



**MOUNTAIN REGIONAL WATER SPECIAL SERVICE DISTRICT
PARK CITY, UTAH**

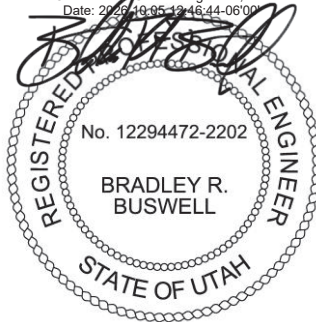
SIGNAL HILL WATER TREATMENT PLANT OPTIMIZATION

ENGINEER PROJECT NO. 203230

**ADDENDUM NO. 1
TO THE
CONTRACT DOCUMENTS**

OCTOBER 5, 2026

Digitally signed by Bradley R. Buswell
Contact Info: Carollo Engineers, Inc.
Date: 2026.10.05 12:46:44 -06'00'



Bidders on the above-named project are hereby notified that the Bidding Documents are modified as indicated below. Bidders are required to acknowledge receipt of this Addendum in the space provided on the Document 00_41_00 - Bid Form.

This Addendum shall become part of the Contract and provisions of the Contract apply.

SPECIFICATIONS

The following sections are modified as indicated below.

1. SECTION 00_11_13 - INVITATION TO BID
 - a. REPLACE bid date of October 15 with October 22.
2. SECTION 00_41_00 - BID FORM
 - a. ADD the price in figures for Bid Item Number 3 - Assignment of the Agreement for pre-purchased Electrical Distribution Equipment as \$412,165.72.
3. SECTION 00_52_00 - AGREEMENT BETWEEN OWNER AND CONTRACTOR
 - a. REPLACE the estimated quantity for Unit Price Item 2.A in the table under paragraph 4.01.B to 17,500 square feet.
4. SECTION 00_73_00 - SUPPLEMENTARY CONDITIONS
 - a. DELETE paragraph 7.10 in its entirety.
5. SECTION 00_82_00 - FEDERAL AND STATE FUNDING REQUIREMENTS
 - a. ADD attached "General Decision Number: UT20260079 05/18/2026, Construction Types: Building" as an addition to Attachment J.
6. SECTION 03_64_25 - HYDROPHILIC AND HYDROPHOBIC FOAM POLYURETHANE RESIN INJECTION SYSTEM
 - a. ADD attached section in its entirety.
7. SECTION 03_70_30 - THERMAL CONTROL OF CONCRETE
 - a. ADD attached section in its entirety.
8. SECTION 11_53_05 - FIXED LABORATORY EQUIPMENT
 - a. DELETE paragraph 1.01.A.1 in its entirety.
 - b. DELETE paragraph 1.01.A.3 in its entirety.
 - c. DELETE paragraph 1.01.A.5 in its entirety.
 - d. DELETE paragraph 2.03.A in its entirety.
 - e. DELETE paragraph 2.03.B in its entirety.
 - f. DELETE paragraph 2.03.D in its entirety.
 - g. DELETE paragraph 2.03.E in its entirety.
 - h. DELETE paragraph 2.03.G in its entirety.
 - i. DELETE paragraph 2.03.H in its entirety.
 - j. DELETE paragraph 2.03.I in its entirety.
 - k. DELETE paragraph 2.03.J in its entirety.

- l. DELETE paragraph 2.03.K in its entirety.
 - m. DELETE paragraph 2.03.L in its entirety.
 - n. DELETE paragraph 2.03.M in its entirety.
 - o. DELETE paragraph 2.03.N in its entirety.
 - p. DELETE paragraph 3.02.C in its entirety.
 - q. DELETE paragraph 3.02.D in its entirety.
 - r. DELETE paragraph 3.02.E in its entirety.
9. SECTION 12_35_54 - METAL LABORATORY CASEWORK
- a. ADD attached section in its entirety.
10. SECTION 12_36_24 - LABORATORY WORK SURFACES
- a. ADD attached section in its entirety.
11. SECTION 40_05_65.01 - GATE, GLOBE, AND ANGLE VALVES
- a. ADD attached section in its entirety.
12. SECTION 40_61_16.10 - SPECIFIC CONTROL STRATEGIES
- a. DELETE the following language from 3.01.D.3.a:
 - 1) "and Section 40_61_15 - Control Strategies"
 - b. DELETE the following language from 3.02.D.3.a:
 - 1) "and Section 40_61_15 - Control Strategies"
 - c. DELETE the following language from 3.03.D.3.a:
 - 1) "and Section 40_61_15 - Control Strategies"
 - d. DELETE the following language from 3.04.A.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - e. DELETE the following language from 3.04.B.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - f. DELETE the following language from 3.05.A.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - g. DELETE the following language from 3.05.B.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - h. DELETE the following language from 3.05.C.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - i. DELETE the following language from 3.05.E.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - j. DELETE the following language from 3.05.F.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"
 - k. DELETE the following language from 3.05.G.4.c.1:
 - 1) "and Section 40_61_15 - Control Strategies"

- l. DELETE the following language from 3.05.H.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- m. DELETE the following language from 3.05.I.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- n. DELETE the following language from 3.05.J.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- o. DELETE the following language from 3.05.K.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- p. DELETE the following language from 3.05.L.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- q. DELETE the following language from 3.05.M.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- r. DELETE the following language from 3.05.N.4.c.1:
 - 1) “and Section 40_61_15 - Control Strategies”
- s. DELETE the following language from 3.06.D.3.a:
 - 1) “and Section 40_61_15 - Control Strategies”
- 13. SECTION 40_71_15 - MAGNETIC FLOW METERS
 - a. ADD the following new paragraph as 2.03.A.5:
 - 1) “Siemens.”
- 14. SECTION 40_71_66 - FLOW MEASUREMENT: ULTRASONIC TRANSIT TIME - NON-INTRUSIVE
 - a. REPLACE the Specification Number reference in Attachment A from “17000” to “40_71_66.”
- 15. APPENDIX D
 - a. REPLACE Appendix D in its entirety with the attached Electrical Distribution Equipment Price and Scope.

DRAWINGS

The following drawings are modified as indicated below.

- 1. DRAWING 04C03
 - a. REPLACE “32_19_19” with “32_92_19” in Keynote 3.
- 2. DRAWING 05C01
 - a. DELETE Keynote 5 in its entirety.
 - b. REPLACE “00_40_00” with “00_41_00” in Keynote 11.
 - c. REPLACE “00_40_00” with “00_41_00” in Keynote 12.
- 3. DRAWING 05C02
 - a. DELETE Keynote 2 in its entirety.

4. DRAWING 00A01
 - a. REMOVE “AND SPECIFICATION SECTION 13_34_19” in Keynote 2.
5. DRAWING 40A01
 - a. REMOVE “AND SPECIFICATION SECTION 13_34_19” in Keynote 2.
6. DRAWING 70P01
 - a. ADD the following language to the end of Keynote 6:
 - 1) “ADD PIPING INSULATION TO EXPOSED PIPING PER SECTION 22_42_01.”

OTHER SUPPORTING DOCUMENTS

1. See attached for the sign-in sheet from Pre-Bid Meeting.
2. See attached geotechnical report titled “Geotechnical Investigation, Signal Hill Water Treatment Plant Expansion”, dated October 2025.
3. See attached geotechnical report titled “Geotechnical Study, Signal Hill WTP Floating Solar Array”, dated September 2023.

"General Decision Number: UT20260079 05/18/2026

State: Utah

Construction Types: Building

Counties: Utah Counties of
Daggett, Duchesne, Rich and Summit

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

BOIL0004-001 01/01/2025

	Rates	Fringes
BOILERMAKER.....	\$ 44.37	26.87

ELEC0354-001 06/01/2024

	Rates	Fringes
ELECTRICIAN.....	\$ 41.23	17.66
ELECTRICIAN (LOW VOLTAGE WIRING ONLY).....	\$ 31.86	15.83

ELEC0354-001 06/11/2025

	Rates	Fringes
ELECTRICIAN.....	\$ 41.23	17.66
ELECTRICIAN (LOW VOLTAGE WIRING ONLY).....	\$ 31.86	15.83

SFUT0669-003 01/01/2025

	Rates	Fringes
SPRINKLER FITTER (FIRE SPRINKLERS).....	\$ 42.17	26.63

SHEE0312-001 07/01/2025

	Rates	Fringes
SHEET METAL WORKER (HVAC DUCT INSTALLATION ONLY)....	\$ 46.79	14.89

SUUT2012-011 07/29/2014

	Rates	Fringes
TILE SETTER.....	\$ 20.63	0.00
TILE FINISHER.....	\$ 17.00	0.00
PLUMBER.....	\$ 24.00	4.62
OPERATOR: BACKHOE/EXCAVATOR/TRACKHOE.....	\$ 16.59	0.79
LABORER: MASON TENDER - BRICK.....	\$ 16.54	0.00
LABORER: COMMON OR GENERAL.....	\$ 13.98	0.00
IRONWORKER, STRUCTURAL.....	\$ 17.41	6.13
IRONWORKER, REINFORCING.....	\$ 15.00	0.00
INSULATOR - BATT.....	\$ 12.50	0.23
CEMENT MASON/CONCRETE FINISHER.....	\$ 21.11	0.00
CARPENTER, EXCLUDES ACOUSTICAL CEILING INSTALLATION.\$	19.51	5.30
CARPENTER (ACOUSTICAL CEILING INSTALLATION ONLY)....	\$ 21.72	1.43

BRICKLAYER.....\$ 23.88

0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least \$13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than **USU**, **UAVG**, **SA**, or **SC** denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in

processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE:

UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The SU identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

SU wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The SA identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the SA identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION

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New Section

SECTION 03_64_25^{AD1}

HYDROPHOBIC FOAM POLYURETHANE RESIN INJECTION SYSTEM

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Hydrophobic foam polyurethane resin injection system.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. D638 - Standard Test Method for Tensile Properties of Plastic.
 - 2. D3574 - Standard Test Methods for Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams.
- B. NSF International (NSF):
 - 1. 61 - Drinking Water System Components - Health Effects.

1.03 SUBMITTALS

- A. Submit as specified in Section 01_33_00 - Submittal Procedures.
- B. Product data: Submit manufacturer's data completely describing polyurethane resin injection system materials.
- C. Quality control Submittals:
 - 1. Certificates of Compliance.
 - 2. Manufacturer's instructions.
 - 3. Protection plan for surrounding areas and non-cementitious surfaces.

1.04 QUALITY ASSURANCE

- A. Products:
 - 1. Provide materials that are new and use them within shelf life limitations set forth by the manufacturer.
- B. Qualifications:
 - 1. Installer:
 - a. Minimum 5 years' experience in concrete repair with focus on application of similar systems and products to projects of similar size and scope.
- C. Pre-installation meeting:
 - 1. At least 1 week prior to commencing work of this Section, convene a meeting at the project site to review and discuss the following:
 - a. Surface preparation.

- b. Substrate conditioning and pre-treatment.
- c. Installation procedures.
- d. Environmental conditions (including weather forecast) and curing requirements.
- e. Testing and inspection procedures.
- f. Protection of surrounding surfaces and equipment.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Labels shall indicate product identification, batch numbers, and shelf life.
- B. Store materials off the ground, away from moisture and direct sunlight, and at temperatures within manufacturer's recommended range.
- C. Pre-condition materials to manufacturer's recommended temperatures before using.

1.06 PROJECT CONDITIONS

- A. Take precautions to protect surfaces and equipment in the work area from damage and staining.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Polyurethane resin injection systems that will be in direct contact with water after the Work is completed shall comply with applicable federal, state, or local regulations.
 - a. Confirm compliance by submitting documentation that products have been tested and listed in accordance with NSF-61 requirements. Provide testing by a nationally-recognized agency acceptable to Engineer.
 - 2. Repair materials shall be free of chlorides or alkalis (except for those attributed to water).
 - 3. To ensure compatibility of materials and methods, a single manufacturer shall produce and provide all products used together in a single area of concrete repair.
- B. Manufacturers: One of the following, or equal:
 - 1. Sika Corp., SikaFix HH LV.
 - 2. Master Builders Solutions/Sika, MasterInject 1230 IUG.
 - 3. SealBoss Corp., 1510 Water Stop Foam.
- C. Resin:
 - 1. Water-insensitive 1-part low-viscosity polyurethane resin adhesive material containing 100-percent solids and meeting or exceeding following characteristics when tested in accordance with standards specified:

Physical Characteristic	Required Results
Viscosity	400 to 600 CPS at 70 degrees Fahrenheit
Flash Point	Greater than 200 degrees Fahrenheit
Corrosiveness	Non-corrosive
Reaction Time	75 to 90 seconds at 80 degrees Fahrenheit
Toxicity	Non-toxic

- a. Uncured.
- b. Cured foam (1:1):

Physical Characteristic	Test Method	Required Results
Tensile Strength	ASTM D3574 ASTM D638	150 to 400 pounds per square inch 29 pounds per square inch
Elongation	ASTM D3574 ASTM D638	400 to 1,200 percent 44 percent

2.02 EQUIPMENT

- A. Pump unit:
 - 1. Furnish unit to be used for injection that is positive displacement type with interlock to provide in-line mixing and metering system for 1 component polyurethane resin.
 - 2. Furnish pressure hoses and injection nozzle of such design as to allow proper mixing of polyurethane resin.
 - 3. Standby injection unit may be required.
- B. Resin pump: Operating pressure in excess of 2,000 pounds per square inch with a variable pressure control trigger mechanism with attached pressure gauge, on the downstream end of the material supply hose.
- C. Water pump: High-pressure water blaster capable of 1,000 pounds per square inch or higher pressure.
- D. Incidentals: To be determined by site conditions and Contractor. See Installation Bulletin 6I12 - Urethane Injection, from Master Builders Solutions Construction Chemicals, LLC.

PART 3 EXECUTION

3.01 PREPARATION

- A. Surface preparation:
 - 1. Confirm that surface temperatures and moisture conditions are within manufacturer's recommended limits. Condition surfaces to within those limits before commencing urethane injection.
 - 2. Sweep or clean area in vicinity of cracks and joints that will be injected with polyurethane resin.

3. Clean cracks and joints so they are free from dirt, laitance, and other loose matter.

3.02 INSTALLATION

- A. Install and cure polyurethane resin materials in accordance with manufacturer's installation instructions.
- B. Mixing:
 1. Mix urethane in accordance with manufacturer's installation instructions.
- C. Injection:
 1. Apply adequate surface seal to crack or joint to prevent escape of polyurethane resin.
 2. Establish injection ports along seal at a spacing not greater than the thickness of cracked member.
 3. Inject polyurethane resin into crack or joint at first port with sufficient pressure to advance polyurethane resin to adjacent port. Start at lowest port along the injection line and work upwards.
 - a. Seal original port and shift injection to next adjacent port at which polyurethane resin appears.
 - b. Continue port-to-port injection until each crack or joint has been injected for its entire length.
 4. For small amounts of polyurethane, or where excessive pressures developed by injection pump unit might further damage the structure, material mixed and installed with a hand caulking gun may be used if acceptable to the Engineer.
 5. Seal ports, including adjacent locations where polyurethane resin seepage occurs, as necessary to prevent drips or run out.
 6. After injection is complete, remove surface seal material and re-finish concrete in the area where the polyurethane was injected to match surrounding concrete. Leave finished work and work area in a neat and clean condition.

3.03 FIELD QUALITY CONTROL

- A. Provide Contractor quality control as specified in Section 01_45_00 - Quality Control.
- B. Field inspections and tests:
 1. Submit records of inspections and test to Engineer within 24 hours after completion.
- C. Manufacturer's services.
 1. Pre-installation meeting: Provide manufacturer's technical representative to attend pre-installation meeting specified in Section 01_45_00 - Quality Control.

3.04 FIELD QUALITY ASSURANCE

- A. Provide Owner quality assurance as specified in Section 01_45_00 - Quality Control.
- B. Special inspections, special tests, and structural observation:
 - 1. Not required.
- C. Field inspections:
 - 1. Preparation.
 - a. Review manufacturer's product data and installation instructions.
 - 2. Required inspections:
 - a. Observe surfaces to be injected for temperature and moisture conditions.
 - b. Observe conditioning and preparation of urethane resin.
 - c. Observe injection procedures for filling cracks.
 - 3. Records of inspections:
 - a. Provide record of each inspection.
 - b. Submit to Engineer upon request.

3.05 NON-CONFORMING WORK

- A. Cracks, after injection, shall show no evidence of running or seeping water. Re-inject as necessary to provide watertight seal at no additional cost to Owner.
- B. Rework surface finishes that do not match surrounding concrete to the satisfaction of the Engineer at no additional cost to Owner.

END OF SECTION

AD1 Addendum No. 1

New Section

SECTION 03_70_30^{AD1}

THERMAL CONTROL OF CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Monitoring and control of concrete hydration temperatures during set and curing.

1.02 DELEGATED DESIGN

- A. As specified in Section 01_35_73 - Delegated Design Procedures.
- B. Thermal control plan.

1.03 SUBMITTALS

- A. Furnish Submittals as specified in Section 01_33_00 - Submittal Procedures and Section 01_60_00 - Product Requirements.
- B. Product data.
- C. Delegated Design Submittals:
 - 1. Thermal control plan.
- D. Temperature monitoring program.
- E. Temperature monitoring data:
 - 1. Tabular data of hourly concrete temperature for each temperature sensor.
 - 2. Tabular data for hourly concrete temperature differential for each temperature sensor.
 - 3. Plot of temperature and temperature differential for each temperature sensor.
- F. Cooling pipe system, if used:
 - 1. Layout showing pipe sizes and material(s), connections, positions and spacing within the concrete, methods of support, and system for monitoring temperature of water in cooling pipes.
 - 2. Grout material for filling pipes.

1.04 QUALITY ASSURANCE

- A. Engineer in responsible charge of development of the thermal control plan shall be a professional engineer and have the following qualifications:
 - 1. At least 10 years recent experience in completion of thermal control plans.
 - 2. Completion of thermal control plans of at least 20 successful projects. Provide contact references for at least 5 projects in the last 2 years.

3. Engineer has determined that the following engineers are qualified to develop thermal control plans:
 - a. Beton Consulting Engineers.
 - b. MJ2 Consulting, PLLC.
4. Contractor's request to use alternate engineers may be considered if qualifications and examples of work product are submitted to the Engineer for approval as follows:
 - a. Cover letter listing the proposed engineer's qualifications.
 - b. Examples of thermal control plans for 5 previous projects, including project name, date, location, and name of contact with telephone number.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Design requirements:
 1. Thermal control plan:
 - a. General:
 - 1) Thermal control plan shall include the following as a minimum:
 - a) Based on the range of average daily ambient air temperatures and initial concrete temperature at point of placement, calculate the following for each concrete placement:
 - (1) Maximum concrete temperature.
 - (2) Time from concrete placement until maximum concrete temperature occurs.
 - (3) Maximum concrete differential temperature.
 - (4) Time from concrete placement until maximum concrete differential temperature occurs.
 - (5) Length of thermal control period.
 - b) Concrete mix design as specified in Section 03_30_00 - Cast-in-Place Concrete.
 - c) Duration and method of curing.
 - d) Procedures to control concrete temperature at time of placement.
 - e) Methods of controlling maximum concrete differential temperature.
 - (1) Include minimum temperature of adjacent concrete at construction joints.
 - f) Temperature sensor types and placement locations.
 - g) Temperature monitoring and recording system.
 - h) Field measures to ensure conformance with maximum concrete temperature and maximum concrete temperature differential requirements.
 - i) Corrective measures to take if it appears specified concrete maximum temperature and maximum concrete differential temperature will be exceeded.
 - 2) Difference in temperature between concrete interior and surface temperatures shall not exceed 35 degrees Fahrenheit.
 - 3) Allow interior of concrete to cool down and stabilize.
 - 4) Maximum allowable concrete temperature: 145 degrees Fahrenheit.
 - 5) Do not place concrete until the Engineer has accepted in writing.

- b. Pre-cooling of concrete:
 - 1) Cool concrete mix prior to placement by the following means:
 - a) Cool batch water.
 - b) Ice may be substituted for portion of batch water.
 - c) Continuously spray coarse aggregate with water to cool aggregate. Adjust batch water content to account for added water content in aggregate due to use of cooling water.
 - d) Nitrogen injection.
 - e) Alternative means proposed by the Contractor that are acceptable to the Engineer.
 - c. Post-cooling of concrete:
 - 1) Use embedded thin walled piping for circulating water to control temperature gain in previously cast concrete.
 - 2) Clearly indicate in the thermal control plan if cooling piping will be embedded in concrete.
 - 3) Do not install embedded piping within top 20 inches of slab or wall.
 - 4) Operate cooling pipe system for duration of cooling period. Cooling period shall be a minimum of 14 days.
 - 5) After use of cooling pipes to cool concrete is complete, fill pipes with grout.
 - a) Flowable non-shrink cement grout with minimum specified 28-day compressive strength not less than that of the surrounding concrete.
2. Temperature monitoring program:
- a. Temperature monitoring and recording system:
 - 1) Consist of temperature sensors connected to data acquisition system capable of transmitting, storing, and downloading data to computer.
 - 2) Locate temperature sensors so that maximum temperature difference within mass concrete element can be monitored.
 - 3) At a minimum, furnish and install sensors to monitor concrete temperatures at the center of the placement, at the most exposed face of the placement, and at the most exposed corner of the placement.
 - 4) In addition to the sensor locations listed above, furnish and install 2 backup sensors.
 - a) Provide 1 backup sensor near the center of placement.
 - b) Provide the second sensor near the sensor at the face of the placement.
 - 5) Secure sensors within formwork before the Engineer's inspection.
 - b. Temperature control period (general):
 - 1) For concrete placements of mass concrete placed during cold weather, the control period shall be the greater of the requirements for mass concrete and the requirements for cold weather.
 - c. Temperature control period (for mass concrete):
 - 1) Monitor and maintain temperature control measures until the following requirements are met:
 - a) Maximum internal concrete temperature has been reached and temperature is falling.
 - b) Difference between interior concrete temperature and the average daily air temperature is less than allowable temperature difference for 3 consecutive days.
 - c) 5 days have elapsed since concrete was placed.

- d) Forecast air temperature is not expected to fall less than 35 degrees Fahrenheit below the maximum interior temperature.
 - e) There are no adjacent mass concrete elements to be cast.
- d. Temperature control period (for cold weather concreting):
 - 1) Monitor and maintain temperature control measures for the duration of the protection period specified in Section 03_30_00 - Cast-in-Place Concrete.
- e. Temperature monitoring procedures:
 - 1) Begin data logging of sensors a minimum of 1 hour before concrete placement.
 - 2) Monitor concrete temperatures during the temperature control period.
 - 3) Do not place adjacent concrete placements during the temperature control period.
- f. Concrete consolidation:
 - 1) Use methods that prevent damage to temperature monitoring and recording system.
- g. Temperature sensor and wiring:
 - 1) Protect wiring connected to temperature sensors cast into concrete to prevent movement.
 - 2) Keep wire runs as short as possible.
 - 3) Do not allow ends of temperature sensors to come into contact with supports concrete forms or reinforcing bars.
- h. Equipment failure:
 - 1) When any equipment used in temperature control, monitoring, and recording system fails during concrete construction operation, take immediate measures to correct situation in accordance with the thermal control plan.
 - 2) Failure to conform to temperature requirements will be cause for rejection of concrete.

2.02 MATERIALS

- A. Concrete admixtures:
 - 1. Air entraining admixture:
 - a. As specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 2. Retarding admixture:
 - a. Set retarding admixture may be used to control set time and minimize premature setting of concrete and formation of cold joints.
 - b. As specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 3. Water reducing admixture:
 - a. As specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 4. Accelerating admixtures:
 - a. Do not use.
- B. Aggregates:
 - 1. As specified in Section 03_30_00 - Cast-in-Place Concrete.
- C. Cement:
 - 1. As specified in Section 03_30_00 - Cast-in-Place Concrete.

- D. Coal ash:
 - 1. As specified in Section 03_30_00 - Cast-in-Place Concrete.
- E. Concrete insulating blankets:
 - 1. Commercially available, with R-value required in the thermal control plan.
- F. Water and ice:
 - 1. Mixing water: As specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 2. Water for making ice: Meet requirements of mixing water as specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 3. Ice may be substituted for mixing water on 1-to-1 ratio based on weight.

2.03 TEMPERATURE MONITORING SYSTEM

- A. Manufacturers: One of the following or equal:
 - 1. FLIR Systems, Inc., Engius IntelliRock II System.
 - 2. The Transtec Group, Inc., Command Center.
- B. Temperature logger:
 - 1. Consist of temperature sensor, microprocessor, and battery encased in polyester resin for protection.
 - 2. Calculate and store temperature readings of concrete.
 - 3. Maximum wire length in concrete: 50 feet.
 - 4. Capable of logging temperature hourly for 28 days.
- C. Handheld reader:
 - 1. Use to communicate with and collect data from temperature loggers embedded in concrete.
 - 2. Use to instruct loggers to begin reading, download data from loggers, and upload logger data to computer.
 - 3. Logger data storage: 999 logger downloads.
- D. Software:
 - 1. Use system software to transfer data from handheld reader to computer in secure, unalterable, electronic files.

2.04 MIXES

- A. As specified in Section 03_30_00 - Cast-in-Place Concrete for Class M concrete.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Concrete placement:
 - 1. As specified in Section 03_30_00 - Cast-in-Place Concrete, except as modified in this Section.
 - 2. Preheat previously placed adjacent concrete to temperature above freezing.
 - 3. Do not place non-mass concrete with mass concrete.

4. Do not place non-mass concrete until after thermal control period for adjoining mass concrete is complete.
- B. Curing concrete:
1. Water cure or plastic membrane cure as specified in Section 03_30_00 - Cast-in-Place Concrete as soon as possible following placement of concrete.
 - a. If water curing is used, use methods that minimize differential temperature between curing water and concrete.
 - b. Consider type of curing in the thermal control plan.
- C. Insulation:
1. If insulation is required by the thermal control plan, install insulation on the following during the thermal control period:
 - a. Formed surfaces.
 - b. Finished surface such as top of slabs.
 - c. Temporary surfaces such as construction joints.
 - d. Reinforcing bars protruding from concrete placements.
 - e. Steel braces and catwalk supports attached to formwork.
 - f. Pipes protruding from concrete placement.
 - g. Conduits protruding from concrete placement.
 - h. Minimum of 3 feet past concrete placement onto previously placed adjacent concrete.
 - i. Other items protruding from concrete that would contribute to heat loss from concrete.
 2. Install insulation blankets on complete area of formwork that extends past concrete placement.
 - a. Install insulation blankets tightly against formwork to prevent air movement between insulating blankets and forms.
 - b. Install insulation on formwork before placing mass concrete.
 3. Install insulation on finished surfaces when:
 - a. Finishing is complete.
 - b. Concrete has sufficient strength to prevent damage due to installation of insulation.
 - c. Before excessive temperature differential develops.
 4. Protruding reinforcing bars, conduits, and pipes:
 - a. For 1-inch diameter, or minimum dimension, and smaller, insulate for minimum of 3 feet from face of concrete placement.
 - b. For diameter, or minimum dimension, greater than 1 inch, insulate for minimum of 6 feet from face of concrete placement.
 - c. Use insulation with R-value equal to or greater than required for adjacent surface of concrete placement.
 - d. Install insulation before placing mass concrete.
 5. Insulation shall remain in place until end of the thermal control period.
- D. Cold weather concreting:
1. As specified in Section 03_30_00 - Cast-in-Place Concrete, except do not use steam or other concrete heating methods that will increase concrete temperature outside range as specified in this Section.

- E. Hot weather concreting:
 - 1. As specified in Section 03_30_00 - Cast-in-Place Concrete.
 - 2. Use fog sprayers to reduce ambient air temperature and increase humidity during concrete placement.

3.02 FIELD QUALITY CONTROL

- A. Temperature monitoring program:
 - 1. Use temperature monitoring system to measure concrete temperatures in interior and near surface of concrete.
 - 2. Continuously monitor temperature of the interior of the concrete and surfaces of concrete during temperature control period.
 - 3. Temperature monitoring data not conforming to requirements of this Section:
 - a. Stop placing concrete.
 - b. Concrete not conforming to temperature requirements of this Section will be rejected. Remove rejected concrete at the Contractor's expense.
 - c. Modify the thermal control plan and calculations to correct problem and resubmit.
 - d. Do not place concrete until revised thermal control plan and calculations have been submitted and accepted by the Engineer.
- B. Concrete placement temperatures:
 - 1. Measure and record concrete temperature at point of placement.
- C. Reporting:
 - 1. If monitoring indicates that the maximum concrete temperature or the maximum concrete differential temperature exceed the limits of this Specification, notify the Engineer within 24 hours.
 - 2. After the temperature control period is complete, submit the temperature record for each placement to the Engineer for Project files within 14 calendar days.

END OF SECTION

^{AD1} Addendum No. 1

New Section

SECTION 12_35_54^{AD1}

METAL LABORATORY CASEWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Requirements for metal laboratory furniture including cabinets; bases, sinks, wall and floor cabinets, and related accessories.

1.02 SUBMITTALS

- A. Submit as specified in Section 01_33_00 - Submittal Procedures.
- B. Verify field measurements prior to preparing Submittals.
- C. Submit as specified in Section 01_60_00 - Product Requirements.
 - 1. Product data:
 - a. Features of construction.
 - b. Performance characteristics.
 - c. Materials.
 - d. Assembly methods.
 - e. Joint details.
 - f. Accessory listings.
 - g. Hardware.
 - 2. Shop Drawings:
 - a. Floor plans and elevations of assembled casework.
 - 1) Indicate cabinet work in full detail.
 - b. Component profiles and elevations.
 - c. Fastening methods.
 - d. Hardware location.
 - e. Schedule of finishes.
 - f. Include size and location of laboratory work surfaces and laboratory service fittings as specified in Section 12_36_24 - Laboratory Work Surfaces and Section 12_47_01 - Laboratory Service Fixtures.
 - 3. Sample:
 - a. Full-size sample of proposed cabinetwork.
 - b. Accepted sample will be standard against which work will be evaluated.
 - c. Accepted sample may be part of Work.
 - 4. Manufacturer's instructions.
- D. Manufacturer's written approval of installer.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. As specified in Section 01_60_00 - Product Requirements.

PART 2 PRODUCTS

2.01 GENERAL

- A. As specified in Section 01_60_00 - Product Requirements.

2.02 MANUFACTURERS

- A. One of the following or equal:
 - 1. Hamilton Manufacturing Co.
 - 2. Kewaunee Scientific Equipment Corp.
 - 3. St. Charles Manufacturing Co.

2.03 WALL AND BASE CABINETS

- A. General: Numbers indicated on the Drawings are Kewaunee Scientific Equipment numbers as reference, not preference.
- B. Sectional units:
 - 1. Flush-face construction.
 - 2. Completely fabricated ready for placement.
 - 3. Complete integral rigid unit.
 - a. Construction and design shall develop maximum strength and rigidity in each sectional unit.
 - 4. Component parts shall be die formed, interchangeable, and be assembled in jigs.
 - 5. Joints shall be notched, keyed, and overlapped.
 - a. Vertical and horizontal members shall be spot-welded and shall be both spot-welded and arc welded at stress points.
 - b. Screws only to be used where backs, pans, and panels are required to be removable for accessibility.
 - 6. Floor sectional units to be equipped with leveling devices adjustable from within the units.
 - a. Black base molding to be field applied to the units.
 - 7. Units to consist of drawers or cupboard or a combination as indicated on the Drawings.
 - 8. Unless otherwise specified, unit backs to have removable panels for access.
 - 9. In corners, sides to have removable panels.
 - a. Designed to permit removal through the front.
 - 10. Units to have a cleanable smooth interior.
 - a. Front and rear posts, reinforcing members, or channel uprights to be enclosed full height on cupboard openings.
 - 11. Drawer heads to be double wall with sound deadening mineral type filler or wood battens between the inner and outer pans.
 - 12. Drawer slides:
 - a. Operate on 4 nylon rollers.

- b. Close flush with the unit rails and against rubber bumpers.
 - c. Self-closing.
 - d. Removable without the use of tools and with stops to prevent inadvertent removal.
- 13. Doors:
 - a. Double wall with sound deadening mineral-type filler or wood battens between the inner and outer pans.
 - b. Reinforcements and hinge mounting brackets to be concealed between the outer pans and inner pans.
 - c. Hung with a pair of institutional type hinges with concealed hinge leaves.
 - d. Inner and outer pans to be flanged all around and fit with minimum clearance.
 - e. Openings in units to be fully rabbeted and doors close flush with the unit rails against rubber bumpers.
- 14. Corner gusset plates:
 - a. 14 gauge provided in each corner.
 - b. Double offset attachment flanges for welding to the unit proper.
 - c. Provide with a leveling device.
 - 1) Integral part of the gusset plate.
 - 2) Slotted for adjustment with a screwdriver from above.
 - 3) Access through holes directly above the leveling bolts.
 - a) Provide with removable snap-on covers.
- 15. Sliding doors:
 - a. As indicated on the Drawings.
 - b. Double-wall construction.
 - c. Glazed as indicated on the Drawings.
 - d. Operate on nylon rollers running on aluminum tracks.
- 16. Hardware and trim:
 - a. Provide units with hardware and trim such as drawer and door pulls, flush pulls, hinges, catches, adjustable shelf clips, leg shoes.
 - 1) Locks as indicated on the Drawings.
 - b. Door and drawer pulls to be of aluminum with a brushed satin finish.
- C. Base cabinets with sinks:
 - 1. Sink sizes shall be as indicated on the Drawings.
 - 2. Sink hangers, tail pieces, and traps supplied.
- D. Spacers, aprons, legs, and end panels:
 - 1. Provide for a complete, well-supported, finished installation.
- E. Wall mounted cabinets:
 - 1. Mounted on blocks which have been bolted to the wall with not less than four 3/8-inch bolts for each cabinet.
 - 2. In accordance with the manufacturer's standard.
- F. Full height floor storage cabinets:
 - 1. Sliding door storage cases interior finished the same as exterior.
 - a. Suspended from the top by nylon rollers in an extruded aluminum track.
 - b. Track designed to prevent accidental removal of doors in operating position.

2.04 HARDWARE AND TRIM

- A. Drawer and door pulls:
 - 1. Aluminum, satin finish, with a clear, lacquer finish.
 - 2. Provide 2 pulls on drawers over 24-inches long.
- B. Flush pulls for sliding doors:
 - 1. Satin finish chrome, providing a recessed finger grip.
- C. Hinges:
 - 1. 0.095 steel, butt-type, wrap-around, tight pin, hospital tip, 5 leaf, 2-3/4-inch heavy duty, institutional grade, with brushed chrome finish.
 - 2. Doors over 48-inches high to have 3 hinges per door.
 - 3. Swinging doors: 5 knuckle institutional, offset type.
 - 4. Mounted with flathead screws to withstand a weight load of 150 pounds.
- D. Locks:
 - 1. On doors and drawers as indicated on the Drawings.
 - 2. Exposed surface of locks to match cabinet trim.
 - 3. Keying: Illinois or National offering positive tumbler operation accomplished by cam action without the aid of springs.
- E. Magnetic latches:
 - 1. Provide on swinging doors.
 - 2. Enclosed in a plastic case and operate against a strike plate on door.
 - 3. Double doors (without locks) shall have a latch on each door.
 - 4. Full height cases to have latching devices located on the structurally fixed center shelf.
 - a. Left hand doors on full height cases to have a positive catch.
 - b. Right hand door to have magnetic latch.
- F. Elbow catches:
 - 1. Elbow catches and strike plates on left-hand doors of double door cases where locks are used.
 - 2. Steel, cadmium plated.
- G. Drawer stops and slides:
 - 1. Stops on the inside back of each drawer, designed to prevent accidental removal.
 - a. Steel, cadmium, or chrome plated.
 - 2. Self-closing, side-mounted steel slides, wrapped under drawer body sides to with 4-point suspension nylon rollers and positive top, 100-pound rating.
 - a. File drawers shall have full extension slides.
 - 3. Units shall be complete with hardware and trim, such as drawer and door pulls, flush pulls, hinges, locks (where shown), catches, adjustable shelf clips, leg shoes, and base molding.
- H. Leg shoes:
 - 1. Provided on table legs, unless otherwise specified, to conceal leveling device.
 - 2. 2-1/2-inches high and a pliable, black vinyl material.

- I. Support rods, upright rod assemblies, and rod sockets:
 - 1. Upright rods, cross rods and ring support rods, where specified, shall be anodized duralumin (1/2-inch or 3/4-inch diameter, as required).
 - 2. Rod sockets shall be chrome-plated brass, secured through tabletops with lock nut and spring washer.
 - 3. Rod clamps shall be heavy-duty, designed to securely hold rod assembly in any position.
 - 4. Use of wood rod assemblies will not be acceptable.
- J. Label holders: When specified, shall be self-adhesive type aluminum with satin finish and designed for 2-1/2-inch by 1-1/8-inch cards, unless otherwise indicated.
- K. Support struts:
 - 1. Consist of two 16-gauge channel uprights fastened top and bottom by 2 adjustable "U" shaped spreaders, each 1/8 inch by 1-1/2 inch by length required.
 - 2. Furnished to support drain troughs and fume hood superstructures, or other abnormal loads.
 - 3. Furnished with hangers to support mechanical service piping and drain lines.
 - 4. Finished with black acid resistant enamel:
 - a. Floor glides:
 - 1) For movable open-leg tables shall be a non-marring material at least 1-1/2-inch diameter to prevent indenting composition flooring and shall have at least a 5/8-inch height adjustment.
 - 2) Use of metal buttons will not be acceptable.
 - b. Shelf support clips:
 - 1) Pin type for mounting on interior of cabinetwork.
 - 2) Coated finish shall prevent corrosion and retain shelves from accidental removal.
 - 3) Shelves shall be adjustable on centers not to exceed 2 inches.
 - 4) Surface-mounted metal support strips and clips subject to corrosion are not acceptable.

2.05 BALANCE TABLES

- A. cast epoxy resin.
 - 1. Legs shall be reinforced with a cast iron support pipe.
 - 2. Edges shall be rounded.
 - 3. Top and legs: 3-inches thick with a smooth, level, working surface.

2.06 GLASSWARE PEGBOARDS

- A. Provide glassware pegboards at the locations indicated on the Drawings.
- B. Board shall be constructed of a non-porous, molded epoxy resin construction. Color shall match laboratory work surface top color as specified in Section 12_36_24 - Laboratory Work Surfaces.
- C. Pegboard type: Wall mounted.

- D. Pegs shall be white polypropylene with rounded top and shall be designed for easy removal and replacement.
 - 1. Pegs shall enter the board at an angle to prevent rotation.
 - 2. Number of pegs shall be 32 pegs for a 24-inch-long by 30-inch-high pegboard.
 - 3. Stainless steel drip troughs fastened to bottom.

PART 3 EXECUTION

3.01 GENERAL

- A. As specified in Section 01_60_00 - Product Requirements.
- B. Move in equipment when finishes are completed.
- C. Maintain room temperature of at least 65 degrees Fahrenheit for 72 hours before equipment installation begins, and continuously after installation.

3.02 INSTALLATION

- A. Install in accordance with the manufacturer's instructions.
- B. Install reinforcement in walls as required.
- C. Adjust and lock leveling adjusters.

3.03 ADJUSTING AND CLEANING

- A. Test, clean, and adjust equipment and apparatus to ensure proper working order and conditions.
- B. Clean cabinets and countertops with soap and water.
 - 1. Rinse with clean water only.
 - 2. No solvent or oil based cleaners, polishes, waxes, or similar products shall be used.

END OF SECTION

^{AD1} Addendum No. 1

New Section

SECTION 12_36_24^{AD1}

LABORATORY WORK SURFACES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Laboratory work surfaces, including:
 - a. Molded epoxy.
 - b. Chemical resistant plastic laminate.

1.02 REFERENCES

- A. American Plywood Association (APA).
- B. Architectural Woodwork Institute (AWI).
- C. ASTM International (ASTM):
 - 1. D570 - Standard Test Method for Water Absorption of Plastics.
 - 2. D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
 - 3. D785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
 - 4. D790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- D. National Electrical Manufacturer's Association (NEMA):
 - 1. LD3 - High Pressure Decorative Laminates (HPDL).

1.03 SUBMITTALS

- A. Submit as specified in Section 01_33_00 - Submittal Procedures.
- B. Product Submittals:
 - 1. Submit as specified in Section 01_60_00 - Product Requirements.
 - 2. Product data:
 - a. Features of construction.
 - b. Materials.
 - c. Performance characteristics.
 - d. Assembly methods.
 - e. Joint details.
 - f. Hardware.
 - 3. Shop Drawings:
 - a. Verify field measurements prior to preparing Shop Drawings.
 - b. Include dimensions, component profiles and elevations, accessory lists, hardware locations, and schedule of finishes.

4. Manufacturer's instructions.
- C. Samples:
1. Complete range of manufacturer's standard, solid, chemical resistant plastic laminate colors for selection.
 2. Special samples:
 - a. Full-size sample of proposed cabinet work.
 - b. Approved sample will be standard against which work will be evaluated.
 - c. Approved sample may be part of Work.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. As specified in Section 01_60_00 - Product Requirements.

1.05 PROJECT OR SITE CONDITIONS

- A. Field measurements: Verify field measurements prior to preparing Shop Drawings.
- B. Move in equipment when finishes are completed.
- C. Maintain room temperature of at least 65 degrees Fahrenheit for 72 hours before equipment installation begins, and continuously after installation.

PART 2 PRODUCTS

2.01 GENERAL

- A. As specified in Section 01_60_00 - Product Requirements.

2.02 MOLDED EPOXY WORK SURFACE

- A. Manufacturers: The following or equal:
1. Kewaunee Scientific Equipment Corp.
- B. Material: Kewaunee "Kemresin," especially compounded, uniformly mixed and cured modified epoxy resin with following physical properties:
1. Flexural strength: 15,000 pounds per square inch when tested in accordance with ASTM D790.
 2. Compressive strength: 35,000 pounds per square inch when tested in accordance with ASTM D695.
 3. Hardness, Rockwell M: 100 when tested in accordance with ASTM D785.
 4. Water absorption, percent by weight:
 - a. 24 hours: 0.02 when tested in accordance with ASTM D570.
 - b. 7 days: 0.04 when tested in accordance with ASTM D570.
 - c. 2-hour boil: 0.04 when tested in accordance with ASTM D570.
 5. Specific gravity: 1.97.
 6. Tensile strength: 8,500 pounds per square inch.

- C. Fabrication: Mold laboratory work tops to the following sizes and configuration:
1. 1-inch-thick top with exposed edges rounded with 1/4-inch radius, drip grooves on underside of exposed edges.
 2. Curbs/backsplashes: 3/4-inch-thick integral 4-inch-high curbs with coved juncture between tops and curbs at 3/4-inch radius for standard 24- and 31-inch wide tops , or 1-inch-thick curbs bonded to top with square joint.
 3. Sink cutouts: Without saw marks, top edge rounded to 1/8-inch radius and corners rounded to 3/4-inch radius.
 4. Fabricate tops in largest practical sections, minimizing number of joints.

2.03 CHEMICAL RESISTANT PLASTIC LAMINATE WORK SURFACES

- A. Manufacturers: The following or equal:
1. Wilsonart International Co.
- B. Material: Chemsurf, special resin applied over phenolic/kraft core with solid colored or patterned alpha cellulose paper interlayer and with following physical properties when tested in accordance with NEMA LD3:
1. Wear resistance: 500 cycles.
 2. Boiling water resistance: No effect.
 3. High temperature resistance: No effect.
 4. Radiant heat resistance: 180 seconds.
 5. Stain resistance: No effect.
 6. Dimensional stability:
 - a. Machine direction: 0.3 percent.
 - b. Cross direction: 0.6 percent.
 7. Impact resistance: 72 inches.
 8. Conductive heat resistance: No effect.
 9. Cleanability: 10 cycles.
 10. Scuff resistance: Slight effect.
 11. Formability, back/face: 5/8 inch - 3/16 inch.
 12. Appearance: No aggregate base coarse defects.
- C. Finish: As selected.
- D. Pattern: As selected.
- E. Fabrication:
1. Materials:
 - a. Backing: Plywood, APA, AC INT with exterior glue, Douglas Fir .
 - b. Adhesive: As recommended by plastic laminate manufacturer.
 - c. Chemical resistant plastic laminate: As specified.
 2. Fabricate work surfaces in accordance with AWI premium grade.
 - a. When necessary to cut and fit on site, make material with ample allowance for cutting.
 - b. Provide trim for scribing and site cutting.
 3. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes, hairline corners and joints, and slightly beveled arises.
 - a. Locate counter butt joints at least 2 feet from sink cutouts.
 - b. Cap exposed plastic laminate edges with material of same finish and pattern.

4. Mechanically fasten backsplashes and aprons to countertops with steel brackets at 16 inches on center.
 - a. Use exposed fastening devices or nails only when permitted.
 - b. Arrange neatly.
5. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings.
 - a. Verify locations of cutouts from on-site dimensions.
 - b. Seal contact surfaces of cutouts.
6. Shop assemble work surfaces for delivery to site in sizes easily handled and to ensure passage through building openings.

PART 3 EXECUTION

3.01 GENERAL

- A. As specified in Section 01_60_00 - Product Requirements.
- B. Move in equipment when finishes are completed.
- C. Maintain room temperature of at least 65 degrees Fahrenheit for 72 hours before equipment installation begins, and continuously after installation.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Insulate areas between dissimilar metals to prevent electrolysis.
- C. Fill joints between molded epoxy countertop sections and between sink and countertop, with acid, alkali, and solvent-resistant material compatible with top to form a smooth integral surface.
 1. Sink installation shall be watertight.
- D. Tolerances:
 1. Flatness shall be 1/16-inch for each 48-inch span.
 2. Location of cutouts and drillings shall be within 1/16 inch.
 3. Size of cutouts and drillings shall be within 1/16 inch.

3.03 ADJUSTING AND CLEANING

- A. Test, clean, and adjust equipment and apparatus to ensure proper working order and conditions.
- B. Do not sand or excessively fill tops to meet tolerances.

END OF SECTION

AD1 Addendum No. 1

New Section

SECTION 40_05_65.01^{AD1}

GATE, GLOBE, AND ANGLE VALVES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Gate, globe (non-pilot controlled), and needle valves.

1.02 REFERENCES

- A. American Society of Mechanical Engineers (ASME):
 - 1. B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24, Metric/Inch Standard.
 - 2. B16.47 - Large Diameter Steel Flanges: NPS 26 through NPS 60, Metric/Inch Standard.
- B. American Water Works Association (AWWA):
 - 1. C515 - Standard for Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Services.
 - 2. C550 - Protective Interior Coatings for Valves and Hydrants.
- C. ASTM International (ASTM):
 - 1. B98 - Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
- D. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry:
 - 1. SP-81 - Stainless-Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.

1.03 SUBMITTALS

- A. Furnish Submittals as specified in Section 01_33_00 - Submittal Procedures.
- B. Product data:
 - 1. As specified in Section 40_05_51.01 - Common Work Results for Valves.
- C. Quality Control Submittals:
 - 1. Manufacturer's representative qualifications.
 - 2. Manufacturer's Certificate of Source Testing as specified in Section 01_75_17 - Commissioning.
 - 3. Manufacturer's Certificate of Installation Verification as specified in Section 01_75_17 - Commissioning.
 - 4. Manufacturer's Certificate of Functional Compliance as specified in Section 01_75_17 - Commissioning.

- D. Operation and maintenance manuals:
 - 1. As specified in Section 01_78_24 - Operation and Maintenance Manuals.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. As specified in Section 01_60_00 - Product Requirements, Section 40_05_51.01 - Common Work Results for Valves, and the manufacturer's instructions.

1.05 WARRANTY

- A. As specified in Section 01_78_36 - Warranties and Bonds.
- B. Interior epoxy coatings: Affidavit of compliance attesting that epoxy coatings applied to interior surfaces of valves comply in accordance with all provisions of AWWA C550.

PART 2 PRODUCTS

2.01 GENERAL

- A. As specified in Section 01_60_00 - Product Requirements and Section 40_05_51.01 - Common Work Results for Valves.

2.02 GATE VALVES - GENERAL SERVICE (GV00)

- A. Aboveground:
 - 1. Valves less than 3 inches in size for clean water and air service:
 - a. Manufacturers: One of the following or equal:
 - 1) Crane, Figure 431.
 - 2) Jenkins, Figure 47.
 - 3) Lunkenheimer Co., Figure 2151.
 - b. Design:
 - 1) Size and configuration: As indicated on the Drawings.
 - 2) Manufacturer's standard bronze, solid wedge disc, rising stem, screwed end, Class 150 pounds.
 - 2. Valves 3 inches in size and larger, single disk.
 - a. Manufacturers: One of the following or equal:
 - 1) American Flow Control, Series 2500.
 - 2) M&H/Kennedy Valve Co.
 - 3) Mueller.
 - b. Design:
 - 1) Size, material, configuration: As indicated on the Drawings.
 - 2) Resilient wedge type in accordance with AWWA C515.
 - 3) Flange, iron body, and bonnet rated for 200-pound working pressure.
 - a) Provide O-ring seal between valve body and bonnet.
 - 4) Ductile or cast iron wedge encapsulated in nitrile rubber and capable of sealing in either flow direction.
 - 5) Bronze stem with double or triple O-ring or braided packing stem seals.

- 6) Rising stem configuration with handwheel diameter sized to allow opening of valve with no more than a 40-pound pull.
 - 7) Coat interior and exterior surfaces of valve body and bonnet with fusion-bonded epoxy in accordance with AWWA C550.
- B. Underground:
 - 1. Manufacturers: One of the following or equal:
 - a. Waterous/ American Flow Control
 - b. Mueller Co.
 - c. M&H/Kennedy Valve Co.
 - 2. Design:
 - a. Size, material, configuration: As indicated on the Drawings.
 - b. Resilient wedge type in accordance with AWWA C515.
 - c. Ductile iron body with resilient seat.
 - d. Stem:
 - 1) Bronze with double or triple O-ring or braided packing stem seals.
 - 2) Non-rising.
 - 3) Valve operator:
 - a) Standard AWWA 2-inch operating nut, matching valve key, and valve box for operating stem.
 - 4) Valve shall open by turning counterclockwise.
 - e. Ductile or cast iron wedge encapsulated in nitrile rubber and capable of sealing in either flow direction.
 - f. Coat interior and exterior surfaces of valve body and bonnet with fusion-bonded epoxy in accordance with AWWA C550.

2.03 KNIFE GATE VALVES (GV60)

- A. Manufacturers: One of the following or equal:
 - 1. DeZURIK, KGC series.
 - 2. ITT, Fabri-Valve, Standard C37.
 - 3. Bray International, Series 740.
- B. Design:
 - 1. Size and configuration: As indicated on the Drawings.
 - 2. Suitable for service under pressures equal to and less than 150 pounds per square inch gauge.
 - 3. Full round port, metal or resilient seated, raised face design.
 - 4. Flanged wafer design drilled and tapped to ASME Class 125/150 standard. Face-to-face dimension shall be in accordance with MSS SP-81 for knife gate valves ASME B16.5 Class 150, 2 to 24 inches, or ASME B16.47 Series A Class 150, 26 to 48 inches.
 - 5. Rounded gate with beveled edge, finish-ground to 32 RMS, maximum, on both sides. Bottom edge shall have a beveled knife edge.
 - 6. Body to incorporate guides and jams to assist in seating.
 - 7. Packing shall consist of multiple layers of packing.
 - 8. Materials:
 - a. Body: Cast or ductile iron or cast steel, with Type 316 stainless steel lining or cast Type 316 stainless steel or 2205 Duplex.
 - b. Wetted components (including gate): Type 316 stainless steel or 2205 Duplex.

- c. Seat: Metal or NBR, EPDM, CR, Viton™.
 - d. Yoke sleeve: Acid resisting bronze or aluminum bronze.
 - e. Packing: PTFE.
 - f. Packing gland: Match valve body material.
 - g. Yoke: Type 304 stainless steel.
 - h. Fasteners: Stainless steel.
9. Outside screw and yoke (OS&Y) with handwheel operator.

2.04 GLOBE VALVES - NON-PILOT-CONTROLLED (GLV00 AND GLV20)

A. General (GLV00):

- 1. Valves 3 inches and smaller:
 - a. Manufacturers: One of the following or equal:
 - 1) Except in welded steel piping:
 - a) Crane, No. 1 Globe or No. 2 Angle.
 - b) Lunkenheimer Co., Figure No. 2140 Globe or No. 2141 Angle.
 - 2) In welded steel piping:
 - a) Crane, No. 351.
 - b) Lunkenheimer Co., Figure No. 1123, or equal with flanged ends.
 - b. Design:
 - 1) Size and configuration: As indicated on the Drawings.
 - 2) Valve: Class 125 threaded ends, rated for 250 degrees Fahrenheit at pressure of 170 pounds per square inch.
- 2. Valves larger than 3 inches:
 - a. Manufacturers: One of the following or equal:
 - 1) Crane, No. 351.
 - 2) Lunkenheimer Co., Figure No. 1123.
 - b. Design:
 - 1) Size and configuration: As indicated on the Drawings.

B. Plug disc type for throttling or severe service (GLV20):

- 1. Manufacturers: One of the following or equal:
 - a. Crane, No. 212P or No. 384P.
 - b. Lunkenheimer Co., 72-PS or 73-PS1.
- 2. Design:
 - a. Size and configuration: As indicated on the Drawings.
 - 1) Material: Iron body stainless steel trimmed plug type seat and disc.

C. Hose valves:

- 1. Manufacturers:
 - a. Globe threaded valve: One of the following or equal:
 - 1) Crane, No. 7TF.
 - 2) Stockham, Figure No. B22T.
 - b. Angle threaded valve: One of the following or equal:
 - 1) Crane, No. 17TF.
 - 2) Stockham, Figure No. B222T.
- 2. Design:
 - a. Size and configuration: As indicated on the Drawings.
 - b. Valve: Globe or angle valve with threaded ends.
 - c. Disc: Renewable, made of Teflon™ or Buna-N.
 - d. Threaded ends rated for a pressure of 200 pounds per square inch.

D. Yard hydrants:

1. Freezeless yard hydrant:

a. Manufacturers: One of the following or equal:

- 1) Kupferle, #1 Total Eclipse Yard Hydrant - 3/4 inch and 1 inch.
- 2) Murdock, #M-75 - 3/4 inch or #M100 - 1 inch.
- 3) Zurn, #1385 - 3/4 inch or 1 inch.

b. Design:

- 1) Self-draining, non-freezing, compression type.
 - a) Inlet connection size: As indicated on the Drawings.
 - b) Outlet connection size: As indicated on the Drawings.
 - c) Materials:
 - (1) Exterior casing pipe material: As indicated on the Drawings.
 - (2) Interior operating rod material: As indicated on the Drawings.
 - (3) Casing guard material: As indicated on the Drawings.
 - (4) Principal interior operating parts material: Brass and/or bronze and removable from yard hydrant for servicing without excavation.
 - d) Provide 4 spoke, ball wheel handle operated.

2. Freezeless post hydrants (HYD01):

a. Manufacturers: One of the following or equal:

- 1) Kupferle, #2 Eclipse Post Hydrant.
- 2) Mueller, #A-411 Post Hydrant.
- 3) Murdock, #M-200 Post Hydrant.

b. Design:

- 1) Self-draining, non-freezing, compression type with a 2-3/16-inch valve opening.
- 2) Inlet connection size: As indicated on the Drawings.
- 3) Outlet connection size: As indicated on the Drawings.
- 4) Materials:
 - a) Exterior casing pipe material: As indicated on the Drawings.
 - b) Interior operating rod material: As indicated on the Drawings.
 - c) Top stock material: As indicated on the Drawings.
 - d) Principal interior operating parts material: Brass and/or bronze and removable from hydrant for servicing without excavation.
- 5) Provide 1-1/2-inch pentagon operating nut operated by a hydrant wrench or 10-inch handwheel:
 - a) Manufacturers: The following or equal:
 - (1) Kupferle.

2.05 NEEDLE VALVES (NV00)

A. Manufacturers: One of the following or equal:

1. Crane, No. 88 or No. 89.
2. Lunkenheimer Co., Figure No. 906-BS or No. 907-BS.
3. Powell, Figure No. 180.

B. Design:

1. Size and configuration: As indicated on the Drawings.

2.06 SOURCE QUALITY CONTROL

- A. Source Testing (Factory Acceptance Tests):
 - 1. As specified in Section 01_75_17 - Commissioning.
 - 2. Furnish test reports and the Manufacturer's Certificate of Source Testing.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Mount yard hydrants on minimum 1-inch supply pipe or size indicated on the Drawings.
- B. Mount post hydrants on minimum 2-inch supply pipe or size indicated on the Drawings.
- C. Set yard and post hydrants in 4 cubic feet of 3/4 inch minimum crushed stone surrounding valve body to allow for proper drainage.
 - 1. Install in accordance with AWWA recommendations for hydrants.
- D. Furnish Manufacturer's Certificate of Installation Verification.

3.02 FIELD QUALITY CONTROL

- A. Functional Testing:
 - 1. Witnessed.
 - 2. Conduct pressure and leak test as specified in Section 40_05_00.09 - Piping Systems Testing.
 - 3. Furnish test reports and the Manufacturer's Certificate of Functional Compliance.

END OF SECTION

^{AD1} Addendum No. 1



October 2, 2026

To Whom It May Concern:

Mountain Regional Water Special Service District (the District) intends to enter into a contract to purchase certain electrical equipment from Royal Automation & Control, as specified in Customer Quote Q11400155, Rev 3, updated quote date 9/28/2026, in the amount of \$412,165.72.

The District is waiting for a larger project bid opening on Oct 22, 2026 to confirm the project will move ahead before committing to the purchase of said electrical equipment.

Sincerely

MOUNTAIN REGIONAL WATER SSD

Andy Garland,

General Manager

Customer Quote For: MOUNTAIN REGIONAL WATER SPECIAL SER

ROYAL - SALT LAKE CITY

Quote: Q1140155

Revision #: 003



3100 S 900 W
SOUTH SALT LAKE UT 84119
Tel: (801)973-6000 Fax: (801)972-8035

Contact Name: JOSH FABER

Quote Date: 09/25/26

Updated On: 09/28/26

Expires On: 10/25/26

Job Name:

Attn:

Ship To: MOUNTAIN REGIONAL WATER
SPECIAL SER
5739 PAINTBRUSH ROAD
PARK CITY, UT 84098-0000
TEL: (435)940-1916

Customer PO #:

Customer PO Date:

FOB: SHIPPING POINT

Freight: PREPAID

LN	Product	Qty	Price	Per *	Ext Price
01	SQD 233114461 REVISED INCOMING	1	\$149,731.64	E	\$149,731.64
02	SQD 233114459 DISTRIBUTION	1	\$207,422.92	E	\$207,422.92
03	SQD 233114460 STARTUP	1	\$24,215.16	E	\$24,215.16
04	ASCO G03ATSA32000NGXM,11BE,44G	1	\$26,808.67	E	\$26,808.67
05	ASCO ATS FREIGHT	1	\$2,227.33	E	\$2,227.33
06	ASCO ATS STARTUP	1	\$1,760.00	E	\$1,760.00
Merchandise:					\$412,165.72
Tax:					\$0.00
Total:					\$412,165.72

PLEASE NOTE: THIS IS NOT AN OFFER TO CONTRACT, BUT MERELY A QUOTATION OF CURRENT PRICES FOR YOUR CONVENIENCE AND INFORMATION. ORDERS BASED ON THIS QUOTATION ARE SUBJECT TO YOUR ACCEPTANCE OF THE TERMS AND CONDITIONS LOCATED AT SALES.OUR-TERMS.COM, WHICH WE MAY CHANGE FROM TIME TO TIME WITHOUT PRIOR NOTICE. WE MAKE NO REPRESENTATION WITH RESPECT TO COMPLIANCE WITH JOB SPECIFICATIONS.

Prepared By:

Joshua Faber
C E D D/B/A ROYAL WHOLESALE ELEC
3100 S 900 W
Salt Lake City, UT 84119
josh@royalslc.com
D:801-347-3418

Proposal Name: WTP_Optimization_Split Setup**Quote Name:** WTP_Optimization_Split Setup_No Rear

Proposal Number: P-260925-6371335**Quote Number:** Q-7379630**Quote Date:** 09/28/2026**Through Addenda Number:** 0**Sales Representative:** Dustin Field**Conditions of Sale**

This Quotation is subject to Coordinated Project Terms. See <https://www.se.com/us/en/download/document/0100PL0043/>

Quoted price in currencies other than U.S. Dollars is per the annual Schneider Electric exchange guidance.
Quote is valid for 30 days. Quoted lead times are approximate and subject to change.

Schneider Electric reserves the right to amend, withdraw or otherwise alter this submission without penalty or charge as a result of any event beyond its control arising from or due to the current Covid-19 epidemic or events subsequent to this epidemic / pandemic including changes in laws, regulations, by laws or direction from a competent authority.

Seq #	Qty	Product Description
1	1	Designation : REVISED Incoming Product Details: 1 - Square D Custom Swbd-QED-2 Switchboard ----- Square D Custom Swbd Designed and Tested in accordance with: UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2 System Voltage - 480Y/277V 3Ph 4W 60Hz System Ampacity - 2000A Source Description - Single Main Tin Plated Copper Main Bus Neutral Bus - 100% Max Available Fault Current (RMS) - 65kA Enclosure - Type 3R Non-Walk-in Accessibility: Front Only Equipment Nameplate Black Surface/White Letters, Adhesive (Field Installed) Rodent Barrier Infrared Window Back 4" (2) Section 1 Infrared Window Front 4" (2) Section 1 Infrared Window Back 4" (2) Section 2 Infrared Window Front 4" (2) Section 2 Infrared Window Back 4" (2) Section 3 Infrared Window Front 4" (2) Section 3 Exterior Paint Color - ANSI 49 Interior Lights - All Section's Strip Heaters - Internal Power Source with Humidistat and Thermostat Ground Lug provided for each device SIS Control Wire Barriers between Sections Copper Ground Bus Bottom Closure Plates Certified Test Report Required Seismic Qualified Special: (1) Per Lineup - dwg changes per tr - PV LUGS - TAG # TR-181953-1 Dimensions ----- 2 - 36" Wide Section(s) 1 - 42" Wide Section(s) 1 - Dimensions: 114.00" W X 35.5" D X 91.5"H 3 - 35.5" Deep Enclosure(s) Approximate Weight: 2708.00 lbs / 1228.35 kgs Incoming Requirements ----- Suitable for Use As Service Entrance Entry Point: Right of Lineup, Through the Bottom Connection Type: Cable in Bussed Auxiliary Line Side Connection - Fire Pump Lugs - Utility Section Hot Sequence Utility: Rocky Mountain PT Provisions Required Non - Standard Door Pattern 15in MS Top, 15in Blank Btm Mains ----- 1 - 2000AS/2000AT 480V 100% Rated 65 kA 3 Pole UL, Fixed Mounted Electronic Trip Circuit Breaker: Type RK Power Trip Unit, Long Time, Short Time, Instantaneous, Ground Fault

Auxiliary Switch 1A/1B - Form C
 Padlock Attachment
 Energy Reduction Maintenance Switch
 Nameplate - White Surface / Black
 Letters, Adhesive (Field Installed)

Seq #	Qty	Product Description
2	1	Designation : Distribution Product Details: 1 - Square D Custom Swbd Series 2-QED-2 Switchboard ----- Square D Custom Swb Series 2 Designed and Tested in accordance with: UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2 System Voltage - 480Y/277V 3Ph 4W 60Hz Source Description - Main is Remote System Ampacity - 2000A Tin Plated Copper Main Bus Neutral Bus - 100% Max Available Fault Current (RMS) - 65kA Enclosure - Type 3R Non-Walk-in Accessibility: Front Only Equipment Nameplate Black Surface/White Letters, Adhesive (Field Installed) Rodent Barrier Utility Requirements per Rocky Mountain Power Infrared Window Back 4" (2) Section 1 Infrared Window Front 4" (2) Section 1 Infrared Window Back 4" (2) Section 2 Infrared Window Front 4" (2) Section 2 Exterior Paint Color - ANSI 49 Interior Lights - All Section's Strip Heaters - Internal Power Source with Humidistat and Thermostat Ground Lug provided for each device SIS Control Wire Barriers between Sections Copper Ground Bus Bottom Closure Plates Certified Test Report Required Seismic Qualified Special: (1) Per Lineup - MiCOM P991 Test Block (P991TT1 - - TAG # TR-181953-2 Special: (1) Per Lineup - METSEPM89M2600 IO for ION/PM - - TAG # TR-181953-4 Special: (1) Per Lineup - METSEPM89M0024 PM8000 ANL MODL - - TAG # TR-181953-3 Dimensions ----- 1 - 24" Wide Section(s) 1 - 48" Wide Section(s) 1 - Dimensions: 72.00" W X 35.5" D X 91.5"H 2 - 35.5" Deep Enclosure(s) Approximate Weight: 1918.00 lbs / 870.00 kgs Incoming Requirements ----- UL Dead Front Entry Point: Right of Lineup, Through the Bottom Connection Type: Cable SPD with Surge Rating 240kA SPD Dry Contacts Includes Surge Counter ION9000 with 7 in Display 3 CTs ION Meter - 480Y/277V 3Ph 4W 60Hz ION9000 IO Digital 6 in 2 out Analog 4 in 2

out

Feeders

Devices Associated with Remote Main:

1 - 800AS/800AT 480V 80% Rated 65 kA 3 Pole
 UL, Group Mounted Electronic Trip
 Circuit Breaker: Type PJ
 Standard Trip Unit, Long Time, Short
 Time, Instantaneous
 Nameplate - White Surface / Black
 Letters, Adhesive (Field Installed)
 2 - 1200AS/1200AT 480V 80% Rated 65 kA 3 Pole
 UL, Group Mounted Electronic Trip
 Circuit Breaker: Type PJ
 Power Trip Unit, Long Time, Short Time,
 Instantaneous
 Energy Reduction Maintenance Switch
 Nameplate - White Surface / Black
 Letters, Adhesive (Field Installed)
 1 - 200AT 480V 80% Rated 100 kA 3 Pole UL,
 Group Mounted Thermal Magnetic Circuit
 Breaker: Type JL
 Nameplate - White Surface / Black
 Letters, Adhesive (Field Installed)

Seq #	Qty	Product Description
3	1	Designation : Product Details: 1 - SRVSQDSER-Startup Services - Straight Time The following startup scope of work is Schneider Electric's manufacturer recommended scope of work for Startup Services. Schneider Electric will perform the Scope of Work per Schneider Electric document 1910DB1302-120213 Scopes of Work for Electrical Acceptance Testing. Work will be performed during Straight Time (any scheduled 8 hour period between 06:00 and 18:00 hours Monday thru Friday). Startup scope of work includes Schneider Electric technician supervision during energization of equipment. Quote price is based on energization during final day of inspection and testing. To allow us to better service your needs, please contact Schneider Electric Services a minimum of 4-6 weeks prior to date of service. Lead times are not guaranteed, but requests less than 4-6 weeks may result in additional charges based on FSR availability and required logistics. To schedule dates of service, please contact your local Schneider Electric project manager or call: 1-888-778-2733. Additionally, to avoid repricing, startup must be performed within 3 months of equipment ship date. Formal report to be issued electronically within 2 weeks of service completion.

2 Days Informal Training
Digital representation of the single line diagram. As the single source of truth for your power system, the digital twin can store detailed information on your equipment and is regarded as the first step towards NFPA70E and 70B compliance. This includes the labor for model development and an ETAP digital twin license. Additional electrical digital twin service plans sold separately.

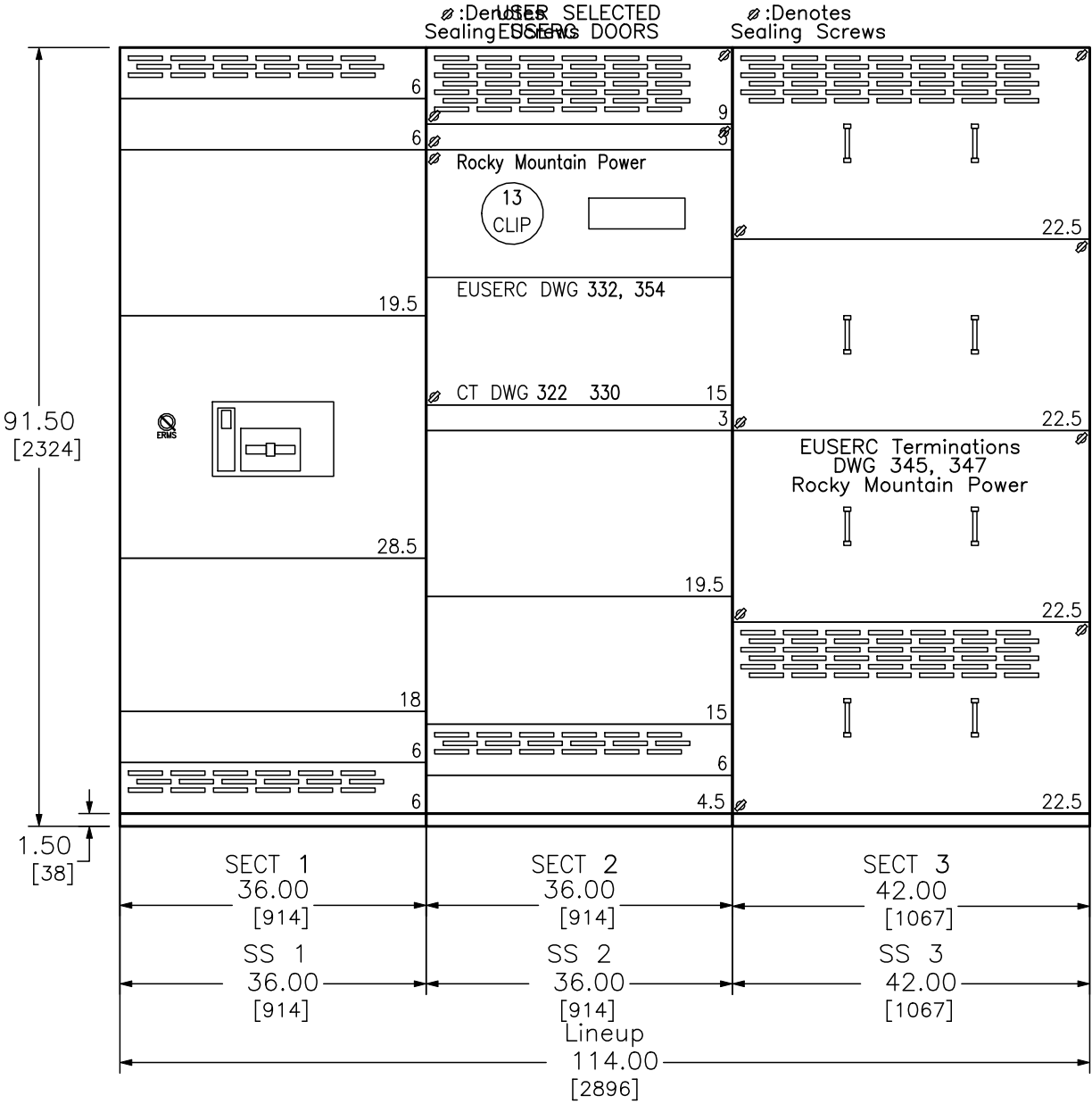
Following user entered devices included in startup:
None

12 month complimentary extended warranty. Schneider Electric Services is pleased to offer a complimentary 12 month warranty extension above and beyond our standard warranty and any purchased extended warranties. The 12 month warranty extension only applies to equipment that is successfully tested, started up, invoiced by SE, and paid in full by the customer.

Qty 1 - QED Switchboard
Designation: REVISED Incoming
Qty 1 - QED Switchboard
Designation: Distribution
1 - 12MTHEXTWARRWSTUP-SIBS 12 MO EXTENDED WARRANTY W/ STARTUP
Schneider Electric Services is pleased to offer a complimentary 12 month warranty extension above and beyond our standard warranty and any purchased extended warranties. The 12 month warranty extension only applies to equipment that is successfully tested, started up, invoiced by SE, and paid in full by the customer.

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
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T-bus 19.5 in T-bus 19.5 in T-bus 19.5 in



SWITCHBOARD GENERAL NOTES
PRODUCT DESCRIPTION & RATINGS

Power System Data

480Y/277V 3Ph 4W 60Hz / 3 Phase Wye
Solidly Grounded
System Short Circuit Current Rating: 65kA RMS
Incoming Section 3 Cable Through the Bottom Right of Lineup

Bus System Data

2000A Tin Plated Copper Main Bus
(1) .25x.875 IN/6x22 mm Cu Ground Bus

Enclosure Data

Type 3R Free Standing
Exterior Paint Color: ANSI 49
Front Accessibility Only Required
Handling: Rollers
Strip Heater w. Thermostat & Humidistat
Rodent barriers
1.5H Corrosion Resist Base Channels
Interior Lights – All Sections
Nameplate Mounting Type: Adhesive (Field Installed)
Equipment Nameplate: Black Surface/White Letters
Steel Bottom Closure Plate
Section Barriers
Device Nameplate: White Surface / Black Letters
Base channels cannot be removed from EUSERC switchboard line-ups
Utility sealing hardware installed for unmetered bus compartments

Estimated Shipping Weight

Shipping Split 1 887.00 lbs / 402.34 kgs
Shipping Split 2 1050.00 lbs / 476.28 kgs
Shipping Split 3 771.00 lbs / 349.73 kgs
Complete Lineup 2708.00 lbs / 1228.35 kgs
NOTE: Refer to the shipping documents for actual weights of the equipment.

Code Standards

U.L. Deadfront and suitable for use as Service Entrance
when not more than six (6) disconnecting means are provided.

Rating Nameplates

ST1– Service Entrance – Section Bus 2000A
ST2– Deadfront – Section Bus 2000A
ST3– Deadfront – Section Bus 2000A

PRODUCT INFORMATION

Wiring

All wiring to be SIS Wire type

Instruction Bulletins

Reference 80043–055 For Handling, Installation,
Anchoring, Inspection And Maintenance Information

Product Accessories/Options

Certified Test Report
Seismic Qualified
24V Trip Unit Display Power
Locally Mounted ERMS Switch
(2) 4” Infrared Viewing Window–Front Section 1

(Continued on next page.)

JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	REVISED Incoming
JOB LOCATION:		EQUIPMENT TYPE:	QED–2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION VIEW
ENGR:			
DATE:	September 28 2026		
DRAWING STATUS:	QUOTE	NOT FOR CONSTRUCTION	DWG# FQ-7379630-233180658-01
		PG 1	OF 3
		REV	–

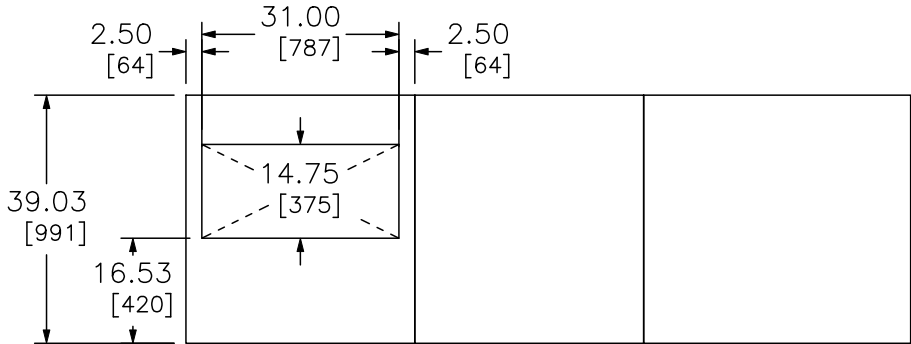
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SWITCHBOARD GENERAL NOTES CONTINUED

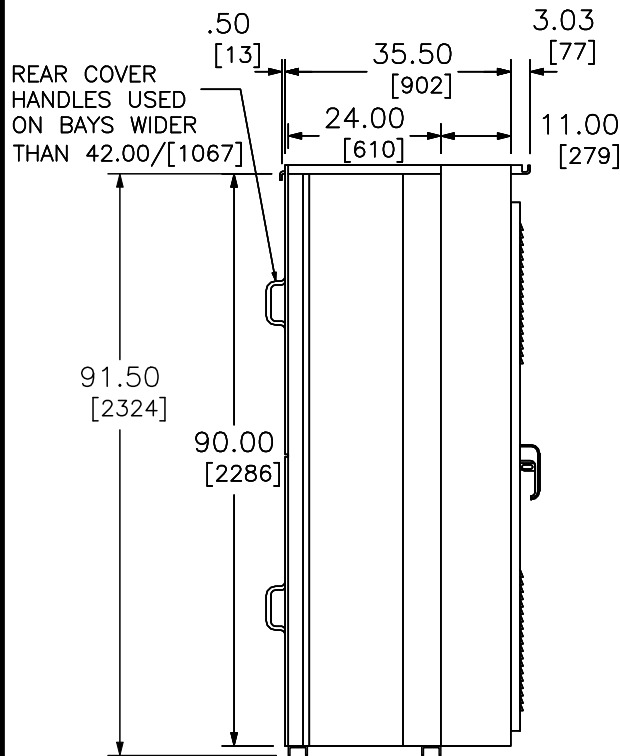
- (2) 4" Infrared Viewing Window—Rear Section 1
- (2) 4" Infrared Viewing Window—Front Section 2
- (2) 4" Infrared Viewing Window—Rear Section 2
- (2) 4" Infrared Viewing Window—Front Section 3
- (2) 4" Infrared Viewing Window—Rear Section 3

JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	REVISED Incoming
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION VIEW
ENGR:		SQUARE D	
DATE:	September 28 2026	by Schneider Electric	
DRAWING STATUS:	QUOTE	DWG# FQ-7379630-233180658-01	PG 2 OF 3 REV -

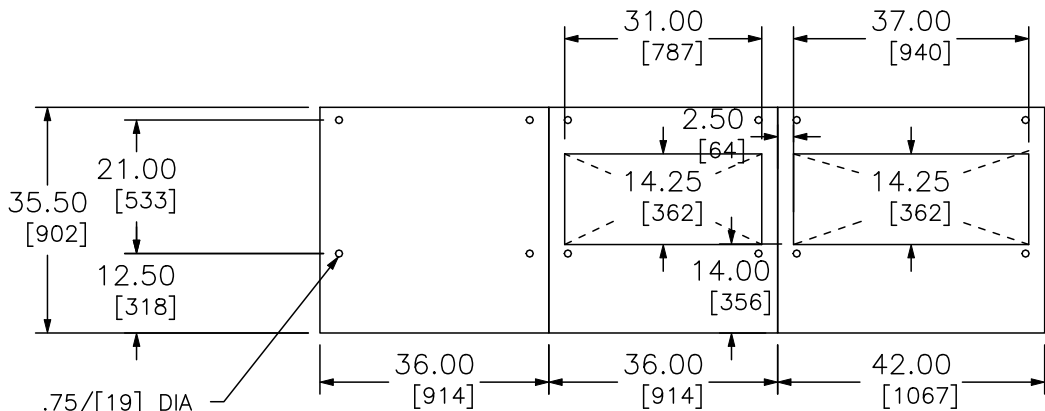
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--	----	--	--/--/--	--	----	--	--/--/--	--	----	--	--/--/--



TOP VIEW – FRONT



LEFT SIDE VIEW



.75/[19] DIA
MTG HOLES OFFSET
3.00/[76] TYP
FROM SIDE

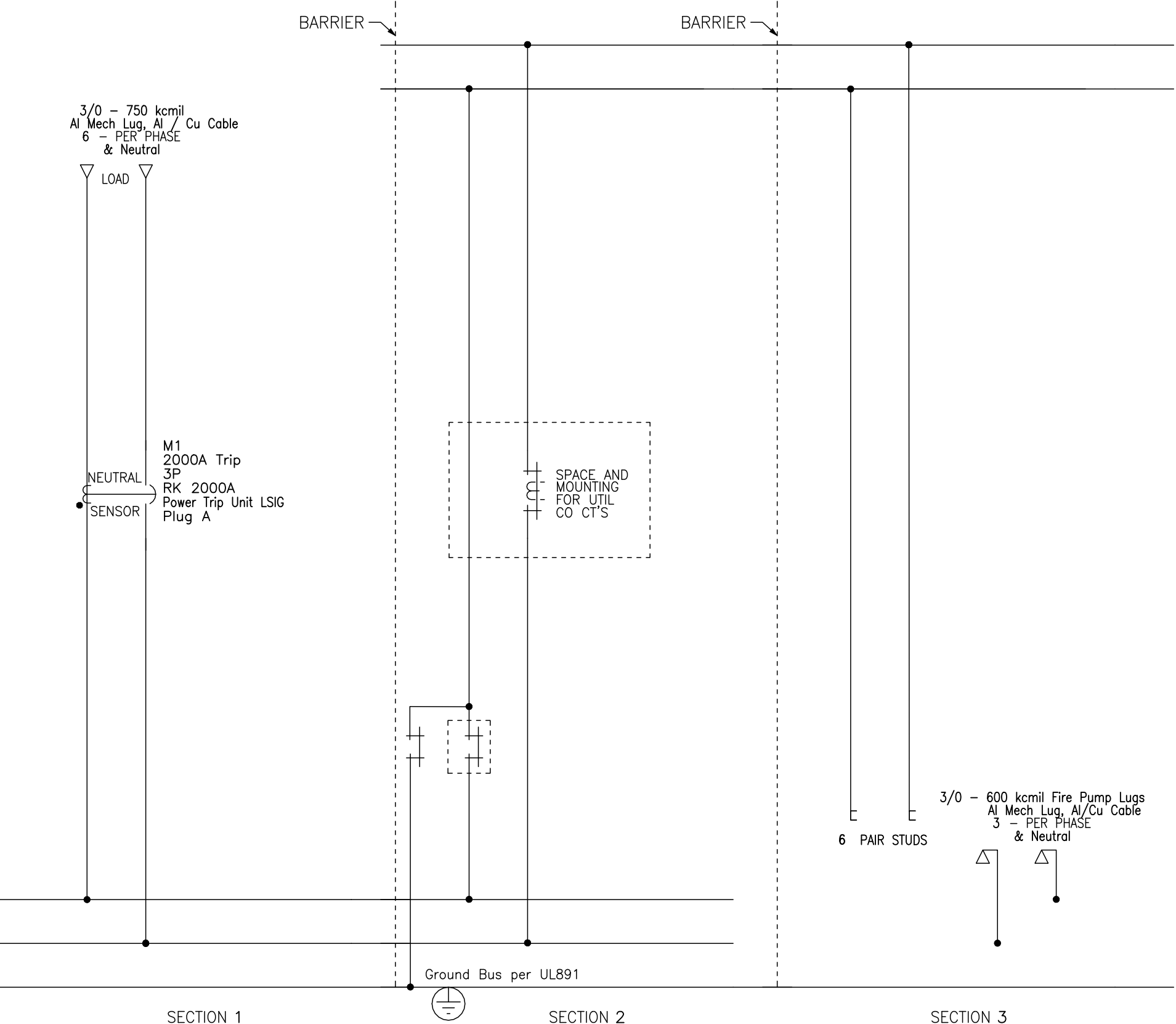
FLOOR PLAN – FRONT

NOTE: ALL DEVICES REQUIRING DRILLING OR INSERTION IN MOUNTING PAD
SUCH AS CONDUIT, ANCHORING STUDS, SLEEVE INSERTS, ETC.
SHOULD BE INSTALLED BEFORE SETTING EQUIPMENT IN PLACE.

NOTE:
A MINIMUM OF 2.00/[51]
CLEARANCE BEHIND THE
SWITCHBOARD IS REQUIRED
FOR TOP COVER OVERHANG.

JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	REVISED Incoming
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	SIDE, TOP VIEW & FLOOR PLAN
ENGR:		SQUARE D by Schneider Electric	
DATE:	September 28 2026		
DRAWING STATUS:	QUOTE	DWG#	FQ-7379630-233180658-01
		PG 3	OF 3
		REV	--

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
-	----	--	--/--/--	-	----	--	--/--/--	-	----	--	--/--/--



JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	REVISED Incoming
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE
ENGR:		 by Schneider Electric	
DATE:	September 28 2026		
DRAWING STATUS:	QUOTE	DWG#	OQ-7379630-233180658-01
		PG	1
		OF	2
		REV	-

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
-	----	--	--/--/--	-	----	--	--/--/--	-	----	--	--/--/--

POWER STYLE QED-2 SWITCHBOARD													LEGEND	
SECT NO	CKT NO	IMD /GMD CONFIG	DEVICE/FRAME RATING	TRIP AMP	FUSE/ TRIP	#P	DESIGNATION	N/P	LUG/WIRE INFORMATION				ACCESSORIES / NOTES	
									QTY	PHASE WIRE RANGE	QTY	NEUT WIRE RANGE		
—	—	—	Equipment Nameplate	—	—	—	SWBD—Main	Yes	—	—	—	—	—	
1	—	—	Strip Heater	—	—	—	—	—	—	—	—	—	SHR	
1	M1	FIX	RK 2000A Plug A 100%	2000A	P—LSIG	3P	2000 A Main	Yes	6	3/0 — 750 kcmil	6	3/0 — 750 kcmil	GF,OF1 PLA,ERMS,TU	
2	UCT	—	2000A Fire Pump Lugs under UCT	—	—	—	Rocky Mountain Power	No	3	3/0 — 600 kcmil	1	3/0 — 600 kcmil		
3	—	—	Incoming Connection	—	—	—	—	—	6	Pair Studs	6	Pair Studs		

ERMS	Energy Reduction Maintenance SW
GF	Ground Fault
OF1	1 Form C Breaker Aux Contacts
PLA	Padlock Attachment—Fixed
SHR	Strip Heater
TU	24V Trip Unit Display Power

NAMEPLATE INFORMATION:	JOB NAME: WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION: REVISED Incoming
MOUNTING TYPE: Adhesive (Field Installed)	JOB LOCATION:	EQUIPMENT TYPE: QED-2 Switchboard
EQUIPMENT: Black Surface/White Letters	DRAWN BY: CAD	DRAWING TYPE: SCHEDULE
DEVICE: White Surface / Black Letters	ENGR:	SQUARE D by Schneider Electric
	DATE: September 28 2026	
	DRAWING STATUS: QUOTE	
DWG# OQ-7379630-233180658-01		PG 2 OF 2 REV -

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
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SWITCHBOARD GENERAL NOTES – SERIES 2
PRODUCT DESCRIPTION & RATINGS

Power System Data

480Y/277V 3Ph 4W 60Hz / 3 Phase Wye
Solidly Grounded
System Short Circuit Current Rating: 65kA RMS
Incoming Section 2 Cable Through the Bottom Right of Lineup

Bus System Data

2000A Tin Plated Copper Main Bus
(4) .25x1.50 IN/6x38 mm Cu Bus Bar Per Phase
(2) .25x4.00 IN/6x102 mm Cu Bus Bar Per Neutral
(1) .25x.875 IN/6x22 mm Cu Ground Bus

Enclosure Data

Type 3R Free Standing
Exterior Paint Color: ANSI 49
Front Accessibility Only Required
Handling: Rollers
Strip Heater w. Thermostat & Humidistat
Rodent barriers
1.5H Corrosion Resist Base Channels
Interior Lights – All Sections
Nameplate Mounting Type: Adhesive (Field Installed)
Equipment Nameplate: Black Surface/White Letters
Steel Bottom Closure Plate
Section Barriers
Device Nameplate: White Surface / Black Letters

Estimated Shipping Weight

Shipping Split 1 578.00 lbs / 262.18 kgs
Shipping Split 2 1340.00 lbs / 607.82 kgs
Complete Lineup 1918.00 lbs / 870.00 kgs
NOTE: Refer to the shipping documents for actual weights of the equipment.

Code Standards

U.L. Deadfront

Rating Nameplates

ST1– Deadfront – Section Bus 2000A
ST2– Deadfront – Section Bus 2000A

PRODUCT INFORMATION

Wiring

All wiring to be SIS Wire type

Instruction Bulletins

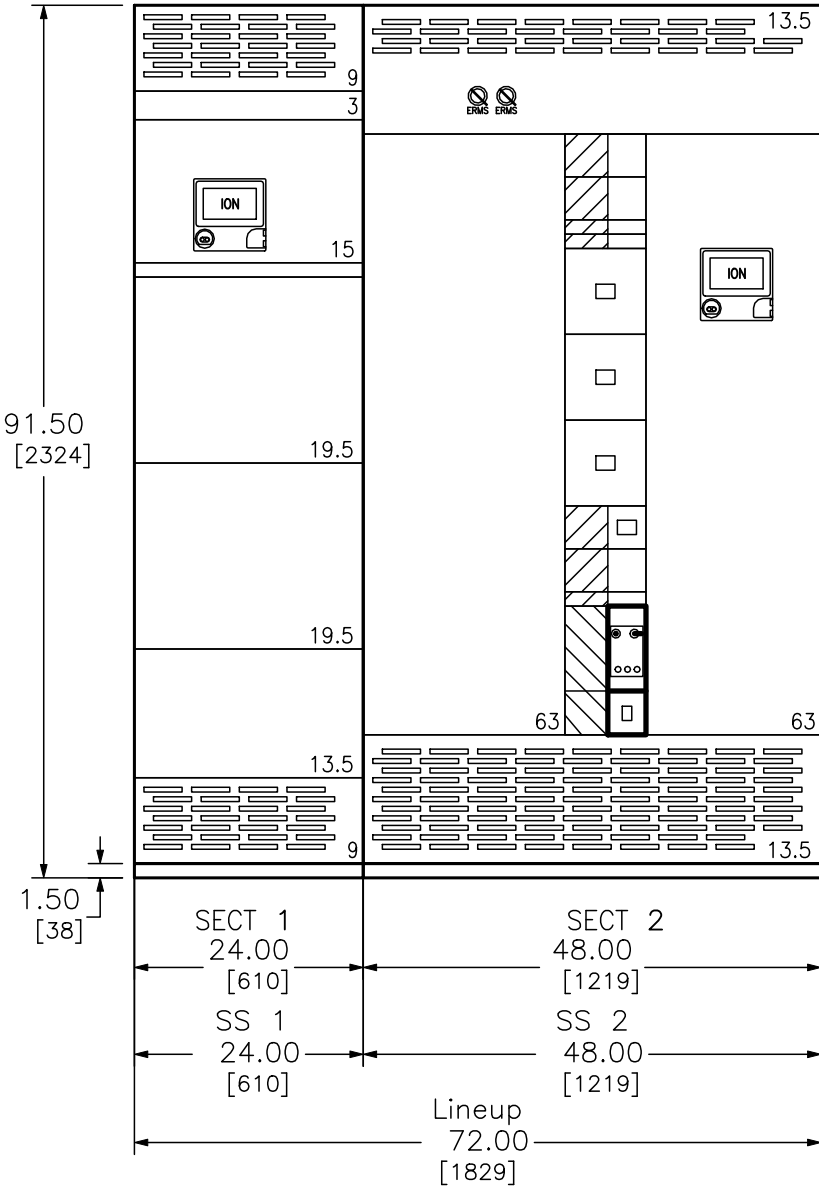
Reference 80043–055 For Handling, Installation,
Anchoring, Inspection And Maintenance Information

Product Accessories/Options

Certified Test Report
Seismic Qualified
24V Trip Unit Display Power
Locally Mounted ERMS Switch
(2) 4” Infrared Viewing Window–Front Section 1
(2) 4” Infrared Viewing Window–Rear Section 1
(2) 4” Infrared Viewing Window–Front Section 2
(2) 4” Infrared Viewing Window–Rear Section 2

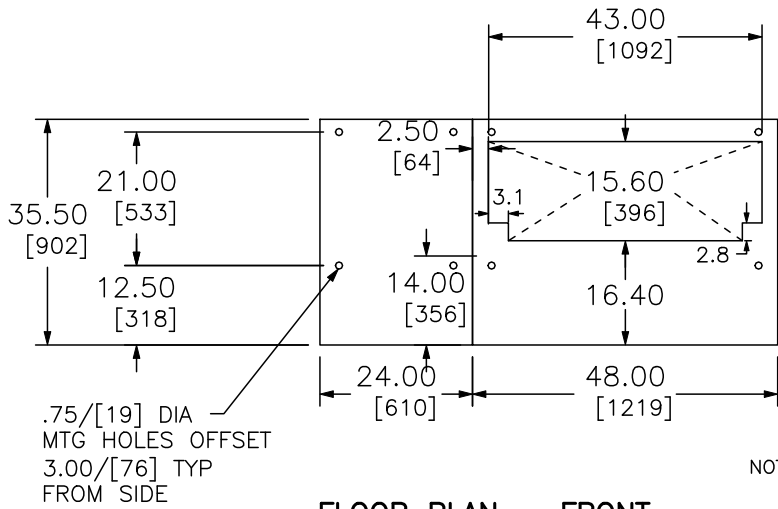
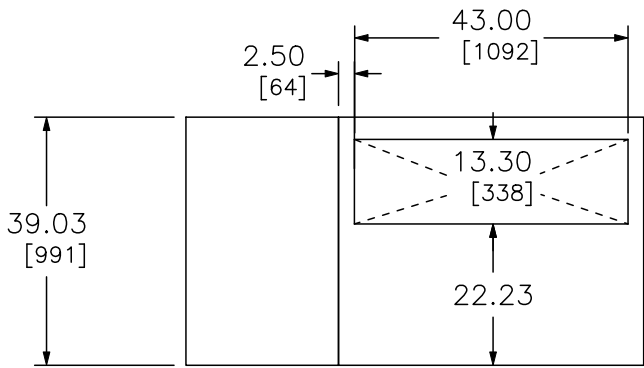
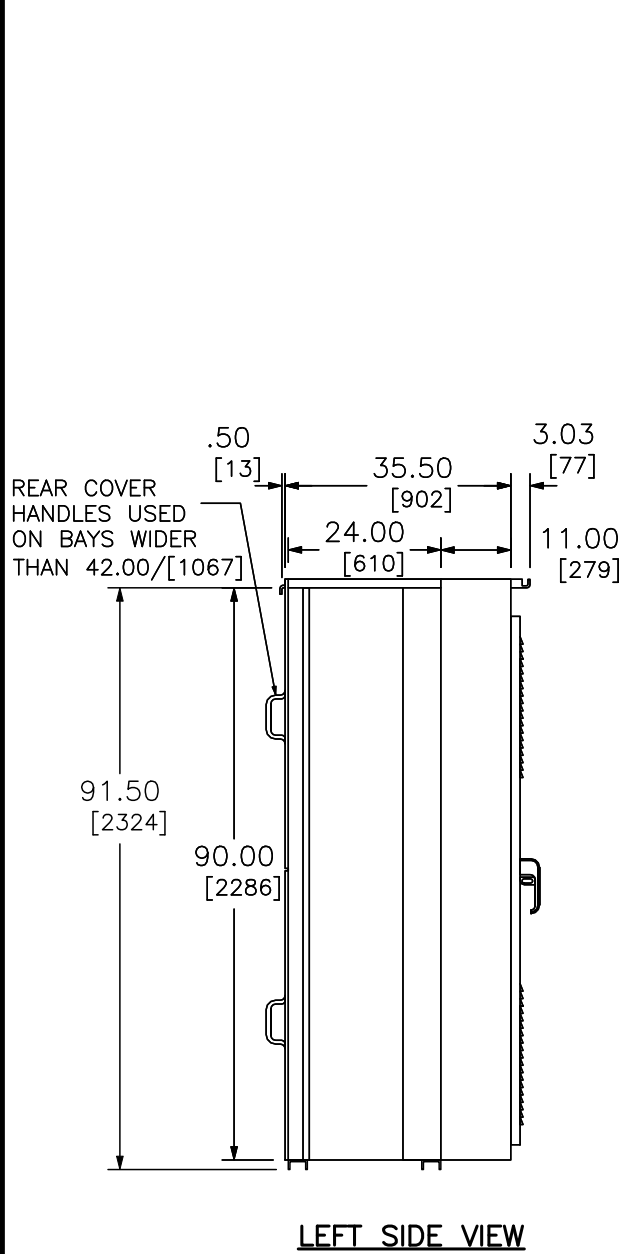
T–bus
19.5 in

T–bus
19.5 in



JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	Distribution
JOB LOCATION:		EQUIPMENT TYPE:	QED–2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	ELEVATION VIEW
ENGR:		 by Schneider Electric	
DATE:	September 28 2026		
DRAWING STATUS:	QUOTE	NOT FOR CONSTRUCTION	DWG# FQ–7379630–233180659–01
			PG 1 OF 2 REV –

REV	DESCRIPTION	BY	DATE	—	----	--	--/--/--	—	----	--	--/--/--
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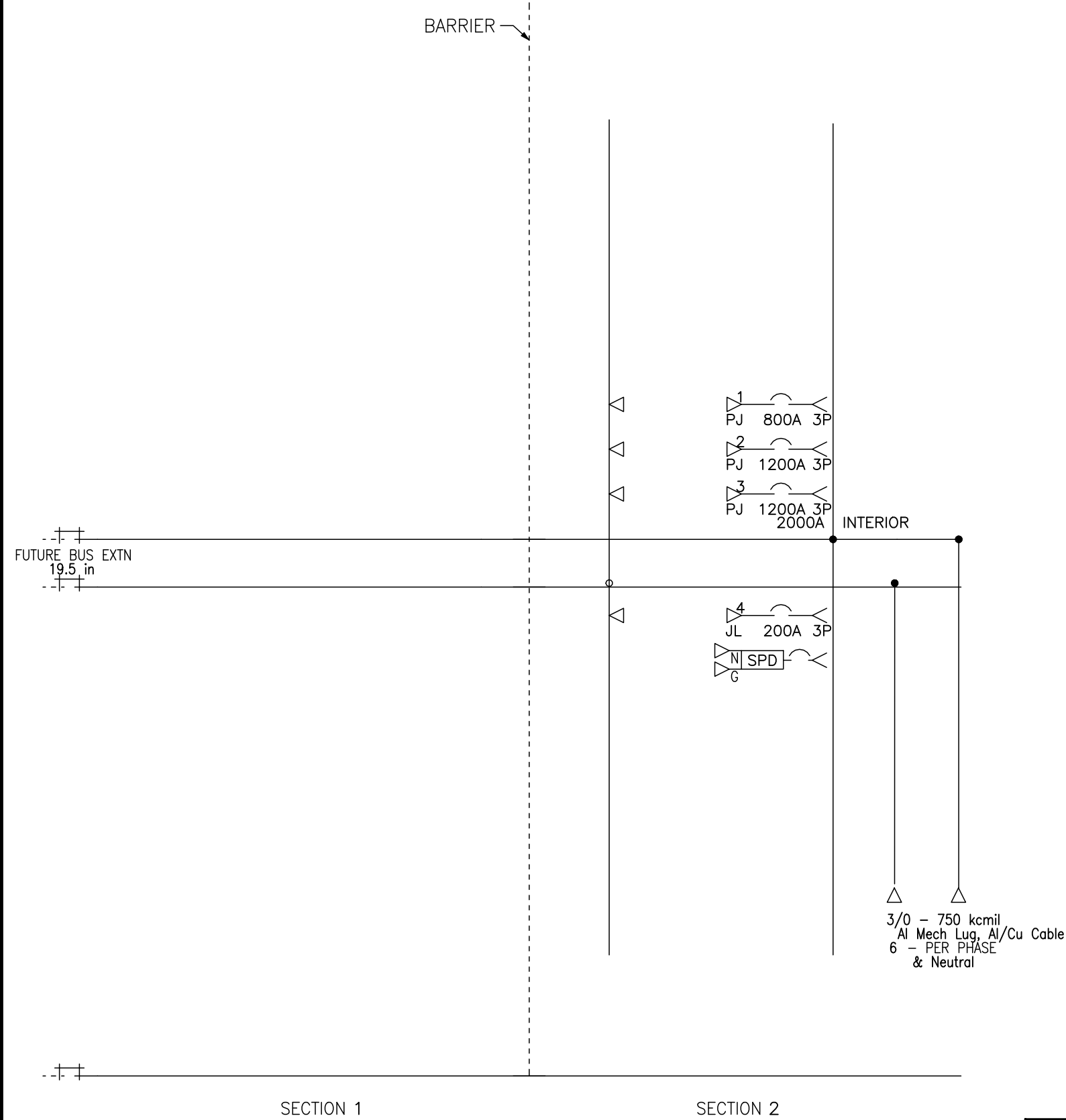


NOTE:
A MINIMUM OF 2.00/[51]
CLEARANCE BEHIND THE
SWITCHBOARD IS REQUIRED
FOR TOP COVER OVERHANG.

NOTE: ALL DEVICES REQUIRING DRILLING OR INSERTION IN MOUNTING PAD
SUCH AS CONDUIT, ANCHORING STUDS, SLEEVE INSERTS, ETC.
SHOULD BE INSTALLED BEFORE SETTING EQUIPMENT IN PLACE.

JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	Distribution
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	SIDE, TOP VIEW & FLOOR PLAN
ENGR:		SQUARE D by Schneider Electric	
DATE:	September 28 2026	DWG#	FQ-7379630-233180659-01
DRAWING STATUS:	QUOTE	NOT FOR CONSTRUCTION	PG 2 OF 2 REV —

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
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JOB NAME:	WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION:	Distribution
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	CAD	DRAWING TYPE:	ONE LINE
ENGR:		SQUARE D[®] by Schneider Electric	
DATE:	September 28 2026		
DRAWING STATUS:	QUOTE	DWG#	OQ-7379630-233180659-01
		PG 1	OF 2
		REV	-

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
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POWER STYLE QED-2 SWITCHBOARD SERIES 2

SECT NO	CKT NO	IMD /GMD CONFIG	DEVICE/FRAME RATING	TRIP AMP	FUSE/ TRIP	#P	DESIGNATION	N/P	LUG/WIRE INFORMATION				ACCESSORIES / NOTES
									QTY	PHASE WIRE RANGE	QTY	NEUT WIRE RANGE	
-	-	-	Equipment Nameplate	-	-	-	SWBD-Main	Yes	-	-	-	-	-
1	-	-	Strip Heater	-	-	-	-	-	-	-	-	-	SHR
2	-	-	Incoming Connection	-	-	-	-	-	6	3/0 - 750 kcmil	6	3/0 - 750 kcmil	SHR
2	-	-	Strip Heater	-	-	-	-	-	-	-	-	-	SHR
2	1	9 in	PJ 800A Plug A	800A	S-LSI	3P	DP-CHEM SHEET	Yes	3	3/0 - 500 kcmil	3	3/0 - 500kcmil	
-	-	-	-	-	-	-	02E02	Yes	-	-	-	-	-
2	2	9 in	PJ 1200A Plug A	1200A	P-LSI	3P	DP-Main	Yes	4	3/0 - 500 kcmil	4	3/0 - 500kcmil	ERMS,TU
2	3	9 in	PJ 1200A Plug A	1200A	P-LSI	3P	DP-MB SHEET	Yes	4	3/0 - 500 kcmil	4	3/0 - 500kcmil	ERMS,TU
-	-	-	-	-	-	-	02E02	Yes	-	-	-	-	-
2	4	4.5 in	JL	200A	-	3P	200 A ACTIVE HARMONIC FILTER	Yes	1	3/0 - 350 kcmil	1	3/0 - 350kcmil	
2	-	13.5 in	240kA SPD	-	-	-	-	-	-	-	-	-	SPD

LEGEND

ERMS	Energy Reduction Maintenance SW
ION9	ION Meter ION9000
SHR	Strip Heater
SPD	Surge Protection Device
TU	24V Trip Unit Display Power

NAMEPLATE INFORMATION:	JOB NAME: WTP_Optimization_Split Setup	EQUIPMENT DESIGNATION: Distribution
MOUNTING TYPE: Adhesive (Field Installed)	JOB LOCATION:	EQUIPMENT TYPE: QED-2 Switchboard
EQUIPMENT: Black Surface/White Letters	DRAWN BY: CAD	DRAWING TYPE: SCHEDULE
DEVICE: White Surface / Black Letters	ENGR:	SQUARE D by Schneider Electric
	DATE: September 28 2026	
	DRAWING STATUS: QUOTE	
		DWG# OQ-7379630-233180659-01
		PG 2 OF 2 REV -

Square D QED-2 Low Voltage Switchboards

A tradition of distinction, with a mission to
innovate solutions for tomorrow



Life Is 

SQUARE D™

by Schneider Electric

A Tradition of Distinction

Square D QED-2 Low Voltage Custom Switchboards

Square D™ QED-2 Switchboards set the standard for system solutions of today and those of tomorrow by delivering on higher expectations and standards! Square D Switchboards have been setting the standards for electrical distribution systems due to their trusted durable construction and continuous innovative progression that keeps Square D one step ahead of all others. This progression includes integrating power metering and communications capabilities providing direct access to energy management at main and feeder level. This allows for flexibility in developing simple or complex monitoring solutions, as well as future expansion. Square D Low Voltage Custom Switchboards are designed to distribute electrical power and provide a reduced footprint without compromising performance or versatility.

A Solid Foundation

Square D Switchboard ratings offer a robust solution through 5,000 A and 200 kA. Higher feeder ampacities are available with individually mounted branch devices up to 4,000 A.



Innovative but Familiar

The Quick Connect capability allows for a simple and seamless connection when installing. Even though Square D Switchboards continue to become more innovative, the quality and familiarity of the equipment leads the industry.

Energy Reduction Maintenance

An ERMS switch helps meet the NEC 240.87 code for arc flash energy reduction, improving worker safety by modifying the trip curve. A "Maintenance Mode" switch is mounted on the switchboard.

Industry Leading Compact Footprint

Square D Switchboards were designed with the customer in mind. They provide front accessibility that aids in reducing footprint as well as provides convenient access for maintenance.



Smart Systems Communications

The Smart Systems solution provides Ethernet-networked metering and status data from Square D switchboards and electrical equipment. Masterpact™ and PowerPact™ circuit breakers with Micrologic™ trip units offer energy and power quality metering capabilities integrated into the trip units. Combined with Smart Systems communications, circuit breakers can be networked, monitored and controlled remotely, revealing opportunities to reduce downtime and monitor energy use for savings in electric system operating costs.

Accelerated Engineering

Meet tighter project schedules with AE Standard Switchboards. It's the faster, better way to order, and options such as the ERMS switch are added easily through Accelerated Engineering.

Designed with the Customer in Mind

Square D Switchboards allow for custom engineering for each line-up such as Main-Tie-Mains, Automatic Transfers, Commercial Multi-Metering, and reduced height configurations.



Efficient Distribution

The I-Line™ distribution section is unique — and popular — for its enhanced safety and ease of installation.

The I-Line offers jaw-type connections which provide a firmer, more secure grip on the bus bar under high-level fault conditions for improved uptime. Distribution sections are available in single or double row construction allowing an increased power density in a compact footprint.

A Mission of Innovative Solutions

QED-2 Accelerated Engineering Standard Switchboards

To better meet our customer's tight schedules, our Square D QED-2 Standard Switchboard is available with Accelerated Engineering, which brings together standard designs for the most frequently requested ratings and options. With Accelerated Engineered Switchboards, on-demand approval drawings and an auto release of the equipment will allow you to stay competitive by simplifying the order process and offering a reduction in ship time. This means the customer will receive their switchboard 2 weeks faster. This allows for a quicker project turnaround for all parties involved, providing a competitive advantage in the industry.

★ Faster Project Turnaround

Accelerated Engineering Standard Switchboards offer a more responsive, faster and more flexible solution.

- On-demand factory approval drawings
- Auto release of Equipment to manufacturing
- Select designs with premier 4-week lead time
- 24/7 services support
- Customer-focused order process
- Customizable options available

Enclosure Options

Switchboard enclosures are available as Indoor NEMA Type 1 or Outdoor NEMA Type 3R construction.

Standard Solution without the Compromise

Surge Protection

Internally mounted Surgelogic™ surge protective devices in mains section or I-Line interior.

Metering Options

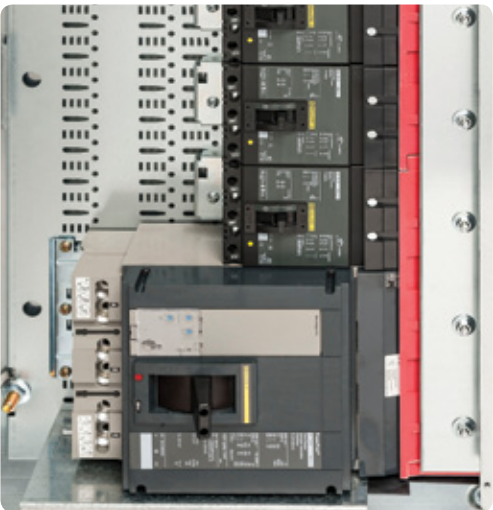
PowerLogic™ Power Meters are available to monitor at main or feeder level.



On-Demand Robust Solution

Accelerated Engineering Standard Switchboards provide expedited

manufacturing and delivery time without sacrificing the robustness of the solution needed. The maximum rating for these standard switchboards is through 4000 A and 100 kAIC.



Unrestricted Branch Mounting*

The unique design of the I-Line single or double row distribution section allows branch circuit breakers the flexibility to mount a 15 A circuit breaker next to a 1,200 A circuit breaker. This presents the opportunity for more effective use of space.

A screwdriver is the only tool you need to install these breakers, which saves valuable installation time.

** Space for high-level communications will need to be taken into account.*



Metering Down to 15 Amps

PowerPact™ with Micrologic trip units offer the capability to meter energy down to 15 A. Standard trip units provide convenient, local data access through a high visibility front display.



Whether it is a highly customizable switchboard or an expedited switchboard needed.

Your requirements and expectations **will not only be met but exceeded** with Square D QED-2 Low Voltage Switchboards.



Introduce Quality into Your Electrical Room

1 This section supplements Section 26.24.13 10 — Low Voltage Switchboards, unless otherwise noted.

2 Comply with requirements as follows:

Standards	
UL 50	Enclosures for Electrical Equipment
UL 98	Enclosed and Deadfront Switches
UL 489	Molded Case Circuit Breakers
UL 891	Deadfront Switchboards
UL 977	Fused Power Circuit Devices
UL 943	Ground Fault Circuit Interrupters
UL 1053	Ground Fault Sensing and Relaying Equipment
NEC Article 834	Switchboards
NFPA 70	National Electrical Code * (NEC *)
ANSI/IEEE C12.1	Code for Electricity Metering
ANSI C39.1	Electrical Analog Indicating Instruments
ANSI C57.13	Instrument Transformers
NEMA AB 1	Molded Case Circuit Breakers and Molded Case Switches
NEMA PB 2	Switchboards

3 QED-2 Switchboard Electrical Ratings:

- a. Nominal AC System Voltage: [600 Vac] [480 Vac] [240 Vac] [208 Vac]
- b. Maximum Design Voltage: 635 Vac
- c. Maximum Short-Circuit Current: 100 kAIR (@ 635 Vac)

4 QED-2 Switchboard General Construction:

- a. Indoor NEMA 1 Enclosure or Outdoor NEMA 3R Enclosure
- b. Fixed or drawout breakers
- c. Removable Rear Cover Panels Secured with Captive Screws [Hinged Doors]

For assistance or more information:



Ask your authorized Schneider Electric Distributor



Call at 888-SQUARED (888-778-2733)



Visit schneider-electric.us/switchboards

Schneider Electric USA

800 Federal Street
Andover, MA 01810
Tel: (978) 794-0800
www.schneider-electric.com/us

SIGNAL HILL WTP OPTIMIZATION PROJECT

MANDATORY PRE-BID CONFERENCE

SIGN-IN SHEET

Date: September 23, 2026

Location: Mountain Regional Water Special Service District

5739 Paintbrush Rd, Park City, UT

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GEOTECHNICAL INVESTIGATION
SIGNAL HILL WATER TREATMENT PLANT EXPANSION
7563 PROMONTORY RANCH ROAD
PARK CITY, UTAH

PREPARED FOR:
CAROLLO ENGINEERS
7090 SOUTH UNION PARK AVENUE, SUITE 600
MIDVALE, UTAH 84047
ATTENTION: BRAD BUSWELL

PROJECT NO. 1250255

OCTOBER 23, 2025

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APPENDIX

SHEAR WAVE VELOCITY TESTING

EXECUTIVE SUMMARY

1. The subsurface soils encountered in the test pits consist of approximately 1 ½, ½, 6 ½, 1, 20 ½, and 5 feet of fill in Test Pits TP-1 through TP-6, respectively. Approximately 1 foot of topsoil was encountered in Test Pit TP-7. Volcanic bedrock was encountered below the fill in Test Pits TP-1 through TP-5. Approximately 2 to 3 feet of clay was encountered below the fill in Test Pit TP-6 and below the topsoil in Test Pit TP-7. Volcanic bedrock was encountered below the clay in Test Pits TP-6 and TP-7.
2. No subsurface water was encountered in the test pits to the maximum depth of exploration, approximately 21 feet.
3. Approximately ½ to 6 ½ feet of fill was encountered in the test pits except for Test Pit TP-5, which has fill extending to a depth of about 20 feet. Where the existing main building has a below grade floor on its northwest side, backfill is anticipated that should be removed from below the new solids holding tank and new garage with truck bay. Unsuitable fill, backfill, topsoil, organics, debris and other deleterious material should be removed from below the area of the proposed structures, pavement and other improvements sensitive to differential settlement.
4. The proposed buildings may be supported on spread footings bearing on the undisturbed bedrock or on compacted structural fill extending down to the undisturbed bedrock. The footings for a building should bear entirely on undisturbed bedrock or structural fill. Where a footing would bear partially on structural fill and partially on bedrock, the bedrock should be over-excavated at least 2 feet and structural fill placed such that the footing bears entirely on at least 2 feet of structural fill or the footing extended down to bear entirely on bedrock. Spread footings may be designed using an allowable net bearing pressure of 3,500 pounds per square foot.
5. Geotechnical information related to foundations, subgrade preparation, materials and pavement is included in the report.

SCOPE

This report presents the results of a geotechnical investigation for the proposed Signal Hill water treatment plant expansion at 7563 Promontory Ranch Road in Park City, Utah. The report presents the subsurface conditions encountered, laboratory test results and recommendations for foundations and pavement. The study was conducted in general accordance with our proposal dated April 29, 2025.

Field exploration was conducted to obtain information on the subsurface conditions. Samples obtained from the field investigation were tested in the laboratory to determine physical and engineering characteristics of the on-site soil. Information obtained from the field and laboratory was used to define conditions at the site for our engineering analysis and to develop recommendations for the proposed foundations and pavement.

This report has been prepared to summarize the data obtained during the study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report.

SITE CONDITIONS

The water treatment facility is located on the northwest side of Promontory Ranch Road near the top of a ridge line sloping down to the southwest and southeast. It appears that development of the site generally included cuts in the northern portion of the facility and fills in the southern portion.

The proposed additions to the building are located on the northwest and southwest sides (see Figure 1). The building is a two-story-high structure with the main floor being one level

below grade on the northwestern side and at grade on the southeastern side. There is likely to be backfill along the northwestern, southwestern and northeastern walls of the building. There is a buried water tank to the northwest of the building and an area that appears to have been filled to the south of the tank where the proposed chemical building is planned. There is some landscaping including brush and trees in this area.

The area on the northwestern side of the building is not paved but generally has a gravel surface. There are some sheds in this area for storage of materials and equipment. There is a small paved apron in the western part of the area where there is a doorway entrance to the building. There is a shed near the west end of the building near the buried water tank.

The area southeast of the building is paved with asphaltic concrete. There is a fuel storage tank and generator southeast of the pavement. An unpaved access road extends along the northeast and northwest sides of the building. This access road continues around the facility to the northwest and southwest of the building and buried tank along the edge of a storage pond that is to the northwest and west. The access road connects to the paved area on the southeast side of the building.

The proposed sewer alignment extends through the pavement area on the southeast side of the building, through the unpaved access road south of the building and then through an undeveloped area to the south, which slopes gently down to the south toward Promontory Ranch Road. There is some sparse brush and trees in this area.

GEOLOGIC CONDITIONS

Geologic conditions at the site were evaluated by a review of geologic literature, aerial photographs, lidar data, and site reconnaissance of the area. Aerial photographs used during the investigation were obtained from the United States Geological Survey website.

The aerial photographs reviewed were dated August 12, 1953 and have the photograph numbers VV AS M 18 AMS 3312 and 3313. The lidar data is 0.5-meter bare-earth DEMs from 2020, downloaded from the Utah AGRC website. A geologist from AGECEC visited the site on June 25, 2025 to map the geology of the site (See Figure 1A).

The sediments at the treatment plant are mapped by Biek (2022) to consist predominately of volcanic mudflow breccia of Silver Creek of Tertiary age. Pleistocene landslide deposits are mapped to the north of the treatment pond area. Biek (2022) maps a lineation trending north to south, to the west of the project site. We noted the lineation on lidar but saw no evidence of vertical offset along the feature. This indicates that the lineation does not represent an active fault. The closest mapped, potentially active fault is the Wasatch Fault located approximately 20 miles to the west (Utah Geological Survey, 2025).

Based on a review of geologic literature, aerial photographs, lidar data, and site reconnaissance of the area, we find no evidence that surface fault rupture, liquefaction, landslide, debris flow, or rockfall are geologic hazards that would affect the proposed treatment plant expansion.

GEOPHYSICAL MEASUREMENTS

Geophysical methods, consisting of multi-channel analysis of surface waves (MASW) and micro-tremor array measurements (MAM) were performed at the site on June 25, 2025. The approximate locations of the arrays are shown on Figure 1 in the appendix.

MASW

The MASW was performed using a 150-foot array of twenty-four 4.5-Hz vertical geophones, placed at 6½-foot spacings. The geophones were used to record wavefields with strong Rayleigh wave content that were actively generated by striking vertically downward with a 16-pound sledgehammer on a steel plate. The

sledgehammer was used at six distinct “shot” locations that were offset 16, 32 and 49 feet relative to the geophones at either end of the array. Five distinct sledgehammer blows were recorded at each “shot” location to allow for signal stacking.

MAM

The MAM was performed using an L-shaped array. The legs of the array were 197 and 180 feet long, respectively, and comprised of twenty-four 4.5-Hz vertical geophones, placed at 16-foot spacings. Ambient vibrations were recorded for approximately 1 hour, with record lengths of 60 seconds each.

The collected data was processed into dispersion data using the *swprocess* software (Vantassel and Cox, 2024). The MAM and MASW data were trimmed together and an experimental target for inversion selected using *swprepost* (Vantassel and Cox, 2022). Results of the trimmed and target data are shown on Figure 2 in the appendix. The inversion target was converted to a suite of possible shear wave velocity profile models using Geopsy Version 3.4.2 (Wathelet, 2025).

The median velocity profile of the best 100 models is shown on Figure 3 in the appendix. We calculate an average shear wave velocity for the top approximately 100 feet ($V_{s,30}$), of $1,640 \pm 70$ feet per second, in general accordance with ASCE 7-22 § 20.4.1. Based on the $V_{s,30}$ value, the site is Site Class C in accordance with ASCE 7-22 Chapter 20.

FIELD STUDY

The field study was conducted on June 5, 2025. Seven test pits were excavated at the approximate locations indicated on Figure 1B using a tracked excavator. Test Pit TP-5 was re-excavated and extended deeper on June 13, 2025 with a rubber-tired backhoe. The test pits were logged and samples obtained by representatives of AGECH. Logs of the subsurface

conditions encountered in the test pits are presented on Figures 2 and 3 with legend and notes on Figure 4.

SUBSURFACE CONDITIONS

The subsurface soils encountered in the test pits consist of approximately 1 ½, ½, 6 ½, 1, 20 ½, and 5 feet of fill in Test Pits TP-1 through TP-6, respectively. Approximately 1 foot of topsoil was encountered in Test Pit TP-7. Volcanic bedrock was encountered below the fill in Test Pits TP-1 through TP-5. Approximately 2 to 3 feet of clay was encountered below the fill in Test Pit TP-6 and below the topsoil in Test Pit TP-7. Volcanic bedrock was encountered below the clay in Test Pits TP-6 and TP-7.

A description of the soils and bedrock encountered in the test pits follows:

Fill - The fill encountered in Test Pit TP-6 consists of clayey sand with small to moderate amounts of gravel. It is slightly moist, brown and contains occasional roots and organics. Moisture-density relationship (Proctor) and classification tests were conducted on a sample of this fill and the results are presented on Figure 8.

The fill encountered in the other test pits consists of silty sand with gravel to silty gravel with sand. The fill includes cobbles and occasional boulders up to approximately 2 feet in size. Results of Proctor and classification tests on this fill are presented on Figures 6 and 7.

Topsoil - The topsoil consists of silty sand with gravel. It is slightly moist, brown and contains roots and organics.

Sandy Lean Clay with Gravel - The clay is stiff, slightly moist and brown.

Bedrock - The bedrock is volcanic mudflow breccia. It is hard to very hard, moist, low to nonplastic and brown to gray.

Laboratory tests on a sample of the bedrock indicate it has a moisture content of 30 percent. A consolidation test was conducted on a sample of the bedrock remolded to a dry density of 87 pounds per cubic foot. The sample did not expand when wetted under a constant pressure of 1,000 pounds per square foot. Results of the consolidation test are presented on Figure 5.

Results of the laboratory tests are summarized on Table I and are included on the test pit logs.

SUBSURFACE WATER

No subsurface water was encountered in the test pits to the maximum depth investigated, approximately 21 feet.

PROPOSED CONSTRUCTION

We understand that the following facilities are planned and are shown on the Figure 1B:

Facility	Anticipated Plan Dimensions (feet)	Antipated Foundation Depth	Risk Category
Solids Holding Tank	28 X 15	Frost Depth	IV
Garage & Truck Bay	28 X 20	Frost Depth (FF elevation is anticipated to be at roughly existing grade)	IV
GAC Building	45 X 32	Frost Depth (FF will be about 10 ft below existing grade)	IV
Chemical Building	104 X 64	Frost Depth (FF elevation will be about 8 ft below existing grade)	IV

We anticipate that the proposed structures will be supported on spread footings. We have assumed maximum column loads of 100 kips and maximum wall loads of 6 kips per foot.

Paved access roads will be constructed at the site. We have assumed traffic for proposed access roads consisting primarily of passenger vehicles and relatively small maintenance equipment and some heavy trucks. Heavy trucks were assumed to be loaded semi tractor-trailers. Daily truck traffic consisting of one and five passes of a heavy truck was assumed for the various pavement thicknesses given in the report.

If the proposed construction, loads or traffic is significantly different from what is described above, we should be notified so that we can reevaluate the recommendations given.

RECOMMENDATIONS

Based on the subsoil conditions encountered, laboratory test results and the proposed construction, the following recommendations are given:

A. Site Grading

We anticipate that there will be moderate amounts of cut and fill for site grading. Significant excavation is anticipated for the proposed chemical building to lower the area to the floor level of the main building, which we understand is on the order of 8 feet below existing grade. Additional excavation is anticipated to remove unsuitable fill from below the proposed chemical building and backfill along the northwest side of the existing building for the other structures. We understand that the proposed GAC Building will extend to the elevation of the main floor of the existing building, approximately 10 feet below existing grade.

1. Subgrade Preparation

Approximately ½ to 6½ feet of fill was encountered in the test pits except for Test Pit TP-5, which had fill extending to a depth of about 20 feet. Where the existing main building has a below grade floor on its northwest side, backfill is anticipated that should be removed from below the new solids holding tank and new garage with truck bay. Unsuitable fill, backfill, topsoil, organics, debris and other deleterious material should be removed from below the area of the proposed structures, pavement and other improvements sensitive to differential settlement. The subgrade should be cut to undisturbed bedrock prior to structural fill or concrete placement.

The owner may consider to accept the risk of slab and pavement distress and leave some of the fill below proposed exterior slabs and pavement. With this option, we recommend that these areas be cut down at least 2 feet below the proposed finish grade, the subgrade moisture conditioned to within 2 percent of optimum and compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557. The grade would then be raised to the desired base of pavement grade with granular borrow compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557.

2. Excavation

Excavation at the site can be accomplished with heavy-duty excavation equipment or with rock excavation methods. Practical excavation equipment refusal was met for a tracked excavator in Test Pits TP-1, TP-3 and TP-7 at depths of approximately 8½, 10½, and 11½ feet, respectively. Excavation difficulty should be expected for excavations extending into the bedrock, particularly for confined excavations such as utility trenches. Rock excavation methods such as ripping, jack-hammering or other methods may be needed where resistant bedrock is encountered.

Temporary unretained excavation slopes in the existing fill may be excavated at 1½ horizontal to 1 vertical or flatter. Temporary unretained excavation slopes in the bedrock or natural clay may be excavated at 1 horizontal to 1 vertical or flatter. Steeper temporary excavation slopes may be considered in competent bedrock but should be evaluated on an individual basis.

3. Compaction

Compaction of materials placed at the site should equal or exceed the minimum densities as indicated below when compared to the maximum dry density as determined by ASTM D 1557.

Fill To Support	Compaction
Foundations	≥ 95 %
Concrete Flatwork	≥ 90 %
Pavement	
Base Course	≥ 95 %
Fill Placed Below Base Course	≥ 90 %
Landscaping	≥ 85 %
Retaining Wall Backfill	85 - 90 %

To facilitate the compaction process, the fill should be compacted at a moisture content within 2 percent of the optimum moisture content.

Fill and pavement materials placed for the project should be frequently tested during construction for compaction.

4. Materials

The following recommendations are given for imported structural fill:

Fill to Support	Recommendations
Footings and Slabs	Non-expansive granular soil Passing No. 200 Sieve < 35% Liquid Limit < 30% Maximum size 4 inches
Floor Slab (Upper 4 inches)	Sand and/or Gravel Passing No. 200 Sieve < 5% Maximum size 2 inches

The existing fill and bedrock that can be broken down to suitably-sized material for placement and compaction and meeting the recommendations given above for imported structural fill may be considered for use as structural fill. Topsoil, organics, oversized particles and other deleterious materials should be removed.

The natural clay and existing fill with high clay or silt content are not recommended for use at structural fill below the proposed structures but may be considered for use as backfill outside of the structures if the topsoil, organics and other deleterious materials are removed or they may be used in landscape areas.

Use of the on-site soil as fill will likely require moisture conditioning (wetting or drying) to facilitate compaction. Moisture conditioning may not be practical during cold or wet weather.

5. Drainage

The ground surface surrounding the proposed structures should be sloped away from the structures in all directions. Roof downspouts and drains should discharge beyond the limits of backfill.

B. Foundations

1. Bearing Material

The proposed buildings may be supported on spread footings bearing on the undisturbed bedrock or on compacted structural fill extending down to the undisturbed bedrock. The footings for a building should bear entirely on undisturbed bedrock or structural fill. Where a footing would bear partially on structural fill and partially on bedrock, the bedrock should be over-excavated at least 2 feet and structural fill placed such that the footing bears entirely on at least 2 feet of structural fill or the foundation extended down to bear entirely on bedrock.

Soil, organics, unsuitable fill and other deleterious materials should be removed from below proposed foundation areas. Structural fill placed below foundations should extend out away from the edge of the footing at least a distance at least equal to the depth of fill placed beneath the footing.

2. Bearing Pressure

Spread footings may be designed using an allowable net bearing pressure of 3,500 pounds per square foot. Footings should have a width of at least 2 feet and a depth of embedment of at least 1 foot.

3. Temporary Loading Conditions

The allowable bearing pressure may be increased by one-half for temporary loading conditions such as wind or seismic loads.

4. Settlement

Based on the subsurface soil conditions encountered and the assumed building loads, we estimate total and differential settlement to be on the order of ½ inch or less for foundations designed as indicated above. The settlement will be differential with respect to existing structures.

Care will be required to not disturb the natural soil at the base of foundation excavations to maintain settlement within tolerable limits.

5. Frost Depth

Exterior footings and footings beneath unheated areas should be placed at least 40 inches below grade for frost protection.

6. Foundation Base

The base of all footing excavations should be cleared of loose or deleterious material prior to structural fill or concrete placement.

7. Construction Observation

A representative of the geotechnical engineer should observe footing excavations prior to structural fill or concrete placement.

C. Concrete Slab-on-Grade

1. Slab Support

Concrete slabs may be supported on the undisturbed bedrock or on compacted structural fill extending down to the undisturbed bedrock.

Topsoil, unsuitable fill, organics and other deleterious materials should be removed from below proposed floor slabs.

2. Underslab Sand and/or Gravel

A 4-inch layer of free draining sand and/or gravel (less than 5 percent passing the No. 200 sieve) should be placed below the concrete slabs for ease of construction and to promote even curing of the slab concrete.

D. Lateral Earth Pressures

1. Lateral Resistance for Footings

Lateral resistance for footings placed on the undisturbed, natural soil or on compacted structural fill is controlled by sliding resistance between the footing and the foundation soils. A friction value of 0.45 may be used in design for ultimate lateral resistance.

2. Subgrade Walls and Retaining Structures

The following equivalent fluid weights are given for design of subgrade walls and retaining structures. The active condition is where the wall moves away from the soil. The passive condition is where the wall moves into the soil and the at-rest condition is where the wall does not move. The values listed below assume a horizontal surface adjacent the wall.

Soil Type	Active	At-Rest	Passive
Clay & Silt	50 pcf	65 pcf	250 pcf
Sand & Gravel	40 pcf	55 pcf	300 pcf

3. Seismic Conditions

Under seismic conditions, the equivalent fluid weight should be increased by 15 pcf for the active condition, no increase for the at-rest condition, and decreased by 15 pcf for the passive condition. This assumes a peak horizontal ground acceleration of 0.25g for a 2 percent probability of exceedance in a 50-year period.

4. Safety Factors

The values recommended above assume mobilization of the soil to achieve the assumed soil strength. Conventional safety factors used for structural analysis for such items as overturning and sliding resistance should be used in design.

E. Seismicity

Listed below is a summary of the site parameters that may be used with the 2024 International Building Code.

Description	Value
Site Class	C ¹
S _s - MCE _R ground motion (period = 0.2s)	0.54g
S ₁ - MCE _R ground motion (period = 1.0s)	0.17g
S _{ms} - spectral response acceleration (period = 0.2s)	0.59g
S _{m1} - spectral response acceleration (period=1.0s)	0.25g
S _{DS} - design spectral acceleration (period = 0.2s)	0.40g
S _{D1} - design spectral acceleration (period = 1.0s)	0.17g
T _L - long period transition period	8s
PGA _M - Site modified peak ground acceleration	0.25g

¹Site Class C was selected based on measuring the shear wave velocity using MASW and MAM. An average shear wave velocity for the top 100 feet ($V_{s,30}$) of 1,640 ± 70 feet per second was measured.

F. Pipe Support

The soils and bedrock encountered are suitable for support of the proposed sewer pipe at the site.

1. Settlement

The materials at the pipe bearing elevation will experience little, if any, increase in stress due to the proposed construction. Thus, settlement of the proposed pipeline will be a function of disturbance of the soil or bedrock beneath the pipe. Disturbance may result from excavation or construction activities. Care should be taken to minimize disturbance of the materials below the pipeline so that settlement can be maintained within tolerable limits.

2. Pipe Bedding

Pipe bedding requirements will depend on the type of pipe selected and design criteria based on the manufacturer's recommendations. Pipe bedding material should be placed on undisturbed natural soil or bedrock. If bearing materials are disturbed, they should be removed and replaced with compacted bedding material. Pipe bedding should meet the criteria given by the pipe manufacturer.

G. Water Soluble Sulfates

One sample of bedrock and one sample of fill were tested in the laboratory for water soluble sulfate content. The test results indicate there is less than 0.1 percent water soluble sulfate in the samples tested. Based on the results of the tests and published literature, sulfate resistant cement is not needed for concrete placed in contact with the bedrock and fill. Other conditions may dictate the type of cement to be used in concrete for the project.

H. Pavement

We assume that traffic at the facility would consist predominantly of passenger vehicles with occasional maintenance trucks and delivery trucks and possibly occasional semis. Based on the assumed traffic, subsoil conditions encountered, a design life of 20 years for flexible pavement and 30 years for rigid pavement and methods presented by AASHTO, the following pavement support recommendations are given:

1. Subgrade Support

We anticipate that the subgrade will consist of silty sand with gravel. A California Bearing Ratio (CBR) value of 10 percent was assumed for the analysis.

2. Pavement Thickness

The following pavement sections are calculated:

Traffic Condition	<u>Rigid Pavement</u>	<u>Flexible Pavement</u>	
	Portland Cement Concrete Thickness	Asphaltic Concrete Thickness	Base Course Thickness
No semi traffic	5"	— 3"	— 6"
1 semi per day	5" —	— 3 ½ "	— 6"
5 semis per day	6" —	— 4"	— 6"

For garbage dumpster approach slabs, we recommend a Portland cement concrete thickness of 6 ½ inches over 4 inches of base course.

3. Pavement Materials and Construction

a. Flexible Pavement (Asphaltic Concrete)

The pavement materials should meet the specifications for the applicable jurisdiction. The use of other materials may result in the need for different pavement material thicknesses.

b. Rigid Pavement (Portland Cement Concrete)

The pavement thickness assumes that the pavement will have aggregate interlock joints and that a concrete shoulder or curb will be provided.

Pavement materials should meet the specifications for the applicable jurisdiction. The pavement thickness indicated above assumes that the concrete will have a 28-day compressive strength of 5,000 pounds per square inch. Concrete should be air entrained with approximately 6 percent air. Maximum allowable slump will depend on the method of placement but should not exceed 4 inches.

4. Jointing

Joints for concrete pavement should be laid out in a square or rectangular pattern. Joint spacings should not exceed 30 times the thickness of the slab. The joint spacings indicated should accommodate the contraction of the concrete and under these conditions steel reinforcing will not be required. The depth of the joints should be approximately one-fourth of the slab thickness.

I. **Continuing Services**

A preconstruction meeting should be held with representatives of the owner, project architect, geotechnical engineer, general contractor, earthwork contractor and other members of the design team to review construction plans, specifications, methods and schedule.

The geotechnical engineer should observe the excavation, earthwork and foundation phases of the work to determine that subsurface conditions are consistent with those used in the analysis and design. During site grading and placement of structural fill, the work should be observed and tested to confirm that the proper density has been achieved.

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the test pits excavated at the approximate location indicated on Figure 1 and the data obtained from laboratory testing. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface conditions or groundwater level is found to be significantly different from what is described above, we should be notified to reevaluate the recommendations given.

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



Jay R. McQuivey, P.E.

Reviewed by Douglas R. Hawkes, P.E.

JRM/bw

REFERENCES

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Anderson, L., Keaton, J., Rice, J., 1994; Liquefaction Potential Map for Central Utah, Plate No. 1 (Park City - Heber), U.S. Geological Survey, Contract Report 94-10.

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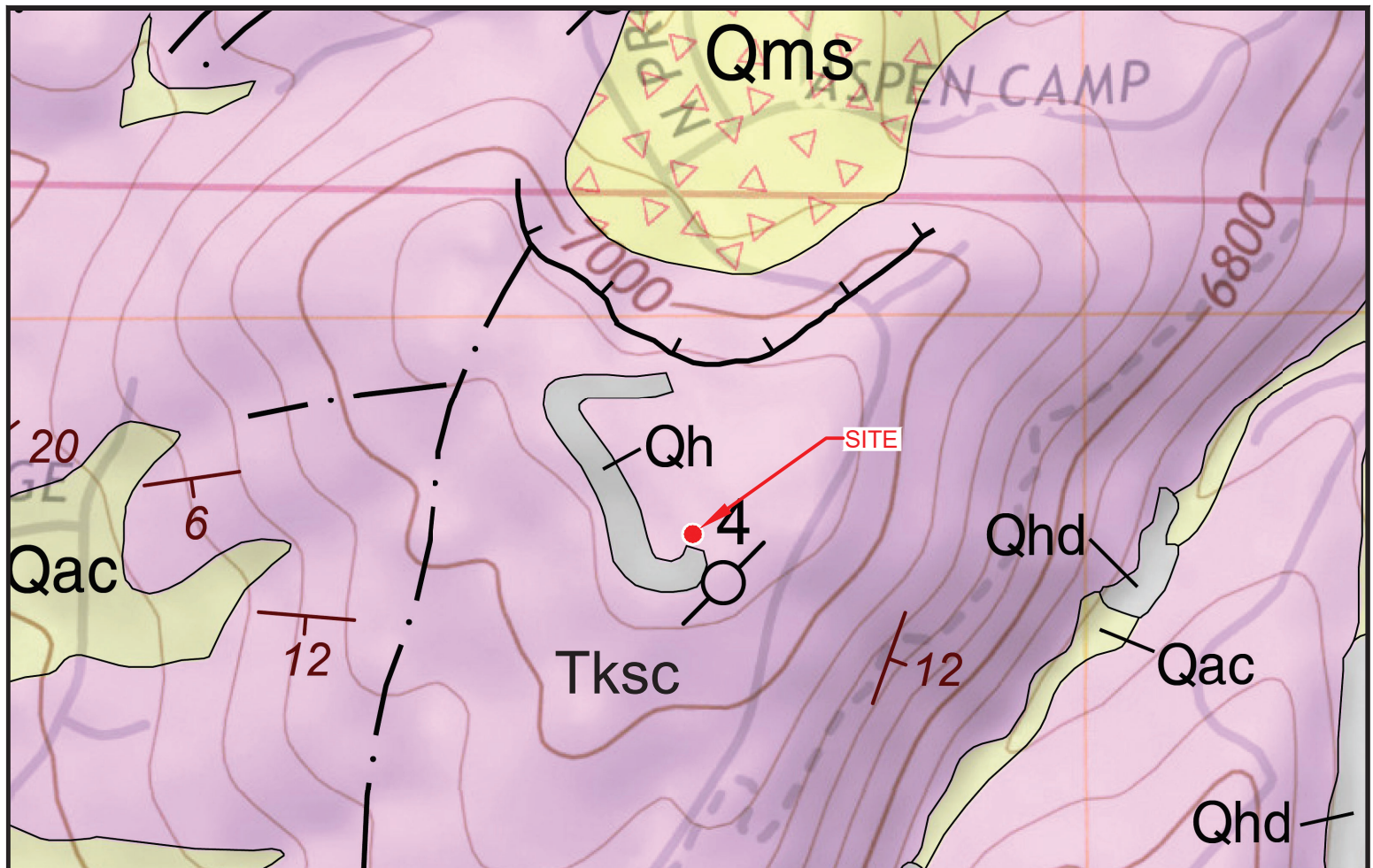
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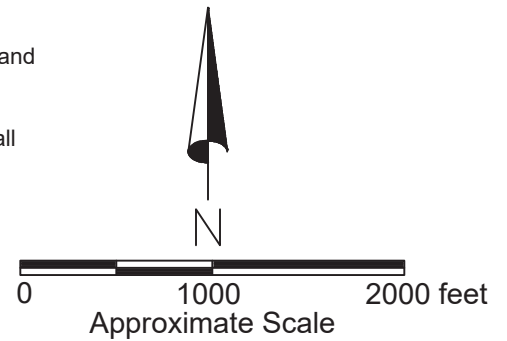
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from Biek (2022)

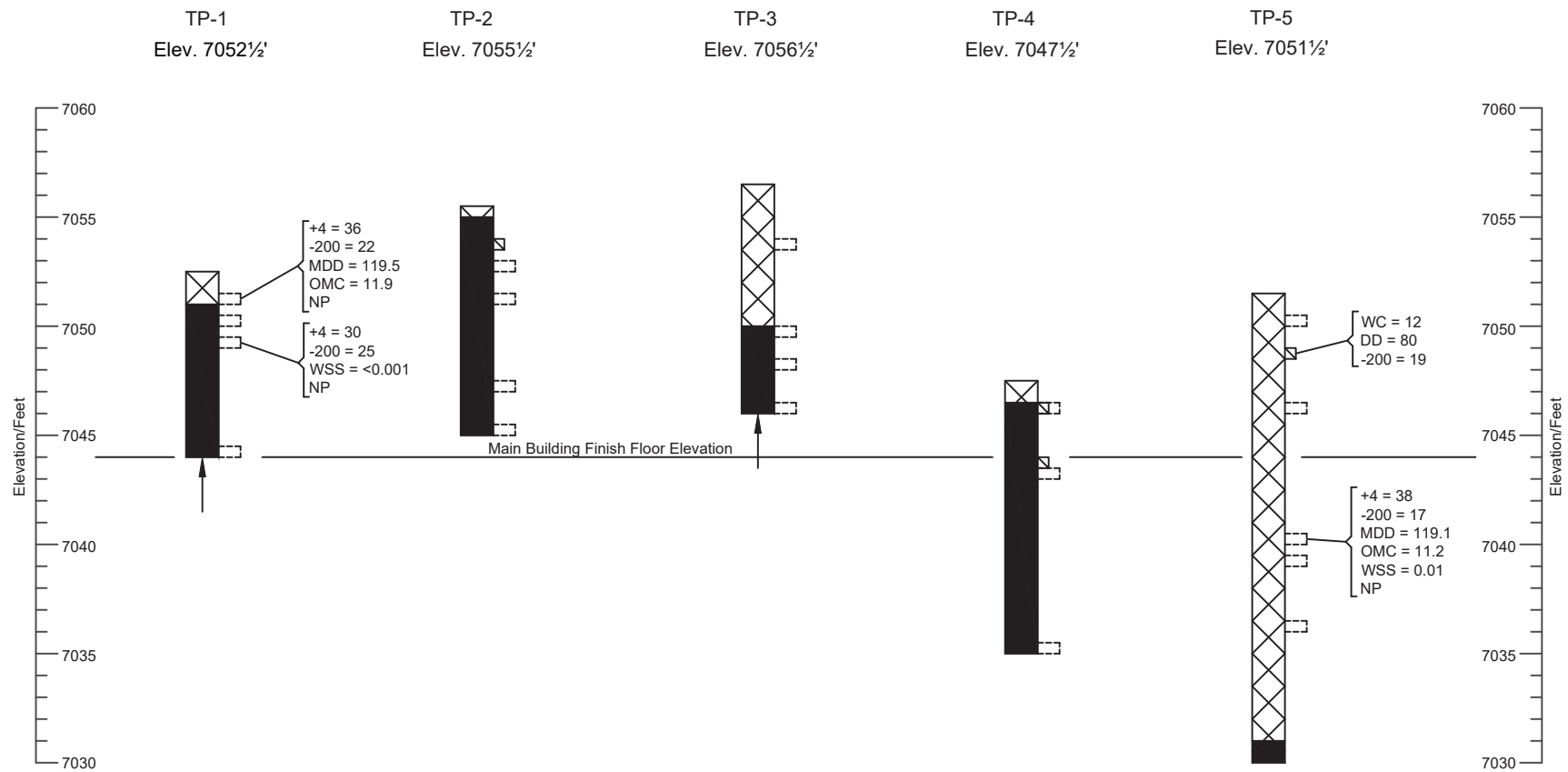
EXPLANATION OF SYMBOLS AND GEOLOGIC UNITS IN AREA OF PROPOSED DEVELOPMENT

- Qh - Artificial fill (Historical).
- Qhd - Disturbed land (Historical).
- Qms - Landslide deposits (Pleistocene).
- Qac - Alluvium and Colluvium (Holocene to upper Pleistocene).
- Tksc - Volcanic mudflow breccia of Silver Creek (lower Oligocene to upper Eocene).
- — — — — Geologic contact between units, dashed where approximate.
- ||||| Landslide scarp, hachures on down-dropped side.
- 50 Strike and dip of inclined bedding, red symbols indicate attitudes from Bromfield and Crittenden (1971).
- — — — — Lineations visible on aerial photographs, most likely joints, some may exhibit small displacement.
- ⊗ Exploration drill hole, plugged.



PROPOSED SIGNAL HILL WATER TREATMENT PLANT EXPANSION
7563 PROMONTORY RANCH ROAD
PARK CITY, UTAH



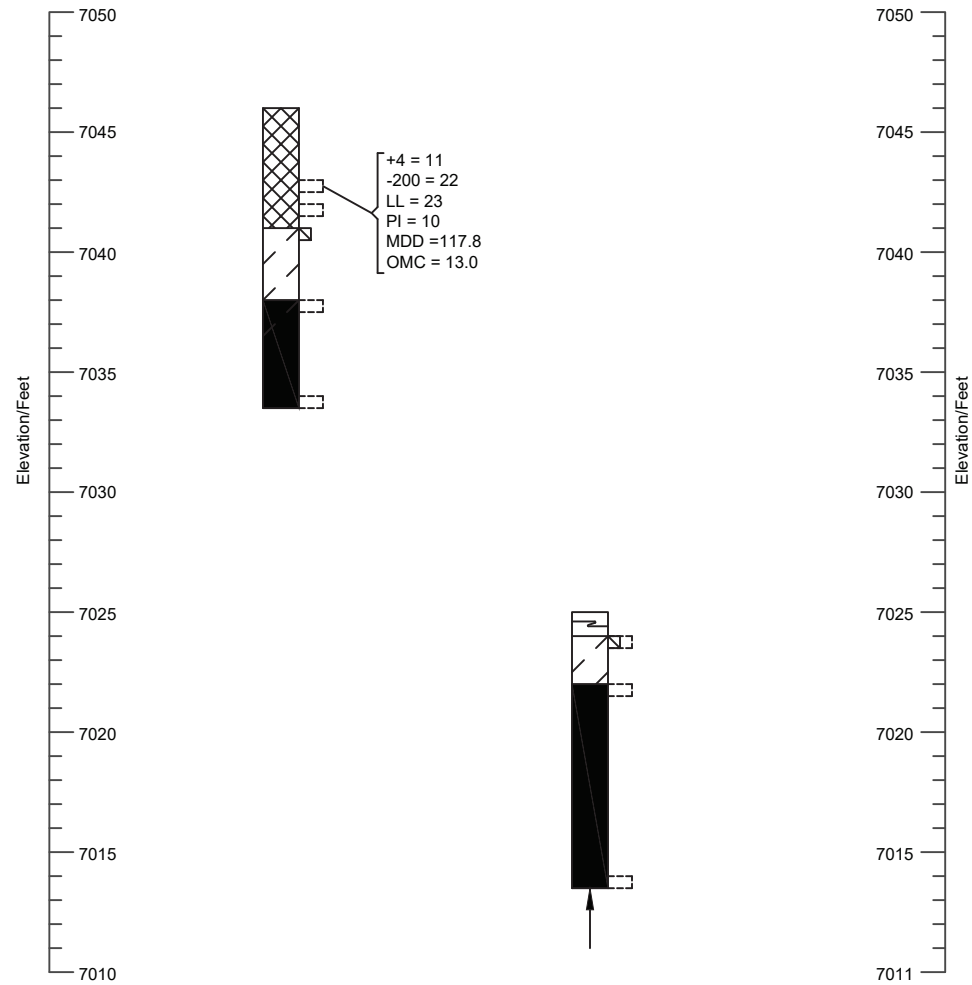


Approximate Vertical Scale 1" = 8'

See Figure 4 for Legend and Notes

TP-6
Elev. 7046'

TP-7
Elev. 7025'



Approximate Vertical Scale 1" = 8'

See Figure 4 for Legend and Notes

LEGEND:



Fill; clayey sand, small to moderate amounts of gravel, slightly moist, brown, occasional roots and organics.



Fill; silty sand with gravel to silty gravel with sand, cobbles and occasional boulders up to approximately 2 feet in size, slightly moist to moist, brown to gray.



Topsoil; silty sand with gravel, slightly moist, brown, roots and organics.



Sandy Lean Clay with Gravel (CL); stiff, slightly moist, brown.



Volcanic mudflow breccia, hard to very hard, moist, low to non plastic, brown to gray.



Indicates relatively undisturbed hand drive sample taken.



Indicates disturbed sample taken.

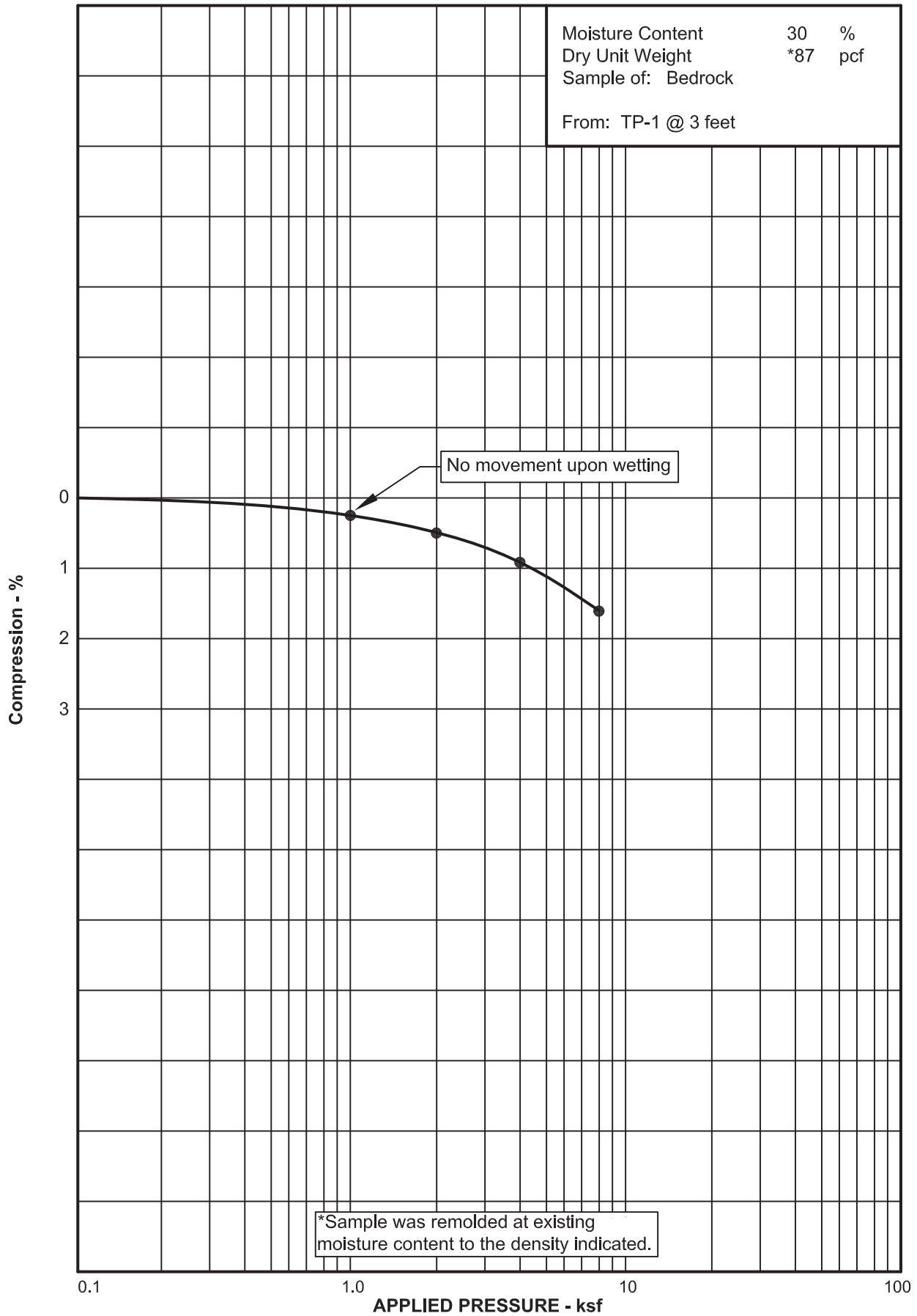


Indicates practical excavation refusal.

NOTES:

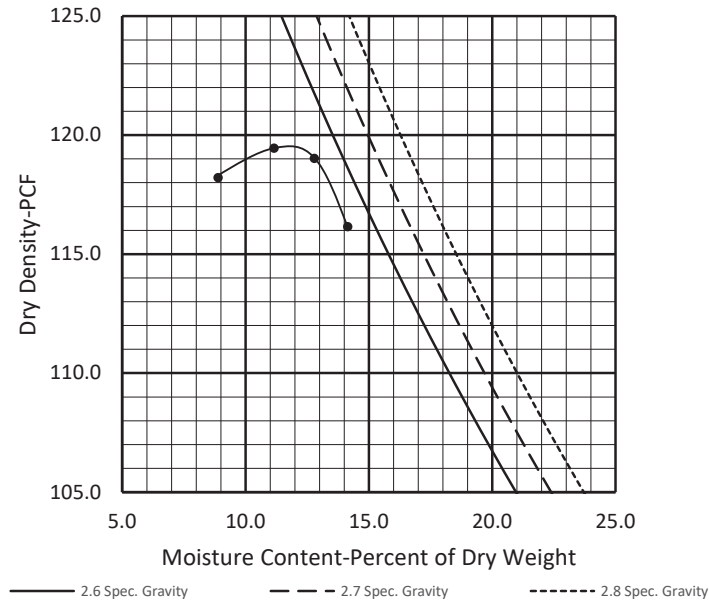
1. The test pits were excavated on June 5, 2025 with a trackhoe. Test Pit TP-5 was re-excavated and extended to a greater depth on June 13, 2025 with a rubber tired backhoe.
2. Locations of the test pits were measured approximately by pacing from features shown on the site plan provided.
3. Elevations of the test pits were provided by the client's surveyor.
4. The test pit locations and elevations should be considered accurate only to the degree implied by the method used.
5. The lines between materials shown on the logs represent the approximate boundaries between material types and the transitions may be gradual.
6. No free water was encountered in the test pits at the time of excavation.
7. WC = Water Content (%);
DD = Dry Density (pcf);
+4 = Percent Retained on the No. 4 Sieve;
-200 = Percent Passing the No. 200 Sieve;
LL = Liquid Limit (%);
PI = Plasticity Index (%);
WSS = Water Soluble Sulfates (%);
MDD = Maximum Dry Density (pcf);
OMC = Optimum Moisture Content (%);
NP = Non-Plastic.

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APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.

Moisture - Density Relationship, Gradation, & Classification Results



SAMPLE IDENTIFICATION

Project Name: Signal Hill WTP

Project No. 1250255

Sample Location: TP-1 at 1'

PROCTOR RESULTS

Maximum Dry Density (Corrected) 119.5 pcf

Optimum Moisture 11.9 %

Rock Correction 6.2 pcf

UNIFIED SOIL CLASSIFICATION (ASTM D2487)

Fill; Silty Sand with Gravel

TESTING INFORMATION

Date Tested: 06/17/25

Tested By: MJM/OC

Reviewed By: KBB

Test Procedure: ASTM D1557 A

Specific Gravity: Assumed 2.65

Moisture Curing: Not Used

ATTERBERG DATA

Liquid Limit (LL) Non-Plastic

Plasticity Index (PI)

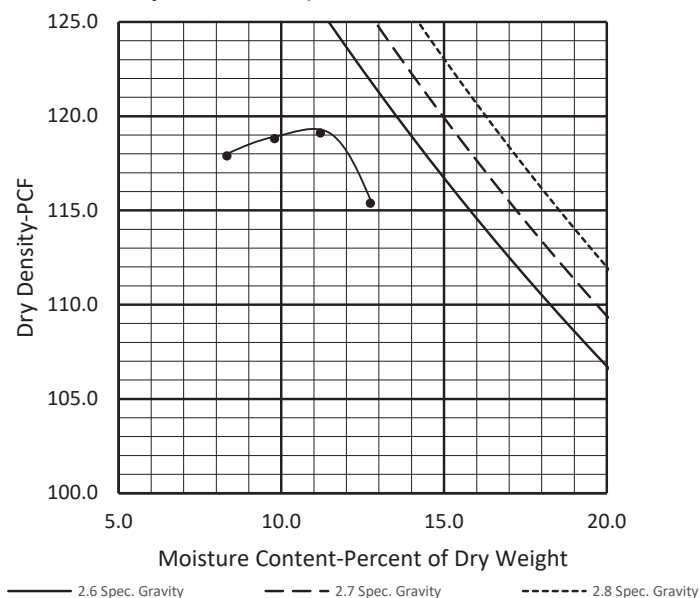
GRADATION RESULTS

Sieve Designation	Sieve Opening Size (mm)	Percent Passing (%)
4"	100	100
3"	76.2	100
1 1/2"	38.1	93
3/4"	19.1	83
3/8"	9.52	73
#4	4.76	64
#8	2.38	55
#16	1.19	51
#30	0.59	45
#50	0.297	38
#100	0.149	30
#200	0.074	22
GRAVEL	SAND	SILT & CLAY
36%	42%	22%

Figure 6

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.

Moisture - Density Relationship, Gradation, & Classification Results



SAMPLE IDENTIFICATION

Project Name: Signal Hill WTP

Project No. 1250255

Sample Location: TP-5 at 11'

PROCTOR RESULTS

Maximum Dry Density (Corrected) 119.1 pcf

Optimum Moisture 11.2 %

Rock Correction 10.2 pcf

UNIFIED SOIL CLASSIFICATION (ASTM D2487)

Fill; Silty Sand with Gravel

GRADATION RESULTS

Sieve Designation	Sieve Opening Size (mm)	Percent Passing (%)
4"	100	100
3"	76.2	100
1 1/2"	38.1	86
3/4"	19.1	75
3/8"	9.52	68
#4	4.76	62
#8	2.38	55
#16	1.19	50
#30	0.59	44
#50	0.297	35
#100	0.149	25
#200	0.074	17
GRAVEL		SAND
38%		45%
		SILT & CLAY
		17%

TESTING INFORMATION

Date Tested: 06/17/25

Tested By: MJM/BK

Reviewed By: KBB

Test Procedure: ASTM D1557 C

Specific Gravity: Assumed 2.65

Moisture Curing: Not Used

ATTERBERG DATA

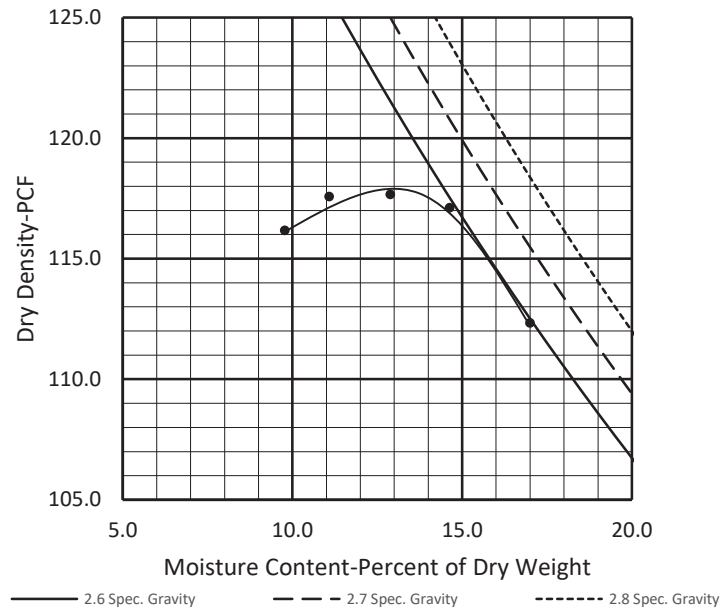
Liquid Limit (LL) Non-Plastic

Plasticity Index (PI)

Figure 7

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.

Moisture - Density Relationship, Gradation, & Classification Results



SAMPLE IDENTIFICATION

Project Name: Signal Hill WTP

Project No. 1250255

Sample Location: TP-6 at 3'

PROCTOR RESULTS

Maximum Dry Density (Corrected) 117.8 pcf

Optimum Moisture 13.0%

Rock Correction 3.9 pcf

UNIFIED SOIL CLASSIFICATION (ASTM D2487)

Fill; Clayey Sand

TESTING INFORMATION

Date Tested: 06/17/25

Tested By: MYM

Reviewed By: KBB

Test Procedure: ASTM D1557 A

Specific Gravity: Assumed 2.65

Moisture Curing: Not Used

ATTERBERG DATA

Liquid Limit (LL) 23

Plasticity Index (PI) 10

GRADATION RESULTS

Sieve Designation	Sieve Opening Size (mm)	Percent Passing (%)
4"	100	100
3"	76.2	100
1 1/2"	38.1	99
3/4"	19.1	97
3/8"	9.52	93
#4	4.76	89
#8	2.38	74
#16	1.19	64
#30	0.59	55
#50	0.297	43
#100	0.149	31
#200	0.074	22
GRAVEL		
11%		
SAND		
67%		
SILT & CLAY		
22%		

Figure 8

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NUMBER: 1250255

[illegible]

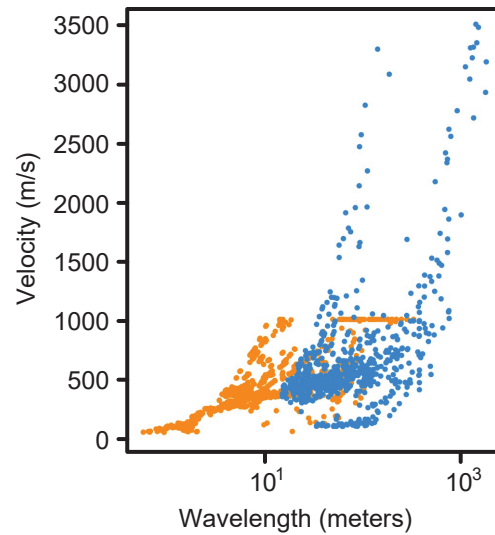
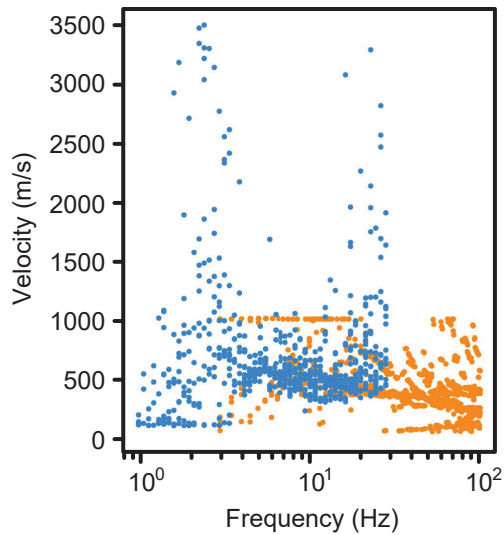
APPENDIX

SHEAR WAVE VELOCITY TESTING

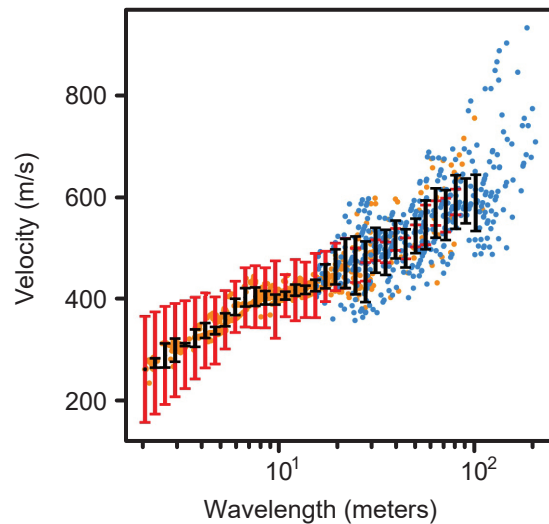
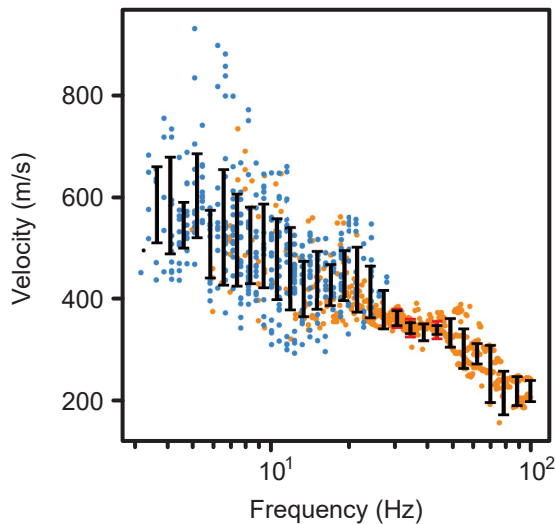


Applied Geotechnical Engineering Consultants, Inc.

a) RAW DATA



b) TRIMMED DATA



LEGEND:

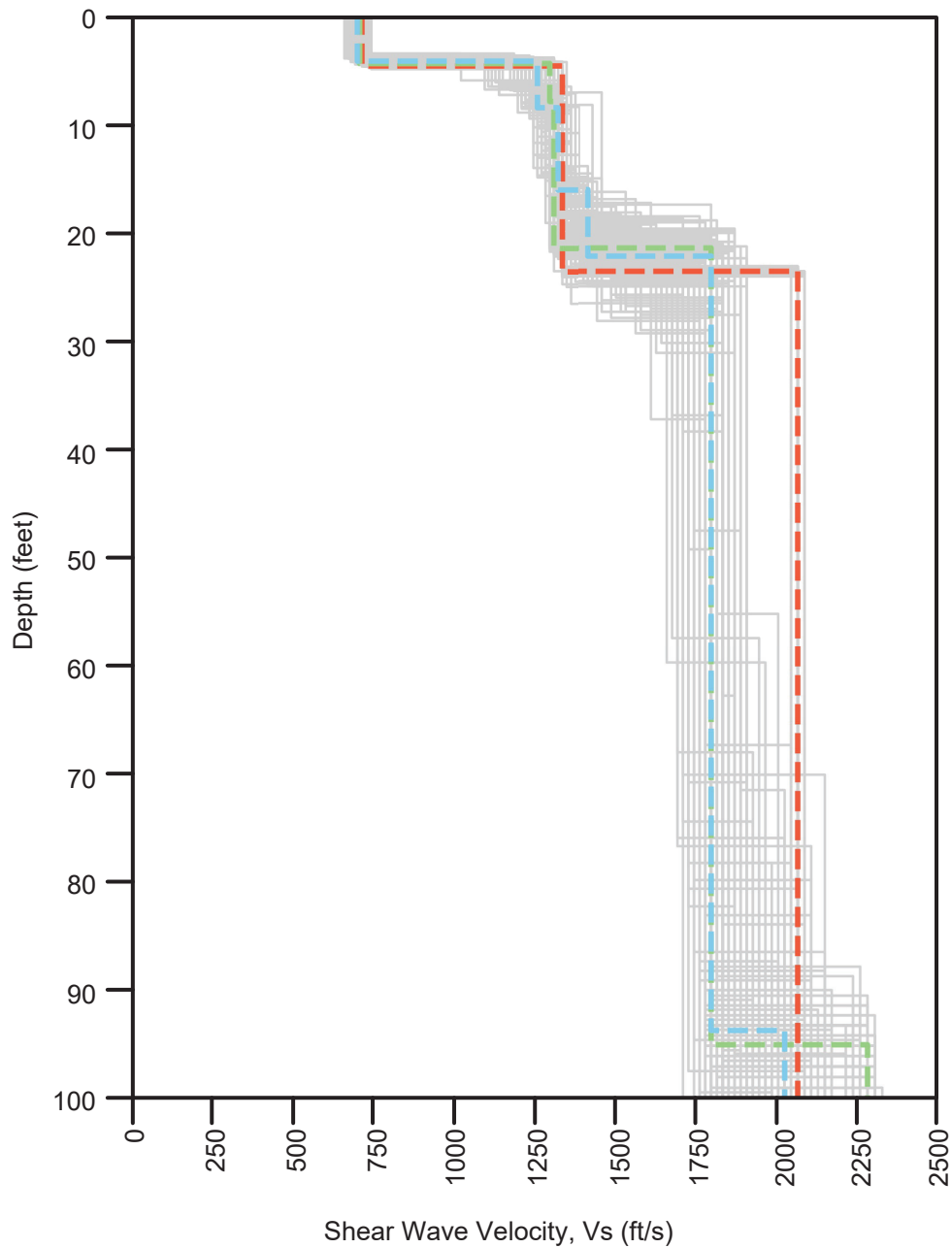
- MASW
- MAM
- Limits
- I Target Experimental Dispersion Data
- I Target Experimental Dispersion Data (min COV=0.05)

Project Name: Signal Hill Water Treatment Plant Expansion
Measurement Method: Multi-channel Analysis of Surface Waves (MASW)
Microtremor Array Measurement (MAM)

Location: MASM-1 and MAM-1

Date of Test: June 25, 2025

Applied Geotechnical Engineering Consultants, Inc.



LEGEND:

- Average of Parametrization 1
- Average of Parametrization 2
- Average of Parametrization 3
- Best 100 Models for each Parameterization

Project Name: Signal Hill Water Treatment Plant Expansion
Measurement Method: Multi-channel Analysis of Surface Waves (MASW)
Microtremor Array Measurement (MAM)

V_{s30} : **1,640 ± 70 ft/s**
Location: MASW-1 and MAM-1

Date of Test: June 25, 2025

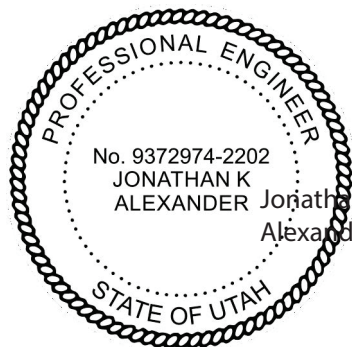
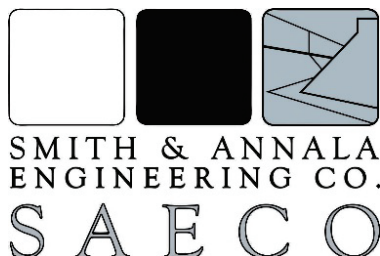
GEOTECHNICAL STUDY
Signal Hill WTP Floating Solar Array
7563 N. Promontory Ranch Rd.
Park City, Utah

PREPARED FOR:

Ameresco
3095 S. Parker Rd.
Suite 200
Aurora, Colorado 80014

PREPARED BY:

Smith & Annala Engineering Co.
3860 S. Palo Verde Road,
Suite 315
Tucson, Arizona 85714
(520) 203-9134



Digitally signed by
Jonathan Alexander, P.E.
Date: 2023.09.01
14:15:30 -07'00'

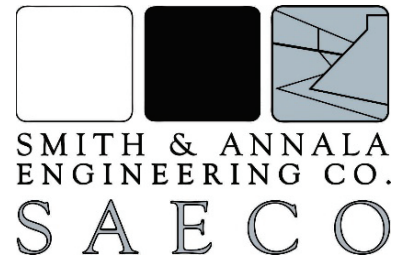
September 1, 2023
SAECO Project No. 29.23.2524

September 1, 2023

Attention: David Goldenberg

Ameresco
3095 S. Parker Rd.
Suite 200.
Aurora, Colorado 80014
Phone: 720-627-8736
dgoldenberg@ameresco.com

Subject: Geotechnical Engineering Study
Signal Hill WTP Floating Solar Array
7563 N. Promontory Ranch Road
Park City, Utah
SAECO Project No. 29.23.2524



We are pleased to submit this report of our geotechnical study for the project. This study was performed in general accordance with our proposal (reference number PG29.23.069, Revision 1) dated July 25, 2023, and your authorization. The report's goal is to provide geotechnical engineering recommendations for project design and construction. The recommendations provided are based on subsurface explorations, laboratory testing, academic publications, and our judgement based on experience with similar projects and similar subsurface conditions.

From a geotechnical standpoint and provided the recommendations contained in the report are followed, we believe the site is suitable for the proposed construction. A summary of our findings and a summary of the recommendations we have provided in the full report are outlined below.

Significant conditions encountered from our investigation at the site include:

- Two of the explorations (B-01 and B-02) encountered fill soils associated with the reservoir dam/embankment. This soil is generally composed of silty sand with gravel.
- Native soils were generally encountered at the top of B-03 and B-04. The native soils vary from sandy lean clay (the upper 5 feet of B-04) to silty sand (below 5 feet in B-4 and all of B-03).
- Field penetration testing indicates the fill soils are medium dense to very dense. The native soils are very dense in relative density or stiff in consistency.
- Based on our laboratory testing on-site soils may be slightly to moderately corrosive to buried metal, the soils appear to have low contents of soluble sulfate and should have negligible effect on concrete.
- The site is less than 25 miles from the Wasatch Fault, and therefore may be subject to strong to severe ground motion.
- Geologic mapping performed by the State of Utah indicates the northern edge of the embankment is at the upslope side of historic landslide.

The following summary of the recommendations in our report are based on the findings from our field investigation:

- We believe helical anchors will be suitable for the anchorage support of the floating array.
- Given the critical importance of a water treatment plant. We have assumed the dam/embankment for the reservoir was designed and constructed in accordance with jurisdictional requirements. This assumption includes consideration for the impacts of ground motion from seismic activity, and a more complete investigation of the potential for landslide on the northern edge of the reservoir. Therefore we believe these hazards will have limited impact on this project.
- Based on what we encountered at locations B-03 and B-04 we believe the very dense native soils may require pre-drilling to install helical anchors.

The recommendations presented in this report are based on the assumed type of construction, structural loading, and grading concepts as presented in Section 1.1 of this report. If any of these items change significantly, we should be contacted to determine if revisions to our recommendations are necessary.

We appreciate the opportunity to be of service to you during this phase of the project.

Sincerely,
SMITH & ANNALA ENGINEERING CO.

Jonathan K. Alexander, P.E.
Senior Geotechnical Engineer



Bryan W. Reed
Senior Project Manager

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

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Geotechnical Study

In accordance with our proposal dated July 25, 2023, and your authorization, we have performed a geotechnical evaluation for Signal Hill WTP Floating Solar Array located at 7563 N. Promontory Ranch Road (refer to Figure A-1 within Appendix A for site plan showing the approximate project limits and location of our explorations). The purpose of this study was to examine the geotechnical profile at the site in order to evaluate the subsurface soils and their engineering properties. This information was used to develop geotechnical engineering recommendations for project design and construction. A description of the project, the scope of our geotechnical services, a description of our findings and our recommendations are presented in the following sections.

1.0 PROJECT UNDERSTANDING

This project consists of the design and construction of a floating solar array on the surface of the existing pond and moored to anchor points along the pond's perimeter. Anchors are to be installed in multiple locations on all sides of the pond, and are assumed to be helical, and to extend to depths of between 10 and 15 feet below ground surface.

2.0 SCOPE OF WORK

The scope of our services for this study included the following major task items:

- Reviewing readily available aerial photographs and published geologic literature, including maps and reports pertaining to the project site and vicinity.
- Coordinating our subsurface investigation activities with Ameresco and Mountain Regional Water.
- Notifying Utah 811 of the proposed exploration locations prior to performing our field explorations.
- Drilling, logging, and sampling 8-inch-diameter exploratory borings at 4 locations. Details of this task and a log of the explorations can be found in Appendix B.
- Performing laboratory testing on selected samples obtained from the exploratory borings. The details of the laboratory testing and the results are included in Appendix C.
- Preparing this report of our study that presents our findings and recommendations.

Our scope of services for this study did not include environmental consulting services with respect to the identification or assessment of any hazardous environmental or biological materials that may be, or may not be, present at the site. A detailed scope of services and estimated fee related to the investigation of the presence or impact of pollution, contamination, or hazardous materials related to this site can be provided upon request.

3.0 FINDINGS

This section contains the results of our evaluation of the site as determined by the scope described in Section 2.0.

3.1 Current Site Conditions

The project site is a water treatment plant and storage pond located on the west side of N. Promontory Ranch Road, approximately 2.75 miles in a straight line east-northeast of the interchange between U.S. Interstate 80 and U.S. Route 40 outside of Park City, Utah. The approximately 4-acre storage-pond is located to the west and south of the treatment plant facility. A relatively level access road extends around the north, west, and south sides of the pond. The pond is retained by an earthen dam on the north, east, and south sides, constructed of compacted engineered fill removed from the treatment plant facility building excavations and the west side of the site. Site topography immediately surrounding the pond and facility has been graded relatively flat, except for the area surrounding a water storage tank in between the pond and the treatment plant, which is higher. The surrounding topography is mountainous, and slopes steeply down to the north and west. The difference in elevation between the top of the dam and the existing native grade to the west is on the order of 20-30 feet. Based on publicly available elevation data, the project site is on the order of 7,000 feet relative to mean sea level.

3.2 Past Site Conditions

Aerial photographs from public sources were reviewed for this project. The following table lists our observations made. The oldest photo we could obtain was taken in 1953.

Year of Photo	Site Description
1953, 1962, 1963, 1967, 1978, 1981, 1983, 1993, 1997	The project site and surrounding area are undeveloped.
2004	The dam and pond are visible in their current configuration. The treatment plant facility is under construction. Dirt roads are visible in the N. Promontory Ranch Road alignment and in other alignments in the surrounding subdivision.
2006, 2009, 2011, 2014, 2018	Site development generally appears like current conditions. In the first photo of this series the surrounding roads appear unpaved. The 2009 photo shows the roads as paved, and single-family houses are present adjacent to the facility.

3.3 Subsurface Conditions

The following generalized description of the subsurface profile at the site is based upon the conditions we observed in a relatively few, widely spaced explorations. The thickness of strata described should be considered approximate and is inferred from changes observed between recovered samples or observed drilling conditions (changes in drilling effort, or from cuttings generated from auger advancement). Conditions could vary significantly between exploration locations. And although we did not observe evidence of or encounter buried structures such as underground utilities, septic tanks, dry wells, or fill materials during our site reconnaissance or within our explorations, such materials could be encountered during construction. Should different conditions be discovered during construction, when earthwork operations expose larger areas of the site, SAECO should be notified to allow revised recommendations to be provided.

- The existing dam/embankment that forms portions of the north, and all the west and southern banks of the reservoir contain fill soil composed of silty sand with gravel. The soil is dark grey in color, moist to touch, medium dense to very dense in relative density, and has low plasticity. We understand the embankment fill was derived from the excavation of the reservoir.
- Exploration B-04 contains an unbound pavement section consisting of about 2 inches of gravel over about 4 inches of aggregate base course.
- The native soils encountered at the surface or below the fill soils extended to the total depths explored. The soil consists of silty sand with varying amounts of gravel. The soil is dark gray in color, moist to touch, medium dense to very dense in relative density and has low plasticity.
- We noted about 5 feet of sandy lean clay at the top of location B-04. The material is dark brown mottled with grayish black, is moist to touch, stiff in consistency, and is medium plastic.

3.4 Groundwater

Groundwater was not encountered in any of our explorations during the field exploration. We did not perform long term monitoring of groundwater levels at the site and the observations reported in the report and on the log of explorations should be considered to only represent the groundwater conditions at the time and location of our explorations. Based on well data from the Utah Department of Natural Resources, the depth to regional groundwater has been historically measured between approximately 200 to 700 feet below the surface near the site (6 wells within 1-mile of the site with groundwater depths reported from the years 1993 to 2000). Groundwater levels may fluctuate due to seasonal variations in precipitation, irrigation, groundwater withdrawal, and other factors. Shallow perched groundwater zones are sometimes encountered near leaking utility lines or near stormwater retention basins.

3.5 Geologic Setting

Utah can generally be divided into four geological provinces; the Colorado Plateau covering the southeastern 1/3 of the state, the Basin and Range in the western half of the state, a Transition Zone between Colorado Plateau and Basin and Range and the Middle Rocky Mountain Province surrounding the “notch” at the northeastern corner of the state. This site lies within the Middle Rocky Mountain Province.

The Middle Rocky Mountain Province is characterized by high peaks and U-shaped valleys cut by glaciers during the Pleistocene (1.6 million years). The Utah portion of the province contains two major mountain ranges: the north-south trending Wasatch (located to the west of the site) and the east-west trending Uintas (located east of the site). The ranges are formed from Precambrian rocks dated up to 2.6 billion years old. The cores have been altered by several cycles of mountain building including thrust faulting, normal faulting and volcanic intrusion.

This site sits on about 500 feet of volcanic debris flows, violently deposited about 35 million years ago. The rock unit referred to as the *Volcanic Mudflow Breccia of Silver Creek* contains andesitic and

rhodacitic volcanic mudflow breccia and interbedded lava flows and ash flow tuff that weathers to round hills, often covered with volcanic-rock boulders.

3.6 Faulting and Seismicity

Based on our field observations and review of pertinent geologic data there are three active faults within 25-miles of the site. They include the Parley's Park faults, located about 3.5 miles southwest of the site (last active at least 1.6 million years ago), the East Kamas Fault is located about 10 miles east of the site (also last active at least 1.6 million years ago), and the Wasatch fault is located about 18 miles to the west of the site.

The Wasatch Fault poses a serious risk to the region, including Salt Lake City. This fault appears to have last ruptured approximately 15-thousand-years-ago (recent relative to geological time) and is capable of generating a 7.3 magnitude earthquake that will result in strong to severe shaking at the site.

Seismic design considerations are presented in Section 4.3 of this report.

3.7 Liquefaction

Based on the lack of near surface water and the relative density of the surface soils, the likelihood or potential for liquefaction is considered negligible at this site.

3.8 Landslides

Based on geologic mapping prepared by the State of Utah a potential landslide scarp is located at the toe of the north embankment (refer to Figure A-2 in Appendix A). Our review of aerial photographs and cursory review of site conditions could not confirm the presence of this feature. We have assumed previous investigations performed for the treatment plant and reservoir have adequately assessed and characterized the risk of this hazard as acceptable.

4.0 RECOMMENDATIONS

From a geotechnical standpoint, we believe the site is suitable for the proposed construction provided the recommendations provided are followed. Some general geotechnical considerations for site design and construction include:

- We believe the site is suitable for helical anchors to be used as anchorage points to support the floating solar array.
- Installing helical anchors in the dam/embankment material should be possible with conventional helical anchor equipment. Locations where helical anchors encounter native soils may require pre-drilling to successfully install the anchors to the required depth.

- We have assumed previous investigations performed for the design and construction of the reservoir and treatment plant have characterized the potential risk of ground motion and landslides as acceptable for the project.

The following sections provide our recommendations for the design and construction of the project. We should be contacted for additional recommendations if the proposed construction or anticipated foundation loads are changed from the project description in Section 1.0 of this report, or if significant changes occur at the site with respect to the site conditions described in Section 3.1 of this report.

4.1 Earthwork

Recommended site grading for roadways and structures are presented below.

4.1.1 Site Preparation

We understand most of the construction will consist of the installation of helical anchors and therefore minimal site preparation with respect to earthwork will be required.

4.1.1.1 Shallow Foundations

If spread footings are used as in addition to helical anchors (to provide additional lateral support). Earthwork preparation for these features should include a construction envelope that extends at least 5 feet beyond the actual limits of the structures' footprint. Finished grade is defined as the lowest point within any structure's building envelope.

If spread footings are used, we recommend the following site preparation steps:

1. Prior to general site grading the site should be stripped of any existing debris, and vegetation. All debris or other deleterious materials should be excavated and disposed of off-site at a legal dumpsite. Prior to placing new fills, all areas should be observed by a representative of the geotechnical engineer for evidence of any remaining undesirable materials.
2. Where existing slopes are steeper than 5:1 (horizontal:vertical), the area should be benched to reduce the potential for slipping at the interface of the fill and existing slope surface. Individual benches should be no more than 18-inches high, wide enough to accommodate equipment, and configured to allow for horizontal fill-lift placement.
3. Undisturbed soils are generally suitable for support of planned footings or engineered fill if required for site grading.
4. Wet, soft, or loose zones of soil may be encountered at the bottom of planned excavation depths within the construction envelope. These materials should be removed and replaced with engineered fill or controlled low strength material. Removal should extend laterally 8 inches for every additional foot removed.

5. The possible re-use of on-site soil in newly compacted fill and the requirements for imported fill soil is discussed in Section 4.1.2.
6. Compact subgrade, fill, backfill, subbase fill, or base material to the relative compaction and moisture content noted in the Section 4.1.3. Lift thickness for backfill will be dependent upon the type of compaction equipment utilized but should generally be placed in lifts not exceeding 10 inches in loose thickness. Fills should be moisture conditioned and compacted by appropriate mechanical methods.

4.1.1.2 Trench Backfill

Recommendations for the placement of engineered fill and aggregate base course with respect to trench backfill follows:

1. The possible re-use of on-site soil in newly compacted fill and the requirements for imported fill soil is discussed in Section 4.1.20.
2. Compact subgrade, fill, backfill, subbase fill, or base material to the relative compaction and moisture content noted in the Section 4.1.3. Lift thickness for backfill will be dependent upon the type of compaction equipment utilized but should generally be placed in lifts not exceeding 10 inches in loose thickness. Fills should be moisture conditioned and compacted by appropriate mechanical methods.

4.1.2 Fill Materials

Fill soils should be free of debris and organic material, and all particles are less than 3 inches in size.

- **On-Site Soils**

The on-site soils we encountered appear suitable for use as engineered fill material below structures and slabs.

- **Imported Soils**

Soils imported from off-site sources for use in new fills below structures or rigid concrete pavements should meet the requirements listed in the following table:

Property	Specification	Remarks
Maximum Particle Size	3 inches	None
Percent Passing No. 4 Sieve	30-100	None
Percent Passing No. 200 Sieve	2-55	None
Maximum Plasticity Index	15	None

The geotechnical consultant should evaluate any imported materials and details of their placement prior to importation.

▪ **Aggregate Base Course**

Untreated base course should meet the requirements of Section 301 of the Utah Department of Transportation Standard Specifications for Road and Bridge Construction.

4.1.3 Compaction

We recommend subgrade, fill, backfill, subbase fill, or base material be prepared and placed to the relative compaction and moisture content provided below. Lift thickness for backfill will be dependent upon the type of compaction equipment utilized but should generally be placed in lifts not exceeding 10 inches in loose thickness. Fills should be moisture conditioned and compacted by appropriate mechanical methods.

Recommendations for Compaction of On-Site and Imported Soils

Material / Location	Percent Compaction (ASTM D698)	Moisture Content Range (ASTM D698)
Below Foundations	95 min.	Opt. -3 to Opt. +3 percent
Above Foundation Level and Below Concrete Slabs or Flatwork	90 min.	Opt. -3 to Opt. +3 percent ¹
Trench backfill, not deeper than 4 ft. below finished grade	95 min.	Opt. -3 to Opt. +3 percent
Trench backfill, 4 ft. or deeper below finished grade	98 min.	Opt. -3 to Opt. +3 percent
Embankments	95 min.	Opt. -3 to Opt. +3 percent
Base Course	100 min.	Opt. -3 to Opt. +3 percent ¹
Miscellaneous Backfill (other backfill areas not used for foundation, pavement, or utility line support)	90 min.	Opt. -3 to Opt. +3 percent

Notes:

1. Maintain in a moist condition until overlying structures, slabs, or pavements are constructed

4.1.4 Workability

If site grading is performed during or subsequent to wet weather, or if ponding or leaking utilities are present, then near-surface site soils may be above optimum moisture content. This could make it difficult to achieve specified compaction, material pumping, and equipment maneuverability problems. If this occurs, disking for aeration followed by sufficient drying time (possibly several days depending upon the weather), chemical treatment, replacement with drier material, stabilization with a geotextile fabric or grid, or other methods may be implemented to reduce excessive soil moisture or otherwise facilitate earthwork operations.

4.1.5 Excavation Conditions

Hollow-stem auger drilling methods were used to advance all the explorations to their planned termination depths.

We believe the excavation conditions encountered in our borings generally represent the conditions to be expected across the site; however, excavation conditions are dependent on many factors including: soil moisture content, relative density or consistency, excavation size, excavation equipment, operator experience, and operator effort. It may not be possible to correlate all of the potential variables with the results of what we experienced during our exploration advancement in terms of the actual excavation conditions that could be encountered. Those involved with the construction of this site should use the information provided in this report as a guideline for the conditions that generally exist only at each boring location. Those using this report should understand the limitations of the methods used to obtain the data and should use the information with caution and only as a guideline.

4.1.6 Temporary Excavations

Those involved with the construction of this project should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

Trenches over 20 feet deep (if needed) should be designed by the contractor's engineer based on alignment-specific soil properties and settlement-sensitive features. Excavations encountering seepage, if any, should be evaluated on a case-by-case basis. Where the stability of structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to protect personnel working within the excavation. Shoring, bracing, or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of Utah. In general, heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within 1/3 the slope height from the top of any excavation, unless incorporated into the engineered design.

4.2 Foundation Design Recommendations

We have included a foundation capacity chart of uplift capacity for helical anchors (see Figure A-3, in Appendix A). Conditions in the dam/embankment will be different than native soils, and we have provided two recommendations dependent on the location where anchors are installed. We assumed the following soil parameters for the site:

Material	γ_m^1 (pcf)	Φ^2 (degrees)
Dam/Embankment	110	35
Native Soils	125	40

Notes

1. In-situ unit weight of the native soil or compacted fill
2. Apparent Friction Angle

4.3 Seismic Design Considerations

Building structural response to seismic events is based on the structure's Seismic Design Category, which is partially dependent on the Seismic Site Classification. The seismic site classification is based on the soil properties within 100 feet of the surface and the methods outlined in the International Building Code and American Society of Civil Engineers publication ASCE-7. We recommend this site be classified as Site Class D.

The classification is based on a weighted average of the standard penetration testing performed at the site and our experience at similar sites in the region.

4.4 Lateral Earth Pressures

The following ultimate lateral earth pressures may be used for the design of shallow foundations subject to lateral loading. The recommended equivalent fluid lateral earth pressures are suitable for unsaturated soils, level backfill behind and in front of retaining walls, and properly compacted backfill.

Type	Equivalent Fluid Lateral Earth Pressure (pcf)
Active	35
Passive	375
At-Rest	55

Sliding resistance between the base of concrete foundation elements, or shear keys, and soil beneath concrete foundations, is evaluated using the frictional resistance, identified using the angle of friction. The angle of friction represents the relationship between the normal load acting on the sliding plane and the shearing load required to initiate sliding. Frictional resistance may also be identified using the friction factor, which is the tangent of the friction angle. An allowable coefficient of base friction of 0.38 should be used to estimate sliding resistance between the base of the foundation element and soil. Friction and passive earth pressure resistance may be combined without reduction.

The ultimate lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided that the passive resistance does not exceed one-half of the total ultimate resistance. The passive resistance may be increased by one-third when considering loads of short duration, such as wind, or seismic forces. Where foundations are designed to resist lateral loading, they should preferably be proportioned such that the resultant force from total loads, including lateral loading, falls within the kern (i.e., middle one-third of the footing base).

4.5 Soil Corrosion and Concrete Exposure

SAECO performed laboratory testing for parameters that commonly affect the corrosion of buried metal elements. Details of the test methods used to determine the parameters and the results are presented in Appendix B. The effect of these properties on buried metal elements is complex and other factors we

have not evaluated may also be present at the site. The test results we have provided should be used to assist others in determining the type and degree of corrosion protection that may be required. We recommend a certified corrosion specialist be consulted to assist you with the specific needs of your project.

Laboratory chemical tests performed on samples of the on-site soils indicated sulfate contents of up to 5 parts per million. Based on the American Concrete Institute (ACI) 318 Building Code, the potential for sulfate attack is negligible for water-soluble sulfate contents in soils ranging from 0 percent to 0.10 percent by weight (0 ppm to 1,000 ppm). We recommend the use of Type II cement for construction of concrete structures in contact with soil at this site. The structural engineer should select the concrete design strength, water-cement ratio, slump at placement, etc., based on the project specific conditions and based on the recommendations presented in ACI. All concrete exposed to the elements should be air entrained.

4.6 Site Drainage

Most of the building, pavement, and retaining wall performance issues we have observed are related to moisture infiltration into the subsurface soils. Sources we have observed include: poorly managed surface run-off, failed potable and non-potable water lines, air-conditioner condensate, inadequate roof drainage, poorly sited landscape features (planting locations, planters, leaking fountains, and leaking swimming pools), inadequate maintenance of surface and subsurface drainage features (clogged storm-drains or plugged weep-hole in retaining walls).

- The ground surface around the edges of structures, flatwork, and pavements should be graded such that water drains away without ponding. In general, pavement and lawns within ten feet of buildings should slope away at gradients of 2 to 5 percent. These surfaces will need to be maintained for the life of the structure to ensure positive drainage and prevent erosion from exposing building foundations.
- Utility trenches that pass under perimeter walls structures should be backfilled with either compacted non-pervious fill material (avoid pea gravel or clean sand backfill in these areas) or lean concrete, to reduce the potential for the utility trench acting as a conduit for water infiltration into the interior of a building. This zone of impervious backfill should extend at least 2 feet outside the perimeter of the building.
- Monitor and promptly repair plumbing leaks and maintain exterior irrigation systems. Consider site-climate-adapted plants and eliminate landscaping irrigation systems once the plants are established (ensure these systems are properly abandoned).

4.7 Pre-Construction Conference

We recommend that a pre-construction conference be held. Representatives of the owner, the civil engineer, the geotechnical consultant, and the contractor should be in attendance to discuss the project

plans and schedule. Our office should be notified if the project description included herein is incorrect, or if the project characteristics are significantly changed.

4.8 Construction Observation and Testing

Since the final design is not complete and final structural loading conditions are not known, we recommend that a general review of the project plans and specifications be conducted before they are finalized to verify that our geotechnical recommendations have been properly interpreted and implemented during design. The recommendations provided in this report assume an adequate program of testing and observation will be conducted during the construction phase to evaluate the compliance with our recommendations.

If another geotechnical consultant is selected to perform observation and testing services for the project, we request that the selected consultant provide a letter to the owner, with a copy to Smith & Annala Engineering Co., indicating that they fully understand our recommendations and that they are in full agreement with the recommendations contained in this report.

5.0 LIMITATIONS

Some variations in the soil conditions are anticipated between the points explored. The nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at this site that are different from those described in this report, our firm should be immediately notified so that we may make any necessary revisions to the recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, our firm should also be notified.

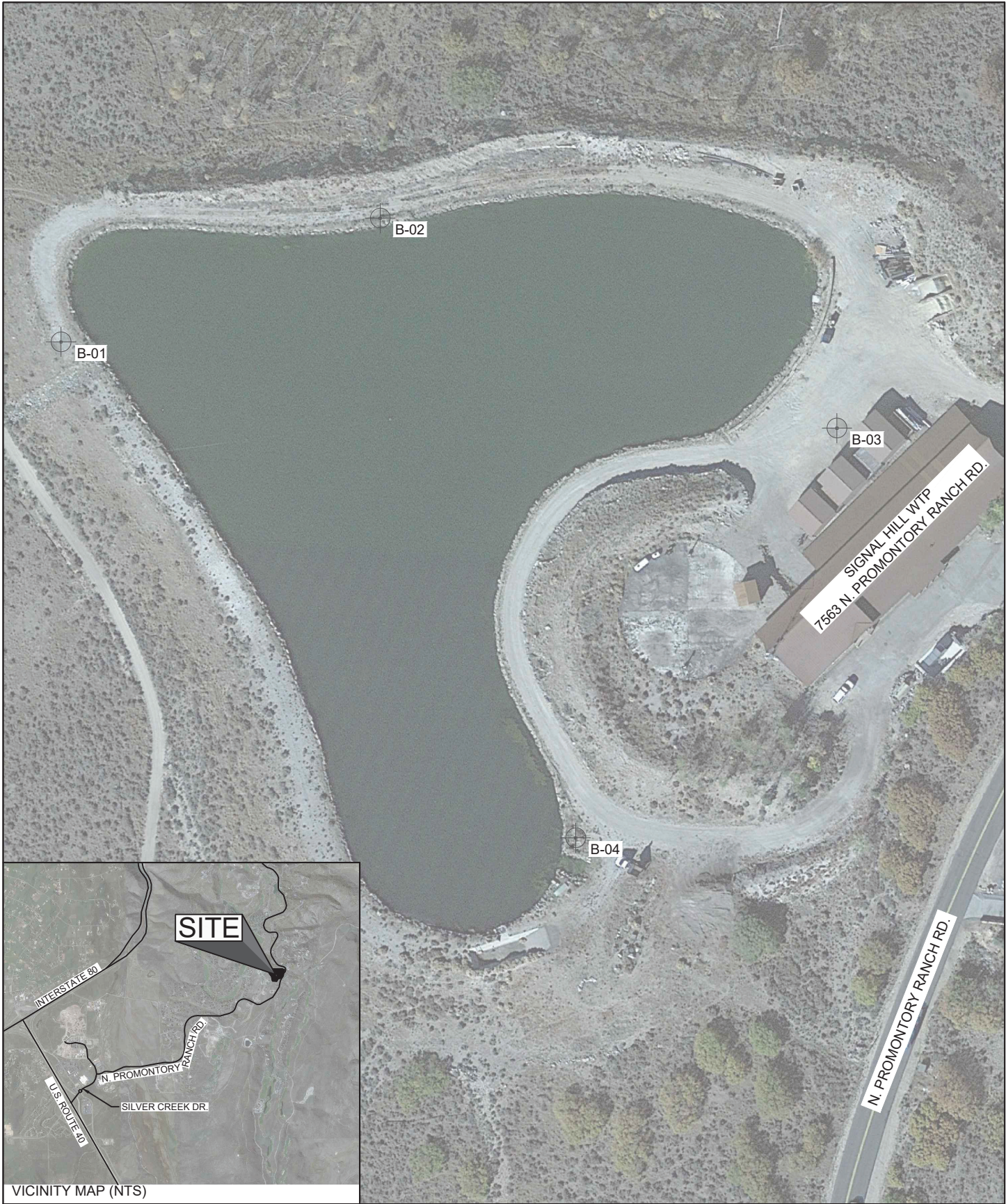
The exploration, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report.

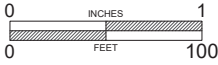
This report may be used only by the client and only for the purposes stated within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Similarly, future irrigation, broken water or sewer pipelines, or other factors may adversely influence the project. Any party other than the client who wishes to use this report shall notify SAECO of such intended use. SAECO may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release SAECO from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold harmless SAECO from any claim or liability associated with such unauthorized use or non-compliance.

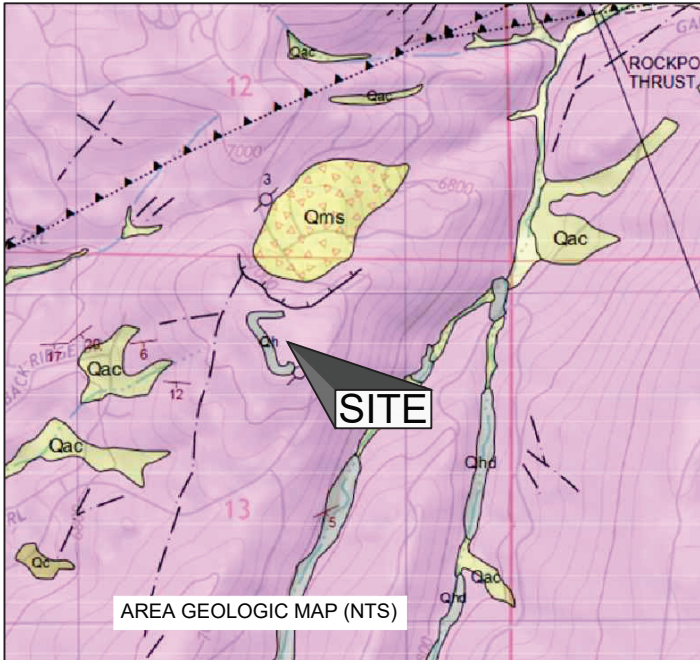
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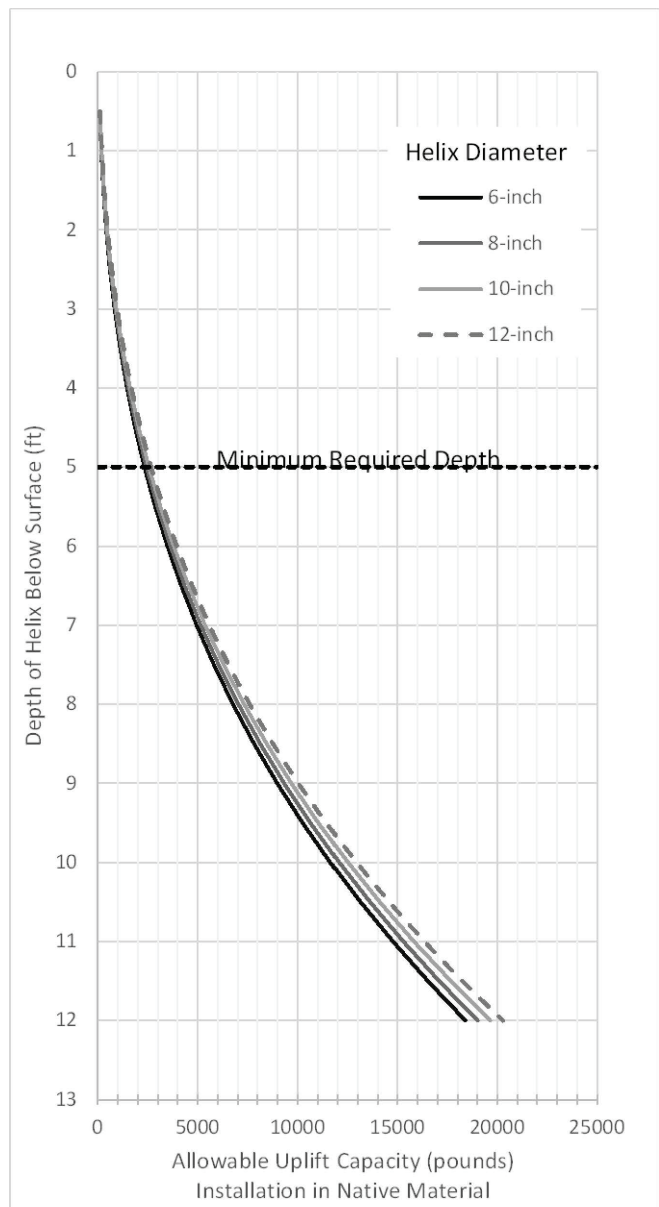
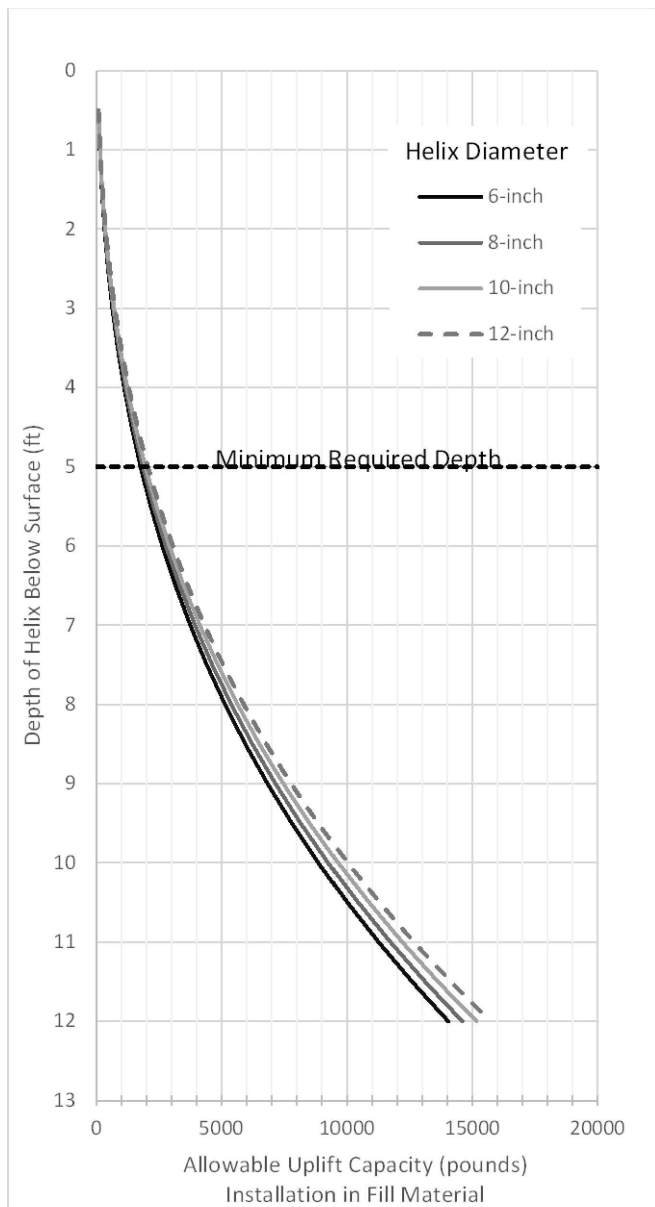
APPENDIX A



SIGNAL HILL WTP FLOATING SOLAR 7563 N. PROMONTORY RANCH RD. PARK CITY, UTAH			 SMITH & ANNALA ENGINEERING CO. SAECO GEOTECHNICAL ENGINEERING • CONSTRUCTION QA/QC • ENVIRONMENTAL SERVICES		MAP KEY  APPROXIMATE BORING LOCATION	 0 INCHES 1 0 FEET 100	
DRAWN BY: AJS	CHECKED BY: BWR	PROJECT NUMBER: 29.23.2524	FIGURE TITLE: EXPLORATION MAP				FIGURE NO.: A-1
CLIENT: AMERESCO	DATE: 8/25/2023	SCALE: 1" = 100'					



SIGNAL HILL WTP FLOATING SOLAR 7563 N. PROMONTORY RANCH RD. PARK CITY, UTAH			GEOTECHNICAL ENGINEERING • CONSTRUCTION QA/QC • ENVIRONMENTAL SERVICES			
DRAWN BY: AJS	CHECKED BY: BWR	PROJECT NUMBER: 29.23.2524				
CLIENT: AMERESCO		DATE: 8/31/2023	SCALE: 1" = 300'	FIGURE TITLE: LANDSLIDE SCARP LOCATION MAP		FIGURE NO.: A-2



SIGNAL HILL WTP FLOATING SOLAR
7563 N. PROMONTORY RANCH RD.
PARK CITY, UTAH

DRAWN BY:
AJS

CHECKED BY:
BWR

PROJECT NUMBER:
29.23.2524



CLIENT:

AMERESCO

DATE:

8/31/2023

SCALE:

n/a

FIGURE TITLE:

HELICAL PILE ALLOWABLE UPLIFT CAPACITY

FIGURE NO.:

A-3

APPENDIX B

APPENDIX B FIELD INVESTIGATION

Our field investigation was performed on August 9, 2023. During the field investigation a representative from SAECO:

- Noted the current site conditions from cursory observations
- Sited the explorations in the field by estimating bearings and distances from site features shown on aerial photographs and with input from Mountain Regional Representative.
- Estimated surface elevations at the explorations by estimating from topographic maps.
- Directed the exploration subcontractor with respect to total depth of exploration and the type and depth of any sampling performed.
- Visually classified the subsurface materials exposed during the advancement of the explorations. In general accordance with ASTM D2487 (Visual Manual Procedure) with some modifications from SAECO.
- Created a log of the explorations, including subsurface materials encountered, results of field testing performed, and a record of any samples collected.
- Appropriately labeled and packaged the samples collected for transport to the SAECO laboratory.

Soil Borings: Soil borings performed as part of the investigation were extended using a Mobile Drill B-80 truck mounted drill-rig utilizing 8-inch (OD) diameter hollow-stem auger operated by Earthcore drilling. Upon completion the borings were backfilled with cuttings derived from auger advancement.

Descriptions of the types of samples obtained during the field exploration are presented below:

Bulk Samples: Bulk samples are typically bags of loose soil or rock material obtained from auger cuttings of borings or from the walls or bottom of a test trench.

Ring Samples: Relatively undisturbed samples were obtained with a modified ring-lined split barrel sampler. It was driven into the bottom of the borehole at selected depths with a 140-pound hammer free-falling from a height of 30 inches, in general accordance with ASTM D1586. The sampler had an external diameter of 3.0 inches and was lined with a stack of 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The ring-lined samples were removed from the sample barrel, sealed in plastic bags, and placed in protective plastic sleeves with end caps.

Standard Penetration Test (SPT) Samples: Disturbed samples were obtained with a Standard Penetration Test sampler. The sampler had an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. It was driven into the bottom of the borehole at selected depths with a 140-pound hammer free-falling from a height of 30 inches, in general accordance with ASTM D1586. The blow counts reported on the logs are those for the last 12 inches of penetration. The soil samples were removed from the sampler and sealed in plastic bags.



Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)



ABC: Aggregate Base Course



CL: USCS Low Plasticity Clay



FILL: Fill (made ground)



SC: USCS Clayey Sand



SM: USCS Silty Sand

SAMPLER SYMBOLS



Bulk Sample



Split-barrel ring-lined sampler, 2.4-inch I.D.



Standard Penetration Test

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION
▽ Water Level at Time Drilling, or as Shown
▼ Water Level at End of Drilling, or as Shown
▽ Water Level After 24 Hours, or as Shown



Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	$C_u \geq 4$ AND $1 \leq C_c \leq 3$	GW	WELL-GRADED GRAVEL	
			$C_u < 4$ AND/OR $1 > C_c > 3$	GP	POORLY-GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	$C_u \geq 6$ AND $1 \leq C_c \leq 3$	SW	WELL-GRADED SAND	
			$C_u < 6$ AND/OR $1 > C_c > 3$	SP	POORLY-GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR MH	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	$PI>7$ AND PLOTS>"A" LINE	CL	LEAN CLAY	
			$PI>4$ AND PLOTS<"A" LINE	ML	SILT	
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY	
			PI PLOTS <"A" LINE	MH	ELASTIC SILT	
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	

SAMPLE TYPES



SPT - Standard Penetration Test



RC - Rock Core, HQ Core Barrel



RING - Ring-lined Sampler



BULK - Bulk Sample



UD - Undisturbed Sample

PARTICLE SIZE DEFINITION FOR SANDS AND GRAVELS

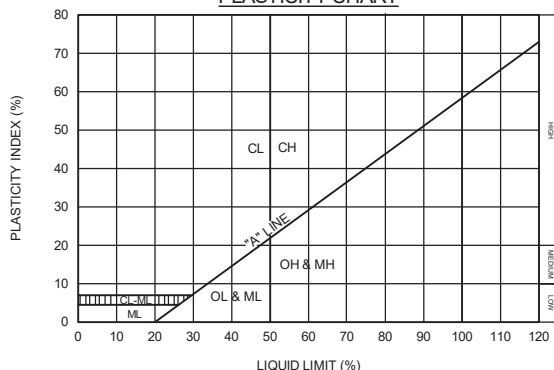
SOIL FRACTION GRAIN SIZE

Boulders	12 inches +
Cobbles	12 inches to 3 inches
Gravel	
Coarse	3 inches to 3/4 inches
Fine	3/4 inches to #4 Sieve
Sand	
Coarse	#4 to #10 Sieve
Medium	#10 to #40 Sieve
Fine	#40 to #200 Sieve

OTHER TESTS OR COMMENTS

(NR) - NO RECOVERY	pH - pH OF SOIL
CN - CONSOLIDATION	RES - MINIMUM ELECTRICAL RESISTIVITY
DS - DIRECT SHEAR	CHLOR - CHLORIDE CONTENT
SW - SWELL	SULF - SULFATE CONTENT
UC - UNCONFINED COMPRESSION	THRM - THERMAL RESISTIVITY
RV - R-VALUE	
CBR - CALIFORNIA BEARING RATIO	
EI - EXPANSION INDEX	
PP - POCKET PENETROMETER (TSF)	

PLASTICITY CHART



CONSISTENCY / RELATIVE DENSITY DEFINITIONS

PENETRATION RESISTANCE (RECORDED AS BLOWS / FT)				
SAND & GRAVEL		COHESIVE SOILS		
RELATIVE DENSITY	N-VALUE BLOWS/FOOT*	CONSISTENCY	N-VALUE BLOWS/FOOT*	UNCONFINED COMPRESSIVE STRENGTH (TSF) **
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
MEDIUM DENSE	10 - 30	FIRM	4 - 8	0.50 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

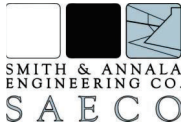
* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** VERY APPROXIMATE

Client: <u>Ameresco</u>	Project Name: <u>Signal Hill WTP Park City Floating Solar Array</u>
Project Number: <u>29.23.2524</u>	Project Location: <u>Park City, Utah</u>
Date Started: <u>8/9/23</u> Completed: <u>8/9/23</u>	Ground Elevation: <u>Not Determined</u> Hole Size: <u>8 inches</u>
Drilling Contractor: <u>Earthcore</u>	Ground Water Levels:
Drilling Method: <u>Mobile Drill B80/Hollow Stem Auger</u>	At time of Drilling: <u>Not Encountered</u>
Logged By: <u>AJS</u> Checked By: <u>BWR</u>	At end of Drilling: <u>Not Encountered</u>
Notes: <u>Boring in dam</u>	After Drilling: <u>Not Encountered</u>

Elevation (ft)	Depth (ft)	Bulbhole Pen. (blows / ft)	Sample type/Interval	Blows per 6 in.	N-value (blows / ft)	Dry Unit Wt. (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing No. 4 Sieve (%)	Passing No. 200 Sieve (%)	Other Tests or Comments	Graphic Log	USCS Classification	MATERIAL DESCRIPTION
	5			14 28	(42)		11	29	3	88	34	pH, RES, CHLOR, SULF		SM	FILL: SILTY SAND WITH GRAVEL, brownish gray, dry to moist, medium dense, low plasticity, no cementation
				12 15 17	32							PP=0.8 TSF			Dense
				50/5"	(50+)										Moist, very dense
	10			6 13 16	29							PP=1.0 TSF			
	15			3 4 16	20							PP=2.0 TSF		SC	CLAYEY SAND, trace gravel, dark brown, dry to moist, medium dense, medium plasticity
	20			17 21 22	43		12					PP=0.5 TSF		SM	SILTY SAND WITH GRAVEL, grayish brown, dry to moist, medium dense, low plasticity, no cementation

Bottom of borehole at 21.5 feet.



Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah

Date Started: 8/9/23

Completed: 8/9/23

Ground Elevation: Not Determined

Hole Size: 8 inches

Drilling Contractor: Earthcore

Ground Water Levels:

Drilling Method: Mobile Drill B80/Hollow Stem Auger

At time of Drilling: Not Encountered

Logged By: AJ5

Checked By: BWR

At end of Drilling: Not Encountered

Notes:

After Drilling: Not Encountered

Elevation (ft)	Depth (ft)	Bulldozer Pen. (blows / ft)	Sample type/Interval	Blows per 6 in.	N-value (blows / ft)	Dry Unit Wt. (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing No. 4 Sieve (%)	Passing No. 200 Sieve (%)	Other Tests or Comments	Graphic Log	USCS Classification	MATERIAL DESCRIPTION
															2" gravel over 4" ABC
															SILTY SAND WITH GRAVEL, brownish gray, dry to moist, very dense, low plasticity, no cementation
	5			20 50/5"	(50+)										
				41 50/4"	100+										
				44 50/5"	100+		10								Dry
	10			50/6"	100+										Water added during drilling advancement
	15			36 46 46	92							PP=1.5 TSF			

Bottom of borehole at 16.5 feet.

Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah

Date Started: 8/9/23 Completed: 8/9/23

Ground Elevation: Not Determined Hole Size: 8 inches

Drilling Contractor: Earthcore

Ground Water Levels:

Drilling Method: Mobile Drill B80/Hollow Stem Auger

At time of Drilling: Not Encountered

Logged By: AJS Checked By: BWR

At end of Drilling: Not Encountered

Notes:

After Drilling: Not Encountered

Elevation (ft)	Depth (ft)	Bulldoze Pen. (blows / ft)	Sample type/Interval	Blows per 6 in.	N-value (blows / ft)	Dry Unit Wt. (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing No. 4 Sieve (%)	Passing No. 200 Sieve (%)	Other Tests or Comments	Graphic Log	USCS Classification	MATERIAL DESCRIPTION
														CL	SANDY LEAN CLAY, dark brown with grayish black, dry to moist, stiff, medium plasticity
	5			4 7	(11)	94	23	32	11	100	52	pH, RES, CHLOR, SULF			Very stiff
				6 9 18	27							PP=0.3 TSF		SM	SILTY SAND, moist, medium dense, low plasticity
				32 50/5"	(50+)										
	10			24 24 19	43							PP=0.3 TSF			Dense
	15			24 50/2"	100+										Very dense
	20			20 26 30	56		11					PP=1.3 TSF			

Bottom of borehole at 21.5 feet.

APPENDIX C

APPENDIX C

LABORATORY TESTING

In-Place Moisture and Density Tests

The moisture contents of samples obtained from the field exploration were evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation

Gradation tests were utilized to aid in soil classification. Gradation testing was performed on selected representative soil samples in general accordance with ASTM D422. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System (USCS).

200 Wash

An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D1140, to aid in soil classification.

Atterberg Limits

Atterberg Limits tests were utilized to evaluate the plasticity characteristics of the soil, aid in soil classification, and to correlate with engineering properties such as shrink-swell potential. Tests were performed on selected representative soil samples in general accordance with ASTM D4318.

Laboratory Compaction Characteristics of Soil

The relationship between water content and dry unit weight of soils (compaction curve) was evaluated in general accordance with ASTM D698, to estimate maximum compacted dry density and optimum moisture content.

Resistivity and pH

Resistivity and pH tests were performed to evaluate the corrosive potential of the site soils. Tests were performed in general accordance with AASHTO test methods.

Sulfate and Chloride

Sulfate and Chloride tests were performed to evaluate the corrosive potential of site soils toward portland cement concrete and ferrous metals. Tests were performed in general accordance with AASHTO test methods.





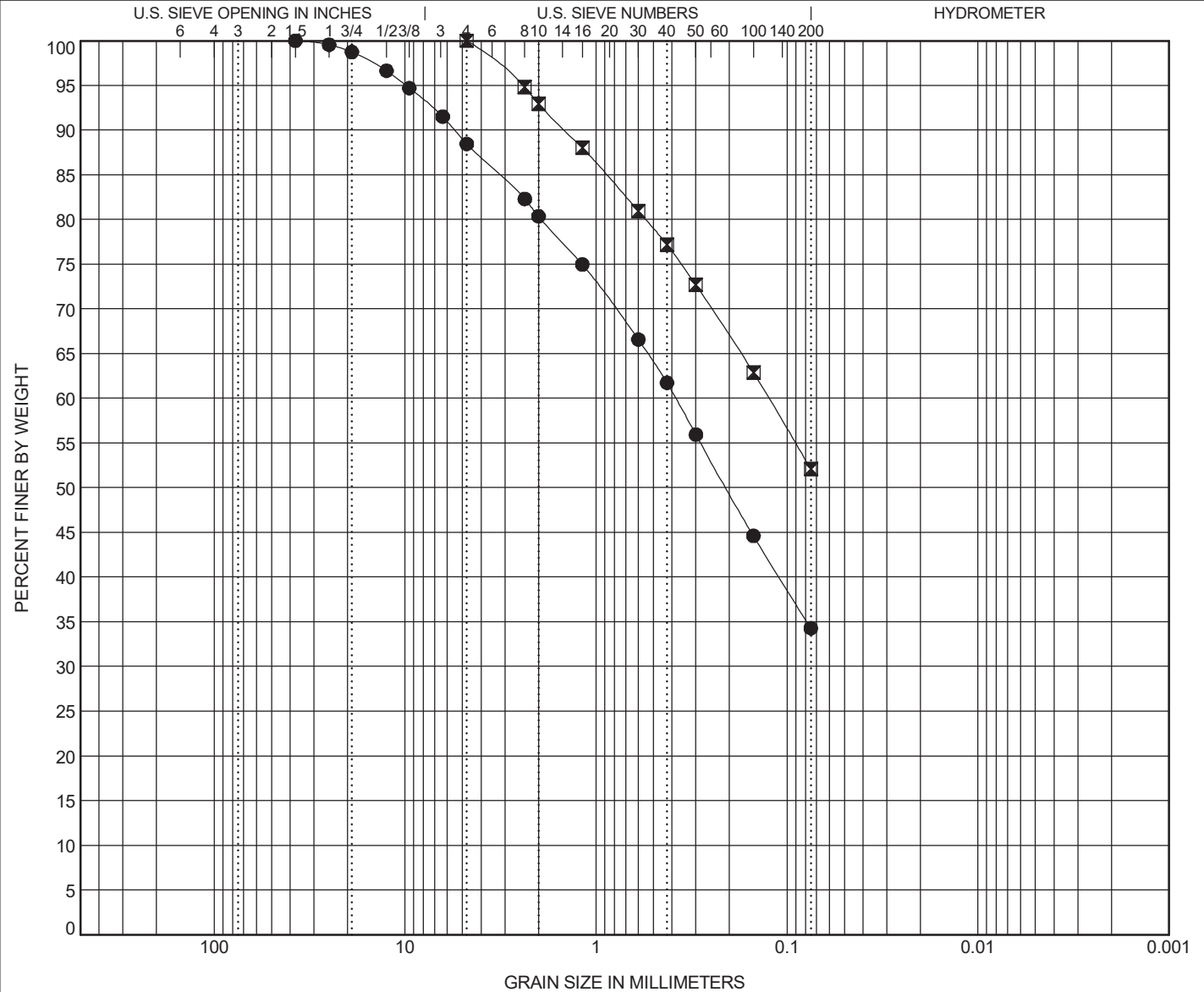
GRAIN SIZE DISTRIBUTION

Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah





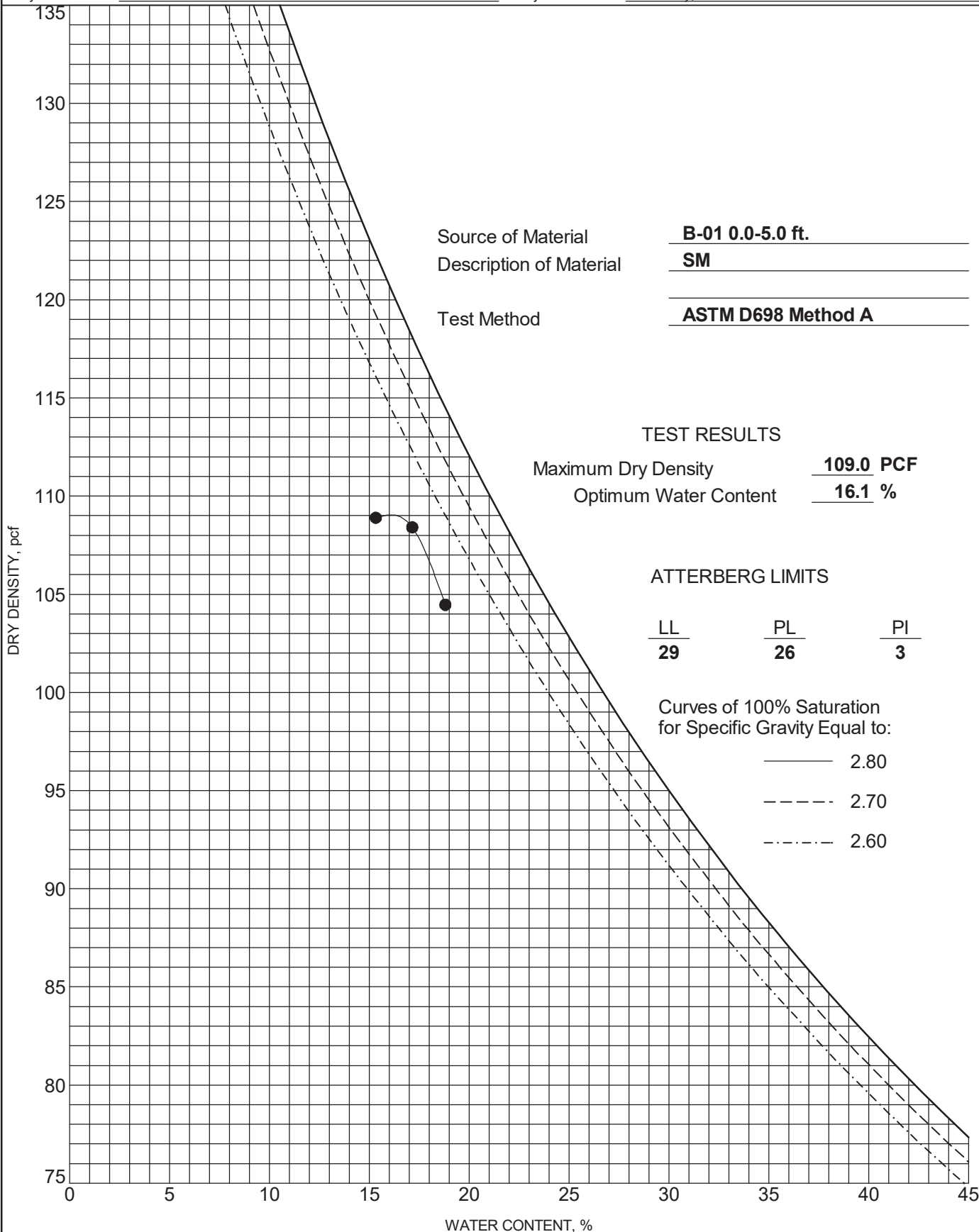
MOISTURE-DENSITY RELATIONSHIP

Client: Ameresco

Project Name: Signal Hill WTP Park City Floating Solar Array

Project Number: 29.23.2524

Project Location: Park City, Utah





SUMMARY OF LABORATORY RESULTS

Client: Ameresco Project Name: Signal Hill WTP Park City Floating Solar Array
Project Number: 29.23.2524 Project Location: Park City, Utah

Borehole	Depth (ft)	USCS Group Symbol	Liquid Limit	Plastic Limit	Plasticity Index	%>#4 Sieve	%<#200 Sieve	Water Content (%)	Dry Density (pcf)	Consol(-)/Swell(+)(%)	pH	Minimum Resistivity (Ohm-cm)	Sulfate (ppm)	Chloride (ppm)
B-01	0.0-5.0	FILL	29	26	3	12	34	10.9			8.7	2275	3	14
B-01	20.0-21.5	SM						12.0						
B-02	5.0-6.0	FILL						20.1	100.5					
B-02	10.0-11.5	SM	NP	NP	NP			20.5						
B-03	7.0-7.9	SM						10.3						
B-04	0.0-5.0	CL	32	21	11	0	52				8.3	2875	5	11
B-04	2.5-3.5	CL						22.8	93.8					
B-04	20.0-21.5	SM						10.9						



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