.5	dense				14-29-30 N=59				
			10			23-43-50/5"	4.6	118		
	15.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, brown, dense	15			6-14-18 N=32			NP	11
2	20.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, light brown, very dense	20			35-50/4"	2.7	104		
	25.0	**SILTY SAND (SM)**, brown, very dense	25			26-50/5"				
	30.0		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R

Logged by
JB

Boring Started
01-08-2025

Boring Completed
01-08-2025

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-4

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4836° Longitude: -118.1464° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**SILTY SAND (SM)**, trace gravel, brown, very loose	35			17-34-37 N=71				
						32-50/6"				
		40.0	40							
		POORLY GRADED SAND WITH SILT (SP-SM), brown, very dense 41.0				28-50/6"				
		Boring Terminated at 41 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R

Logged by
JB

Boring Started
01-08-2025

Boring Completed
01-08-2025

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-5

Location: See Exploration Plan

Latitude: 34.4839° Longitude: -118.1454°

Model Layer	Graphic Log	Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1			**SILTY SAND (SM)**, brown							
			medium dense				1.5			17
						8-16-19	1.6			
						6-9-10 N=19				
						6-9-17	1.9	104		
		10.0								
2			very dense			20-32-35 N=67				
			dense			18-26-29	2.8	121		
						12-15-17 N=32				
		21.5								
			Boring Terminated at 21.5 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
6-Tech

Hammer Type
Automatic

Driller
Terracon

Logged by
JB

Boring Started
01-06-2025

Boring Completed
01-06-2025

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-6

Location: See Exploration Plan
Latitude: 34.4828° Longitude: -118.1444°

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		**SILTY SAND (SM)**, light brown, trace gravel medium dense			5-9-13 N=22				
2		5.0 brown, dense			50/6"	6.2	106		
1		7.5 light brown, medium dense			6-8-10 N=18				
					11-18-20	1.0			
2		15.0 dense			16-21-22 N=43				
					16-21-24 N=45			NP	16
					24-50/6"	1.4	111		
		30.0							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
6-Tech

Hammer Type
Automatic

Driller
Terracon

Logged by
JB

Boring Started
01-06-2025

Boring Completed
01-06-2025

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-6

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4828° Longitude: -118.1444° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**SILTY SAND (SM)**, light brown, very dense				18-35-36 N=71				
			35			20-29-22 N=51				
		dense	40			13-13-19 N=32				
		41.5 ***Boring Terminated at 41.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
6-Tech

Hammer Type
Automatic

Driller
Terracon

Logged by
JB

Boring Started
01-06-2025

Boring Completed
01-06-2025

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-7

Location: See Exploration Plan
Latitude: 34.4834° Longitude: -118.1434°

Model Layer	Depth (Ft.)	Graphic Log	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0	**CLAYEY SAND (SC)**, trace gravel, light brown							
		medium dense			19-23-33	2.2	125	27-15-12	31
	5.0								
2	5	**SILTY SAND (SM)**, trace gravel, brown, dense			18-21-29 N=50				
		medium dense			10-26-25	1.1	106		
	10	dense			15-19-23 N=42				
	15	very dense			31-50/5"	2.1	118		
	20				21-31-38 N=69				
	25				26-28-38 N=66				
	30.0								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-23-2024

Boring Completed
12-23-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-7

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4834° Longitude: -118.1434° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**SILTY SAND (SM)**, trace gravel, brown, very dense	35			21-26-36 N=62				
						20-35-38 N=73				
			40			30-37-45 N=82				
		41.5 ***Boring Terminated at 41.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-23-2024

Boring Completed
12-23-2024

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-8

Location: See Exploration Plan

Latitude: 34.4831° Longitude: -118.1427°

Model Layer	Depth (Ft.)	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.0	**SILTY SAND (SM)**, brown								
		medium dense				11-10-11 N=21			19-16-3	26
		trace gravel	5			8-15-16	2.4	115		
		medium dense				9-10-16 N=26				
	10.0	dense	10			12-37-48	2.7	116		
2	15.0	**POORLY GRADED SAND (SP)**, trace gravel and silt, light brown, very dense	15			19-28-33 N=61				
	20.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, brown, dense	20			20-48-40	1.4			
	21.5	***Boring Terminated at 21.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-20-2024

Boring Completed
12-20-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-9

Location: See Exploration Plan

Latitude: 34.4838° Longitude: -118.1424°

Model Layer	Graphic Log	Depth (Ft.)	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		0	**SILTY SAND (SM)**, brown to light brown, very dense	5			33-37-50/5"	3.2	125		
							30-49-50/4"				
		7.5	**POORLY GRADED SAND (SP)**, trace silt, trace gravel, brown, dense				24-49-46	1.2	122		
			light brown	10			11-14-24 N=38				
		15.0	**POORLY GRADED SAND WITH GRAVEL (SP)**, trace silt, light brown, very dense	15			24-48-50/4"	2.1	117		
				20			32-35-35 N=70				
		21.5	***Boring Terminated at 21.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-20-2024

Boring Completed
12-20-2024

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-10

Location: See Exploration Plan

Latitude: 34.4835° Longitude: -118.1417°

Model Layer	Depth (Ft.)	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.0	**SILTY SAND WITH GRAVEL (SM)**, brown, medium dense	0							36
						8-11-11 N=22				
			5			13-23-25	2.2	115		
	7.5									
2		**SILTY SAND (SM)**, trace gravel, brown, very dense				18-32-42 N=74			NP	26
		dense	10			23-28-33	3.3	111		
	15.0		15			12-28-39 N=67				
		POORLY GRADED SAND WITH GRAVEL (SP), trace silt, light brown, very dense								
		dense	20			24-35-48	1.3			
			25			43-28-34 N=62				
	30.0		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-20-2024

Boring Completed
12-20-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-10

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4835° Longitude: -118.1417° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**POORLY GRADED SAND WITH GRAVEL (SP)**, trace silt, light brown, very dense	35			29-46-50/4"				
						28-33-38 N=71				
			40							
		41.3 ***Boring Terminated at 41.3 Feet***				31-48-50/4"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-20-2024

Boring Completed
12-20-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-11

Location: See Exploration Plan
Latitude: 34.4838° Longitude: -118.1409°

Model Layer	Depth (Ft.)	Graphic Log	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0	**SILTY SAND WITH GRAVEL (SM)**, light brown, medium dense			9-23-24	1.1	124	NP	19
2	5.0	very dense			50/6"				
					36-50/6"	2.4			
	10				17-24-36 N=60				
	15.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, brown, dense			17-22-50/6"	1.3	110		
	20.9	very dense			40-50/5"				
		Boring Terminated at 20.9 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-19-2024

Boring Completed
12-19-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-12

Location: See Exploration Plan
Latitude: 34.4843° Longitude: -118.1400°

Model Layer	Depth (Ft.)	Material Description	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2	0	**SILTY SAND (SM)**, trace gravel, light brown							
		very dense			24-26-47 N=73				
	5	dense			26-41-42	3.9	123		
	7.5	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, light brown, medium dense			8-11-15 N=26				
	10				6-18-21	0.9			
	15	dense			11-15-16 N=31				
	20				14-30-42	1.8	106		
	25	very dense			30-35-42 N=77				
	30.0								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-23-2024

Boring Completed
12-23-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-12

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4843° Longitude: -118.1400° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, light brown, very dense	35			21-31-43 N=74				
						19-35-42 N=77				
			40			21-47-50/6"				
		41.5 ***Boring Terminated at 41.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
AT

Boring Started
12-23-2024

Boring Completed
12-23-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-13

Location: See Exploration Plan
Latitude: 34.4850° Longitude: -118.1389°

Model Layer	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.0	**SILTY SAND (SM)**, brown, medium dense					2.1			41
						22-28-25	2.7	130		
	5.0	dense	5			7-17-18 N=35				
	7.5	**SILTY SAND WITH GRAVEL (SM)**, light brown, dense				7-18-46	1.2	106		
			10			8-14-18 N=32			NP	12
	15.0		15			50/6"	1.4	115		
2		**SILTY SAND (SM)**, trace gravel, brown, very dense								
	20.0	**SILTY SAND WITH GRAVEL (SM)**, brown, dense	20			9-17-21 N=38				
	25.0	**SILTY SAND (SM)**, trace gravel, brown, dense	25			17-42-37	2.8	111		
	30.0		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-19-2024

Boring Completed
12-19-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-13

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4850° Longitude: -118.1389° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**POORLY GRADED SAND (SP)**, trace silt and gravel, light brown, very dense	35			14-41-18 N=59				
						15-23-29 N=52				
			40			24-50/5"				
		45.0 **POORLY GRADED SAND WITH GRAVEL (SP)**, light brown, very dense	45			20-35-40 N=75				
		50.8 ***Boring Terminated at 50.8 Feet***	50			29-50/4"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
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OW

Boring Started
12-19-2024

Boring Completed
12-19-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-14

Location: See Exploration Plan

Latitude: 34.4854° Longitude: -118.1394°

Model Layer	Graphic Log	Depth (Ft.)	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0	**SILTY SAND WITH GRAVEL (SM)**, brown loose				3-5-4 N=9				
			medium dense	5			8-10-13	3.5	119		
		7.5									
2			dense				7-12-24 N=36				32
			medium dense	10			12-23-18	4.2	113		
			dense	15			8-18-19 N=37				
		20.0		20							
			POORLY GRADED SAND WITH GRAVEL (SP), trace silt, brown, dense				14-30-31	1.4	113		
		21.5	***Boring Terminated at 21.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-18-2024

Boring Completed
12-18-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-15

Location: See Exploration Plan
Latitude: 34.4857° Longitude: -118.1383°

Model Layer	Depth (Ft.)	Material Description	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2	0.0	**SILTY CLAYEY SAND (SC-SM)**, brown, very dense		37-50/5"	2.1	124	21-15-6	41
1	5.0	medium dense		4-4-6 N=10				
	7.5	**SILTY SAND (SM)**, brown, medium dense		10-24-28	2.6	112		
	10			11-8-8 N=16				
	15.0	**SILTY SAND WITH GRAVEL (SM)**, brown, medium dense		8-19-26	3.1	104		
2	20.0	**POORLY GRADED SAND WITH GRAVEL (SP)**, trace silt, brown, dense		8-14-26 N=40				
	25	very dense		7-25-32				
	30.0							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-19-2024

Boring Completed
12-19-2024

Prairie Song Reliability Project
Soledad Canyon Rd | Acton, Los Angeles County, California
Terracon Project No. LA245085

Terracon
145 W Walnut St
Carson, CA

Boring Log No. BESS-15

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 34.4857° Longitude: -118.1383° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		POORLY GRADED SAND (SP), trace silt, light brown, very dense				18-31-31 N=62				
		35.0	35							
2		**POORLY GRADED SAND WITH GRAVEL (SP)**, trace silt, light brown and white, very dense				24-50/6"				
		41.5	40			34-44-48 N=92				
		Boring Terminated at 41.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
Terracon

Logged by
OW

Boring Started
12-19-2024

Boring Completed
12-19-2024

Notes

Advancement Method
Hollow Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite