GEOTECHNICAL ENGINEERING SERVICES

INVESTIGATION AND REPORT CHECKLIST

Project Information

NAME OF PROJECT: *Dalton RICE Generation Facility*
CONTRACTING PARTY: *Dalton Utilities*
PROJECT NUMBER: *197347*
PROJECT LOCATION: *Dalton, Georgia*
DATE PREPARED: *05/15/2026*
VERSION: *3*
OTHER STANDARDS: *n/a*
PREPARED BY: *Abbie LaFleur*
PROJECT DESCRIPTION: *A new Gas Reciprocating Engine Plant is planned in Whitfield County, Georgia. The project will be comprised of reciprocating engines, a warehouse, storage tanks, stacks, radiators, various equipment buildings, transformers, and other associated equipment.*

Foundation loads are anticipated to generally range from relatively light to heavy, with some lightly-loaded miscellaneous equipment. It is planned to support the structures on shallow foundations (mats, spread footings, slabs-on-grade), provided foundation movements (heave or settlement) can be limited to 1-inch or less (2-inches or less for tanks). If not, deep foundations (drilled shafts, auger-cast piles, driven piles, etc.) will be considered. Preliminary structure loading is summarized in the following table.

Structure	Assumed Foundation Type	Average Pressure (ksf)
Main Building - Engine Hall, Mech/Elec/Ops	Mat 110' x 190'	1.5
Oil Tank Containment	Mat 86' x 40'	2
Stacks	Mat 20' x 80'	1
Step-Up Transformer	Mat 28' x 48'	1.5
MV Building	Mat 26' x 55'	1
Warehouse	Mat 100' x 75'	1
Radiators	Drilled Shafts	
Backup Power Transformer	Mat 25' x 16'	0.7
Charge Air Filter	Mat 110' x 22'	1
SCR	Mat 30' x 72'	0.8
Gas Coalescing Filter	Mat 20' x 15'	0.8
Station Transformer	Mat 20' x 18'	0.8
Oil Water Separator	Potentially buried, 15' depth, 26' x 8'	
MAU Gen Side	Mat 110'x 15'	0.5
MAU Aux Side	Mat 20' x 28'	0.75
Deadend Structures	Drilled Shafts	100 ft-K base moment
Truck Unloading Station	120' x 15'	HS-20 Truck Loading

New pavement areas are also planned. Parking and drive areas will be constructed as asphaltic and Portland cement concrete, gravel surfacing, or some combination.

Grading plans have not yet been developed. Final grading plans are not yet available, but between 10 feet of cut and 10 feet of fill is anticipated. An infiltration pond is planned on the north side of the site.

The items marked (X) below represent the minimum scope required for this project. Additional scope items may be proposed as part of the services if required to provide the information requested.

Definitions and requirements for each scope items listed on this checklist are detailed in the Geotechnical Investigation Technical Guidelines that is included in this package.

1.0 Field Investigation Requirements

☒ 1.1 Locations:
- ☒ GPS Coordinates:
- ☐ Dimensions from Existing Features:
- ☐ Staked by others:
- ☐ Survey elevation of final locations:

☒ 1.2 Site Access: *Coordinate with Owner*
- ☐ 1.2.1 Project Specific Rutting Limitations:
  - ☐ Maximum rut depth:
- ☐ 1.2.2 Surfacing:

☒ 1.3 Utilities:
- ☐ 1.3.1 Soft Dig:
  - ☐ Depth:
  - ☐ Locations:
- ☐ 1.3.2 Private Utility Locate:
  - ☐ Locations:

☒ 1.4 Contamination:
- ☐ 1.4.1 No Known Contamination:
- ☐ 1.4.2 Possible Contamination in Soils:
  - ☐ Type of possible contamination:
  - ☐ Party responsible for disposal:
- ☒ 1.4.3 Known Contamination in Soils:
  - ☒ Type of expected contamination: PFAS
  - ☒ Party responsible for disposal: Owner

☒ 1.5 Borings:
- ☒ 1.5.1 Spoils/Drilling Fluids:
  - ☐ Containerize in drums:
  - ☐ Off-site disposal:
- ☐ 1.5.2 Environmental Drilling Techniques Required:
- ☐ 1.5.3 Coring of Pavement:
- ☒ 1.5.4 Bedrock: *Highly weathered and variable bedrock is anticipated.*
  - ☐ 1.5.4.1 No coring needed:
  - ☐ 1.5.4.2 Bedrock unanticipated:
  - ☒ 1.5.4.3 Coring required:
    - ☒ Minimum core length: *If bedrock is encountered in borings, core to the minimum lengths indicated in the attached prior to termination.*
    - ☒ Minimum boring depth:

☒ 1.6 Sampling:
- ☐ Sampling Interval:
- ☐ Field Directed Sampling:

☐ 1.7 Rock Probes:

☐ 1.8 Cone Penetrometer (CPT) Soundings:
☒ 1.9 Backfill:
  ☐ 1.9.1 Cement-bentonite grout:
  ☐ 1.9.2 Bentonite chips/pellets:
  ☒ 1.9.3 Unspecified:
  ☐ 1.9.4 Pavement patching:
☒ 1.10 Groundwater Measurements:
  ☒ Additional intervals: *Perform 24hr groundwater readings.*
☐ 1.11 Piezometers:
  ☐ Attached scope:

2.0 Field Testing

☒ 2.1 Electrical Resistivity Testing:
  ☒ Attached Scope:
☐ 2.2 Field Crosshole Seismic Testing:
☐ 2.3 Field Downhole Seismic Testing:
☒ 2.4 Field MASW Survey:
☐ 2.5 CPT Dissipation Testing:
  ☐ Bottom of each CPT sounding:
  ☐ Additional Interval:
☐ 2.6 Field Hydraulic Conductivity Testing:
  ☐ Attached scope:
☐ 2.7 Pressuremeter Testing:
  ☐ Attached scope:
☒ 2.8 Thermal Resistivity:
  ☒ Attached Scope:
☒ 2.9 Infiltration Testing:
  ☒ Attached Scope:
☐ 2.10 Geophysical Scope:
  ☐ Attached Scope:
☐ 2.11 Solar/BESS Pile Load Testing Scope:
  ☐ Attached Scope:
☐ 2.12 Test Pits Scope:
  ☐ Attached Scope:

3.0 Laboratory Testing

☐ 3.1 Specified Testing Program:
  ☐ Attached estimated testing type and quantity:
  ☐ Specified Swell Testing:
    ☐ Attached Scope:
☒ 3.2 Non-specified Testing Program:
  ☐ Project specific requirements:
  ☐ Applicable Proctor Test:

4.0 Reporting

☐ 4.1 Data Report Only:

☒ 4.2 Interpretative Report:
- ☒ 4.2.1 General:
  - ☒ IBC: *2024*
  - ☒ ASCE7: *7-22*
  - ☐ Other:
- ☒ 4.2.2 Data:
- ☒ 4.2.3 Subsurface Conditions:
- ☒ 4.2.4 Geologic Hazards:
- ☒ 4.2.5 Seismic Hazards:
  - ☒ Risk Category: *III*
  - ☒ Seismic Design Category: *C*
- ☐ 4.2.6 Seismic Hazards Analysis:
  - ☐ Attached Scope:
- ☒ 4.2.7 Previous Construction Activity:
- ☐ 4.2.8 Settlement:
- ☒ 4.2.9 Earthwork:
  - ☒ Estimated cut/fill: *Grading plans are not yet available. Preliminarily anticipate between 10 feet of cut and 10 feet of fill.*
  - ☐ Other earthwork features:
  - ☐ Provide earthwork balance factors:
- ☒ 4.2.10 Shallow Foundation Design:
  - ☒ Shallow footings:
  - ☒ Slab on grades:
  - ☒ Mats:
  - ☒ Tanks:
- ☒ 4.2.11 Deep Foundation Design: *Radiators and deadend structures will likely be supported by drilled shafts, but other deep foundations may be considered.*
  - ☒ Drilled Shafts:
  - ☐ Direct Embedded Poles:
  - ☒ Augercast Piles:
  - ☒ Driven Piles:
  - ☐ Micropiles:
  - ☐ Helical Piles:
  - ☒ Lateral Program:
    - ☒ LPILE:
    - ☒ FAD Tools: *FAD may be considered for transmission line foundation design.*
- ☒ 4.2.12 Lateral Earth Pressures:
  - ☒ Below Grade Structures: *Below grade structures may be utilized for the oil/water separator.*
  - ☐ Retaining Walls:
  - ☐ Dynamic:
  - ☐ Other:
- ☒ 4.2.13 Temporary Slopes and Excavations:
- ☐ 4.2.14 Excavation Requirements:
- ☐ 4.2.15 Trenchless Excavations:
  - ☐ Attached Scope:
- ☒ 4.2.16 Dewatering:
- ☒ 4.2.17 Corrosion Potential:

☒ Site specific testing required: *Perform a minimum of 6 chemical testing suites from samples recovered within the upper 3 to 10 feet from broings.*

☒ 4.2.18 Pavement: *Please advise on whether or not geogrid is needed.*

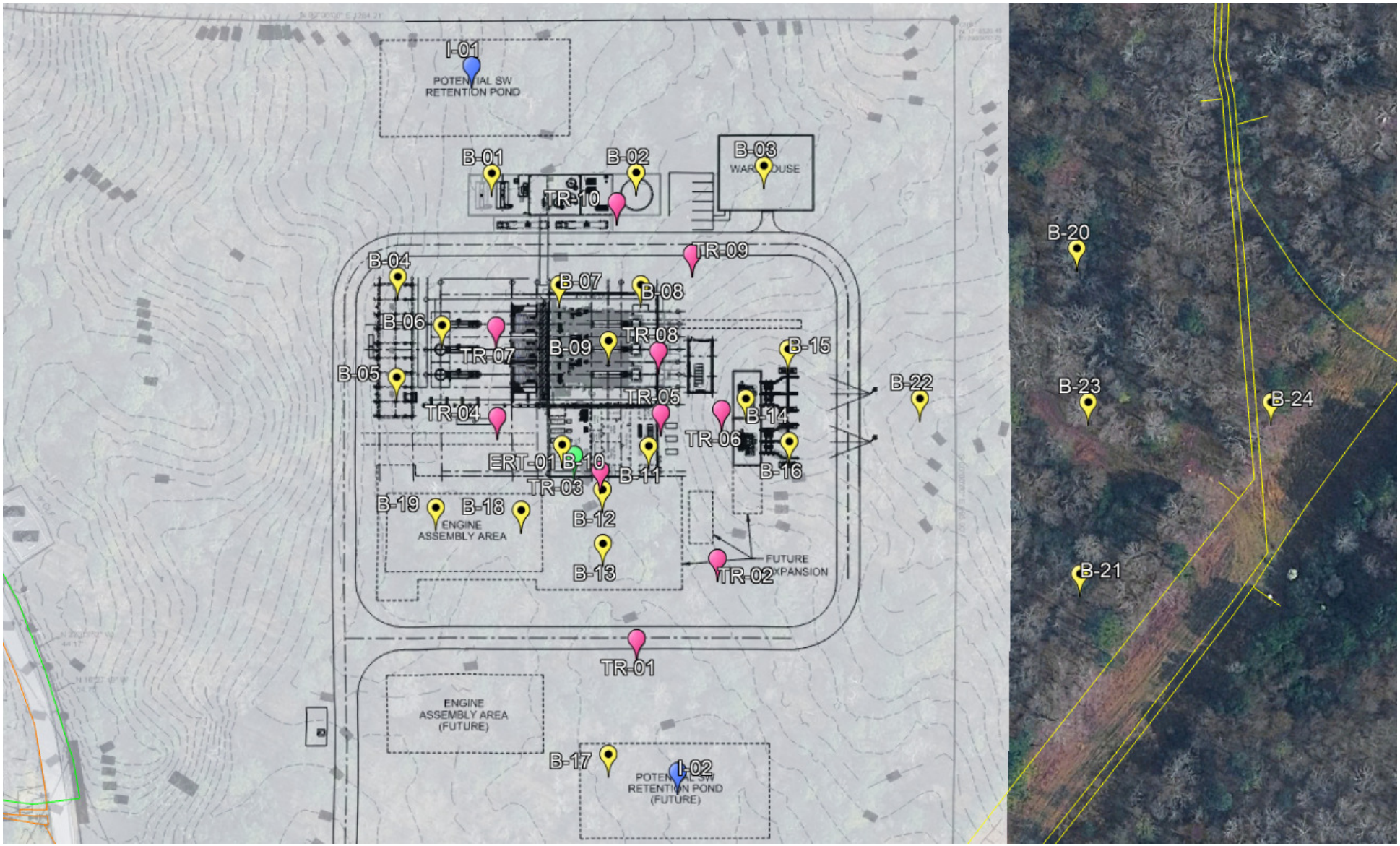
☒ Design Values:

☐ Recommended Section:

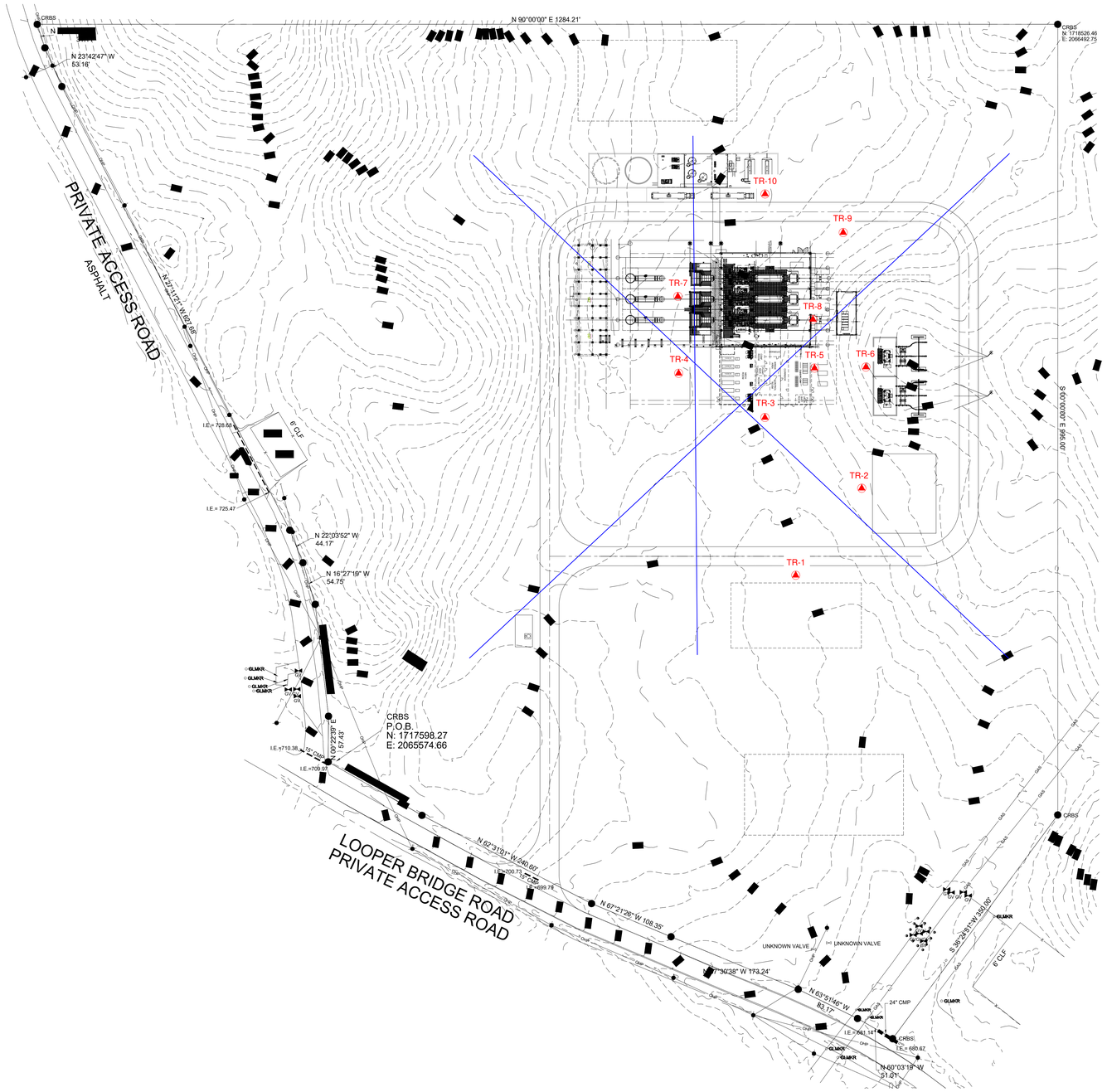
☐ Traffic Loading Information:

☐ 4.2.19 Summary of Environmental Screening:

5.0 Other Miscellaneous Notes and Requirements



BURNS McDONNELL	Geotechnical Investigation	Investigation Location Plan 1 of 1
	Dalton RICE Generation Facility	
	May 2026	



no.	date	by	ckd	description
0	5/14/26	JCR	JCR	ISSUED FOR USE

NORTH

OVERALL SITE PLAN

0 32' 64' 128'

SCALE IN FEET

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
Firm Lic. No. PEF000100

designed J. RUARK | detailed J. RUARK

Dalton UTILITIES

JD COPE ENERGY FACILITY
WHITFIELD COUNTY, GEORGIA

ELECTRICAL RESISTIVITY SURVEY
&
THERMAL RESISTIVITY SURVEY

project 197347 | contract N/A

drawing EX-01 | rev. 0

sheet of sheets

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Scale For Microfilming: Millimeters / Inches

Boring Schedule

Project Name: Dalton RICE Generation Facility
Project Number: 197347

Boring/Sounding	Latitude (deg)	Longitude (deg)	Estimated Boring Depth (ft)	Minimum Rock Core Length (ft)	Notes
B-01	34.72093	-84.93401	40	10	
B-02	34.72093	-84.93351	80	15	
B-03	34.72095	-84.93307	50	10	
B-04	34.72064	-84.93434	50	10	
B-05	34.72035	-84.93434	50	10	
B-06	34.72050	-84.93418	80	15	
B-07	34.72061	-84.93378	80	15	
B-08	34.72061	-84.93349	80	15	
B-09	34.72045	-84.93360	100	15	MASW Location - see attached scope
B-10	34.72016	-84.93377	50	10	
B-11	34.72015	-84.93347	50	10	
B-12	34.72003	-84.93363	50	10	
B-13	34.71987	-84.93363	80	15	
B-14	34.72029	-84.93313	50	10	
B-15	34.72043	-84.93298	50	10	
B-16	34.72017	-84.93298	50	10	
B-17	34.71927	-84.93361	30	0	
B-18	34.71997	-84.93391	80	15	
B-19	34.71998	-84.93421	50	10	
B-20	34.72072	-84.93198	40	10	Substation Area
B-21	34.71979	-84.93198	40	10	
B-22	34.72029	-84.93253	40	0	
B-23	34.72028	-84.93195	40	0	
B-24	34.72028	-84.93132	50	10	
I-01	34.72124	-84.93409	N/A		Infiltration Testing - see attached scope
I-02	34.71922	-84.93337			
TR-01	34.71960	-84.93351	N/A		Thermal Testing - see attached scope
TR-02	34.71983	-84.93323			
TR-03	34.72008	-84.93364			
TR-04	34.72024	-84.93399			
TR-05	34.72025	-84.93342			
TR-06	34.72026	-84.93321			
TR-07	34.72049	-84.93399			
TR-08	34.72042	-84.93343			
TR-09	34.72070	-84.93332			
TR-10	34.72085	-84.93358			

Geotechnical Investigation Technical Guidelines

Rev 3

April 24, 2026

Document Use:
This document provides technical guidance for activities associated with geotechnical investigations and reporting. Refer to Geotechnical Engineering Services Investigation and Report Checklist for applicable portions to this project as well as any modifications to the requirements or criteria defined herein. The requirements outlined herein, and on the Checklist, represent the minimum scope required for this project. Additional scope items may be proposed as part of the services if required to provide the information requested. There must be no removal of scope items outlined herein, and on the Checklist, without acceptance by Contracting Party.

Applicable Standards:
Perform drilling and rock coring, field testing, sampling, sample storage and transportation, logging of soil and rock types, and laboratory testing and reporting in general accordance with the latest revision or supplement to the applicable ASTM Standards.

If indicated under Project Information, other standards may apply to the work being performed. Applicable portions of these standards are attached to these Guidelines.

Scope of Services:
Provide all labor, equipment, and materials (including drill rigs, sampling equipment, survey instruments, soil testing equipment, and water) required to perform the investigations as specified herein. Obtain all necessary local permits and land access authorizations to complete the investigations unless otherwise directed by Contracting Party. Investigation activities shall be supervised full-time and logged by an experienced geotechnical engineer or geologist.

1.0 Field Investigation Requirements

1.1. Locations
Perform indicated investigation techniques and/or field-testing techniques at indicated investigation locations. If coordinates are provided, utilize GPS equipment that provides accuracy of less than 10 feet for establishing investigation locations. If dimensions are provided, establish investigation locations using methods that provide accuracy of less than 0.5 feet. Stake final placement of investigation locations.

Investigation locations may be adjusted in the field to avoid utilities, overhead obstructions, or to permit easier access, provided the final locations (latitude and longitude coordinates) are noted on the respective logs and plans and adjustment is discussed in final report. Offsets shall not exceed 10 feet from the original location unless approved in advance. In addition, the final latitude and longitude coordinates of all investigation locations shall be summarized as a table in the report and on the boring logs and shall have an accuracy of five (5) decimal places.

If indicated, survey the elevation of each final investigation location, and note the elevation on each boring log. Be responsible for using an established plant benchmark for elevation information or establish a temporary benchmark.

1.2. Site Access
Coordinate with the Contracting Party for access to the site and determine requirements to access the test locations and site restoration requirements.

In general, equipment access should be staged and performed in a manner to prevent significant rutting or damage to existing ground surfaces.

1.2.1 – Project Specific Rutting Limitations

If indicated, additional techniques to prevent rutting including matting, low pressure drilling equipment or other mitigation techniques must be utilized. Any ruts greater than the depth indicated that occur during field work must be repaired including filling, compacting, re-establishing vegetation and erosion control.

1.2.2 – Surfacing

If investigation is located in area with dedicated gravel, stone or other placed material, remove the surface material prior to work and replace in kind after field work is completed.

1.3. Utilities

Locate all underground utilities, obstructions, objects and subsurface structures in vicinity of investigation prior to commencement of any intrusive operations. This includes making appropriate One-Call utility locate, reviewing private utility information made available and meeting with on-site personnel familiar with locations of private utilities as needed. Be responsible for protection of all utilities, obstructions, objects and subsurface structures once identified and be responsible for all damage to such utilities, obstructions, objects and subsurface structures caused by operations.

1.3.1 – Soft Dig

If indicated, perform soft dig techniques in the indicated upper footage at the indicated investigation locations. Soft dig techniques may include hydro-vac excavation or other techniques accepted during the proposal phase to verify clearances from subsurface utilities and structures. Soft dig techniques shall be performed in an "L" shape or in a perimeter around the investigation locations such that undisturbed samples in the indicated upper footage can be obtained. Backfill with material that prevents subsidence at surface. Note backfill material and method in report.

1.3.2 – Private Utility Locate

If indicated, subcontract a private utility locate service to locate utilities at the indicated investigation locations. Use of ground penetration radar or other techniques accepted during the proposal phase shall be used. Provide results of private utility locate service including any plan drawings of the site with located utilities noted.

1.4. Contamination

1.4.1 - No Known Contamination

No contamination is known at the site. If contamination is encountered, cease work and contact contracting party for further direction.

1.4.2 - Possible Contamination in Soils

Previous construction in the vicinity of the proposed project encountered the indicated contamination in the subsurface soils. Due to the potential for encountering additional amounts of the indicated contamination at the proposed subsurface investigation areas, take appropriate measures to detect the presence of contaminants and properly handle any contaminated materials encountered during the proposed subsurface investigation. If contaminated materials are encountered during the investigation, immediately notify the contracting party. Be responsible for the safety and protection of its persons and

property at the project site and shall comply with all applicable federal, state, and local safety laws and regulations.

If indicated, contaminated soil cuttings and drilling fluids shall be containerized and removed from the investigation area and disposed of at an off-site location at the direction of the contracting party.

If indicated, contaminated soil cuttings and fluids shall be containerized as required to meet federal, state, and/or local regulations, and moved to an off-site location at the direction of the contracting party. The contracting party will be responsible for treatment and/or disposal of the contaminated materials.

1.4.3 - Known Contamination in Soils

Known contamination is expected to be encountered during the investigation. Investigation and material handling shall be performed in accordance with the direction of the contracting party.

1.5. Borings

Advance borings to the indicated minimum depths with drilling methods that minimize the potential for disturbance, sloughing, or mixing of materials within soil samples. When water is encountered within a hole in cohesionless material, rotary wash drilling methods with bentonite or polymer slurry shall be used, in which positive head is maintained within the hole. Water levels encountered as well as the method used in advancing drilling shall be indicated on the respective boring logs.

Do not terminate borings in soils that do not provide adequate resistance for the structure types, foundations, loads, earthwork or other project aspects that affect geotechnical performance. At a minimum, medium stiff cohesive soils or medium dense sands are required for boring termination.

1.5.1 – Spoils/Drilling Fluids

Spoils and drilling fluids are to be disposed of properly based on site conditions and as directed. For undeveloped sites, spoils and drilling fluids can be spread along the surrounding ground surface with acceptance by Contracting Party. For developed sites, spread soils and drilling fluids in nearby open area with acceptance by Contracting Party or dispose of spoils and drilling fluids off-site. If specified, containerize all spoils and drilling fluids in 55-gallon metal drums and manage as directed by Contracting Party. If specified, dispose of drums and contents at an off-site location per local, state, and federal regulations.

1.5.2 – Environmental Drilling Techniques

Utilize techniques that prevent cross-contamination between sampling locations. All drilling and sampling equipment shall be decontaminated before initial use and between each boring or use of an individual sampler. For all equipment, augers and samplers, remove soil and other materials, wash with detergent solution, and rinse with potable water after use.

1.5.3 – Coring of Pavement

If specified, coring of pavement is required to perform investigation. Provide required equipment for coring. Where coring samples are obtained, the boring logs shall include detailed information regarding the pavement type, thickness and any base course as well as photographs of the pavement cores.

1.5.4 – Bedrock

1.5.4.1 – No Coring Needed: If bedrock is encountered and no rock coring is indicated, borings can be terminated upon auger refusal on bedrock and a confirmatory sample taken. Auger refusal is defined as less than 3-inches of drill advancement over a one-minute interval with full drilling effort.

1.5.4.2 – Bedrock Unanticipated:

If unanticipated bedrock is encountered, boring may be terminated upon achieving 10 feet of rock core or the minimum boring depth. Under no circumstances shall the total boring depth be less than 50 percent of the indicated minimum boring depth. Notify the Contracting Party within 24 hours of encountering unanticipated bedrock.

1.5.4.3 – Coring Required:

If coring is required, drill boring to refusal on bedrock and then core to minimum core length and/or boring depth as indicated.

Where rock core samples are obtained, the boring logs shall include detailed information regarding the rock types, rock formations, degree of hardness, cementation, extent of weathering, percentage of recovery, and Rock Quality Designation (RQD) values.

1.6. Sampling

Obtain indicated samples every 2.5 feet in the upper 15 feet and every 5 feet below 15 feet unless otherwise indicated by the following methods:

a. Split-Barrel Sampler (SPT) or Ring-Lined Barrel Sampling in cohesionless soils (sands, gravels, non-plastic silts), and cohesive soils (clays and plastic silts) where a disturbed sample is appropriate or a Shelby tube cannot be obtained (hard soils); ASTM D1586 or D3550.

b. Thin-Walled Tube (Shelby) in cohesive soils (clays, plastic silts and materials with cohesive binder); ASTM D1587.

c. Obtain bulk samples of materials from near-surface, cut areas and/or borrow areas for compaction testing.

d. If applicable, perform rock coring continuously to obtain rock core samples and store in core boxes in accordance with ASTM D2113. Take color photographs of each complete core box for inclusion in the Report.

If Field Directed Sampling is indicated, obtain Thin-Walled Tube and bulk samples at locations and depths as directed in the field.

Practical refusal of the sampler shall be defined as a minimum of 50 blows for one inch when within the first six inches of the sampler penetration, and 50 blows for six inches or less when the sampler penetration exceeds six inches.

Provide hammer calibration, and blow count correction to obtain standard N60 value, if an automatic hammer is utilized. Note on the logs what type of hammer is utilized (rope and cathead, or auto hammer and relative energy).

Obtain calibrated hand-held pocket penetrometer and/or torvane readings on all cohesive samples in the field. Seal samples to prevent disturbance and moisture changes and transport to the laboratory for testing. Field extrusion of thin-walled tube (Shelby) samples shall not be performed. Maintain samples for six months after the final Report is provided.

1.7. Rock Probes

Perform rock probe borings at the indicated locations. Drill rock probes until termination criteria is met. Obtain SPT samples every 5 feet for depth of rock probe unless otherwise indicated. An SPT sample shall be obtained at the termination depth of the rock probe. No laboratory testing on SPT samples from rock probes will be performed.

1.8. Cone Penetrometer (CPT) Soundings

Perform CPT soundings at the indicated locations. Complete the CPT soundings to the previously defined depth or refusal criteria utilizing a minimum 10-ton CPT rig that is specifically outfitted to perform only CPT soundings. Other equipment may be considered at discretion of Contracting Party. Utilize seismic CPT as required for indicated work.

Raw cone penetrometer data shall include direct measurements of the cone depth, tip resistance, sleeve friction, and pore pressure for maximum intervals of 2 inches over the full sounding depth. Graphical presentation of the CPT data shall include the above direct measurements, plus additional graphics for the friction ratio, soil classification and shear strength parameters, as applicable. Provide raw data including cone depth, tip resistance, sleeve friction and pore pressure in .XLS format. Provide probe radius, cone area ratio and location of pore pressure measurements on cone.

1.9. Backfill

1.9.1 – Cement-Bentonite Grout

If indicated, backfill all borings and CPT soundings, after water level measurements, with cement-bentonite grout (or in general accordance with the specific requirements of applicable federal, state, and/or local agencies). The backfill material and technique shall be noted on the boring logs and in Report.

1.9.2 – Bentonite Chips/Pellets

If indicated, backfill all borings and CPT soundings, after water level measurements, with bentonite chips or pellets (or in general accordance with the specific requirements of applicable federal, state, and/or local agencies). The backfill material and technique shall be noted on the boring logs and in Report.

1.9.3 – Unspecified

If a particular backfill method is not indicated, backfill all borings and CPT soundings in general accordance with the specific requirements of applicable federal, state, and/or local agencies.

1.9.4 – Pavement Patching

For existing pavements, patch in kind with existing materials by using concrete or cold patch asphalt.

1.10. Groundwater Measurements
In all borings, measure groundwater when first encountered during drilling and at completion of drilling. Perform additional measurements of groundwater depth as indicated.

1.11. Piezometers
Install piezometers as indicated for use in monitoring piezometric levels and obtaining water samples. Install piezometers in augered borings only. Install each piezometer in accordance with the applicable federal, state, or local regulations. Obtain all necessary piezometer installation permits.

Minimum requirements for piezometer installation and finishing shall be as noted in attached scope.

2.0 Field Testing

2.1. Field Electrical Resistivity Survey
Perform a field resistivity survey at the locations indicated. Perform survey per attached scope. The survey shall be completed in an area that is not influenced by the presence of overhead EHV transmission lines, underlying storage facilities, underground utilities or other obstructions that would impact the results of the survey.

2.2. Field Crosshole Seismic Testing
Perform field crosshole seismic testing at the locations indicated. The field crosshole seismic testing shall be performed in accordance with ASTM D4428, Standard Test Methods for Crosshole Seismic Testing. Provide a summary of the field crosshole seismic testing, including a design soil profile with soil unit weight, compression wave velocity, shear wave velocity, shear modulus, and Poisson's ratio values as a function of depth for the site in final report.

2.3. Field Downhole Seismic Testing
Perform field downhole seismic testing, including seismic CPT soundings, at the locations indicated. The field downhole seismic testing shall be performed in accordance with ASTM D7400, Standard Test Methods for Downhole Seismic Testing. Provide a summary of the field downhole seismic testing, including a design soil profile with soil unit weight, compression wave velocity, shear wave velocity, shear modulus, and Poisson's ratio values as a function of depth for the site in final report.

2.4. Field MASW Survey
Perform a field MASW (Multichannel Analysis of Surface Waves) survey at the indicated locations. Complete each survey in an area that is not influenced by the presence of underlying utilities or other obstructions that would impact the results of the survey. Obtain approval in advance of adjustments of a survey location as needed to avoid utilities or other obstructions if approved in advance. Provide a summary of the field MASW testing, including a design soil profile with soil unit weight, compression wave velocity, shear wave velocity, shear modulus and Poisson's ratio values as a function of depth for the site and final survey location in final report.

2.5. CPT Dissipation Testing
Perform dissipation tests at indicated CPT sounding locations in accordance with ASTM D5778, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils. Dissipation tests shall be performed at intervals indicated within the CPT sounding depth below groundwater. Each

dissipation test shall be held until all excess pore pressures dissipate. If time to fully dissipate excess pore pressures is greater than 600 seconds, dissipation test shall be held until 50% of excess pore pressures dissipate. Provide dissipation test result data in XLS format.

If depth interval is not indicated, a minimum of one dissipation test shall be performed at the termination depth or refusal of the CPT sounding.

2.6. Field Hydraulic Conductivity Testing
If indicated, perform field hydraulic conductivity testing at indicated piezometers and/or borings. Perform testing and provide results per attached scope.

2.7. Pressuremeter Testing
Perform pressuremeter testing at locations indicated. Perform pressuremeter testing per attached scope.

2.8. Thermal Resistivity
Obtain samples for laboratory thermal resistivity testing or perform in-situ thermal resistivity testing at locations indicated. Perform thermal resistivity testing per attached scope.

2.9. Infiltration Testing
Perform infiltration testing at locations indicated. Perform infiltration testing per attached scope.

2.10. Geophysical Testing
Perform geophysical testing at locations indicated. Perform geophysical testing per attached scope.

2.11. Solar/BESS Pile Load Testing
Perform Solar/BESS pile load testing per attached scope.

2.12. Test Pits
Perform test pits at locations indicated per attached scope.

3.0 Laboratory Testing

3.1. Specified Testing Program
For specified testing program, perform test types and quantities as specified during the investigation. Provide any necessary information including draft/field logs, CPT sounding data, soil sample type and recoveries or other pertinent information to aid in laboratory testing assignments.

Perform specified swell testing at locations and using methods as indicated in attached scope.

3.2. Non-specified Testing Program
Perform laboratory test types and quantities to classify soils and obtain geotechnical physical characteristics for soils and rock such as strength, compressibility, and compaction characteristics. Perform laboratory testing consistent in quantity and quality with local geotechnical engineering practice to provide the information for the required recommendations. The quantity of tests to be performed shall be dependent upon type of soil and/or rock encountered during drilling and sampling and in consideration of recommendations required for the structures.

Laboratory tests may include, but are not limited by, the tests listed below:

a. Moisture Content
b. Dry Unit Weight
c. Sieve Analyses
d. Percent Finer than No. 200 Sieve
e. Atterberg Limits
f. Unconfined Compression – Soil (Although pocket penetrometer test results can be used to support unconfined compression strength results, they shall not be used exclusively to establish design recommendations for cohesive soils.)
g. Unconfined Compression - Rock
h. One-Point Triaxial Compression (Unconsolidated Undrained)
i. Three-Point Triaxial Compression (Consolidated Undrained with Pore Pressure Measurements)
j. Direct Shear (Consolidated Drained) (to be used in soils not conducive to Unconfined or Triaxial Tests) (Note: soil samples which exhibit a tendency to premature failure due to low cohesion should be tested with a confining pressure equal to the overburden pressure at the depth which the sample was located.)
k. Swell Pressure
l. Consolidation (perform consolidation tests to maximum pressure of 32 ksf, perform one (1) unload/reload curve at load step after reaching preconsolidation pressure and measure coefficient of consolidation for all load steps)
m. Compaction Characteristics (Standard or Modified Proctor Test, as indicated)
n. Chemical Analyses
   (1) pH
   (2) Soluble Sulfates
   (3) Chloride Ion
   (4) Electrical Resistivity
   (5) Redox Potential
   (6) Sulfides

4.0 Reporting

4.1. Data Only Report

Provide report prepared under the direction of a Registered Professional Engineer in applicable locale and signed and sealed in accordance with applicable state regulations. Draft version shall be submitted for review and comment. Following receipt and incorporation of draft comments provide an electronic copy (pdf format) of the final report.

Provide all data and information related to the work performed and applicable to the project. Data includes final boring logs, computer generated CPT sounding logs as well as raw CPT data files, boring location plan, laboratory testing program results, results of the field resistivity survey, results of the field crosshole seismic testing, results of field downhole seismic testing, results of MASW survey testing, results of thermal resistivity testing, CPT dissipation testing results, groundwater depths, results of pressuremeter testing, results of field hydraulic conductivity testing and/or results of infiltration testing.

Provide all laboratory testing result data sheets in report including in addition to results noted on boring logs. Summarize all laboratory testing results in a table attached to report as required by Contracting Party.

4.2. Interpretative Report

4.2.1 - General

Provide report prepared under the direction of a Registered Professional Engineer in applicable locale and signed and sealed in accordance with applicable state regulations. Draft version (pdf format) shall be submitted for review and comment. Following receipt and incorporation of draft comments, provide a final report (pdf format). If requested by Contracting Party, provide all documented calculations for review.

Prepare geotechnical analysis and recommendations in accordance with applicable provisions of the International Building Code (IBC), ASCE7, and any applicable local or state codes as indicated.

4.2.2 - Data

Provide all data and information related to the work performed and applicable to the project. Data includes investigation location plan, final boring logs, computer generated CPT sounding logs as well as raw CPT data files, laboratory testing program results, results of the field resistivity survey, results of the field crosshole seismic testing, results of field downhole seismic testing, results of MASW survey testing, results of thermal resistivity testing, CPT dissipation testing results, groundwater depths, results of pressuremeter testing, results of field hydraulic conductivity testing, and/or results of infiltration testing.

Provide all laboratory testing result data sheets in report including in addition to results noted on boring logs. Summarize all laboratory testing results in a table attached to report as required by Contracting Party.

4.2.3 - Subsurface Conditions

Provide discussion of subsurface conditions encountered based upon stratigraphic sequence observed and local geology. Provide figures displaying soil borings, CPT soundings and generalized cross sections. Provide a general description of the engineering properties or parameters developed from the investigation and applied to foundation recommendations. Provide prevailing groundwater elevations observed and those recommended for design.

4.2.4 - Geologic Hazards

Perform a review of geologic information and provide a discussion of site geologic-seismic conditions that may impact the proposed development, considering the geologic setting, geologic materials, groundwater conditions and faults. Provide a discussion of the potential geologic hazards in the vicinity of the site which may impact the project; including but not limited to fault rupture, landslides, dispersive or collapsible soils, flooding, tsunamis, seiches, inundation, scour and subsidence, as applicable to the site. Provide an evaluation of the applicable geologic hazards and special design features required to resist or reduce these tendencies.

Provide an evaluation of the potential of subgrade materials to develop karst features, solution channels or sinkhole formations and special design features required to resist or reduce these tendencies. Provide definition and discussion of the relative risk for sinkhole development and/or the presence of voids within the subsurface materials encountered.

Provide an evaluation of the expansive (swelling) nature of subgrade materials and special design features required to resist or reduce these tendencies shall be discussed. If soils present at the site are suspected of exhibiting expansive characteristics, perform a sufficient number of swell/collapse potential tests to adequately characterize the site's active zone.

4.2.5 - *Seismic Hazards*

Perform a review of seismic hazards which may include slope instability, liquefaction, total and differential settlement (seismic induced), surface displacement due to faulting or seismically induced lateral spreading or lateral flow. Provide recommendations to address the following seismic design parameters in accordance with applicable provisions of IBC and ASCE7.

- Provide a determination of the Site Class in accordance with Chapter 20 of ASCE7.
- Provide a determination of mapped acceleration parameters S_s, S_1, F_a, F_v, S_{DS}, and S_{D1} in accordance with ASCE7.
- Provide a determination of the Seismic Design Category per Section 11.6 of ASCE7, based upon the site-specific information and Risk Category classification.
- If evaluating Site Class with SPT blow counts, consider range of Site Classes using the approach defined by ASCE7, if applicable, to determine mapped acceleration parameters and Seismic Design Category.
- When structures are noted as Seismic Design Categories C through F, the geotechnical investigation shall include an evaluation of all of the following potential geologic and seismic hazards in accordance with Sections 11.8.2 and 11.8.3 of ASCE7: slope instability, liquefaction, total and differential settlement (seismic induced), surface displacement due to faulting or seismically induced lateral spreading or lateral flow. Provide recommendations for foundation designs or other measures to mitigate the effects of the above hazards.

4.2.6 - Site Specific Response Analysis

If indicated, perform per attached scope.

4.2.7 - Previous Construction Activity

Provide a discussion of previous construction activity which addresses any existing fills or subsurface openings (including surface or underground mining), if applicable. Outline the engineering properties of any existing fills in regard to foundation design.

4.2.8 – Settlement

Provide a discussion on the potential for immediate and long-term settlement of soils from earthwork, mat foundations, tank foundations, pile groups or other features that can cause appreciable settlement. Provide a table indicating recommended consolidation/settlement design values for each layer encountered. Provide multiple tables based on structure layout, subsurface variability and grading plan. At a minimum, the parameters provided for each design layer must include unit weight, compression index, recompression index, coefficient of consolidation, preconsolidation pressure, initial void ratio, elastic modulus,

4.2.9 - Earthwork

Provide grading recommendations taking into consideration conceptual grading plan for the site. Provide recommended slope percent and associated distance from structures to maintain proper drainage away

from foundations. Provide estimated of range of settlement caused by fill and timeline for time-dependent settlement.

Provide general criteria and recommendations for acceptable fill and backfill materials (general and structural fill). If overexcavation of unsuitable materials and structural backfill appear warranted, provide vertical and horizontal extent of the overexcavation and structural backfill. Fill and/or backfill material shall provide a stable, well-drained site to minimize the potential for excessive settlement and/or shrink/swell related movements of the foundations and structures.

For compaction of or re-use of on-site soils for fill, provide discussion on needed wetting or drying of this material to meet geotechnical recommendations. Justify this discussion based on moisture content and standard Proctor testing of on-site soils.

Where applicable, address whether the available borrow material on site is suitable for general and/or structural fill. Provide recommendations for recommended treatment to available borrow material, if applicable. Compaction criteria, including acceptable gradations, moisture control, compactive effort, and need for proof rolling shall be discussed, including criteria for both granular and cohesive fill, as applicable to material type.

If indicated, provide earthwork balance factors for cut and fill operations, accounting for in-situ soils and bedrock that may be removed during excavation and grading operations. Factors should account for material swell/shrinkage for cut-to-compaction, and for cut-to-spoil. Perform compaction and density as required to support factor development.

4.2.10 - Shallow Foundation Design

Provide the following recommendations for shallow foundations:

- Net allowable bearing pressure. All factors of safety utilized in developing the allowable load capacities shall be outlined in detail or provide minimum recommended factors of safety if ultimate values provided. Provide maximum size of foundation for net allowable bearing pressure.
- Minimum foundation width.
- Minimum cover for frost depth.
- Recommendations for resistance to lateral loads, such as passive earth pressures or sliding friction and recommended factor of safety.
- Design groundwater level for evaluation of buoyancy and means to resist buoyancy and other uplift forces.
- Modulus of subgrade reaction for soils supporting slab-on-grade or mat foundations and the appropriate formula(s) for adjusting this value for varying mat sizes.
- Total and differential settlement estimates for each foundation type.
- Requirements for mitigation of poor materials if loose random fills, soft subgrade soils, collapsible and/or expansive clay soils are encountered. Provide distances, extent of limits, and depths to which mitigation is required. Provide figures for clarity of proposed dimensions.
- For tank foundations, provide the estimated range of settlement along the perimeter of the tank, estimated settlement at the center of the tank, and edge stability capacity if applicable.

4.2.11 - Deep Foundation Design

Provide the following recommendations for deep foundations:

- Type(s) of foundation.
- Minimum embedment lengths.
- Ultimate skin friction and end bearing values for compression and uplift for each soil or rock stratum encountered.
- Appropriate factors of safety to utilize in design.
- Estimated settlement for deep foundations including group and individual settlement of piles.
- Generalized stratigraphic profile for the site which defines the depths and/or elevations for the interfaces and changes in soil and rock materials and water conditions.
- If applicable, discuss the requirements or constructability of belled drilled shafts in soil or the use of shear rings in rock to increase axial and uplift capacities.
- If the depths or elevations of stratigraphic layers vary substantially across the site, provide the extent of variability, both vertically and horizontally across the site, and provide the subsurface parameters for each respective stratigraphic profile.
- For linear projects, provide stratigraphic profiles and design parameters for each boring or CPT location.
- Direct embedded poles will utilize crushed rock or unreinforced concrete backfill.

If specified, provide the following LPILE recommendations:

- Design water level.
- Lateral design parameters for each soil layer including the recommended soil model type, effective unit weight, cohesion or friction angle.
- Lateral design parameters for each rock layer including specified rock model and required parameters as specified in LPILE technical documentation.

If specified, provide the following FAD Tools recommendations:

- Design water level.
- Lateral design parameters for each soil layer including the total unit weight, cohesion or friction angle, and deformation modulus. Standard penetration resistance should also be provided for each layer of the stratigraphic profile.
- Lateral design parameters for each rock layer including Rock Mass Rating System (RMR76), rock φ' (effective phi angle), rock c' (effective cohesion), rock mass modulus of deformation and rock to concrete bond strength.

4.2.12 - Lateral Earth Pressures

Provide lateral earth pressures for below grade vertical walls both of the flexible and rigid type. Provide the lateral earth pressures as equivalent fluid pressure values. Provide any assumptions relating to the construction method or type of backfill in detail (i.e., granular, cohesive, drained, or undrained conditions). Active, passive, and at-rest coefficients used in calculating these pressures shall be noted.

If indicated, provide recommendations on dynamic lateral earth pressures during a seismic event. Use Mononobe-Okabe method or approved alternative method.

4.2.13 - Temporary Slopes and Excavations
Provide recommendations on inclination of both temporary excavations and temporary slopes. Identify OSHA soil types and address any temporary slopes required for excavation and the need for sheeting and shoring.

4.2.14 - Excavation Requirements
Address the excavatability of the soils and rock that may be exposed during foundation excavation and site grading. Provide general recommendations corresponding to the effort and type of equipment generally utilized to perform excavations of noted size and depth of the excavation and materials to be encountered.

4.2.15 - Trenchless Excavations
If indicated, provide data and recommendations as specified in attached scope.

4.2.16 - Dewatering
Provide discussion on conditions present at the site requiring groundwater control, dewatering, or surface drainage during excavation and construction. Anticipated types of dewatering shall be described along with extent or time of operation. Special consideration to exposed subsoils within the bottom of excavations during construction shall be addressed.

4.2.17 - Corrosion Potential
Provide an evaluation of representative subsurface materials and provide laboratory test results for chemical constituents including pH, chloride ion, soluble sulfates, electrical resistivity, redox potential and sulfides. These parameters are required to evaluate the potential for corrosion of underground piping, for design of grounding, and for selection of cement type to resist potential sulfate attack. Provide recommendations on cement type for concrete in contact with soil to resist chemical attack.

4.2.18 - Pavement
Provide recommendations for subgrade preparation in areas requiring paving or gravel surfacing as well as pavement design recommendations. If indicated, provide a design CBR value, the modulus of subgrade reaction, k, the resilient modulus, M_R, and the undrained shear strength values for the near surface soils and soils at the anticipated final grade. If indicated, provide representative concrete pavement section and asphalt pavement section based on traffic loading provided.

4.2.19 - Summary of Environmental Screening
Provide a summary of the environmental screening, and the extent of environmental contamination encountered during this investigation at the Site.

Geotechnical Scope of Work
Field Infiltration Scope

Perform double-ring infiltration tests and provide results at specified locations and per State or local requirements. The tests shall be 5 feet below ground surface. Test shall be performed in compliance with ASTM D-3385 or as applicable. Alternate testing methods can be submitted for acceptance prior to mobilization.

Provide estimated average seasonal groundwater levels across the Site. Provide a description of the soil layering and soil grain analysis, soil permeability, and other soil characteristics in the vicinity of the storm water management system required for design in accordance with State or local requirements. Provide recommendations regarding surrounding drainage aggregate, aggregate filter material or geotextile as deemed necessary to prolong the use of the infiltration system.

Geotechnical Scope of Work
Field Electrical Resistivity Scope

A. Field Electrical Resistivity Survey:
   1. A field resistivity survey shall be performed where indicated on the attached boring location plan.
   2. The resistivity testing shall be conducted in accordance with IEEE Standard 81 and ASTM G 57 using the Wenner 4-Point method.
   3. Test shall utilize a frequency other than 60Hz and its harmonics.
   4. All underground and above ground current paths in the testing area shall be identified prior to testing. Items include (but are not limited to) pipes, cables, tanks, ground grids, cathodic protection, railroad tracks, transmission/distribution lines, structures, fences, and bodies of water.
   5. The survey shall be conducted along three (3) lines at the proposed locations
      a. Select the alignment for the measurements to include uniform topography over the limits of the electrode span. In the electrode span, do not include large non-conductive bodies such as frozen soil, boulders, concrete foundations, etc. which are not representative of the soil of interest.
      b. Conductive structures such as pipes and cables should not be within ½ 'a' of the electrode span unless they are at right angles to the span and 20 feet away from the test setup.
   6. Measurements shall be taken when the ground is dry and no less than 24 hours after measurable precipitation has occurred at the measuring site. If the soil is too dry to achieve good contact with the probe, water shall be added into the soil at each probe location.
   7. Probe lead magnetic coupling shall be minimized by probe lead separation of at least 10 feet where running parallel and/or test instrument selection with integral filtering.
   8. Where unsuitable conditions are encountered, test may be run in an area adjacent or close to the original site that has comparable soil and ground conditions.
   9. For each line of testing, readings shall be taken with "a" spacings of at least the following: 1.5, 2.5, 5, 7.5, 10, 20, 30, 40, 50, 60, 70, 80 90, 100, 200, etc., out to the extents of the traverses placed on the layout drawing or as far as otherwise practical.
   10. Pin depth for the Potential Electrodes shall be no more than 10% of the "a" spacing. Make a record of the electrode spacing, resistance (or amps and volts), date, time, air temperature, topography, drainage, and indications of contamination, to facilitate subsequent interpretation. The values reported for each "a"-spacing shall include current, potential, and apparent resistivity, reported in Ohm-cm.
   11. Resistivity shall be measured at each point with two different injection currents that differ by at least a factor of 2. If the test values differ by more than 10% from each other, the tests shall be repeated for confirmation. If the discrepancy persists, the tests shall be repeated at a different location near the first site that has comparable soil and ground conditions.

B. Field Electrical Resistivity Survey:
   1. Laboratory electrical resistivity testing and in-situ moisture content testing shall be performed on all samples obtained from borings at locations indicated.

Geotechnical Scope of Work
MASW Scope of Work

Field Multichannel Analysis of Surface Waves (MASW) surveys shall be performed at the location indicated. The survey shall be completed in an area that is not influenced by the presence of underlying utilities or other obstructions that would impact the results of the survey. The survey locations may be adjusted as needed to locate an appropriate area within a reasonable vicinity of the specified location. Indicate the location of the field MASW surveys on the boring location plan provided in the Report. The CONSULTANT shall present a summary of the field MASW testing, including a design soil profile with soil unit weight, shear wave velocity, shear modulus and Poisson's ratio values as a function of depth for the site.

Location (See Investigation Schedule and Location Plan):

Boring: B-09

Geotechnical Scope of Work
Thermal Resistivity Scope

Sample Depths and Types

Boring Designation	Sample Depths (ft)
T-01, T-02, T-03, T-04, T-05, T-06, T-07, T-08, T-09, T-10	3-5

Select soil samples shall be bulk sampled by the consultant and tested for thermal characteristics. Subcontract and coordinate with Geotherm, Inc. regarding this laboratory testing to assure that samples for laboratory thermal resistivity testing are obtained at the appropriate intervals and depths, proper sampling techniques are used, adequate sample size is obtained, samples are stored and shipped properly, and to perform the thermal resistivity testing. Samples shall be shipped to **Geotherm USA, 21239 FM529 Road, Bldg F, Cypress, Texas 77433 Telephone Number: 281-985-9344**.

Bulk samples should be recompacted to 95% standard Proctor effort (ASTM D698) to simulate native backfill conditions. Laboratory testing shall be completed on samples taken at depths indicated. Testing shall include a description of the soils, moisture content, density and thermal dryout tests (thermal resistivity versus moisture content) and shall be in accordance with IEEE 442.

The data from the thermal resistivity testing shall be incorporated into the Report. The Report data shall include a summary of the laboratory test results, Geotherm's evaluation of the results, and thermal dryout curves (thermal resistivity versus moisture content).

Sampling should be performed in accordance with Geotherm's sampling specification. For your convenience, general requirements for sampling are below:

1. If cohesive soils (clayey or silty) are encountered, samples should be taken in nominal 3-inch diameter Shelby tubes, standard split spoon samples or auger cuttings should be taken.
2. The samples should be representative of the soil at the duct bank burial depth. If the soil above this elevation is different, it should be sampled as well.
3. Undisturbed tube samples should be about 6" long and disturbed (bulk) samples should be about 10 pounds in weight.
4. Tube samples should be sealed at both ends with plugs or plastic caps and tape to minimize disturbance and moisture loss during shipment.
5. Disturbed (bulk) samples should be contained in heavy-duty zip-lock bags and properly sealed to ensure natural moisture content.
6. If bedrock is encountered at the depth of the line, obtain core samples (minimum 2 inches diameter by 5 inches long) or block samples of about 5-inch cube of irregular shape.
7. Provide a copy of the boring logs to Geotherm.

21239 FM529 Road, Bldg F
Cypress, Texas 77433
Tel: 281-985-9344
Fax: 832-427-1752
info@geothermusa.com
http://www.geothermusa.com

Sampling and Shipment of Soil/Backfill Samples for Thermal Analysis

Undisturbed Tube Samples and Bulk Samples

- If cohesive soils (clayey or silty) are encountered, samples should be taken in nominal 3" diameter Shelby tubes or large diameter California sampler with brass liners (no rings), otherwise, standard split spoon samples or auger cuttings should be taken (see bulk soil section below).

- Please do not extrude sample from Shelby tube. Cut the bottom 6" section (+/- ½") of the tube, seal both ends with plastic caps and tape it to prevent any moisture loss.

- Identify the samples with Project Name, Location, Bore Hole, Depth, Date samples taken, etc

- The samples should be representative of the soil at the cable (or ductbank) burial depth. If the soil above this elevation is different, it should be sampled as well.

- Please include a copy of the borehole logs.

- Email the details of the shipment - courier name, tracking number, etc. to info@geothermusa.com and lab@geothermusa.com

- If ***bedrock*** is encountered, take core samples (minimum 2" diameter by 5" long) or block samples of about 5" cube of irregular shape.

Bulk Soil or Backfill Samples

- Send ~10 pounds of each sample, contained in double heavy-duty plastic (Ziploc) bags, identified with Project Name, Sample Location, Bore Hole, Depth, Date samples taken, etc…

- Email the details of the shipment - courier name, tracking number, etc. to info@geothermusa.com and lab@geothermusa.com

- For all foreign shipments

    - declare a value of $10 for the entire package and send it via ***FedEx or UPS*** overnight service (or 2nd day air service).
    - Mark the package "***Aggregate samples for laboratory testing only".***
    - Request import permit instructions to info@geothermusa.com

- Provide the Proctor (Standard or Modified) density, starting moisture content and percent compaction effort.

Purpose for testing (in-situ vs. construction phase), the following apply:

For thermal resistivity measurements to determine in-situ values

- For soils that are cohesive
  - Undisturbed tube samples
    - bottom 6-inches of Shelby tube or
    - brass/stainless steel liner (minimum diameter of 2-inches)
      - must be continuous and NOT ring samplers
  - Disturbed samples
    - Provide Proctor Density Curve for each sample (Standard or Modified)
    - Provide percent (%) compaction (i.e. 95%, 90% or 85%)
    - ***In-situ moisture content unless otherwise specified***

For thermal resistivity measurements to determine construction phase (materials to be used around cables)

- Disturbed samples
  - Provide Proctor Density Curve for each sample (Standard or Modified)
  - Provide percent (%) compaction (i.e. 95%, 90% or 85%)
  - Provide moisture content the sample should be installed at (i.e. in-situ, optimum or %)

1. **Provide soil descriptions or borehole logs, a business card or contact information with the samples in a separate Ziploc bag.**
2. **Please issue a PO or a charge to number with the samples**
3. **Email the tracking number to info@geothermusa.com and lab@geothermusa.com**
4. **Turnaround time is about 12 calendar days after we receive all the necessary information**

Ship all samples to:

GEOTHERM USA
ATTN: Lab Manager
21239 FM529 Road, Bldg F
Cypress, Texas 77433
Tel: 281-985-9344

Native Soil or Backfill Chain of Custody Form

Company Name: ________________________ Contact Name: ______________________

Contact Number: _______________________ Project Name: _______________________

Project Location: _______________________ Project Number: _____________________

PO/Job Number: _______________________ Company to Invoice: __________________

A/P Email Address: _____________________ Rush Testing (additional fee) ☐ Yes ☐ No

Thermal Requirements: ____

Testing Instructions – for bulk samples, all sample testing instructions are required for testing to begin.
1) Proctor - (Modified or Standard) Max Dry Density and Optimum Moisture Content
2) Compaction Effort(s) – how the material will be placed back in the ground
3) Test Moisture Content(s) - Please Select all that apply

Proctor Type[1]: ☐ Standard (ASTM D698) ☐ Modified (ASTM D1557)

Material/Sample Information					Proctor Results (Bulk)		Testing Requirements	
Sample ID	Collection Date	Sample Depth (ft)	Sample Type	Soil/Backfill Description	Max Dry Density (lb/ft^3)	Optimum M/C (%)	Compaction Effort(s) for testing[2] (% of Max Density)	highest Moisture Content for Testing[3] Select all that apply
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Receive: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________
			☐ Tube ☐ Bulk ☐ Both					☐ Optimum ☐ In-Situ/As Received: ______ Specified: ______________