



**DOCUMENT 00 90 01**  
**ADDENDUM #1**

**Project:** 2019-0406  
**Date:** Friday, August 5, 2022  
**Bid Date:** Friday, August 12, 2022  
**Bid Time:** 2:00 p.m.

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This addendum shall be considered part of the Contract Document for the above referenced project as though it had been issued at the same time and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents, this Addendum shall govern and take precedence. Receipt of this addendum shall be acknowledged in Document 00 41 00 – Bid Form.

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## Project Manual

### Section 07 41 13 – Metal Roof Panels

Added this section in its entirety to the technical specifications.

### Section 08 70 00 – General Hardware Requirements

Delete and replace this section with the version attached.

### Section 09 24 00 – Portland Cement Plaster for Framed Walls (Stucco)

Added this section in its entirety to the technical specifications.

### Section 09 29 00 – Gypsum Wallboard

Added this section in its entirety to the technical specifications.

### Section 09 96 56 – High Humidity Interior Epoxy Painted Gypsum Board

Added this section in its entirety to the technical specifications.

### Section 26 32 13.13 – Diesel Engine Generator Spec

Added this section in its entirety to the technical specifications.

## Project Drawings

### Sheet A301

Delete and replace this sheet. A callout has been added showing the location and requirement to include an under slab vapor barrier per specification section 07 26 16.

### Sheets E202, E204, E207, E301, E402, E403, E404, E501, E502, E601, E603

Delete and replace these sheets. Updated electrical wire sizes and details on these sheets.

## Attachments:

1. Section 00 00 01 Title Page & TOC
2. Section 07 41 13 Metal Roof Panels
3. Section 08 70 00 General Hardware Requirements
4. Section 09 24 00 Portland Cement Plaster for Framed Walls (Stucco)
5. Section 09 29 00 Gypsum Wallboard
6. Section 09 96 56 High Humidity Interior Epoxy Painted Gypsum Board
7. Sheets A301, E201, E202, E204, E207, E301, E402, E403, E404, E501, E502, E601, E603.

**END OF ADDENDUM**

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## SECTION 07 41 13 METAL ROOF PANELS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Exposed fastener metal roof panels, with related metal trim and accessories.

#### 1.2 RELATED WORK

- A. Section 07 21 00 Insulation
- B. Section 07 60 00 Flashing and Sheet Metal
- C. Section 07 71 23 Manufactured Gutters and Downspouts

#### 1.3 REFERENCES

- A. ASTM A 653 – Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A 755 – Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- C. ASTM A 792/A792M – Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- D. ASTM C 645 – Specification for Nonstructural Steel Framing Members.
- E. ASTM C 754 – Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- F. ASTM C 920 – Specification for Elastomeric Joint Sealants.
- G. ASTM D 1003 – Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
- H. ASTM D 2244 – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- I. ASTM D 4214 – Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
- J. ASTM E 1646 – Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
- K. ASTM E 1680 – Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
- L. ASTM E 1980 – Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

#### 1.4 SUBMITTALS

- A. Product data.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener, and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.

- C. Sample for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch-long section of each metal panel profile. Provide color chip verifying color selection.
- E. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- F. Qualification Information: For Installer firm and Installer's field supervisor.
- G. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
  - 1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
  - 2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

#### 1.6 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail within one year from date of Substantial completion.
- B. Special Panel Finish Warrant: On manufacturer's standard form, in which manufacturer agree to repair or replace metal panels that evidence deterioration of factory-applied finish within 25 years from date of Substantial completion, including:
  - 1. Modified Silicone-Polyester Two-Coat System:
    - a. Color fading in excess of 7 Hunter units per ASTM D 2244, for vertical applications.
    - b. Color fading in excess of 10 Hunter units per ASTM D 2244, for non-vertical applications.
    - c. Chalking in excess of No. 7 rating per ASTM D 4214, for vertical applications.
    - d. Chalking in excess of No. 6 rating per ASTM D 4214, for non-vertical applications.
    - e. Failure of adhesion, peeling, checking, or cracking.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.
- C. Air Filtration: Maximum 0.006 cfm/sq. ft. at 6.24 lbf/sq. ft. static-air-pressure difference.

- D. Water Penetration: No uncontrolled water penetration at a static pressure of 20 lbf/sq. ft.

## 2.2 METAL PANEL MATERIALS

- A. Aluminum-Zinc Alloy-Coated Steel Sheet: Grade 50, coating class AZ50, prepainted by the coil-coating process per ASTM A755/A 755M.

## 2.3 METAL ROOF PANELS

- A. Minimum Coverage Width: 32 inches
- B. Nominal Coated Thickness: 24 gauge
- C. Panel Surface: Smooth
- D. Exterior Finish: Modified silicone-polyester two-coat system

## 2.4 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating ridge, eave, rake, valley, and parapet trims, copings, fascias, gutters and downspouts, and miscellaneous flashings, in manufacturer's standard profiles. Provide required fasteners, closure strips, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Self-tapping screws and other acceptable fasteners recommended by roof panel manufacturer.
  - 1. Exposed Fasteners: Long life fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- C. Self-Adhering, High-Temperature Underlayment: Self-adhering, cold-applied sheet underlayment, minimum 30 mils (0.76 mm), recommended by metal panel manufacturer for application. Provide primer when recommended by underlayment manufacturer.
- D. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
  - 1. Tape Sealers: Manufacturer's standard non-curing butyl tape.
  - 2. Concealed Joint Sealantst: Non-curing butyl.
  - 3. Exposed Joint Sealants: Urethane, single component.

## 2.5 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Panel Lengths: Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

## 2.6 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Modified Silicone-Polyester Two-Coat System: 0.20 – 0.25 mil primer with 0.7 – 0.8 mil color coat.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
  - 1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
  - 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
    - a. 1/4 inch in 20 foot in any direction.
    - b. 3/8 inch over any single roof plane.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with metal roof panel system installation.

### 3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.
- B. Flashings: Install flashings to cover exposed underlayment per Section 07 62 00 "Sheet Metal Flashing and Trim."

### 3.3 METAL PANEL INSTALLATION

- A. A. Exposed Fastener Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Panel Sealants: Install manufacturer's recommended tape sealant at panel sidelaps and endlaps.
- C. Panel Fastening: Attach panels to supports using screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
  - 1. Fasten metal panels to supports at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
  - 2. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
  - 3. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

### 3.4 ACCESORRY INSTALLATION

- A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.





2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
  3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.

### 3.5 CLEANING AND PROTECTION

- A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Engineer.

**END OF SECTION**



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## SECTION 08 70 00 GENERAL HARDWARE REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

##### A. Includes But Not Limited To

1. General requirements for finish hardware related to architectural wood and hollow metal doors.

#### 1.2 RELATED WORK

Not Used.

#### 1.3 REFERENCES

##### A. Builders Hardware Manufacturer's Association (BHMA) Hardware Functions

#### 1.4 SUBMITTALS

##### A. Hardware Templates

1. Provide hardware templates to Sections 08 12 13 and 08 13 13 within 14 days after hardware schedule is approved.
2. Supply necessary hardware installation templates to Division 06 prior to pre-installation meeting.

#### 1.5 DEFINITIONS

##### A. Builders Hardware Manufacturer's Association (BHMA) Hardware Functions

1. F 75 Passage Latch - Latch bolt operated by knob / lever from either side at all times.
2. F 76 Privacy Lock - Latch bolt operated by knob / lever from either side. Outside knob / lever locked by push button inside and unlocked by emergency key from outside or rotating knob / lever from inside.
3. F 81 Office Door Lock - Dead locking latch bolt operated by knob / lever from either side, except when outside knob / lever is locked by turn button in inside knob/lever. When outside knob / lever is locked, latch bolt is operated by key in outside knob/lever or by rotating inside knob / lever. Turn button must be manually rotated to unlock outside knob / lever.
4. F 84 Classroom Deadlock - Dead locking latch bolt operated by knob / lever from either side, except when outside knob / lever is locked, latch bolt is operated by key in outside knob / lever or by rotating inside knob / lever.
5. F 86 Utility Space Door Lock - Dead locking latch bolt operated by key in outside knob / lever or by rotating inside knob / lever. Outside knob / lever is always fixed.
6. F 91 Latch And Deadlocks - Dead locking latch bolt operated by key from both sides.
7. E 2142 Deadbolt - Dead bolt operated by key from either side. Bolt automatically dead locks when fully thrown.
8. E 2152 Deadbolt - Dead bolt operated by key from outside and turn button from inside. Bolt automatically dead locks when fully thrown.



## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Neatly and securely package hardware items by hardware group and identify for individual door with specified group number and set number used on Supplier's hardware schedule. Include fasteners and accessories necessary for installation and operation of finish hardware in same package.

## PART 2 - PRODUCTS

### 2.1 FINISHES

- A. Finishes for steel, brass, or bronze hardware items shall be US26D, Chromium plated, satin, except flat goods which may be US32D, stainless steel, satin. Materials other than steel, brass, or bronze shall be finished to match the appearance of US26D / 32D.

### 2.2 FASTENERS

- A. Fasteners shall be of suitable types, sizes and quantities to properly secure hardware. Fasteners shall be of same material and finish as hardware unless otherwise specified. Fasteners exposed to weather shall be non-ferrous or corrosion resisting steel.

## PART 3 - EXECUTION

### 3.1 APPROVED SUPPLIERS

- A. Architectural Building Supply, Salt Lake City, UT Russ Farley  
Phone (800) 574-4369 FAX 801-484-6817
- B. Beacon Metals Inc, Salt Lake City, UT Chad Riches  
Phone (888) 823-2206 FAX 801-485-7647
- C. Approved Equal

### 3.2 PREPARATION

- A. Before ordering materials, examine documents to be assured that material to be ordered is appropriate for substrate to which it is to be secured and will function as intended.

### 3.3 HARDWARE GROUP SCHEDULE

- A. Double Exterior Doors
  - 1. Group 1 -
    - a. 3 each - Hinges
    - b. 1 - Latchset Function F-76
    - c. 1 - Hold Open Closer
    - d. 1 set each - Weatherstrip
    - e. 1 set -Threshold
    - f. No Mullion
    - g. Right Hand Reverse Active

**END OF SECTION**

## SECTION 09 24 00 PORTLAND CEMENT PLASTER FOR FRAMED WALLS (STUCCO)

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Work includes all labor, materials, and equipment necessary to install all aspects of a portland cement plaster assembly.

#### 1.2 RELATED WORK

- A. 06 61 00 – Rough Carpentry
- B. 07 92 13 – Elastomeric Joint Sealants

#### 1.3 REFERENCES

- A. ASTM C150 – Portland Cement
- B. ASTM C847 – Standard Specification for Metal Lath
- C. ASTM C1032 - Woven Wire Plaster Base
- D. ASTM C933 - Welded Wire Lath
- E. ASTM C144/C897 – Aggregate for Job-Mixed Portland Cement-Based Plaster
- F. ASTM C926 – Application of Portland Cement-Based Plaster
- G. ASTM C1063 – Installation of Lathing and Furring for Portland Cement Based Plaster
- H. PCA (Portland Cement Association) – Plaster (Stucco) Manual
- I. ICC-ES Acceptance Criteria for Weather-resistive Barriers (AC308)
- J. SMA Details and Bulletins

#### 1.4 ASSEMBLY DESCRIPTION

- A. General: Portland cement plaster is comprised of a water-resistive barrier, sheathing, lath, scratch, brown coats, and a finish coat. Minimum nominal 3/4 inch cement thickness.
- B. Application Methods: The plaster may be applied by hand tools or machine pumps but must have sufficient force to adhere to the substrate.
- C. Fire Rated assemblies shall be per the test report or special instructions.

#### 1.5 SUBMITTALS

- A. Product Data: All product data sheets, evaluation reports, details, and warranty information that pertain to the project in accordance with Section 00 70 00 Submittal Procedures.
- B. Samples: Submitted upon request.
- C. Samples of the finish coat shall be of an adequate size as required to represent each color and texture to be utilized on the project and produced using the same techniques and tools required to complete the project. No sample shall be less than 12" by 12".
- D. Retain approved samples at the construction site throughout the application process.

## 1.6 QUALITY ASSURANCE

### A. Qualifications:

1. Manufacturer: All component materials shall be SMA approved and shall be distributed by authorized dealers.

### B. Plastering Contractor:

1. Shall specialize in lath and plaster contracting, document experience of at least 5 years, and follow SMA published recommendations or provide certificates to demonstrate stucco knowledge.
2. Provide proof of current contractor's license and bond where required.
3. On-Site Mock-Ups: Produced upon request.
4. Prior to commencement of work, provide an on-site mock-up if requested.
5. Mock-up shall represent construction using the same quality/techniques to be utilized on the project.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- ### A. Delivery:
- Deliver all materials to the construction site in their original, unopened packaging with labels intact.

- ### B. Inspection:
- Inspect the materials upon delivery to assure that specified products have been received. Report defects or discrepancies to the responsible party according to the construction documents; do not use reported material for application.

- ### C. Storage:
- Store all products per manufacturer's recommendations. Generally, store materials in a cool, dry location; away from direct contact with the ground and/or concrete; out of direct sunlight; and protect from weather and other damage.

## 1.8 PROJECT CONDITIONS

- ### A. Environmental Requirements:
- Follow product manufacturer's recommendations for environmental conditions and surface preparation.

- ### B. Temperatures:
- Before, during and following the application of the portland cement plaster, the ambient and surface temperatures must remain above 40 degrees F ( 4 C) for a minimum period of 24 hours. Protect stucco from uneven and excessive evaporation, especially during hot, dry and/or windy weather. Protect the portland cement plaster from freezing for a period of not less than 24-hours after set has occurred.

- ### C. Substrates:
- Prior to installation, inspect the wall for surface contamination or other defects that may adversely affect the performance of the materials, and shall be free of residual moisture. Do not apply the portland cement plaster to substrates whose temperature are less than 40 degrees F (4° C) or contain frost or ice.

- ### D. All wood based products covered shall be dry and have a moisture content below 19% . DO NOT COVER WET FRAMING.

- ### E. Inclement Weather:
- Protect applied material from deleterious effects until cured or dry.

### F. Existing Conditions:

1. Contractor shall walk the project prior to starting work and notify the design team or owner's representative of any deficiencies that will negatively impact the plaster assembly. Do NOT proceed until remedied.
2. Contractor shall advise design team of any horizontal surfaces with inadequate slope.

## 1.9 WARRANTY

- A. Submit warranty documentation on all products. At completion of work, contractor shall provide a written warranty documentation for the assembly and products used.

## 1.10 MAINTENANCE

- A. The following materials shall be presented to the owner following the application of the work:
1. One container of finish for each color and texture utilized on the project.
  2. Supply a maintenance program for the owners O&M manual as required.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Scratch and Brown Coat (Basecoat)

1. Cement: Portland cement complying with ASTM C150. Plastic cement complying with ASTM C1328.
2. Sand:
  - a. Field mixes shall comply with ASTM C-926 and must have sand that is clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sampling and testing shall comply with ASTM C144 or C897.
  - b. An "engineered performance mix" by an SMA manufacturer is acceptable with appropriate approvals (ICC ES, IAPMO or Interek report).
3. Water: Clean and potable without foreign matter.

B. Water Resistive Barrier

1. Over Open Framing [and non-Wood-based Sheathing] (use one of the following):
  - a. One layer of D kraft building paper, minimum 30 minute, complying with UBC Standard 14-1.
  - b. One layer of asphalt-saturated felt complying with ASTM D226 Type I.
  - c. Equivalent material recognized in a current evaluation report as complying with the ICC-ES Acceptance Criteria for Water-Resistive Barriers (AC38).
2. Over Wood-based Sheathing (use one of the following):
  - a. Two layers of D kraft building paper, minimum 30 minute, complying with UBC Standard 14-1.]
  - b. Two layers of asphalt-saturated felt complying with ASTM D226 Type I.
  - c. Double layer of equivalent material recognized in a current evaluation report as complying with the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).
  - d. SMA approved fluid applied WRB and one layer D paper, felt or equivalent.

C. Lath (use one of the following)

1. Woven-Wire Lath: Nominal No. 17 gauge (0.058 inch), 1.5-inch opening, galvanized steel complying with ASTM C1032.
2. Welded Wire: Nominal No. 16 gauge (0.065 inch), 2-inch-by-2-inch opening, or No. 17 gauge 1 ½ by 1 ½ inch opening, galvanized steel complying with ASTM C933.]
3. Expanded Lath: Nominal [2.5 lb/yd<sup>2</sup>] [3.4 lb/yd<sup>2</sup>] weight, galvanized steel complying with ASTM C847.



## 2.2 ACCESSORIES

- A. Fasteners: Nails, staples, or screws used to rigidly secure lath and associated accessories shall be corrosion-resistant and meet the minimum requirements of ASTM C1063.

## 2.3 MIXES

A. Portland Cement Plaster Basecoats:

1. Prescriptive Method: Ratios and Mix Design shall be per ASTM C926. Contractor shall select one of the following mixes (sand is per combined volume of cements):

a. Portland Cement 1 part

Masonry Cement 1 part

Sand 3 ½ to 4 ½ parts per Cement

Fibers Maximum 3 oz per batch

b. Portland Cement 1 part

Lime (type S) ¼ to ½ part

Sand 3 to 4 parts per cement & Lime

Fibers Maximum 3 oz per batch

c. Plastic Cement 1 part

Sand 3 ½ to 4 ½ parts per cement

Fibers Maximum 3 oz per bag plastic cement

2. Engineered Method: Pre-mix blends or silos per SMA manufacturer.

- B. Finish Coats: Mixing and tinting instructions are contained in the appropriate product data sheets by the SMA Manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Prior to the application of the portland cement plaster basecoat the plastering contractor shall ensure that:

1. Surface and site conditions are ready to receive work.
2. Grounds and Blocking: Verify that the items within the walls for other sections of work have been installed.
3. Notify architect/owner of any defects that may impact the finished assembly. Proceed as directed.

B. Substrates:

1. Acceptable substrates must be sound, secure, and suitable for lath and plaster.
2. Substrates and adjacent materials must be dry and clean. Substrate surface must be flat, free of protrusions

- C. Flashings: All flashing around windows, at deck attachments, utility penetrations, roof lines, etc. and all kick-out flashing must be properly installed prior to application of portland cement plaster. Notify owner if flashings are missing, proceed as directed.

- D. Unsatisfactory conditions or concerns shall be reported to the general contractor and/or



builder and/or architect and/or owner. Do not proceed until directed in writing by architect or general contractor.

E. Preparation

1. Substrate/Framing: inspect all work prior to starting lath and plastering. Notify architect of any issues impacting performance, proceed as directed.
2. Surrounding Areas: Protect surfaces near the work of this section from damage, disfiguration, and overspray. Mask off all dissimilar materials.

3.2 INSTALLATION

A. General

1. Install per ASTM C926, ASTM C1063, and manufacturer's recommendations.

B. Installing Weather Protection

1. Water-Resistive Barrier: Apply water-resistive barrier complying with Section 1404.2 of the IBC or Section R703.2 of the IRC. Start at base of wall and overlap flashing flanges and in a "shingle-fashion" by a minimum of two (2) inches horizontal and six (6) inches vertical. Integrate with flashings to insure incidental moisture drains down and weeps out. Reverse laps shall not be allowed.

C. Installing Lath/TRiMS

1. General: Installed per ASTM C1063 or per Architect's direction. Trims shall be full length and installed plumb/level to within 1/8 inch in eight (8) feet.
2. Weep screed shall be installed at the base of all framed walls.
3. Trims shall be attached per the trim manufacturer's instructions; however do not exceed 24 inches on center spacing.
4. Apply lath per manufacturers recommendations. Laps shall occur at horizontal and vertical joints. Attach lath six (6) to seven (7) inches on center along framing supports (studs). Fastener shall penetrate wood by a minimum 3/4 inch, penetration of wood-based sheathing shall count as 50% of dimensional lumber. Metal framing by a minimum of three (3) full threads and engage the lath.
5. Lath shall lap the flange of accessories by more than 50%.
6. Control Joints: Installed per Architects direction. Single-piece control joint may be installed over continuous lath if approved by Building Official and/or Architect. If lath is discontinuous, framing shall support lath terminations. Notify architect of issues or changes.
7. Expansion Joints: Install per Architect's direction. Two-piece joints (expansion) must have lath terminate each side.
8. Contractor shall honor control or expansion joints in substrates.
9. Do not mix lath products on same wall.
10. Avoid excessive laps with expanded metal lath
11. Do not use rib lath on walls
12. Use wire nose corner for cement finish, PVC nose for acrylic finish
13. Lath shall cover more than 75% of solid flanges.

D. Installing portland cement plaster

1. Per ASTM C926, apply portland cement plaster by hand-troweling or machine-spraying to a nominal thickness of 3/8-inch (9.5mm) for scratch coat. Then apply a second coat to a nominal thickness of 3/8-inch (9.5 mm) brown coat. Total basecoat shall be a

nominal ¼ inch thickness.

2. Scratch coat shall substantially cover the lath and be applied with sufficient pressure to encase the lath in cement. Slickers to apply cement plaster are prohibited. Score in a horizontal pattern.
3. Allow to cure 48 hours, or until sufficiently rigid to accept a brown coat.
4. Apply brown coat to fill and complete basecoat. Nominal ¼ inch thickness. Rod to a flat plane. Do not apply to frozen or soft scratch coat. When excess moisture leaves brown coat, hard float to provide densification per ATSM. Hard floating procedure may be omitted if the "Base coat and Mesh or Stucco crack reduction system" is selected.
5. Moist Curing: Provide sufficient moisture by fog or moist curing to permit proper hydration of the cementitious materials. The length of time and most effective procedure for curing will depend on climatic and job conditions. Refer to SMA curing guidelines.

#### E. Installing Finish Coat

1. General: Mix and apply per manufacturer's product data sheet.
2. Do not apply to soft, contaminated, or frozen basecoat.
3. Avoid applying to excessively hot walls.
4. Verification: Verify the desired color, material, and texture to match the approved sample and/or mock-up prior to installation.
5. Avoid scaffold lines and cold joints
6. Fog coat (cement finish only) as needed to blend color variations
7. Finish coat shall be free of eye-catching imperfections.

#### F. CLEANING/Patching/tolerance

1. Cleaning: Remove any and all materials used, overspray from adjacent surfaces, and all protective masking.
2. Patch and repair as needed, including but not limited to fog coating, imperfections and blisters.
3. Cracks shall be repaired per the most current SMA Crack Policy (Technical Bulletin 4)
4. The basecoat of plaster shall be in tolerance:
  - a. Residential: Not to exceed ¼ inch in eight (8) feet
  - b. Commercial: Not to exceed ¼ inch in ten (10) feet
5. Eye catching variations in color or texture pattern will not be accepted.

#### G. Protection

1. Protect applied material from inclement weather until dry and prevent it from freezing for a minimum of 24-hours after set and/or until dry. Refer to manufacturer's product data sheet for additional requirements.

**END OF SECTION**



## SECTION 09 29 00 GYPSUM WALLBOARD

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Includes But Not Limited To
  - 1. Furnish and install gypsum wallboard as described in Contract Documents, except behind ceramic tile.
  - 2. Furnish and install acoustical sealants as described in Contract Documents.

#### 1.2 RELATED WORK

- A. Section (01600 -Unknown # and Title)

#### 1.3 REFERENCES

- A. Gypsum Association
  - 1. GA-214 - Recommended Specification: Levels of Gypsum Board Finish
  - 2. GA-216 - Application and Finishing of Gypsum Panel Products
- B. American Society For Testing And Materials
  - 1. ASTM C 1396 - Standard Specification for Gypsum Wallboard
  - 2. ASTM C 475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
  - 3. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board
  - 4. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Board or Metal Plaster Bases to Wood Studs or Steel Studs

#### 1.4 SUBMITTALS

Not Used.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name, applicable standard designation, and Manufacturer's name.
- B. Store material under roof and keep dry. Stack gypsum board flat and protect from damage.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Requirements
  - 1. Temperature shall be 50 deg F and 95 deg F maximum day and night during entire joint operation and until execution of Certificate of Substantial Completion.
  - 2. Provide ventilation to eliminate excessive moisture.
  - 3. Avoid hot air drafts which will cause too rapid drying.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Gypsum Board - except high humidity locations

1. For single layer gypsum board applied to trussed rafters, Corridor ceilings, or plywood web joists, use following 'Improved Type X' products -
  - a. Approved Products -
    - (i) Gyproc Fireguard C by Georgia Pacific, Atlanta, GA (800) 225-6119 or (404) 652-4000
    - (ii) Fire-Shield G Wallboard by National Gypsum, Charlotte, NC (800) 628-4662 or (704) 365-7300
    - (iii) Fire-Code 'C', by United States Gypsum Co, Chicago, IL (800) 874-4968 or (312) 606-4000
    - (iv) 'Improved Type X' boards from other manufacturers may be approved by Architect upon submission of letter of acceptance from jurisdiction having authority before bidding.
  2. For all other applications - Any manufacturer's product meeting requirements of ASTM C 36, Type X, UL one-hour rated, tapered edge, face paper suitable for painting.

#### B. Water-Resistant Gypsum Board - high humidity areas

1. 5/8" Water-resistant gypsum board -
  - a. Approved Products -
    - (i) DensArmor Plus® by GP Gypsum
    - (ii) ProRoc® by Certainteed
    - (iii) WaterCurb® by PABCO
    - (iv) ComfortGuard® by Temple-Inland
    - (v) Other water-resistant gypsum board by other manufacturers may be approved by Architect.

### 2.2 ACCESSORIES

#### A. Gypsum Wallboard Mounting Accessories

1. Acceptable Products -
  - a. Furring Channels -
    - (i) Walls - Galvanized USG DWC-25
    - (ii) Ceilings - Galvanized USG DWC-20
  - b. Resilient Channels - RC-1 by USG
  - c. Other accessories as required by Manufacturer's fire tests to provide necessary fire ratings.
  - d. Equal as approved by Architect before installation. See Section 01600.

#### B. Corner And Edge Trim

1. Acceptable Types And Manufacturers -
  - a. Metal - 24 ga minimum steel, electrolytic galvanized zinc-coated, treated for maximum cement and paint adhesion. Surfaces to receive bedding cement shall be knurled for maximum bonding.
  - b. Paper-Faced Metal -
    - (i) Beadex Drywall Accessories, Auburn, WA (800) 726-2397 or (253) 931-6600

- (ii) Chicago Metallic, Chicago, IL (800) 323-7164 or (708) 563-4600
    - (iii) Goldline Drywall Trim by Unimast Inc, Schiller Park, IL (800) 654-7883 or (847) 928-3400
    - (iv) United States Gypsum Co, Chicago, IL (800) 874-4968 or (312) 606-4000
    - (v) Equal as approved by Architect before installation. See Section 01600.
  - c. Paper-Faced Plastic -
    - (i) No-Coat by Drywall Systems International, Bend, OR (888) 662-6281 or (541) 330-0668
- C. Joint Compound
  - 1. Best grade or type recommended by Wallboard Manufacturer and meeting requirements of ASTM C 475.
    - a. Use Taping Compound for first coat to embed tape and accessories.
    - b. Use Taping Compound or All-Purpose Compound for subsequent coats except final coat.
    - c. Use Finishing Compound for final coat and for skim coat.
- D. Joint Reinforcing - Paper reinforcing tape acceptable to Wallboard Manufacturer.
- E. Primer Under Surfaces To Be Textured
  - 1. Acceptable Products And Manufacturers -
    - a. Sheetrock First Coat by United States Gypsum Company (800) 874-4968 or (312) 606-4000
    - b. Prep Coat Plus by Hamilton Materials Inc, Orange, CA (800) 331-5569 or (714) 637-2770
    - c. Primer recommended by manufacturer of finish paint coat.
- F. Fasteners
  - 1. Bugle head screws meeting requirements of ASTM C 1002.
    - a. Types -
      - (i) Type W - For fastening gypsum board to wood members other than truss members and plywood web joists.
      - (ii) Type S - For fastening gypsum board to steel framing and ceiling suspension members, truss members, and plywood web joists.
    - b. Lengths -
      - (i) Of length to penetrate wood framing 5/8 inch minimum.
      - (ii) Of length to penetrate steel framing 3/8 inch minimum.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Interface With Other Work - Coordinate with Division 06 for location of backblocking for edges and ends of gypsum board and for blocking required for installation of equipment and building specialties. Do not install gypsum board until required blocking is in place.
- B. General - Install and finish as recommended in ASTM C 840 unless specified otherwise in this Section.
- C. Mounting Accessories

1. Furring Channels - Apply with screws through flanges into each framing member.

#### D. Gypsum Wallboard

##### 1. General -

- a. Install so trim and reinforcing tape are fully backed by gypsum wallboard. No hollow spaces between pieces of gypsum board over 1/8 inch wide before taping are acceptable.
- b. Rout out backside of gypsum board to accommodate items which extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.

##### 2. Single Layer Application -

- a. Apply ceilings first using minimum of two men.
- b. Use board of length to give minimum number of joints.
- c. On walls over 108 inches high and on ceilings, apply board perpendicular to support.
- d. Stagger end joints. End and edge joints of board applied on ceilings shall occur over framing members or be back blocked with 2x4 blocking. End joints of board horizontally applied on walls shall occur over framing members. Edge joints of board vertically applied on walls shall occur over framing members.
- e. Butt edges in moderate contact. Do not force in place. Shim to level.
- f. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
- g. Scribe work closely. Keep joints as far from openings as possible. If joints occur near an opening, apply wallboard so vertical joints are centered over openings. No vertical joints shall occur within 8 inches of external corners or openings.
- h. Install board tight against support with joints even and true. Tighten loose screws.
- i. Calk perimeter joints in sound insulated rooms with specified acoustical sealant.

##### 3. Double Layer Application -

- a. Apply base layer as specified for single layer application, except edge joints need not occur over framing members or be back blocked.
- b. Apply face layer with joints staggered in relationship to base and occurring over supports. Use combination of adhesive and screws if required to meet Manufacturer's specifications for fire-rated assembly. Apply screws attaching face layer through base layer into support for specified penetration.

##### 4. Fastening -

- a. Apply from center of wallboard towards ends and edges.
- b. Apply screws 3/8 inch minimum from ends and edges, one inch maximum from edges, and 1/2 inch maximum from ends.
- c. Spacing -
  - (i) Ends - Screws not over 7 inches on center at edges where blocking or framing occurs.
  - (ii) Wood Framed Walls And Ceilings - Screws 7 inches on center in panel field.
  - (iii) Metal Framed Walls - Screws 12 inches on center in panel field.
- d. Set screw heads 1/32 inch below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches away.

- e. Screws on adjacent ends or edges shall be opposite each other.
- f. Drive screws with shank perpendicular to face of board.

#### E. Trim

- 1. Corner Beads -
  - a. Attach corner beads to outside corners.
    - (i) Attach metal corner bead with staples spaced 4 inches on center maximum and flat taped over edges of corner bead. Also, apply screw through edge of corner bead where wood trim will overlay corner bead.
    - (ii) Set paper-faced trim in solid bed of taping compound.
- 2. Edge Trim - Apply where gypsum board abuts dissimilar material in accordance with Manufacturer's instructions. Hold channel and 'L' trim back from exterior metal window and door frames 1/8 inch to allow for calking.

#### F. Finishing

- 1. General -
  - a. Tape and finish joints and corners as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.
  - b. First Coat -
    - (i) Apply tape over center of joint in complete, uniform bed of specified taping compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum wallboard.
    - (ii) Completely fill gouges, dents, and fastener dimples.
    - (iii) Allow to dry and sand lightly if necessary to eliminate high spots or excessive compound.
  - c. Second Coat -
    - (i) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.
    - (ii) Re-coat gouges, dents, and fastener dimples.
    - (iii) Allow to dry and sand lightly to eliminate high spots or excessive compound.
  - d. Third Coat - Apply same as second coat except extend application 6 inches on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
  - e. Fourth Coat - Apply same as second coat except extend application 9 inches on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
- 2. Finishing Levels -
  - a. Unfinished Gypsum Board Surfaces And Under Acoustical Tile -
    - (i) GA-214-90 Level Two - 'All joints and interior angles shall have tape embedded in joint compound and one separate coat of joint compound applied over all joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable,' except under acoustic tile.
  - b. Gypsum Board Surfaces in Mechanical, Storage, And Utility Areas to Receive Paint, and Surfaces to Receive Sisal Wall Covering -



- (i) GA-214-90 Level Three - 'All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.'
  - c. Gypsum Board Surfaces to Receive Vinyl Wall Covering, Multi-Color Coating System, and Painted Texturing, Except in Mechanical, Storage, And Utility Areas -
    - (i) GA-214-90 Level Four - 'All joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.'
  - d. Painted Smooth Gypsum Board Surfaces, Except in Mechanical, Storage, And Utility Areas -
    - (i) GA-214-90 Level Five - 'All joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. A thin skim coat of finishing compound shall be applied to the entire surface. Surface shall be smooth and free of tool marks and ridges.'
3. Prime gypsum board surfaces which are to receive texturing.

3.2 CLEANING

- A. Remove from site debris resulting from work of this Section including taping compound spills.

**END OF SECTION**





## **SECTION 09 96 56 HIGH HUMIDITY INTERIOR EPOXY PAINTED GYPSUM BOARD**

### **PART 1 - GENERAL**

#### 1.1 SECTION INCLUDES

- A. Includes But Not Limited To
  - 1. Preparing, priming, and finish painting new interior gypsum board in high humidity location.

#### 1.2 RELATED WORK

- A. Not Used

#### 1.3 REFERENCES

- A. Master Painters Institute (MPI) Approved Product List

#### 1.4 SUBMITTALS

Not Used

#### 1.5 SYSTEM DESCRIPTION

- A. Water Treatment Plant - Epoxy primer, 2 coats high performance epoxy, gloss finish -Use MPI INT 9.2E Epoxy Finish system for new work.

### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

- A. Products listed in edition of MPI Approved Product List current at time of bidding and later and following products are approved, providing they meet VOC requirements in force where Project is located.
- B. Primers
  - 1. Devoe Epoxy Prime: DR 23350801
- C. Finish Coats
  - 1. Gloss / Sheen required: Gloss
  - 2. Devoe high performance epoxy: DC 23383501

### **PART 3 - EXECUTION**

#### 3.1 APPLICATION

- A. General - See appropriate paragraphs of Section 09 90 00.
- B. New Surfaces
  - 1. Primer -
    - a. Apply primer to be covered with other paint coats or with multi-color coating system with roller only, or with spray gun and back-rolled.



2. Finish Coats

- a. Two coats required.
- b. First coat to have lighter shade than final coat.
- c. Apply finish coats with roller only, or with spray gun and back-rolled.

**END OF SECTION**

## SECTION 26 32 13.13 DIESEL-ENGINE GENERATOR SETS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Engine-generator set.
  2. Provide engine generator set including but not necessarily limited to the following:
    - a. Engine.
    - b. Cooling system.
    - c. Exhaust system.
    - d. Mounting.
    - e. Starting system.
    - f. Generator.
    - g. Control equipment and accessories.
    - h. Housing.
    - i. Output circuit breaker.
- B. Related Sections include but are not necessarily limited to:
1. Division 01 00 00 - General Requirements.
  2. Division 26 05 00 - Electrical.

#### 1.2 QUALITY ASSURANCE

- A. Referenced Standards:
1. National Electrical Manufacturer's Association (NEMA).
  2. National Fire Protection Association (NFPA):
    - a. 70, National Electrical Code (NEC).
    - b. 110, Underwriter's Laboratories, Inc. (UL).
- B. Testing:
1. Prototype Test: The manufacturer shall have successfully tested a prototype of each engine/generator set series offered. The tests performed shall include the following:
    - a. Maximum power test.
    - b. Maximum motor starting kVA.
    - c. Transient response, steady state governing, and voltage regulation.
    - d. Single step load pick-up per NFPA 110.
    - e. Three-phase short circuit test for mechanical and electrical strength.
    - f. Fuel consumption.
    - g. Cooling system test.
    - h. Endurance run test.
    - i. Torsiograph analysis and test.
    - j. Temperature rise test.
  2. Factory Tests: Prior to shipment, each unit shall be factory performance tested under load. Test results shall be certified and documented on a strip chart recorder. The tests shall be performed in accordance with the Manufacturer's standards and NFPA Standard 110. The following tests shall be performed:
    - a. Stepped load test at 1/2, 3/4, and full load for 5 minutes each step.
    - b. Three-quarter block load.
    - c. Full single step block load.
    - d. Results documented shall include steady-state voltage and frequency analysis,

transient response, maximum power analysis, and fuel consumption.

3. Field Tests: Each complete installation shall be tested for compliance with the plans and specifications following completion of all site work. Testing shall be conducted by a representative of the supplier. The Contractor shall supply fuel, load bank, and other equipment required for the test. The Owner and Engineer shall be notified in advance and shall have the option to witness the tests. The tests shall be repeated until the equipment performs as specified. The tests to be conducted on site shall be as follows:
  - a. Cold Start Test: Perform a cold start test on the generator using the generator's actual load as a test load. A power failure shall be simulated by opening the normal power disconnect and the following information shall be recorded:
    - (1) Time delay on start.
    - (2) Cranking on time.
    - (3) Time required to come up to speed.
    - (4) Voltage and frequency overshoot.
    - (5) Time to achieve steady state.
    - (6) Voltage, frequency, and amps at standby state.
    - (7) Oil pressure, water temperature, and battery charge rate at 5-minute intervals for the first 15 minutes and at 15-minute intervals thereafter for 2 hours.
    - (8) Time delay on retransfer after return of normal power.
    - (9) Cool-down time delay.
  - b. Full Load Test: Immediately after cooling time from cold start test, perform a one step full load test using a load bank. Record the same data as in the cold start test except for time delays on transfer and retransfer.
  - c. Crank Cycle Test: Disable the generator from starting by a method approved by the Manufacturer and test the crank cycle by switching the generator to run.
  - d. Safety Shutdowns: Test all the generator safety shutdowns.

### 1.3 SUBMITTALS

- A. See Section 01 33 00 and 26 05 00.
- B. Verify dimensions, coordination and applicability of equipment furnished.
- C. Full detail for performing of engine testing required. Upon completion of engine testing prepare and submit final results along with all new data.
- D. Upon satisfactory completion of startup, secure a written statement from manufacturer that each engine generator is installed in accordance with manufacturer's recommendations, properly started up and is ready for operation by the Owner's personnel. Also certify that required operation and maintenance training has been fully satisfied.
- E. Wiring diagrams for each engine-generator set. Indicate clearly factory versus field wiring connections.
- F. Generator fault current at full rpm and main circuit breaker trip curves and fault interrupting rating.
- G. Operation and Maintenance Manuals: See Section 01700.

### 1.4 WARRANTY

- A. Comply with General Conditions.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  - 1. Caterpillar.
  - 2. Cummins/Onan.
  - 3. Generac.
  - 4. Kohler
  - 5. Approved equal.
- B. Assure engine, generator and accessories are provided by the engine manufacturer and its authorized dealer.
- C. Assure local availability of service and replacement parts.

## 2.2 PERFORMANCE AND OPERATING REQUIREMENTS

- A. Operating Conditions: Provide complete generator sets, controls and accessories rated for the following conditions:
  - 1. Location: Cornish, Utah
  - 2. Altitude: 4,600 FT AMSL.
  - 3. Fuel: #2 diesel.
  - 4. Enclosure rating: indoors open frame.
- B. Performance: Establish net rating of each generator set under operating conditions specified when equipped and fully loaded with all necessary operating accessories. Substantiate ratings with manufacturer's standard published curves and data.
  - 1. Minimum ratings:
    - a. Standby rating:  
(1) 200 kW at 0.8 PF.
    - b. Frequency: 60 HZ.
    - c. Voltage and phase: 480/3.
    - d. Engine speed, max: 1800 rpm.
    - e. Maximum voltage dip: 35 percent.
  - 2. Fuel: Engines requiring special or premium fuel will not be acceptable.

## 2.3 ENGINE

- A. Engine Construction: Provide diesel-type engine of heavy-duty construction, full compression ignition diesel, radiator and fan cooled, "V" type multi-cylinder, four stroke, four cycle.
  - 1. Engines solid-state designed for cold quick start, capable of delivering full load output in 10 seconds.
  - 2. Engine must meet scheduled performance without turbo-charging or after-cooling.
  - 3. Engines shall have replaceable cylinder liners of wet sleeve-type and replaceable valve seat inserts.
  - 4. Design combustion chambers of open type.
  - 5. Cross tie bolt main bearing caps to crankcase for rigidity. Design connecting rods of forged steel, angle split line for precise cap alignments.
  - 6. Design crankshaft of forged steel.
  - 7. Provide exhaust manifolds.
- B. Lubrication:
  - 1. Provide pressure-type lubrication system with gear-type oil pump and fullflow filters fitted to engines. Provide pressure-regulating valve. Provide level indicator or dipstick.

2. Locate filter for convenient servicing. Equip filters with spring loaded bypass to ensure oil circulation if filters are clogged.
  3. Oil drain piped to edge of skid with valve or cap.
- C. Air Cleaner:
1. Provide one or more dry-type replaceable element air cleaners suitable for high dust load operation.
  2. Equip each air cleaner with service indicator.
- D. Governor:
1. Provide a fully enclosed electronic governor.
  2. Frequency at any constant load shall not deviate more than plus or minus 0.5 percent of rated frequency.
  3. The governor to provide adjustable frequency regulation from isochronous to 5 percent droop.
  4. Equal to Woodward 2301 single controller with an EGLOP Woodward actuator.
- E. Fuel System: Dual replaceable element filter, engine supply and return line, solenoid shut off valve, and engine driven fuel pump.

## 2.4 GENERATOR

- A. Construction: Provide brushless, revolving field type, synchronous generator coupled directly to engine flywheel through a flexible driving disc for positive alignment.
1. Bolt generator housing directly to engine flywheel housing.
  2. Provide (a single) double ball-bearing support for the rotor in the generator housing. Dynamically balance rotor for up to 25 percent overspeed.
  3. Provide Class H insulation operating on Class F temperature rise on the stator and rotor, and protect with 100 percent epoxy impregnation and an overcoat of resilient insulating material to reduce possible fungus and abrasion deterioration. Equip field with full amortisseur winding.
  4. Perform generator field excitation with static-type rotating exciter mounted on the generator rotor shaft through a brushless rotating diode system.
  5. Provide volts-per-hertz type voltage regulator of solid-state 3-phase sensing, construction matching characteristics of each unit. Provide no load to full load regulation within  $\pm 0.5$  percent at rated voltage during steady state conditions.
  6. Provide permanent magnet generator to provide excitation power to the automatic voltage regulator. Provide shock-resistant mounting of regulators.

## 2.5 COOLING SYSTEM

- A. Provide unit-mounted radiator cooling system with sufficient capacity for cooling generator set at full rated load and operating conditions specified.
1. Equip engine with engine-driven centrifugal-type water circulating pumps and thermostatic valve to maintain coolant temperature below 200 Deg F.
- B. Coolant:
1. Flush and drain cooling system.
  2. Fill with minimum 50 percent ethylene glycol and water solution.
  3. Assure radiator, engine block and related items protected to minus 50 Deg F.
  4. Coolant drain piped to edge of skid with valve or cap.
- C. Jacket Water Heaters: Furnish one or more engine mounted thermal circulation type water

heaters to maintain engine jacket water at 70 Deg F at minimum ambient temperature specified.

1. Include integral thermostatic controls to maintain desired temperatures.
2. Rate heater for 208/240 V, 1 PH, 60 HZ.

## 2.6 EXHAUST SYSTEM

- A. Exhaust Silencer. Provide a Critical-grade silencer and related hardware to include side inlet, standard 125-150 LB flange connections, companion-flanges, cleanouts, Type E support arrangement, and stainless steel bellows type flexible exhaust connectors at least 24 IN long.
1. Ensure silencers and related hardware are properly sized and installed according to the manufacturer's recommendation.
  2. The silencer shall be mounted horizontally such that its weight is NOT supported by the engine. Silencer shall be mounted inside enclosure.
  3. Furnish and install exhaust pipe constructed of schedule 40 steel pipe with standard 125-150 LB flange connections as shown on the Drawings. Exhaust pipe size shall be sufficient to ensure that measured exhaust back pressure does not exceed 20-inches of water.
- B. Install insulation so that it does not interfere with the functioning of the flexible exhaust fitting.

## 2.7 STARTING SYSTEMS

- A. Starting Motors: Provide 24 V DC starting system with solenoid operated positive engagement drive.
- B. Batteries: Furnish lead acid batteries with each engine generator with sufficient capacity to crank engines for three 20-second cranking periods with a 30-second rest period between cranks without recharging.
1. Provide battery rack appropriately sized for the batteries furnished, painted with alkaline-resistant paint.
  2. Provide constant voltage, current limiting, full wave rectifier type battery chargers using silicon-controlled rectifiers as the power controlling elements.
  3. Provide float and equalize charge rates. Rate charger for 120 V, 1 PH, 60 HZ with output current rating to recharge the battery from a 70 percent discharged condition to 95 percent charged condition in 12 HRS.
  4. Provide malfunction alarm contacts for actuation of alarm in the event of malfunction in the battery charging system.
  5. Provide DC voltmeter and ammeter, ac input and dc output circuit breakers.
  6. Provide cables, clamps and all other necessary connections.
  7. Size main cables to exhibit total circuit resistant of 0.005 ohm or less.
  8. Batteries and charger located in generator enclosure.
  9. Starting shall be initiated by a normally open, dry contact closure.

## 2.8 CONTROLS

- A. Control Panel:
1. Provide NEMA 1 enclosed control panel mounted on each generator terminal box with vibration isolators.
  2. Construct dead front panel with 14 GA steel.
  3. Include the following devices in panel:
    - a. Engine coolant temperature gage.
    - b. Engine lube oil pressure gage.
    - c. Engine lube oil temperature gage.

- d. Engine running hour meter.
  - e. Battery charging indicators.
  - f. Voltmeter.
  - g. Ammeter with true RMS output, supplied by 3 CT's at generator output leads.
  - h. Ammeter and voltmeter phase selector switch or switches.
  - i. Frequency meter.
  - j. Manual and automatic starting controls.
  - k. Panel illumination lights and switch.
  - l. Voltage level adjustment rheostat.
  - m. Fault indicators including low oil pressure, high water temperature, overspeed and overcrank. Provide dry contacts for common annunciation of fault conditions.
4. Provide minimum 3-1/2 IN DIA, dial type meters. Accuracy shall be within  $\pm 2$  percent.
- B. Main Line Circuit Breaker: Provide main circuit breaker for each generator set, sized as indicated on Contract Drawings.
1. Breakers are to operate both manually for normal switching function and automatically during overload and short circuit conditions.
  2. The trip unit for each pole of each breaker is to have elements providing inverse time delay during overload conditions and instantaneous magnetic tripping for short circuit protection.
  3. Provide breakers to interrupt bolted 3 PH fault from generator at full rpm at load terminals.
  4. Provide a NEMA 1 enclosure for circuit breakers and mount on generator using suitable vibration isolators.

## 2.9 AUTOMATIC TRANSFER SWITCH

### A. GENERAL

1. The automatic transfer switch shall be furnished by the manufacturer of the engine-generator set so as to maintain system compatibility and local service responsibility for the complete emergency power system. Representative production samples of the transfer switch supplied shall have demonstrated through tests the ability to withstand at least 10,000 mechanical operation cycles. One operation cycle is the electrically operated transfer from normal to emergency and back to normal. Wiring must comply with NEC table 312.6. The manufacturer shall furnish schematic and wiring diagrams for the particular automatic transfer switch and a typical wiring diagram for the entire system.

### B. RATINGS & PERFORMANCE

1. The automatic transfer switch shall be a 3 pole design rated for 200 amps continuous operation in ambient temperatures of -20 degrees Fahrenheit (-30 degrees Celsius) to +140 degrees Fahrenheit (+60 degrees Celsius). Main power switch contacts shall be rated for 600 V AC minimum. The transfer switch supplied shall have a minimum withstand and closing rating of 35,000 amperes. Where the line side overcurrent protection is provided by circuit breakers, the short circuit withstand and closing ratings shall be 35,000 amperes RMS. These RMS symmetrical fault current ratings shall be the rating listed in the UL listing or component recognition procedures for the transfer switch. All withstand tests shall be performed with the overcurrent protective devices located external to the transfer switch.

### C. CONSTRUCTION

1. The transfer switch shall be double throw construction, positively electrically and mechanically interlocked to prevent simultaneous closing and mechanically held in both normal and emergency positions. Independent break before make action shall



be used to positively prevent dangerous source to source connections. When switching the neutral, this action prevents the objectionable ground currents and nuisance ground fault tripping that can result from overlapping designs. The transfer switch shall be approved for manual operation under no load conditions. The electrical operating means shall be by electric solenoid. Every portion of the contactor is to be positively mechanically connected. No clutch or friction drive mechanism is allowed, and parts are to be kept to a minimum. This transfer switch shall not contain integral overcurrent devices in the main power circuit, including molded case circuit breakers or fuses.

2. The transfer switch electrical actuator shall have an independent disconnect means to disable the electrical operation during manual switching. Maximum electrical transfer time in either direction shall be 160 milliseconds, exclusive of time delays. Main switch contacts shall be high pressure silver alloy with arc chutes to resist burning and pitting for long life operation.

#### D. CONTROLS

1. All control equipment shall be mounted on the inside of the cabinet door in a metal lockable enclosure with transparent safety shield to protect all solid state circuit boards. This will allow for ease of service access when main cabinet lockable door is open, but to prevent access by unauthorized personnel. Control boards shall have installed cover plates to avoid shock hazard while making control adjustments. The solid state voltage sensors and time delay modules shall be plug-in circuit boards with silver or gold contacts for ease of service.
2. A solid state undervoltage sensor shall monitor all phases of the normal source and provide adjustable ranges for field adjustments for specific application needs. Pick-up and drop-out settings shall be adjustable from a minimum of 70% to a maximum of 95% of nominal voltage. A utility sensing interface shall be used, stepping down system voltage of 480Y/277 vac 3 phase to 24VAC, helping to protect the printed circuit board from voltage spikes and increasing personnel safety when troubleshooting.
3. A solid state undervoltage sensor shall monitor all phases of the normal source and provide adjustable ranges for field adjustments for specific application needs. Pick-up and drop-out settings shall be adjustable from a minimum of 70% to a maximum of 95% of nominal voltage. A utility sensing interface shall be used, stepping down system voltage of 480Y/277 vac 3 phase to 24VAC, helping to protect the printed circuit board from voltage spikes and increasing personnel safety when troubleshooting.
4. Signal the engine-generator set to start in the event of a power interruption. A set of contacts shall close to start the engine and open for engine shutdown. A solid state time delay start, adjustable, 0.1 to 10 seconds, shall delay this signal to avoid nuisance start-ups on momentary voltage dips or power outages.
5. Transfer the load to the engine-generator set after it reached proper voltage, adjustable from 70-90% of system voltage, and frequency, adjustable from 80-90% of system frequency. A solid state time delay, adjustable from 5 seconds to 3 minutes, shall delay this transfer to allow the engine-generator to warm-up before application of load. There shall be a switch to bypass this warm-up timer when immediate transfer is required.
6. Retransfer the load to the line after normal power restoration. A return to utility timer, adjustable from 1-30 minutes, shall delay this transfer to avoid short term normal power restoration.
7. The operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred. Controls shall provide an automatic retransfer of the load from emergency to normal if the emergency source fails with the normal source available.
8. Signal the engine-generator to stop after the load retransfers to normal. A solid state engine cool down timer, adjustable from 1-30 minutes, shall permit the engine to run unloaded to cool down before shutdown. Should the utility power fail during this time, the switch will immediately transfer back to the generator.
9. Provide an engine minimum run timer, adjustable from 5-30 minutes, to ensure an adequate engine run period.

10. The transfer switch shall have a time delay neutral feature to provide a time delay, adjustable from 0.1-10 seconds, during the transfer in either direction, during which time the load is isolated from both power sources. This allows residual voltage components of motors or other inductive loads (such as transformers) to decay before completing the switching cycle. A switch will be provided to bypass all transition features when immediate transfer is required.
11. The transfer switch shall have an in phase monitor which allows the switch to transfer between live sources if their voltage waveforms become synchronous within 20 electrical degrees within 10 seconds of transfer initiation signal. A switch must be provided to bypass this feature if not required.
12. If the in phase monitor will not allow such a transfer, the control must default to time delay neutral operation. Switches with in phase monitors which do not default to time delay neutral operation are not acceptable.
13. Front mounted controls shall include a selector switch to provide for a NORMAL TEST mode with full use of time delays, FAST TEST mode which bypasses all time delays to allow for testing the entire system in less than one minute, or AUTOMATIC mode to set the system for normal operation.
14. Provide bright lamps to indicate the transfer switch position in either UTILITY (white) or EMERGENCY (red). A third lamp is needed to indicate STANDBY OPERATING (amber). These lights must be energized from utility or the engine-generator set.
15. Provide manual operating handle to allow for manual transfer. This handle must be mounted inside the lockable enclosure so accessible only by authorized personnel.
16. Provide a maintenance disconnect switch to prevent load transfer and automatic engine start while performing maintenance. This switch will also be used for manual transfer switch operation.
17. Provide LED status lights to give a visual readout of the operating sequence. This shall include utility on, engine warm-up, standby ready, transfer to standby, in phase monitor, time delay neutral, return to utility, engine cool down and engine minimum run. A "signal before transfer" lamp shall be supplied to operate from optional circuitry.

E. MISCELLANEOUS TRANSFER SWITCH EQUIPMENT

1. The transfer switch mechanism and controls are to be mounted in a NEMA 12 or better enclosure.

2.10 SPARE PARTS

A. Furnish Owner the following extra parts and supplies for each generator set:

1. One complete set of belts.
2. Two sets of filters, i.e., fuel, oil, and air.
3. Oil for one complete oil change.
4. One complete set of control panel indicating lights.
5. Complete replacement set of all fuses.

B. Spare parts shall be suitably packaged with labels indicating contents of each package.

**PART 3 - EXECUTION**

3.1 MOUNTING, FUEL TANK AND ENCLOSURE

- A. Base: Mount engine, generator and cooling system on a common structural steel subbase capable of maintaining unit alignment suitable for mounting unit on a base fuel tank. Equip subbase with vibration isolators between subbase and fuel tank.
- B. Fuel Tank: Provide double-wall welded steel UL listed base tank assembly designed and supplied by the generator manufacturer.

1. Size tank for minimum 24 HRS of continuous engine operation at full load.
  2. Provide mounting and anchoring means suitable for installation on concrete pad.
  3. Provide double wall construction with leak detection and alarm contact.
  4. Provide low fuel level alarm contact.
- C. Flexible Connections: Provide stainless steel flexible fittings on all engine piping and electrical conduits.
1. Engine control conduit.
  2. Fuel connection: Braided metallic.
  3. Exhaust connector bellows: Stainless steel.
  4. Coolant water pipes: Braided metallic.
- D. Enclosure:
1. Provide the generator and engine with a Level 1 lockable enclosure. Generator will be installed outdoors on a concrete pad.

### 3.2 FIELD QUALITY CONTROL

- A. Employ and pay for services of equipment manufacturer's field service representative(s) to:
1. Inspect equipment covered by these Specifications.
  2. Supervise any adjustments and installation checks.
  3. Conduct initial start up of equipment and perform operational checks at jobsite.

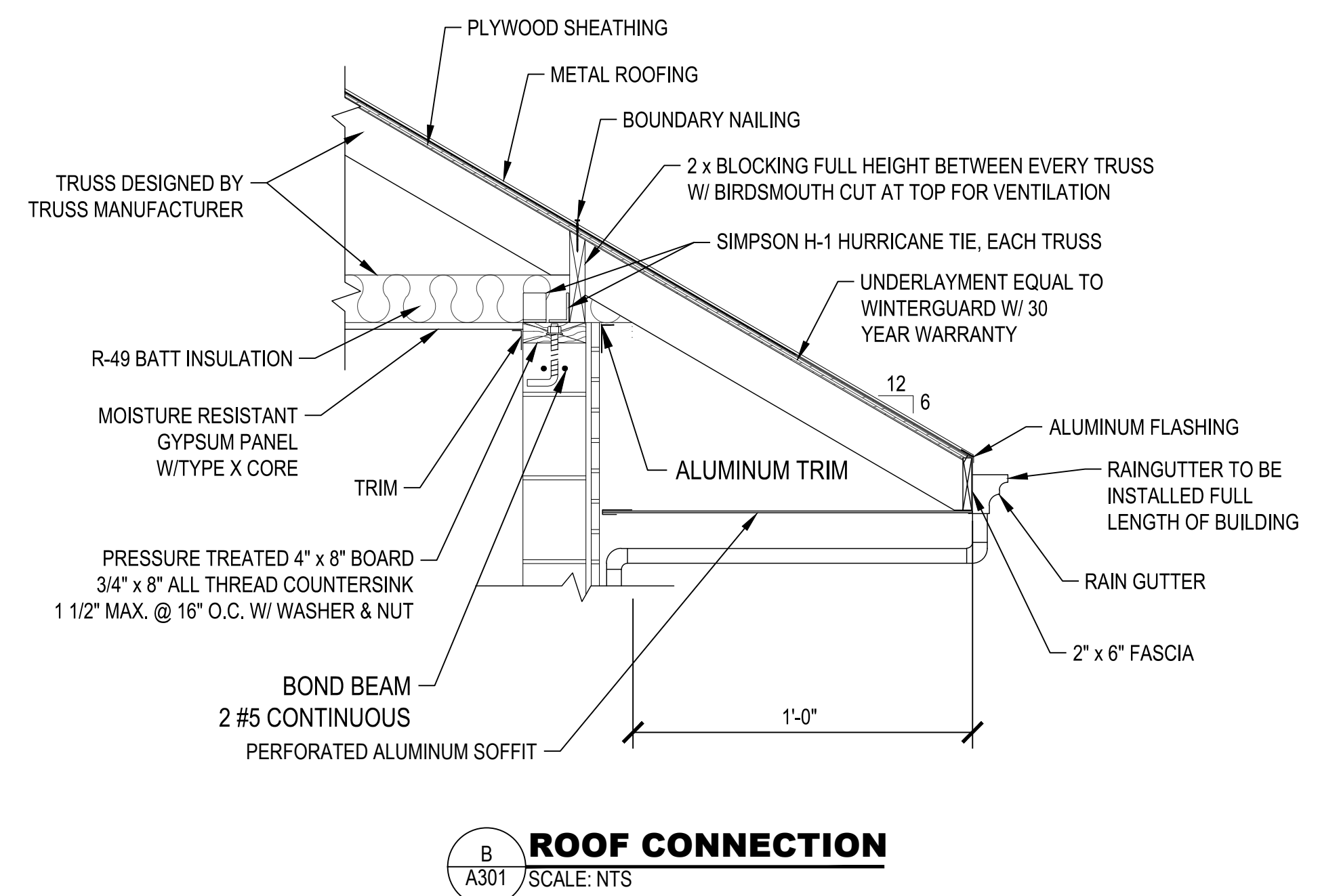
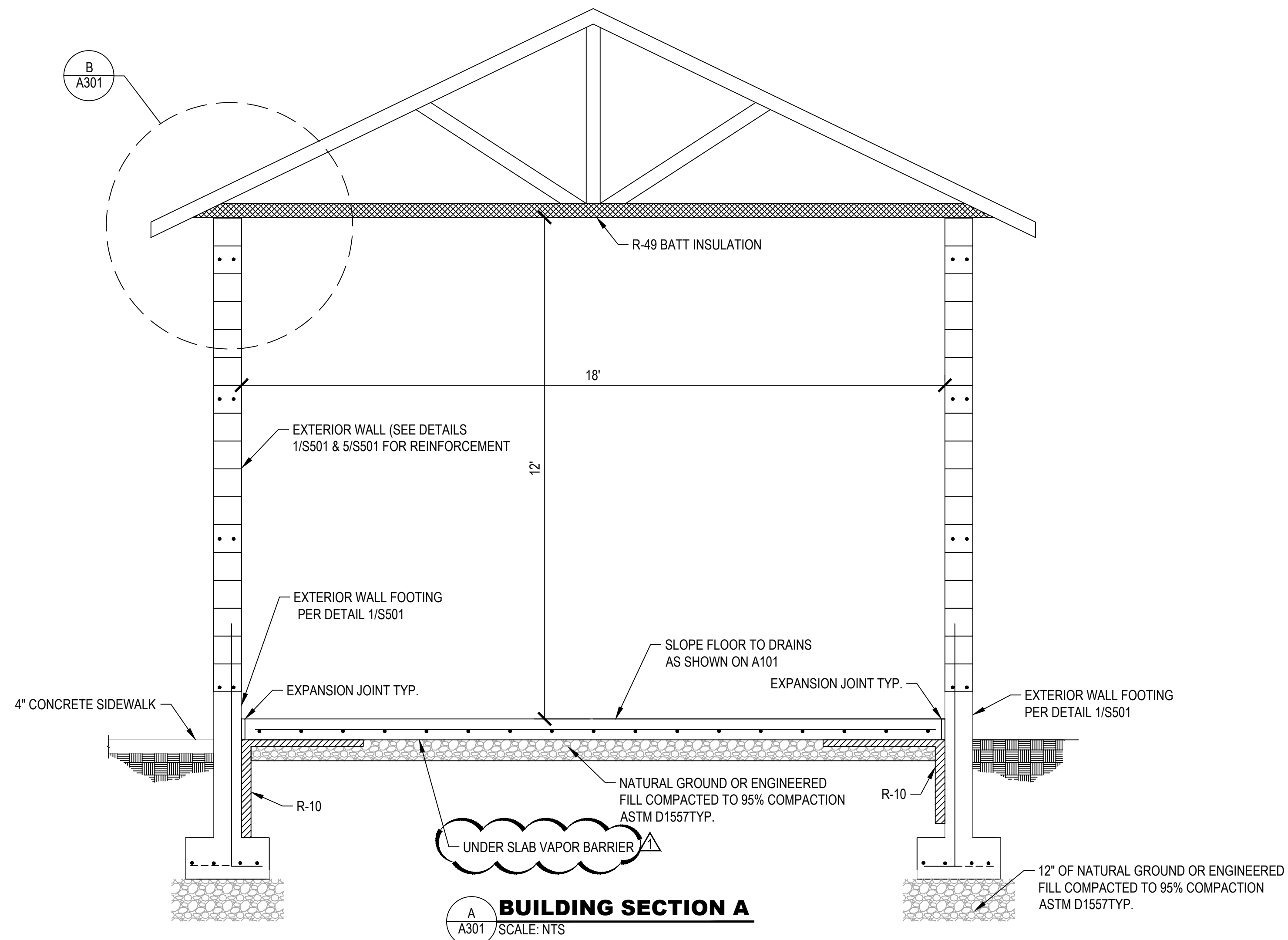
### 3.3 TESTING

- A. Provide services of authorized manufacturer's technician to start, test, and adjust system for proper operation.
- B. Provide services of factory trained and authorized technician to give Owner a 4 hour class in proper operation and maintenance.
- C. Site Acceptance Test:
1. Prior to performing any on-site testing of the generator or associated systems, the generator vendor must demonstrate to the Owner that all generator shut-downs and alarms are working. This includes all remote annunciators included with the emergency generator system. The system must be operational and working before proceeding. Any item that fails must be repaired before proceeding with the testing.
  2. The complete standby generator set shall be tested under the supervision of capable service engineers provided by the diesel engine-generator manufacturer. (Submit a detailed chronological test plan with the Shop Drawings.) Prior to any testing, verify that the set is complete and ready for testing and that all instrumentation required is connected and ready for Start-up and test. Tests shall be witnessed by the Owner's representatives. Provide necessary lube oil, fuel oil, and testing equipment to obtain full load conditions, including any required additional resistive load banks, for the system test.
  3. The on-Site test program shall cover the following as a minimum:
    - a. Verify that all components are correctly installed and interconnected. Exercise each circuit breaker, and each automatic transfer switch, including its draw out mechanisms.
    - b. Individually test each engine protective device and verify the accuracy of instrumentation set points. Provide coordination study for each overcurrent and ground fault device and calibrate same at the Project Site by means of primary injection testing before any tests are performed. Coordination study shall be

- submitted with Shop Drawings.
- c. The diesel generator set shall operate under full load conditions for a minimum of four (4) hours. The generator set shall maintain rated voltage and rated frequency per Specifications for the duration of the full load test. Voltage, amperage and frequency measurements, as well as engine gauge and monitor points, shall be recorded at 15 minute intervals. All doors of the weatherproof housing shall remain closed during testing.
  - d. Operate the diesel engine-generator from 0 to 100 percent load, starting at no-load and increasing in increments of 25 percent. Hold at each incremental load for 15 minutes and check at each load point for stable operation, fuel consumption, engine performance, and generator performance. The generator shall be capable of returning to its rated voltage and frequency per Specifications when incremental loads are added.
  - e. Verify acoustical performance, if the enclosure is so rated, with the diesel engine generators operating at full load.
4. Provide all labor and materials required for on-Site testing with 100 percent load at unity power factor, including but not limited to, the following:
    - a. The required resistive portable temporary dummy load banks to achieve 100 percent of generator rated output conditions.
    - b. Temporary connections from generator output breaker fuse to dummy load, including grounding conductor.
    - c. Overcurrent and short-circuit protection devices, contactors, relays, etc., for temporary cables, as required.
    - d. All instrumentation and connections required to measure and record test data. Provide accurate voltage, current, frequency, and kW meters to accomplish this. For each transient or load change, provide oscillograph trace recordings of voltage frequency and current, showing the entire restabilization period for each. Record and log all test data and submit to Owner in a comprehensive test report.
    - e. Disconnection and removal of all temporary power and control wiring and equipment.
    - f. Seven (7) sets of certified test reports, submitted within fourteen (14) calendar days.
    - g. Provide all fuel required for the test. After the test and prior to final acceptance the Contractor shall fill the fuel tanks to full level.
  5. A final system test (pull-the-plug) to demonstrate the system as a whole, including safeties, etc., shall be conducted to the satisfaction of the Owner/Engineer. This test shall not be conducted as an extension of the Site acceptance test, but rather as a separate test after Substantial Completion and acceptance of all other Work associated with this Project. Submit a detailed chronological test plan with the Shop Drawings.
  6. Any item documented as being failed or not working will be submitted to the vendor for repair. The vendor has five (5) working days to either fix the item or respond in writing why the item is not being repaired. If the item is not repaired or no response is received in five (5) working days, the Owner will make repairs and deduct the cost of repairs from the final payment of the generator.

END OF SECTION

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NO.	DATE	BY	DESCRIPTION
1	AUG. 1, 2022	JCD	ADDENDUM 1

IF THE ABOVE SCALE BAR DOES NOT MEASURE 1-INCH IN LENGTH, DO NOT USE THIS DRAWING FOR SCALING PURPOSES. DIMENSIONS AND MEASUREMENTS SPECIFIED IN THE DRAWING TAKE PRECEDENCE TO SCALED MEASUREMENTS.

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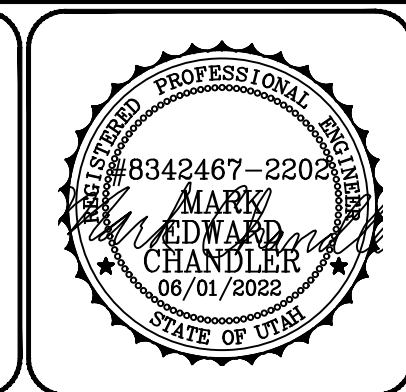
PRINCIPAL: M. HIRST, PE  
PROJECT MANAGER: M. CHANDLER, PE, PG  
CHECKED BY: M. CHANDLER, PE, PG  
DRAWN BY: C. HATCH  
DRAWING SCALE: AS SHOWN  
ISSUE DATE: JULY 8, 2022

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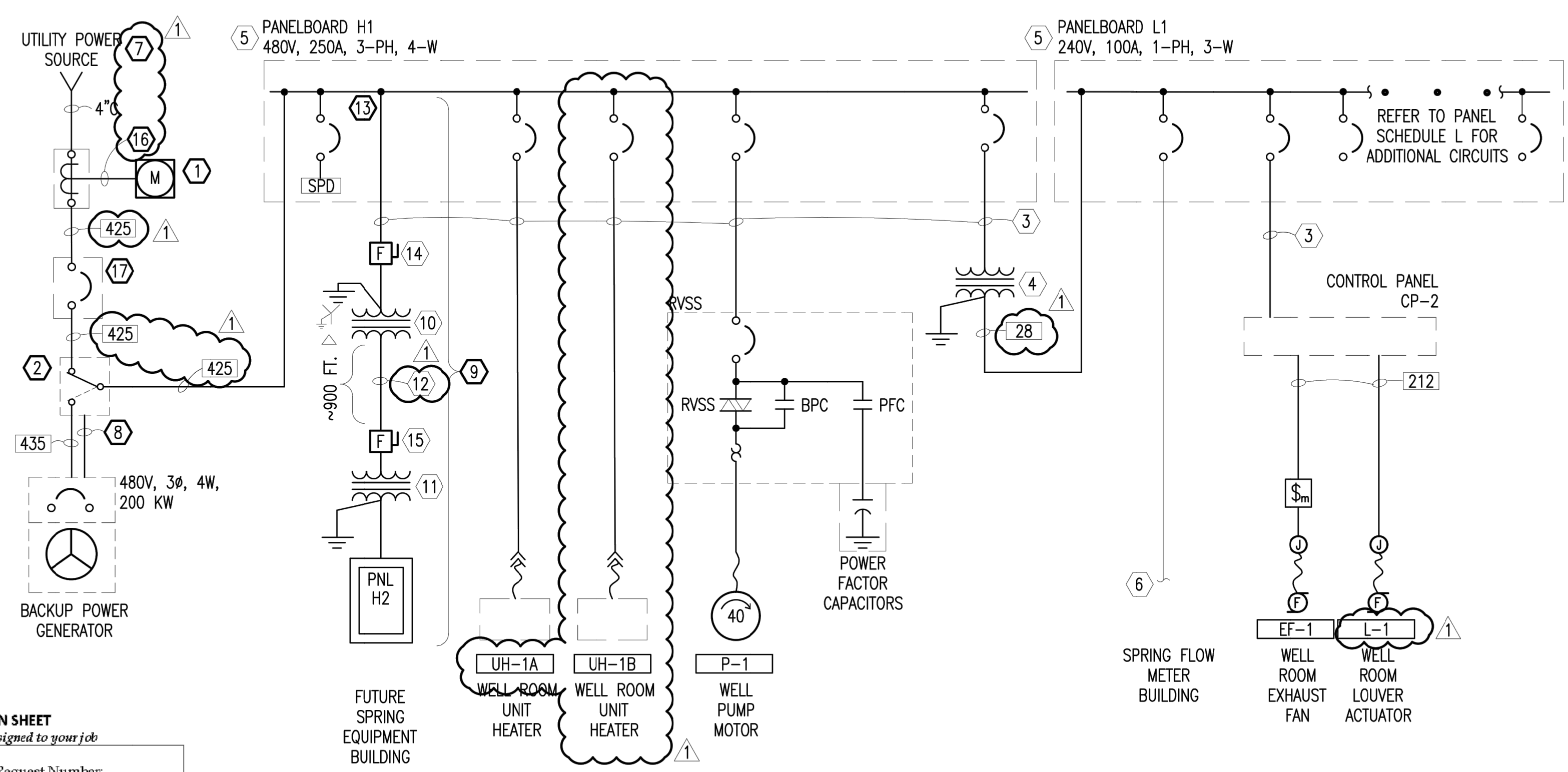
TOWN OF CORNISH  
PITCHER WELL HOUSE  
BUILDING SECTIONS

12200 NORTH 5600 WEST  
CORNISH, UT 84308



PROJECT NUMBER	2019-0406	
SHEET	15	OF 43
SHEET NUMBER	A301	

ELECTRICAL UTILITY INSTALLATION		
UTILITY INFORMATION		
UTILITY COMPANY:	ROCKY MOUNTAIN POWER	
UTILITY COMPANY CONTACT:	JAN BARKER	
CONTACT INFORMATION:	PHONE: 801-220-7297	
WORK ORDER NUMBER:	6835022	
SERVICE PRIMARY	SUPPLIED BY:	INSTALLED BY:
PRIMARY TRENCHING/BACKFILL	-	CONTRACTOR
PRIMARY CONDUIT	CONTRACTOR	CONTRACTOR
PRIMARY CONDUCTOR	UTILITY COMPANY	UTILITY COMPANY
SERVICE TRANSFORMER	SUPPLIED BY:	INSTALLED BY:
TRANSFORMER PAD	CONTRACTOR	CONTRACTOR
TRANSFORMER	UTILITY COMPANY	UTILITY COMPANY
SERVICE SECONDARY	SUPPLIED BY:	INSTALLED BY:
SECONDARY TRENCHING/BACKFILL	-	CONTRACTOR
SECONDARY CONDUIT	CONTRACTOR	CONTRACTOR
SECONDARY CONDUCTOR	UTILITY COMPANY	UTILITY COMPANY
METERING EQUIPMENT	SUPPLIED BY:	INSTALLED BY:
METER	UTILITY COMPANY	UTILITY COMPANY
METER SOCKET	CONTRACTOR	CONTRACTOR
COMBO METER/MAIN	-	-
CURRENT TRANSFORMER ENCL.	CONTRACTOR	CONTRACTOR
CT ENCL. TO METER SOCKET WIRING	UTILITY COMPANY	UTILITY COMPANY
CT ENCL. TO METER SOCKET CONDUIT	CONTRACTOR	-
MAIN SERVICE DISCONNECT	SUPPLIED BY:	INSTALLED BY:
CIRCUIT BREAKER	CONTRACTOR	CONTRACTOR
FUSED DISCONNECT SWITCH	-	-



1 POWER ONE-LINE DIAGRAM  
SCALE: NTS

H.P.E. INC. ELECTRICAL ENGINEERS  
POWER SYSTEMS, CONTROL & INSTRUMENTATION SYSTEMS  
HEGERHORST POWER ENGINEERING INCORPORATED (801) 642-2051  
708 EAST 50 SOUTH AMERICAN FORK, UT 84003 FAX (801) 642-2154  
HPE PROJECT: 20.081 © 2022  
FOR INFORMATION ABOUT THIS JOB, PLEASE CONTACT: KEITH HEGERHORST

- GENERAL NOTES:**
- REFER TO CONDUIT/CONDUCTOR TABLE FOR WIRE AND CONDUIT REQUIREMENTS.
  - FOR EQUIPMENT LOCATIONS REFER TO ELECTRICAL PLANS.
  - REFER TO "ELECTRICAL UTILITY INSTALLATION" TABLE FOR CONTRACTOR AND UTILITY RESPONSIBILITIES.

- SHEET KEYNOTES:**
- METER SOCKET: AS REQUIRED BY UTILITY COMPANY.
  - AUTOMATIC TRANSFER SWITCH (ATS): 600V, 250A (MIN), 3-PHASE, 4-WIRE, NEMA1.
  - FOR WIRE AND CONDUIT REQUIREMENTS REFER TO PANELBOARD SCHEDULE.
  - TRANSFORMER L: 7.5 KVA, 480 VAC PRI, 240/120 VAC SECONDARY.
  - REFER TO PANELBOARD SCHEDULE FOR PANELBOARD INFORMATION.
  - SPRING FLOW METER IS LOCATED IN A BUILDING (SHACK) WEST OF THE EXISTING WELL. IT IS APPROXIMATELY 900-1000 FEET FROM THE WELL BUILDING. PRESENT POWER TO THE SHACK IS A 30A/1P CIRCUIT BREAKER IN THE EXISTING PANELBOARD FOR A 120 VAC BRANCH CIRCUIT TO THE SHACK. THE SPRING FLOW METER BUILDING CONDUCTORS ARE AWG#2 CONDUCTORS IN 2" CONDUIT. CONTRACTOR SHALL REMOVE POWER FROM THE EXISTING POWER PANEL AND RE-INSTALL FROM THE NEW PANELBOARD L AS REQUIRED. PROVIDE A BURIED J-BOX TO TRANSITION FROM AWG#10 CONDUCTORS TO THE EXISTING AWG#2 CONDUCTORS IN THE 2" AS REQUIRED. LOCATE J-BOX ON AS-BUILD DRAWINGS. USE WATERPROOF CONNECTIONS AS REQUIRED.
  - REFER TO ADDITIONAL UTILITY POWER SITE TRENCHING AND CONDUIT NOT SHOWN ON THIS ONE-LINE.
  - 1" C, WITH CONDUCTORS AS REQUIRED FOR ATS TO REMOTELY START/STOP THE BACKUP POWER GENERATOR.
  - FUTURE EQUIPMENT. DO NOT PROVIDE FOR THIS PROJECT AT THIS TIME. STUB CONDUIT FROM FUTURE FUSED DISCONNECT TO 5-FT. OUTSIDE BUILDING AND IDENTIFY LOCATION ON AS-BUILD DRAWINGS.
  - TRANSFORMER T1: 112.5 KVA, 480Y/277 V PRIMARY, 600 V SECONDARY.
  - TRANSFORMER T2: 112.5 KVA, 600 V PRIMARY, 480Y/277 V SECONDARY.
  - FUTURE: (1) 3" C, W/3-3/0 ALUMINUM, #6 AL GROUND, (1) 3" C SPARE.
  - PROVIDE PANEL WITH FEED-THRU LUG CONNECTION FOR FUTURE LOAD.
  - FUSED DISCONNECT: 200A, 600V, 3-POLE WITH 150A FUSES.
  - FUSED DISCONNECT: 200A, 600V, 3-POLE WITH 110A FUSES.
  - 1" C, CONDUCTORS BY UTILITY COMPANY.
  - MAIN SERVICE DISCONNECT: 250A, 600V, 3-POLE, NEMA 3R ENCLOSURE.

**ROCKY MOUNTAIN POWER**  
COMMERCIAL / INDUSTRIAL CUSTOMER INFORMATION SHEET  
Please complete this form and return to the Estimator assigned to your job

**Business Information**

Name of Customer's Business: \_\_\_\_\_ Phone No.: \_\_\_\_\_ Request Number: \_\_\_\_\_  
Address: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Person responsible for advance and contract billing (if different than monthly billing customer): \_\_\_\_\_  
Address/Street Address City, State, Zip: \_\_\_\_\_ E-mail Address: \_\_\_\_\_  
Building/Square Footage: \_\_\_\_\_ Note: Please breakdown into warehouse, office and manufacturing if applicable  
Hours of Operation (include days & hours): \_\_\_\_\_

**Service Description**

Desired Secondary Voltage: 3 Phase 277/480 V If 'other' list here Note: Not all voltages may be available  
Panel Size (in Amps): 200 Number of Meters: 1 List addresses for each above  
Nearest Pole or Equipment number: \_\_\_\_\_ Type of Service Desired: Underground  
Electrical Contractor: \_\_\_\_\_ Phone #: \_\_\_\_\_

**Load List (attach additional sheets if necessary)**

Description	Phase and Voltage	New Load to be added	Load to be removed	Total Connected Load after changes	Unit
HVAC (name plate rating)	1 Phase 120/240 V	-	-	-	Tons*
Refrigeration Equipment	1 Phase 120/240 V	-	-	-	Tons*
<b>Total connected Tons</b>				0 Tons	
Exhaust Fans	1 Phase 120/240 V	0.5	-	0.5	HP
Gas/Fuel/Sump Pump	1 Phase 120/240 V	-	-	-	HP
Small Motors (include motor codes)	3 Phase 120/208 V	10	-	10	HP
Air Compressor	1 Phase 120/240 V	-	-	-	HP
Swimming Pool	1 Phase 120/240 V	-	-	-	HP
Largest Motor (not included above) & code	3 Phase 277/480 V	40	-	40	HP
<b>Total connected HP</b>				50.5 HP	
Electric Heat	3 Phase 277/480 V	17	-	17	kW
Water Heating	1 Phase 120/240 V	-	-	-	kW
Lighting	1 Phase 120/240 V	-0.5	-	0.5	kW
Outlets	1 Phase 120/240 V	1.44	-	1.44	kW
Office Equipment	1 Phase 120/240 V	1.0	-	1.0	kW
Kitchen Equipment	1 Phase 120/240 V	-	-	-	kW
Computers, Magnetic Power Supplies	1 Phase 120/240 V	-	-	-	kW
Machinery	1 Phase 120/240 V	-	-	-	kW
Thermoplastic Injection Equipment	1 Phase 120/240 V	-	-	-	kW
Elevators	1 Phase 120/240 V	-	-	-	kW
Boiler	1 Phase 120/240 V	-	-	-	kW
Snow Melting	1 Phase 120/240 V	-	-	-	kW
Signs	1 Phase 120/240 V	-	-	-	kW
X-Ray Equipment	1 Phase 120/240 V	-	-	-	kW
Washer/Dryer	1 Phase 120/240 V	-	-	-	kW
Miscellaneous	1 Phase 120/240 V	2.4	-	2.4	kW
Heat Exchanger	1 Phase 120/240 V	-	-	-	kW
Humidifier	1 Phase 120/240 V	-	-	-	kW
Future	1 Phase 120/240 V	-	-	0	kW
<b>Total connected kW</b>				17.5 kW	

It is important to provide the most accurate information available, as it is used by the Estimator to design PacifiCorp's facilities and determine the customer's costs. Please sign and date this form before giving it to your estimator.

Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note:  
 • You may wish to consult a trained professional (electrician, engineer, etc.) prior to providing the information to your estimator.  
 • Commercial metering can have many restrictions that should be discussed with the estimator prior to the purchase and installation of your metering equipment. There are also restrictions regarding master metering. If your plans call for master metering, please discuss this with your estimator.  
 • Motors larger than 35hp three phase or 5hp single phase will require approval by our engineering department prior to installation in order to determine the acceptable starting current. \*Tons = BHP/12,000

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NO.	DATE	DESCRIPTION
1	8/5/2022	ADDENDUM NO. 1

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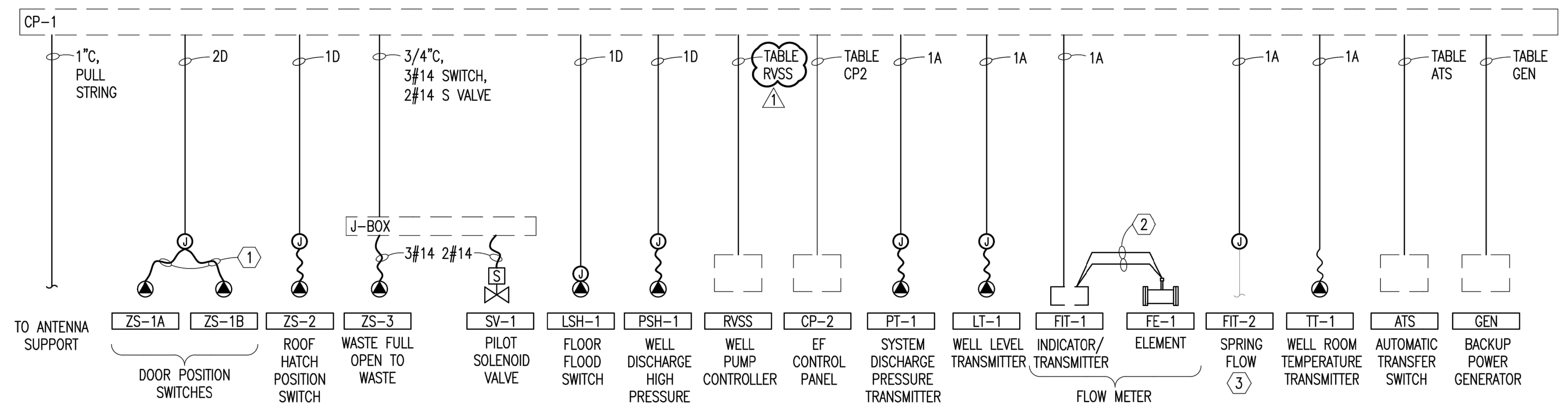
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PRINCIPAL: D. ANDERSON, PE.  
PROJECT MANAGER: M. CHANDLER, PE. PG. CFM.  
CHECKED BY: C. HATCH  
DRAWING BY: GILLIAN SORENSON  
DRAWING SCALE: AS SHOWN  
ISSUE DATE: JULY 8, 2022

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CORNISH TOWN CORP  
PITCHER WELL HOUSE  
ELECTRICAL DIAGRAMS, SHT. 1  
12200 NORTH 5600 WEST  
CORNISH, UT 84308

PROJECT NUMBER: 2019-0180  
SHEET: 25 OF 43  
SHEET NUMBER: E-201  
No. 86-171214-2202  
KEITH B. HEGERHORST  
8 / 5 / 2022  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF UTAH



**GENERAL NOTES:**

- FOR LOCATIONS OF INSTRUMENTS, PANEL AND DEVICES, REFER TO INSTRUMENTATION AND CONTROL PLAN.
- CONTRACTOR MAY COMBINE CONDUITS AND JUNCTION BOXES. DO NOT INSTALL DISCRETE AND ANALOG SIGNALS IN SAME RACEWAY.
- SEE POWER PLANS AND PANEL SCHEDULES FOR POWER REQUIREMENTS TO EQUIPMENT AND/OR INSTRUMENTS.

**SHEET KEYNOTES:**

- CONDUCTOR/CABLE SUPPLIED BY MANUFACTURER.
- CONDUCTORS BY FLOW METER SUPPLIER. CONDUIT SIZE AND QUANTITY OF CONDUCTORS VARY DEPENDING ON FLOW METER SUPPLIED. COORDINATE WITH FLOW METER SUPPLIER PRIOR TO ROUGH-IN. VERIFY LENGTH OF CONDUCTORS BEFORE ORDERING.
- REFER TO E-403, KEYNOTE 2.

**CONTROL ONE-LINE DIAGRAMS**  
 SCALE: NTS

**I&C WIRE/CONDUIT TABLE**

IDENT.	CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1A	3/4"	1	#18TSP	1 ANALOG SIGNAL
2A	3/4"	2	#18TSP	2 ANALOG SIGNALS
3A	3/4"	3	#18TSP	3 ANALOG SIGNALS
IDENT.	CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1D	3/4"	2	#14	1 COMMON, 1 DISCRETE SIG.
2D	3/4"	3	#14	1 COMMON, 2 DISCRETE SIG.
3D	3/4"	4	#14	1 COMMON, 3 DISCRETE SIG.
4D	3/4"	5	#14	1 COMMON, 4 DISCRETE SIG.

**TABLE RVSS (CP-1 TO RVSS)**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	CP-1 TO RVSS SIGNAL DESCRIPTION
3/4"	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	RVSS HAND-OFF-AUTO IN AUTO
	1	#14	RVSS HAND-OFF-AUTO IN HAND
	1	#14	RVSS RUNNING
	1	#14	RVSS RUN COMMAND
	1	#14	RVSS FAULT
4	#14	SPARES	

**TABLE CP2 (CP-1 TO CP-2)**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	CP-1 TO CP-2 SIGNAL DESCRIPTION
3/4"	1	#14	COMMON OUTPUT
	1	#14	COMMON INPUT
	1	#14	WELL RM. EF-1 HOA IN AUTO
	1	#14	WELL RM. EF-1 HOA IN HAND
	1	#14	WELL RM. EF-1 ON
	1	#14	WELL RM. EF-1 RUN COMMAND
	4	#14	SPARE

**TABLE GEN**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	CP-1 TO GENERATOR SIGNAL DESCRIPTION
3/4"	1	#14	COMMON
	1	#14	GENERATOR RUNNING
	1	#14	GENERATOR FAULT

**TABLE ATS**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	CP-1 TO ATS SIGNAL DESCRIPTION
3/4"	1	#14	COMMON INPUT
	1	#14	ATS IN GENERATOR POSITION
	1	#14	ATS IN UTILITY POSITION

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**RECORD OF REVISIONS**

NO.	DATE	DESCRIPTION
1	8/5/2022	ADDENDUM NO. 1

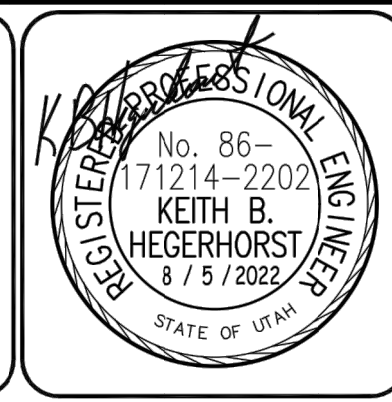
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PRINCIPAL: D. ANDERSON, PE.  
 PROJECT MANAGER: M. CHANDLER, PE. PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

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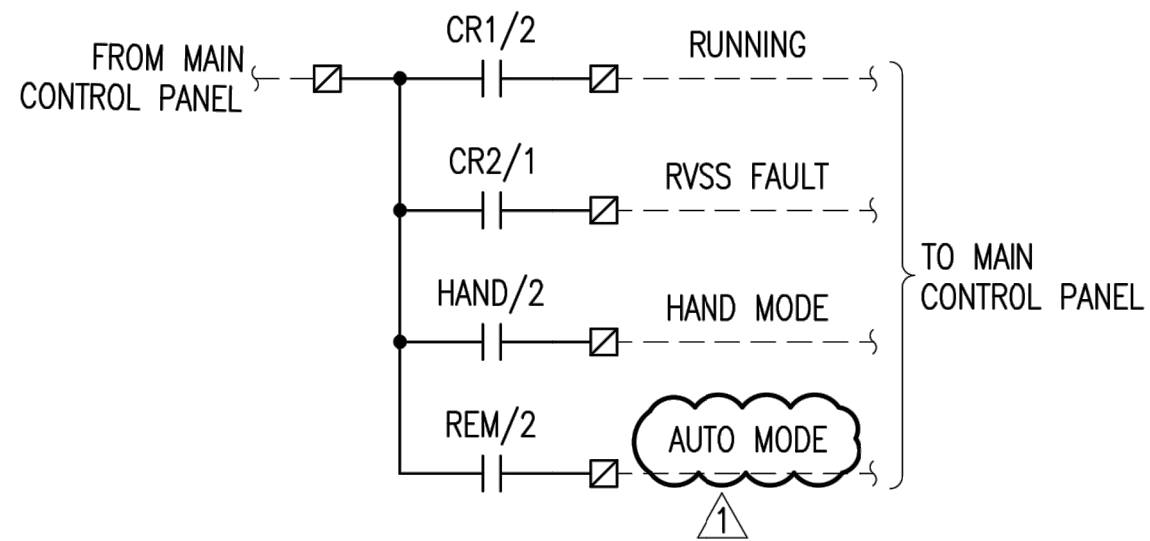
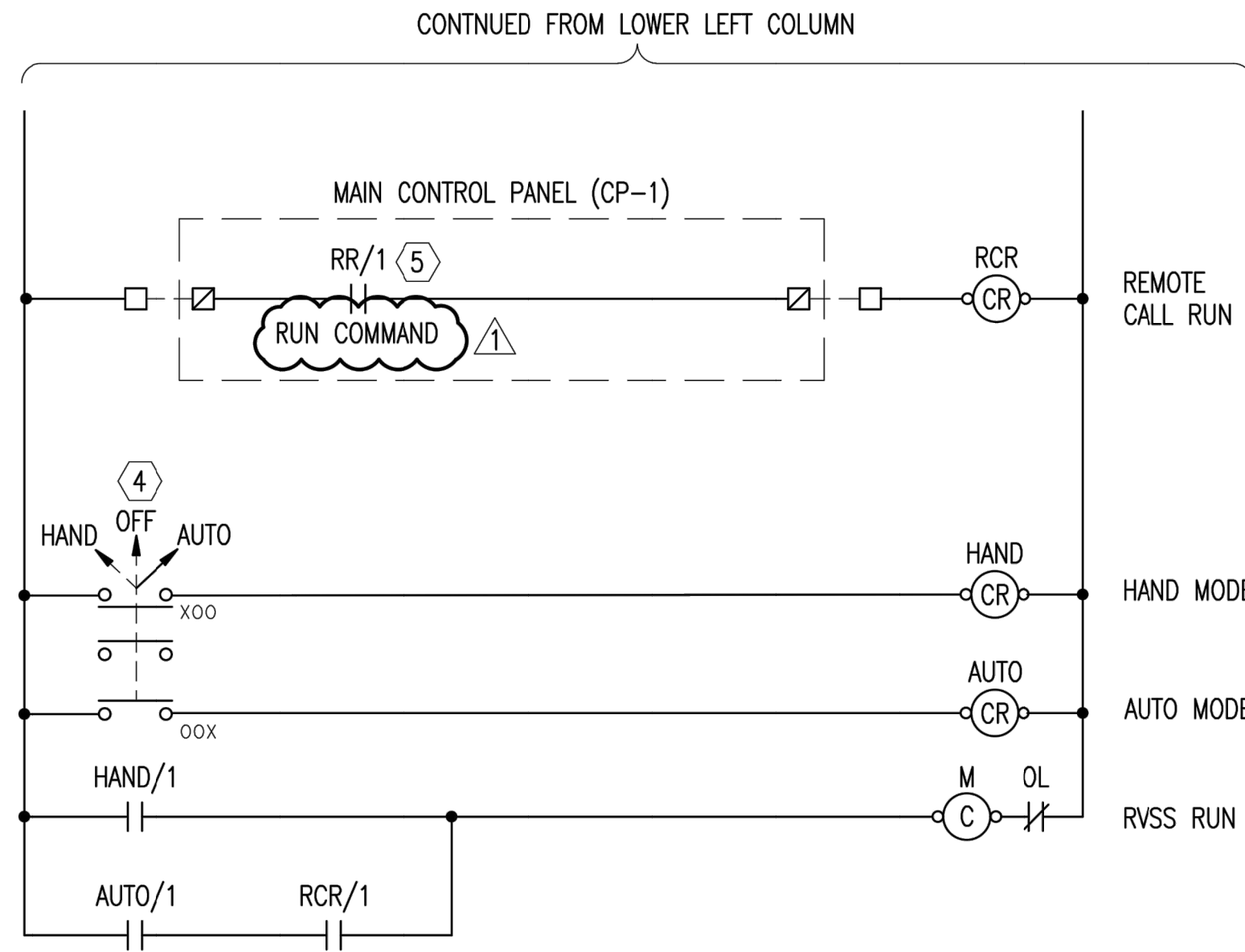
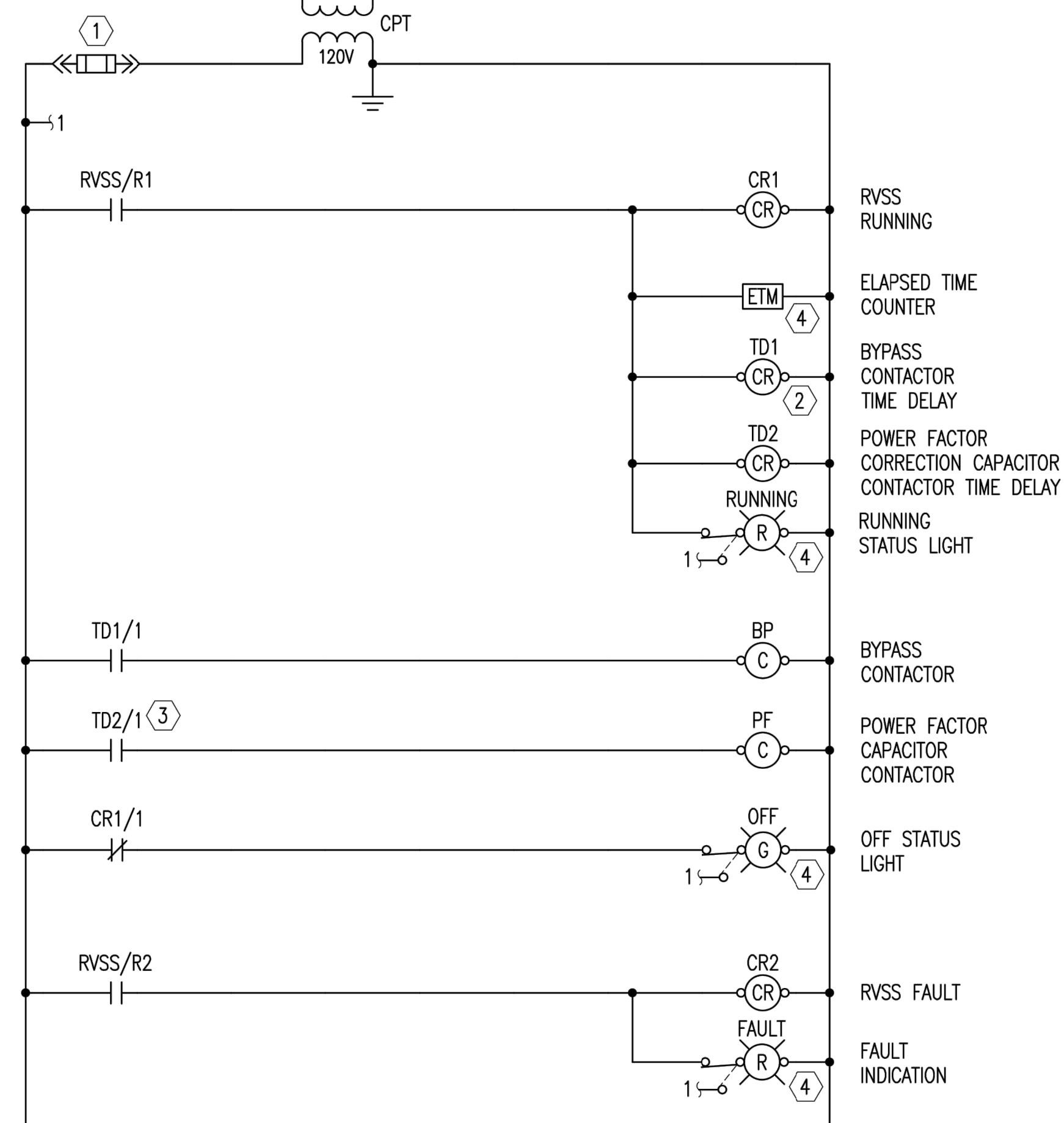
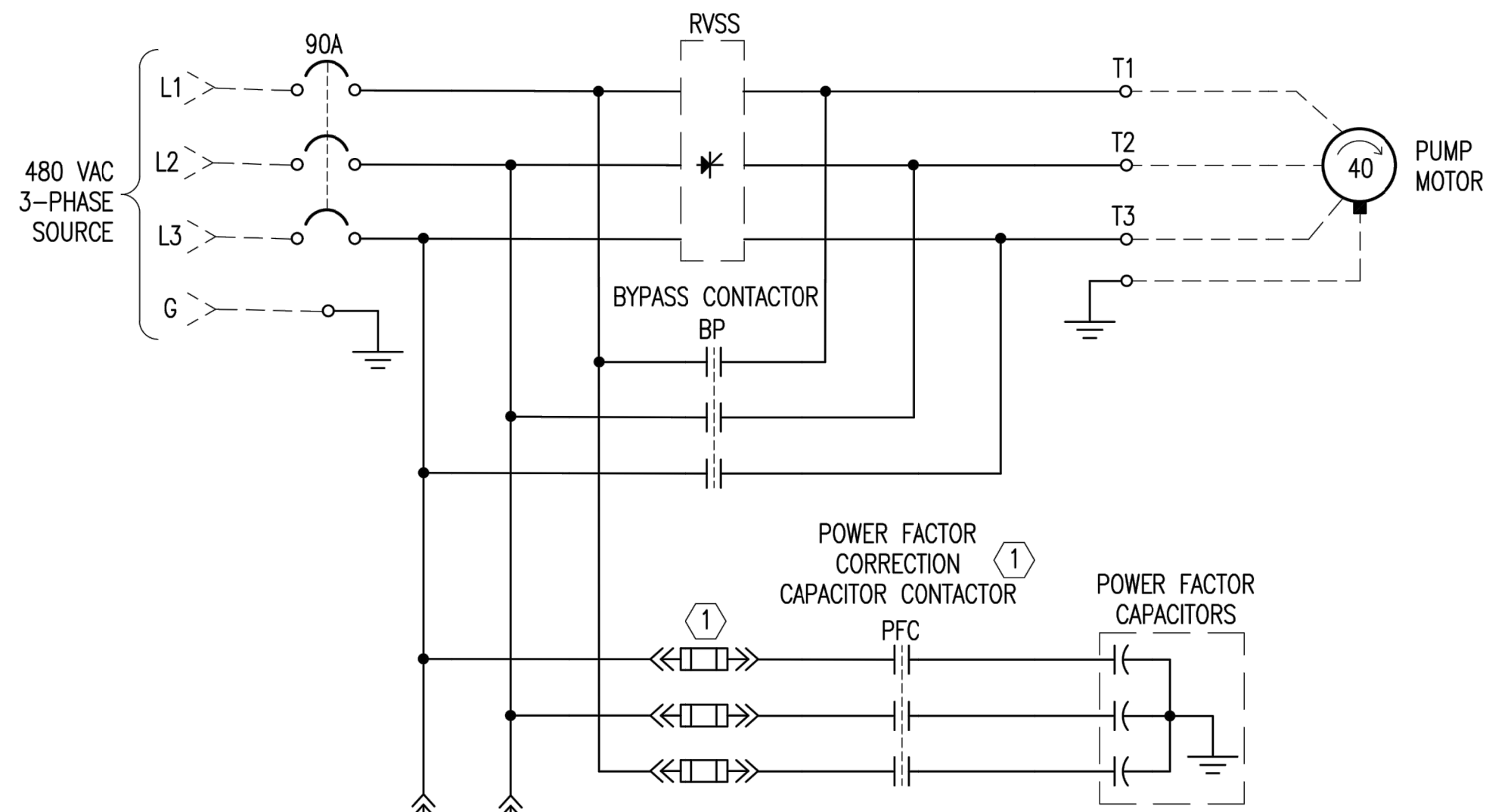
CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 ELECTRICAL DIAGRAMS, SHT. 2  
 12200 NORTH 5600 WEST  
 CORNISH, UT 84308



PROJECT NUMBER: 2019-0180

SHEET: 26	OF: 43
SHEET NUMBER: E-202	

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**RVSS CONTROL WIRING DIAGRAM**  
SCALE: NTS

**TERMINAL LEGEND**

- FIELD TERMINAL
- ☒ MAIN CONTROL PANEL (CP-1)
- ⊙ CONTROL PANEL (CP-2)
- RVSS MOTOR CONTROLLER

H.P.E. INC. ELECTRICAL ENGINEERS  
POWER SYSTEMS, CONTROL & INSTRUMENTATION SYSTEMS  
HEGERHORST POWER ENGINEERING INCORPORATED (801) 642-2051  
708 EAST 50 SOUTH AMERICAN FORK, UT 84003 FAX (801) 642-2154  
HPE PROJECT: 20.081 ©2022  
FOR INFORMATION ABOUT THIS JOB, PLEASE CONTACT: KEITH HEGERHORST

- GENERAL NOTES:**
- CONTROL DIAGRAM IS TYPICAL AND SHALL BE MODIFIED BY THE CONTRACTOR FOR THE SPECIFIC EQUIPMENT SUPPLIED.
  - DIAGRAM IS BASED ON THE HIGH DISCHARGE PRESSURE AND LOW INTAKE LEVEL SHUTDOWN LOGIC PROVIDED BY THE MAIN CONTROL PANEL PLC AND NOT HARD-WIRED IN THE MOTOR CONTROLLER. BOTH ALARMS SHALL SHUTDOWN THE WELL PUMP IN HAND AND REMOTE MODES.

- SHEET KEYNOTES:**
- SUPPLIER SHALL SIZE FUSES.
  - BYPASS CONTACTOR TIME DELAY FUNCTIONS MAY BE BUILT INTO THE RVSS UNIT.
  - POWER FACTOR CAPACITORS SHALL BE ENERGIZED AFTER MOTOR IS RUNNING FULL SPEED AND ON THE BY-PASS CONTACTOR.
  - DEVICE SHALL BE INSTALLED IN THE MOTOR CONTROLLER DOOR.
  - RELAY IS IN CP-1 (MAIN CONTROL PANEL) AND THE RELAY DESIGNATION IS DETERMINED BY THE OWNER.

NO.	DATE	BY	DESCRIPTION
1	8/5/2022	KBH	ADDENDUM NO. 1

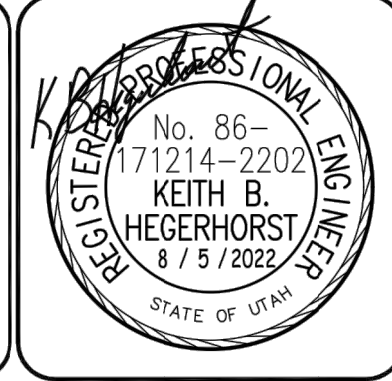
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DESIGNED BY: D. ANDERSON, PE.  
PROJECT MANAGER: M. CHANDLER, PE, PG. CFM.  
CHECKED BY: C. HATCH  
DRAWN BY: GILLIAN SORENSON  
DRAWING SCALE: AS SHOWN  
ISSUE DATE: JULY 8, 2022

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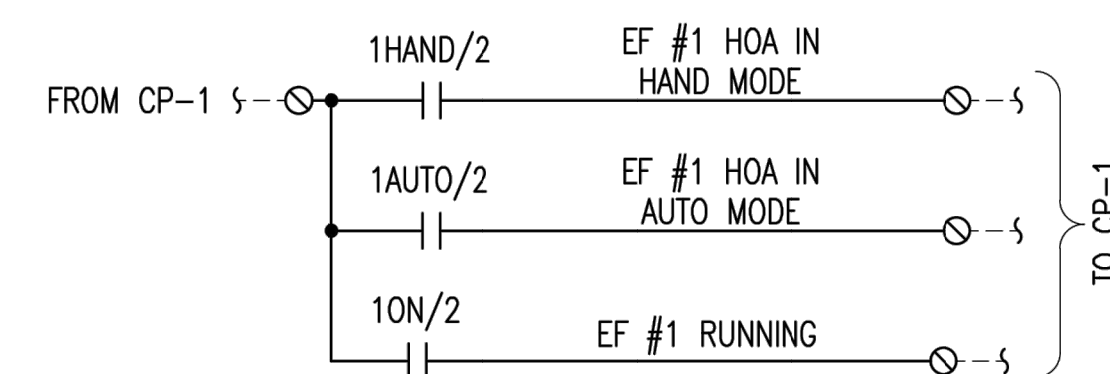
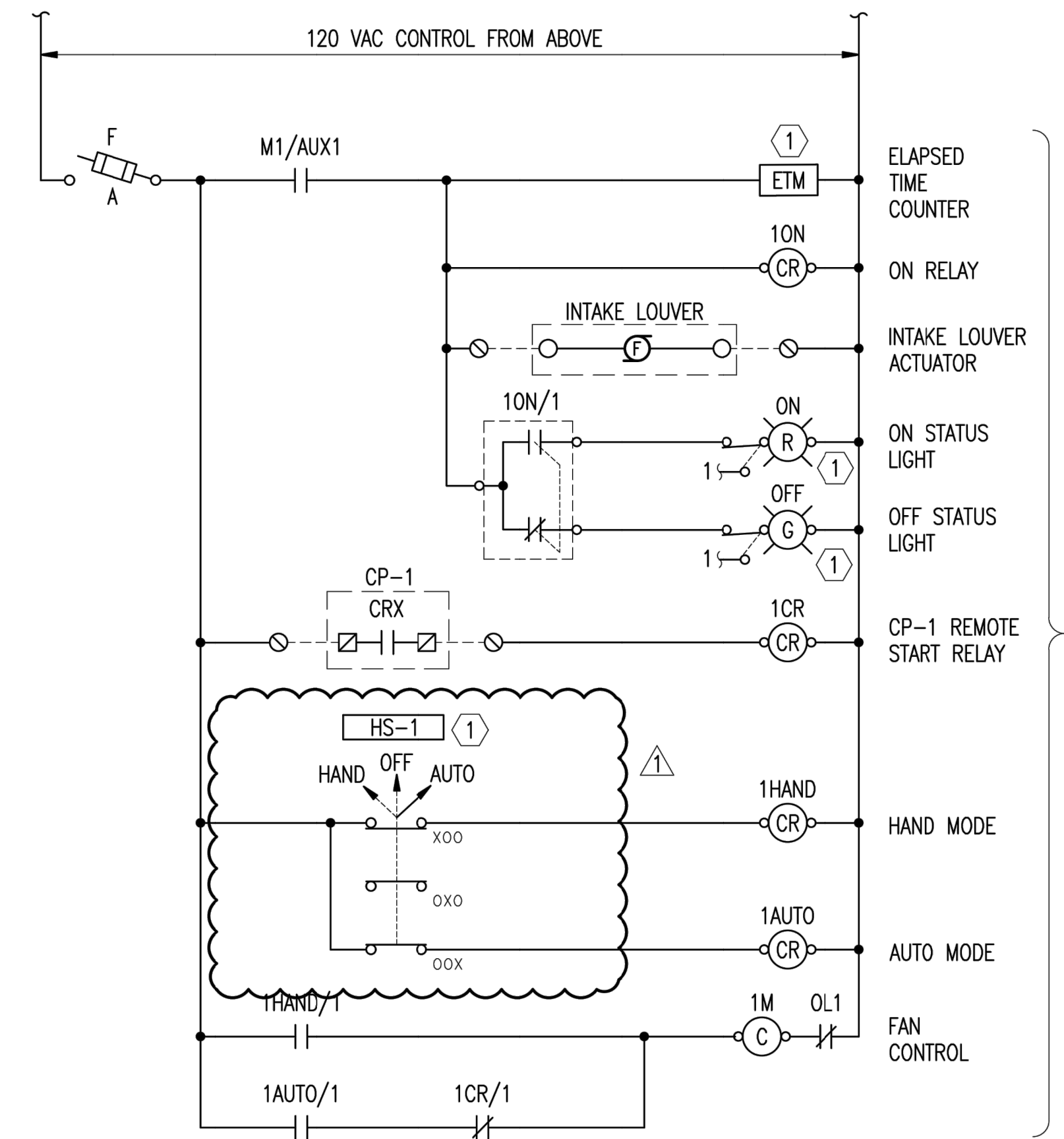
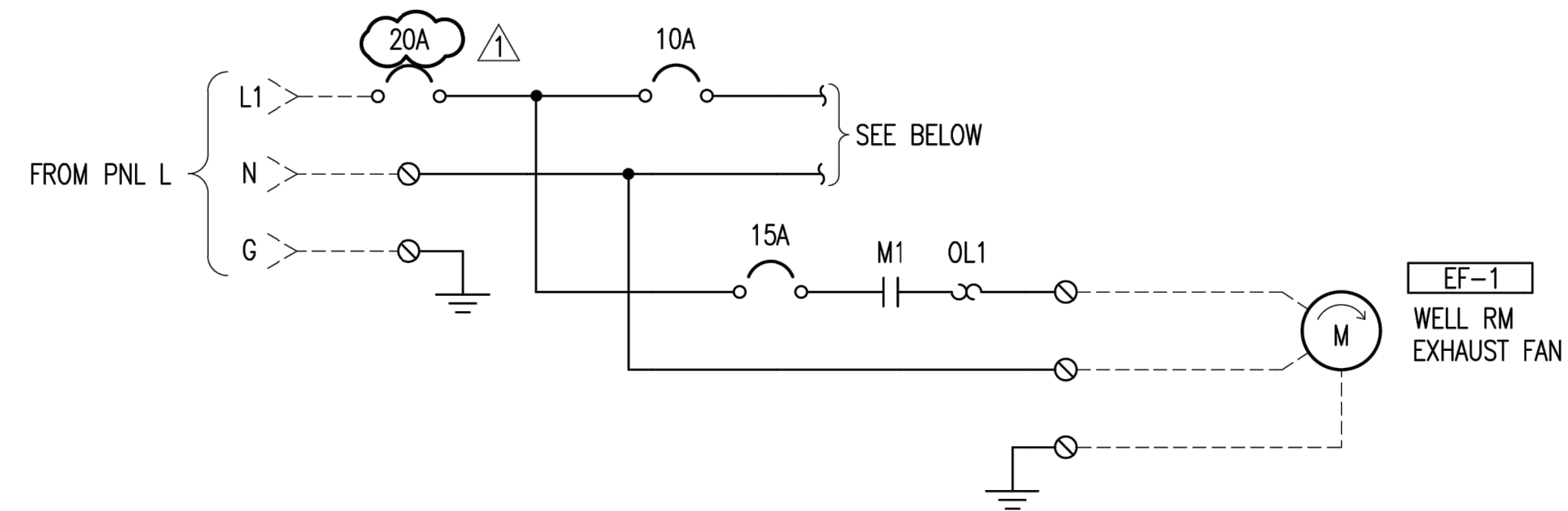
CORNISH TOWN CORP  
PITCHER WELL HOUSE  
TYPICAL RVSS CONTROL DIAGRAM  
12200 NORTH 5600 WEST  
CORNISH, UT 84308



PROJECT NUMBER	2019-0180
SHEET	28 OF 43
SHEET NUMBER	E-204



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**CP-2 TYPICAL CONTROL DIAGRAM**  
SCALE: NTS

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HPE PROJECT: 20.081 ©2022  
FOR INFORMATION ABOUT THIS JOB, PLEASE CONTACT: KEITH HEGERHORST

**GENERAL NOTES:**

1. CP-2 TYPICAL ARRANGEMENT SHOWN ON E-504.
2. CONTROL DIAGRAM IS TYPICAL AND INDICATES THE BASIC CONTROL CONCEPT. CONTRACTOR TO MODIFY AS REQUIRED FOR THE PROVIDED COMPONENTS AND PROVIDE WIRE, TERMINAL AND FUSE NUMBERS AS REQUIRED.

**SHEET KEYNOTES:**

1. DEVICE SHALL BE INSTALLED ON ENCLOSURE DOOR AND AVAILABLE TO THE OPERATOR.
2. INTAKE LOUVER ACTUATOR, WIRE THE LOUVER TO AUTOMATICALLY OPEN WHEN THE FAN IS RUNNING. LOUVER CLOSES WHEN THE FAN IS STOPPED. PROVIDE 3/4" WITH 2#14 TO THE LOUVER ACTUATOR.
3. COORDINATE WITH CP-1 PROVIDER FOR RELAY DESIGNATION.

NO.	DATE	REVISION
1	8/5/2022	ADDENDUM NO. 1

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PRINCIPAL: D. ANDERSON, PE.  
PROJECT MANAGER: M. CHANDLER, PE, PG. CFM.  
CHECKED BY: C. HATCH  
DRAWN BY: GILLIAN SORENSON  
DRAWING SCALE: AS SHOWN  
ISSUE DATE: JULY 8, 2022

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CORNISH TOWN CORP  
PITCHER WELL HOUSE  
CP-2 WIRING DIAGRAM  
12200 NORTH 5600 WEST  
CORNISH, UT 84308

REGISTERED PROFESSIONAL ENGINEER  
No. 86-171214-2202  
KEITH B. HEGERHORST  
8/5/2022  
STATE OF UTAH

PROJECT NUMBER: 2019-0180  
SHEET: 31 OF 43  
SHEET NUMBER: E-207

### PANELBOARD H

LOCATION: WELL ROOM	MFGR: SQUARE D COMPANY	225 AMPS	VOLTS: 480Y/277
DIMENSIONS: 26"W x 6.5"D x 52"H	TYPE: NF	X M.L.O	PHASE: 3
MOUNTING: SURFACE	NEMA: 1	22,000 A.I.C.	WIRES: 4
FEED: BOTTOM	X SURGE PROTECTION		FED FROM: ATS

BRKR	A	P	DESCRIPTION	CIRCUIT ID	PHASE LOADS			N-CONT. NO	CONT. WATTS	CIRCUIT ID	DESCRIPTION	BRKR					
					CONT. WATTS	N-CONT. WATTS	NO										
20	3		CP-1 SURGE DEVICE		1	2,616	1,700			2	1,700	2,616	38	TRANSFORMER L	40	3	
-	-	-	-	-	3					4	1,930	122	-	-	-	-	
-	-	-	-	-	5					6	-	-	-	-	-	-	
90	3		WELL VFD (40 HP)	36	14,394	7	14,394	1,100		8	1,100	312	-	UNIT HEATER UH-1A	20	3	
-	-	-	-	-	9		14,394	1,100		10	1,100	-	-	-	-	-	
-	-	-	-	-	11					12	1,100	-	-	-	-	-	
-	-	-	-	-	13	0	1,100			14	1,100	312	-	UNIT HEATER UH-1B	20	3	
-	-	-	-	-	15			0	1,100	16	1,100	-	-	-	-	-	
-	-	-	-	-	17				0	1,100	18	-	-	-	-	-	
-	-	-	-	-	19	0	0			20	-	-	-	-	-	-	
-	-	-	-	-	21			0	0	22	-	-	-	-	-	-	
-	-	-	-	-	23				0	24	-	-	-	-	-	-	
-	-	-	-	-	25	0	0			26	-	-	-	-	-	-	
-	-	-	-	-	27			0	0	28	-	-	-	-	-	-	
-	-	-	-	-	29				0	30	-	-	-	-	-	-	
FEED THRU LUG PROVISION (XFMR T1)						2,250	98,696	2,150	34,287	100	32,295	0	32,115	-	-	-	
TOTAL WATTS:						45,431	98,696	19,160	38,187	14,616	36,425	14,394	34,315	10,230	2,738		
CONTINUOUS LOAD:						48,169											
CONTINUOUS LOAD * 125%:						60,211											
NON-CONTINUOUS LOAD:						108,926											
DESIGN WATTS:						169,137											
MIN. RATING (AMPS):						204											

### PANELBOARD L

LOCATION: WELL ROOM	MFGR: SQUARE D	100 AMPS	VOLTS: 120/240
DIMENSIONS: 20"W x 5.75"D x 38"H	TYPE: NQ	35 M.C.B.	PHASE: 1
MOUNTING: SURFACE	NEMA: 1	10,000 A.I.C.	WIRES: 3
FEED: BOTTOM	X SPD		FED FROM: MDP

BRKR	A	P	DESCRIPTION	CIRCUIT ID	PHASE LOADS			N-CONT. NO	CONT. WATTS	CIRCUIT ID	DESCRIPTION	BRKR					
					CONT. WATTS	N-CONT. WATTS	NO										
20	1		LTS, INTERIOR	212	380	1	1,380	0		2	1,000	212	CP-1 MCP/SCADA RTU	20	1		
20	1		LTS, EXTERIOR	212	72	3		122	0	4	50	212	WELL FLOW METER	20	1		
20	1		CO, WELL ROOM	212		900	5	60	950	6	50	60	20	SPRING BUILDING & FLOW METER	30	1	
20	1		CO, EXTERIOR	212		180	7		930	8	750	212	GEN. KEEP WARM HEATER	20	2		
20	1		SPARE			9	0	750		10	750	-	-	-	-	-	
20	1		SPARE			11			1,000	12	1,000	212	GEN. BATTERY CHARGER	20	1		
1			AVAILABLE SPACE			13	1,176	0		14	1,176	212	EVAPORATIVE COOLER	20	1		
1			AVAILABLE SPACE			15		0	0	16		-	CP-1 CONTROL PANEL	20	1		
1			AVAILABLE SPACE			17	0	0		18		-	AVAILABLE SPACE	20	1		
TOTAL WATTS:						452	1,080	2,616	1,700	122	1,930	0	0	2,550	2,286		
CONTINUOUS LOAD:						2,738											
CONTINUOUS LOAD * 125%:						3,423											
NON-CONTINUOUS LOAD:						3,630											
DESIGN WATTS:						7,053											
MIN. RATING (AMPS):						29											

### TRANSFORMER L

LOCATION: WELL ROOM	8.5 PRIMARY AMPS	PRIMARY VOLTS: 480
DIMENSIONS: 20"W x 16"D x 27"H	19.6 SECONDARY AMPS	SECONDARY VOLTS: 208Y/120
MOUNTING: FLOOR		KVA: 7.5
FED FROM:		

BRKR	A	P	DESCRIPTION	PHASE LOADS					
				CONT. WATTS	N-CONT. WATTS	CONT.	N-CONT.		
CP-1 CONTROL PANEL				2,738	3,630	2,616	1,700	122	1,930
TOTAL WATTS:				2,738	3,630	2,616	1,700	122	1,930
CONTINUOUS LOAD:				2,738					
CONTINUOUS LOAD * 125%:				3,423					
NON-CONTINUOUS LOAD:				3,630					
DESIGN WATTS:				7,053					

#### GENERAL NOTES:

1. NOT USED.

#### SHEET KEYNOTES:

1. NOT USED.

### CP-2 CONTROL PANEL

LOCATION: WELL ROOM	MFGR: CUSTOM	N/A AMPS	VOLTS: 208Y/120
DIMENSIONS: BY CONTRACTOR	TYPE:		PHASE: 3
MOUNTING: SURFACE	NEMA: 1		WIRES: 4
FEED:	FED FROM: PANEL L		

BRKR	A	P	DESCRIPTION	CIRCUIT ID	PHASE LOADS			N-CONT. NO	CONT. WATTS	CIRCUIT ID	DESCRIPTION	BRKR
					CONT. WATTS	N-CONT. WATTS	NO					
20	1		WELL MAIN ROOM EXHAUST FAN	212	355	1	355			4		
TOTAL WATTS:						355	0	355	0	0	0	0
CONTINUOUS LOAD:						355						
CONTINUOUS LOAD * 125%:						444						
NON-CONTINUOUS LOAD:						0						
DESIGN WATTS:						444						
MIN. RATING (AMPS):						1						

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NO	DATE	DESCRIPTION
1	8/5/2022	ADDENDUM NO. 1

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PRINCIPAL	D. ANDERSON, PE.
PROJECT MANAGER	M. CHANDLER, PE, PG, CFM.
CHECKED BY	C. HATCH
DRAWN BY	GILLIAN SORENSON
DRAWING SCALE	AS SHOWN
ISSUE DATE	JULY 8, 2022

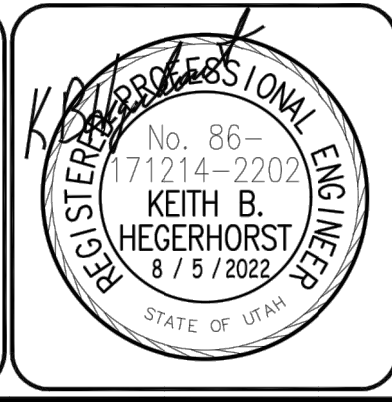
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CORNISH TOWN CORP  
PITCHER WELL HOUSE  
ELECTRICAL SCHEDULES, SHT. 1

12200 NORTH 5600 WEST  
CORNISH, UT 84308



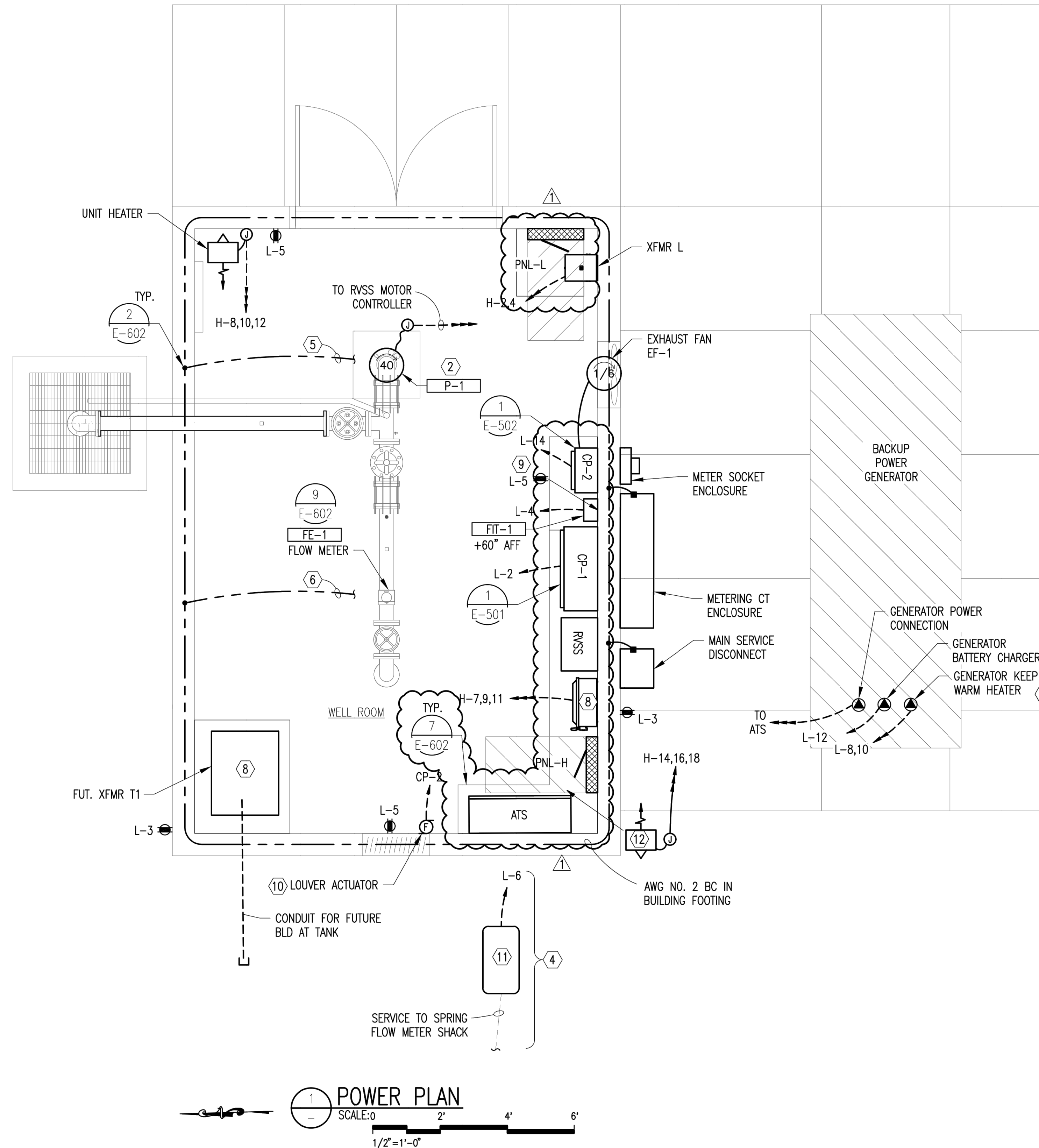
PROJECT NUMBER	2019-0180
SHEET	32 OF 43
SHEET NUMBER	E-301

**GENERAL NOTES:**

- REFER TO ONE-LINE DIAGRAM AND PANEL SCHEDULES FOR CIRCUIT ID, THEN REFER TO THE CONDUIT/CONDUCTOR TABLE FOR WIRE AND CONDUIT REQUIREMENTS.
- ALL INTERIOR OUTLETS SHALL BE +36" AFF. ALL EXTERIOR OUTLETS SHALL BE +18" AFS WITH IN-SERVICE WEATHERPROOF COVERS.
- NOT USED.

**SHEET KEYNOTES:**

- VERIFY LOCATION OF FILTER CONTROL PANEL PRIOR TO CONDUIT ROUGH-IN. LOCATION SHOWN MAY NOT BE ACCURATE.
- WELL IS A SUBMERSIBLE MOTOR/PUMP.
- INSTALL RECEPTACLE 6-INCHES ABOVE SCALE DISPLAY.
- REFER TO E-201/KEYNOTE 7. LOCATION SHOWN ON THIS PLAN IS NOT ACCURATE, BUT IS SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD LOCATE CONDUIT AND J-BOX AS NECESSARY.
- GROUND WELL CASING AS REQUIRED BY NEC 250.112 (M).
- GROUND FLOW METER AS REQUIRED BY THE MANUFACTURER.
- VERIFY VOLTAGE OF GENERATOR HEATER AND MODIFY AS REQUIRED FOR THE HEATER SUPPLIED WITH THE GENERATOR.
- FUTURE EQUIPMENT. PROVIDE ADEQUATE SPACE ON EQUIPMENT ROOM WALL FOR THE FUTURE EQUIPMENT.
- INSTALL RECEPTACLE BELOW FLOW INDICATOR.
- VERIFY LOCATION OF LOUVER ACTUATOR PRIOR TO CONDUIT ROUGH-IN.
- POLYMER CONCRETE PULL BOX.
- WALL MOUNT UNIT HEATER ABOVE ELECTRICAL EQUIPMENT



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NO.	REVISION	DATE	BY	APP.
1	ADDENDUM NO. 1	8/5/2022	KBH	

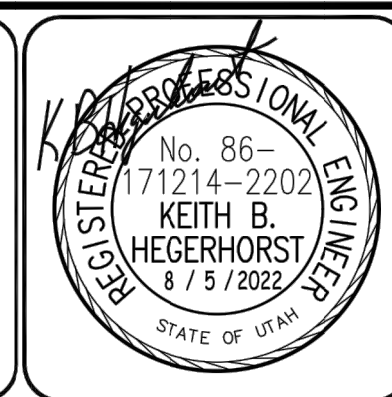
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 PROJECT MANAGER: M. CHANDLER, PE. PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 POWER PLAN  
 12200 NORTH 5600 WEST  
 CORNISH, UT 84308



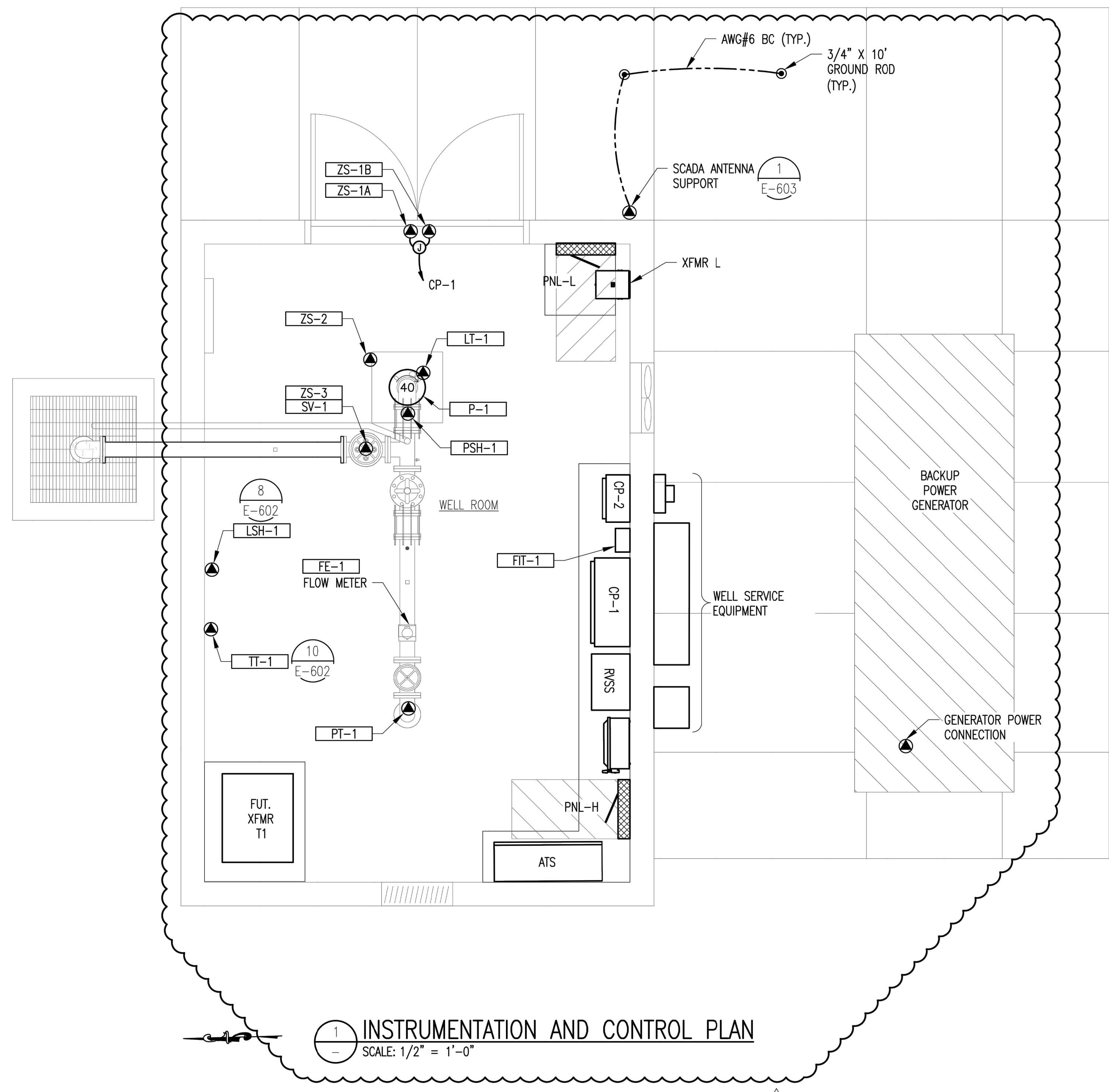
PROJECT NUMBER	2019-0180
SHEET	35
OF	43
SHEET NUMBER	E-402

**GENERAL NOTES:**

- REFER TO THE INSTRUMENTATION AND CONTROL ONE-LINE DIAGRAM FOR WIRE AND CONDUIT REQUIREMENTS.
- PRIOR TO CONDUIT ROUGH-IN VERIFY ALL CONDUIT LOCATIONS WITH SUPPLIERS DRAWINGS.

**SHEET KEYNOTES:**

- NOT USED.



1 INSTRUMENTATION AND CONTROL PLAN  
 SCALE: 1/2" = 1'-0"

File Path: M:\20.081 - Cornish Pitcher Well Drawings\E-403.dwg Aug 04, 2022 - 6:09pm

NO.	DATE	REVISION
1	8/5/2022	ADDENDUM NO. 1

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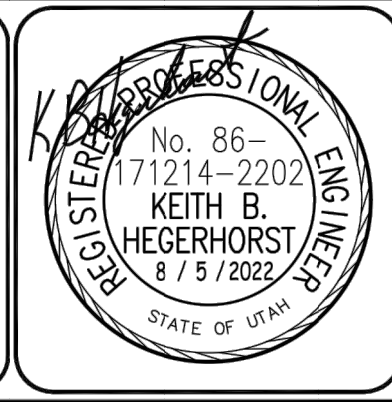
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PRINCIPAL  
 D. ANDERSON, PE.  
 PROJECT MANAGER  
 M. CHANDLER, PE. PG. CFM.  
 CHECKED BY  
 C. HATCH  
 DRAWN BY  
 GILLIAN SORENSON  
 DRAWING SCALE  
 AS SHOWN  
 ISSUE DATE  
 JULY 8, 2022

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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 INSTRUMENT & CONTROL PLAN

12200 NORTH 5600 WEST  
 CORNISH, UT 84308



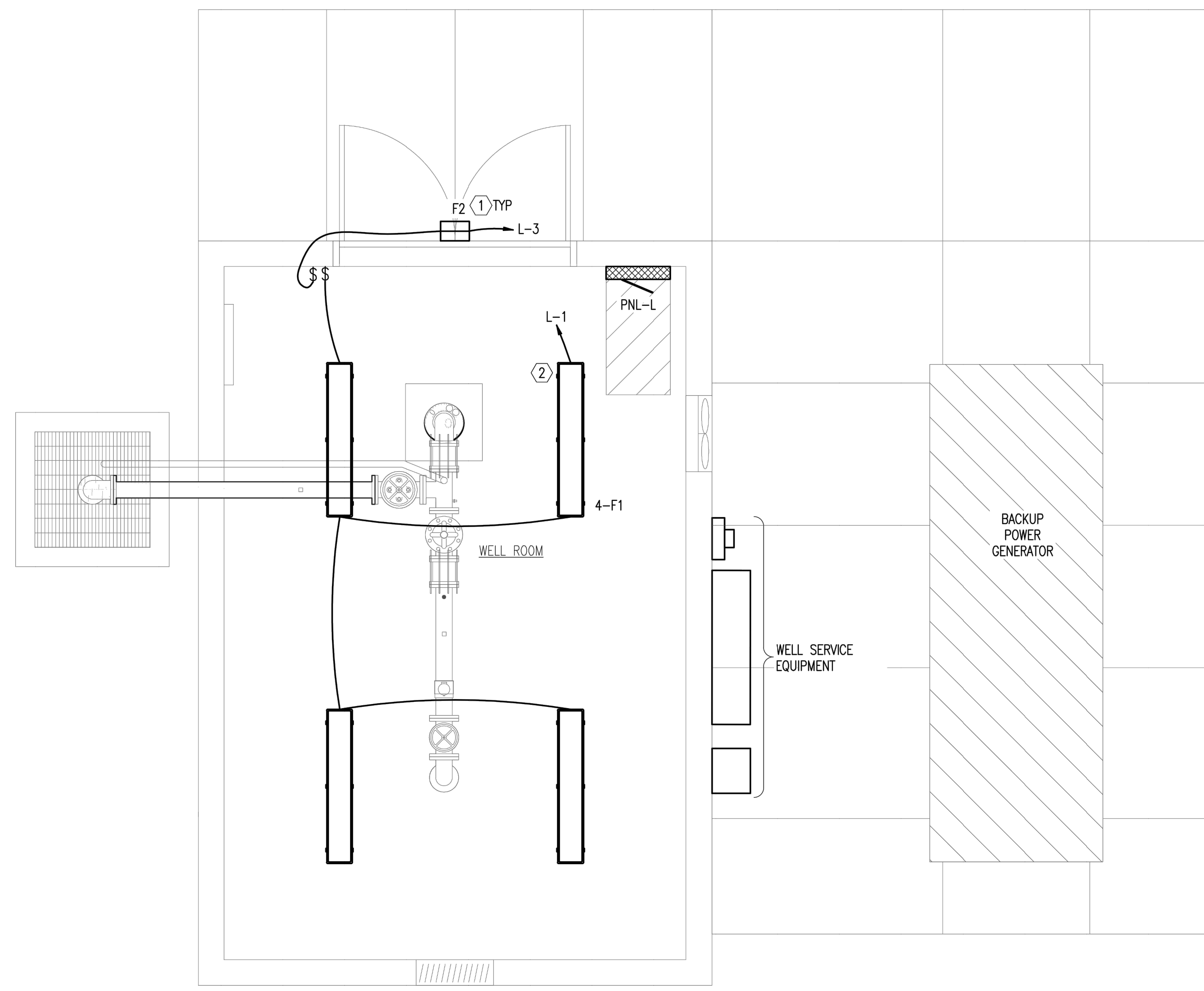
PROJECT NUMBER	2019-0180
SHEET	36
OF	43
SHEET NUMBER	E-403

**GENERAL NOTES:**

- REFER TO PANELBOARD SCHEDULE FOR CIRCUIT ID, THEN REFER TO CONDUIT/CONDUCTOR TABLE FOR WIRE AND CONDUIT REQUIREMENTS.

**SHEET KEYNOTES:**

- INSTALL EXTERIOR FIXTURES 8-INCHES ABOVE THE DOOR FRAME.
- PROVIDE A 90-MINUTE EMERGENCY BATTERY IN THIS FIXTURE.



1 LIGHTING PLAN  
 SCALE: 1/2" = 1'-0"

File Path: M:\20.081 - Cornish Pitcher Well\Drawings\E-404.dwg Aug 04, 2022 - 6:14pm

NO.	REVISION	DATE	BY
1	ADDENDUM NO. 1	8/5/2022	KBH

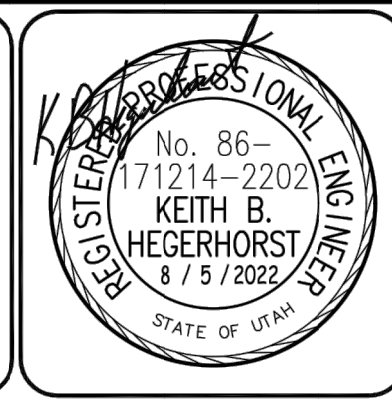
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PRINCIPAL: D. ANDERSON, PE.  
 PROJECT MANAGER: M. CHANDLER, PE, PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 LIGHTING PLAN  
 12200 NORTH 5600 WEST  
 CORNISH, UT 84308



PROJECT NUMBER	2019-0180
SHEET	37
OF	43
SHEET NUMBER	E-404

CP-1 MAIN CONTROL PANEL I/O LIST  
 DISCRETE INPUTS

DESCRIPTION	FROM	TO	NOTES
ATS IN UTILITY POSITION	ATS	CP-1	
ATS IN GENERATOR POSITION	ATS	CP-1	
CP-1 POWER LOSS	CP-1	CP-1	
GENERATOR RUNNING	GEN	CP-1	
GENERATOR FAULT	GEN	CP-1	
WASTE VALVE (V-1) FULL WASTE POSITION	ZS-3	CP-1	
WELL HATCH OPEN	ZS-5	CP-1	
WELL HIGH DISCHARGE PRESSURE	PSH-1	CP-1	
WELL RM. EF (EF-1) HOA IN AUTO	CP-2	CP-1	
WELL RM. EF (EF-1) RUNNING	CP-2	CP-1	
WELL ROOM DOOR 1A OPEN	ZS-1A	CP-1	
WELL ROOM DOOR 1B OPEN	ZS-1B	CP-1	
WELL ROOM FLOOR HIGH WATER	LSH-1	CP-1	
WELL ROOM ROOF HATCH OPEN	ZS-2	CP-1	
WELL RVSS FAULT	RVSS	CP-1	
WELL RVSS HOA IN AUTO	RVSS	CP-1	
WELL RVSS HOA IN HAND	RVSS	CP-1	
WELL RVSS RUNNING	RVSS	CP-1	

NOTES: 1)

DISCRETE OUTPUTS

DESCRIPTION	FROM	TO	NOTES
WASTE VALVE (V-1) PILOT SOLENOID VALVE	CP-1	SV-1	
WELL ROOM EF (EF-1) RUN	CP-1	CP-2	
WELL RVSS RUN COMMAND	CP-1	RVSS	

NOTES: 1)

ANALOG INPUTS

DESCRIPTION	FROM	TO	NOTES
WELL FLOW	FIT-1	CP-1	
ROOM TEMPERATURE	TT-1	CP-1	
SPRING FLOW	FIT-2	CP-1	1)
SYSTEM PRESSURE	PT-1	CP-1	
WELL LEVEL	LT-1	CP-1	

NOTES: 1) REFER TO E-403 KEYNOTE 2.

ANALOG OUTPUTS

DESCRIPTION	FROM	TO	NOTES
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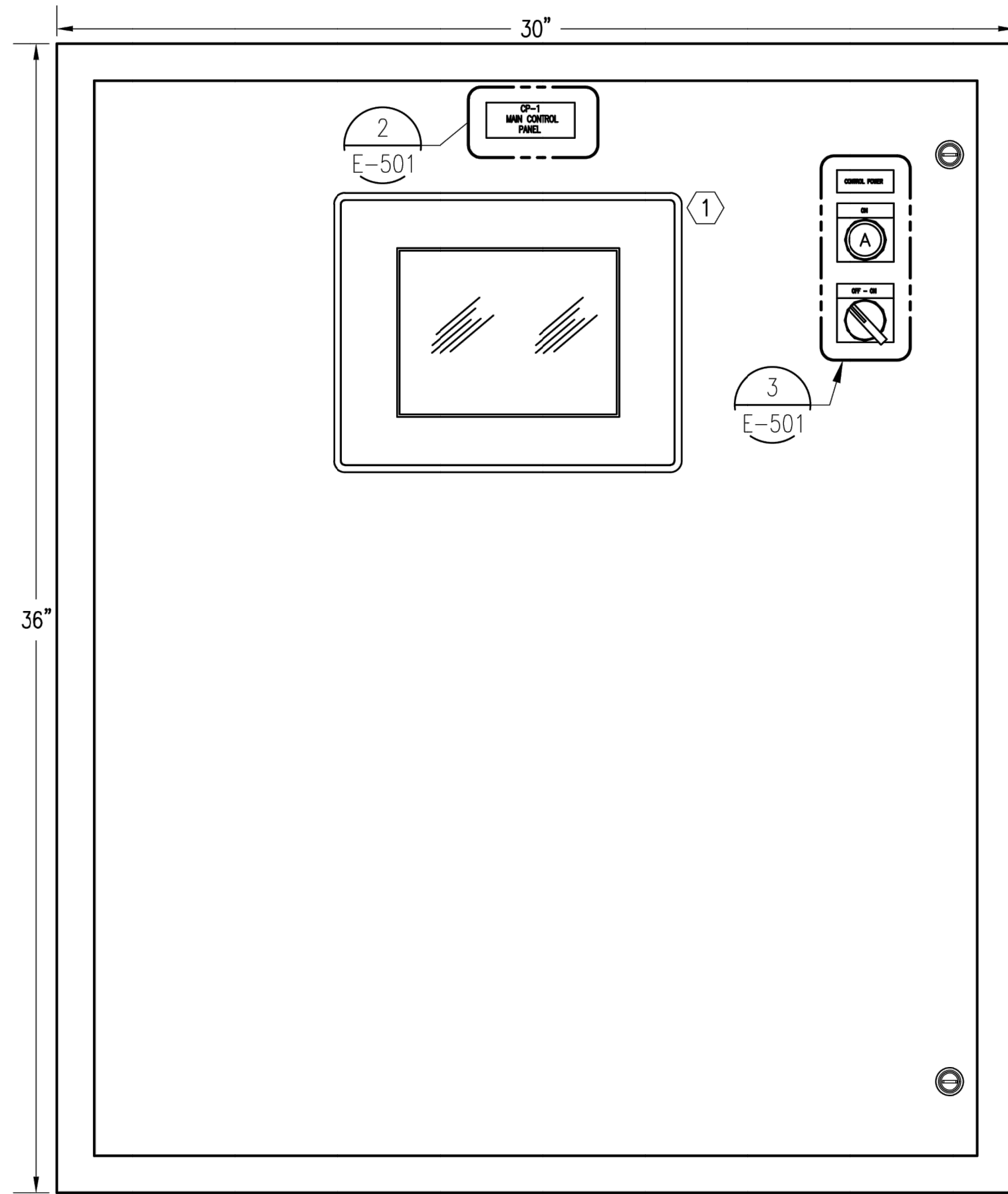
NOTES: 1)

GENERAL NOTES:

- ENCLOSURE DIMENSIONS SHOWN ARE TYPICAL AND SHALL BE MODIFIED BY THE PANEL FABRICATOR AS REQUIRED FOR THE INTERNAL DEVICES AND COMPONENTS FOR THIS PROJECT.
- REFER TO E-205 AND E-206 FOR TYPICAL WIRING DIAGRAMS.

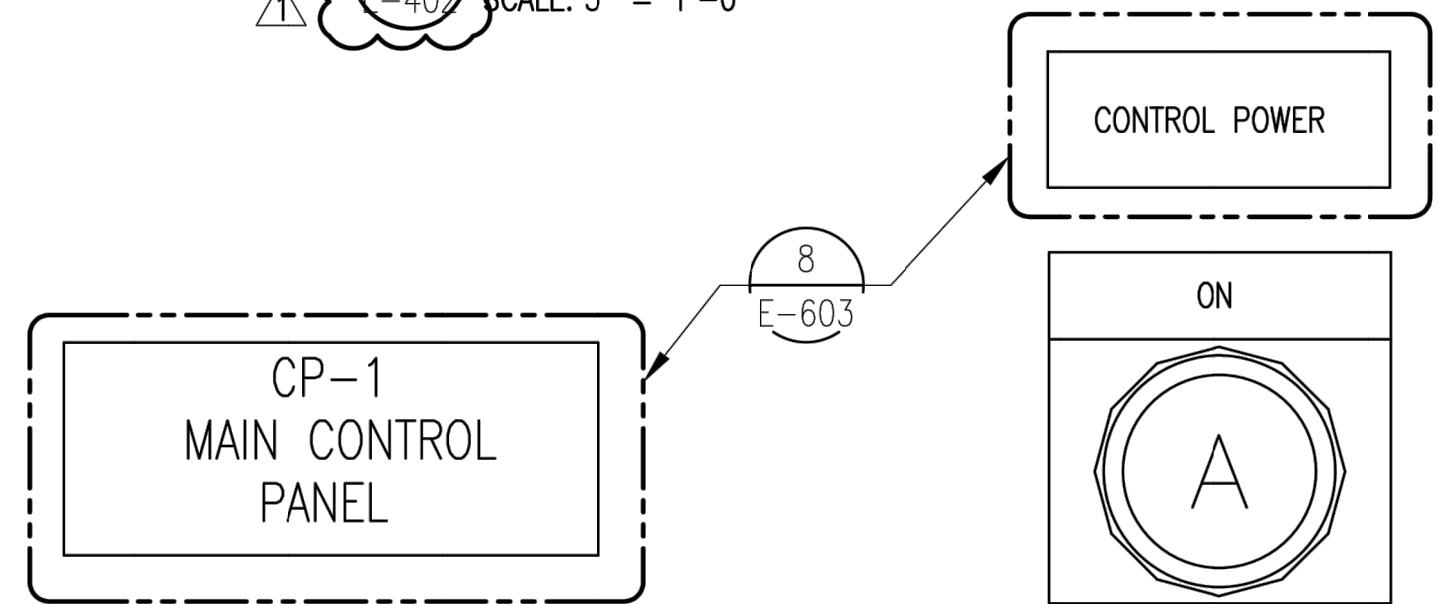
SHEET KEYNOTES:

- 10" OPERATOR HMI DISPLAY SCREEN.
- NOT USED.

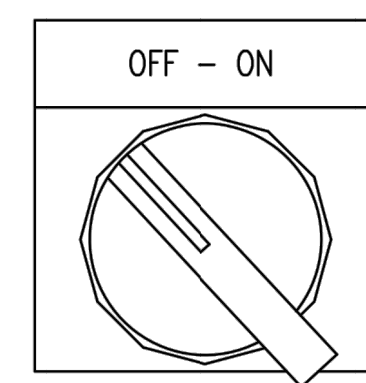


CP-1 ARRANGEMENT

SCALE: 3" = 1'-0"



ENLARGED VIEW  
SCALE: NTS



ENLARGED VIEW  
SCALE: NTS



File Path: M:\20.081 - Cornish Pitcher Well\Drawings\E-501.dwg Aug 05, 2022 - 8:18am

REVISION	DATE	BY	DESCRIPTION
1	8/5/2022	KBH	ADDENDUM NO. 1

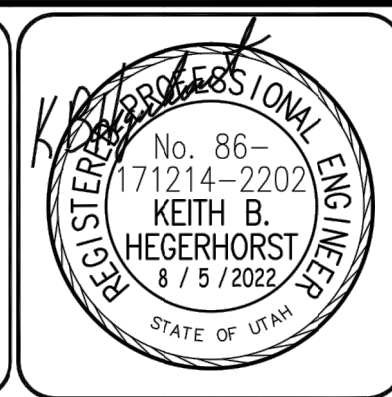
IF THE ABOVE SCALE BAR DOES NOT MEASURE 1-INCH IN LENGTH, DO NOT USE THIS DRAWING FOR SCALING PURPOSES. DIMENSIONS AND MEASUREMENTS SPECIFIED IN THE DRAWING TAKE PRECEDENCE TO SCALED MEASUREMENTS.

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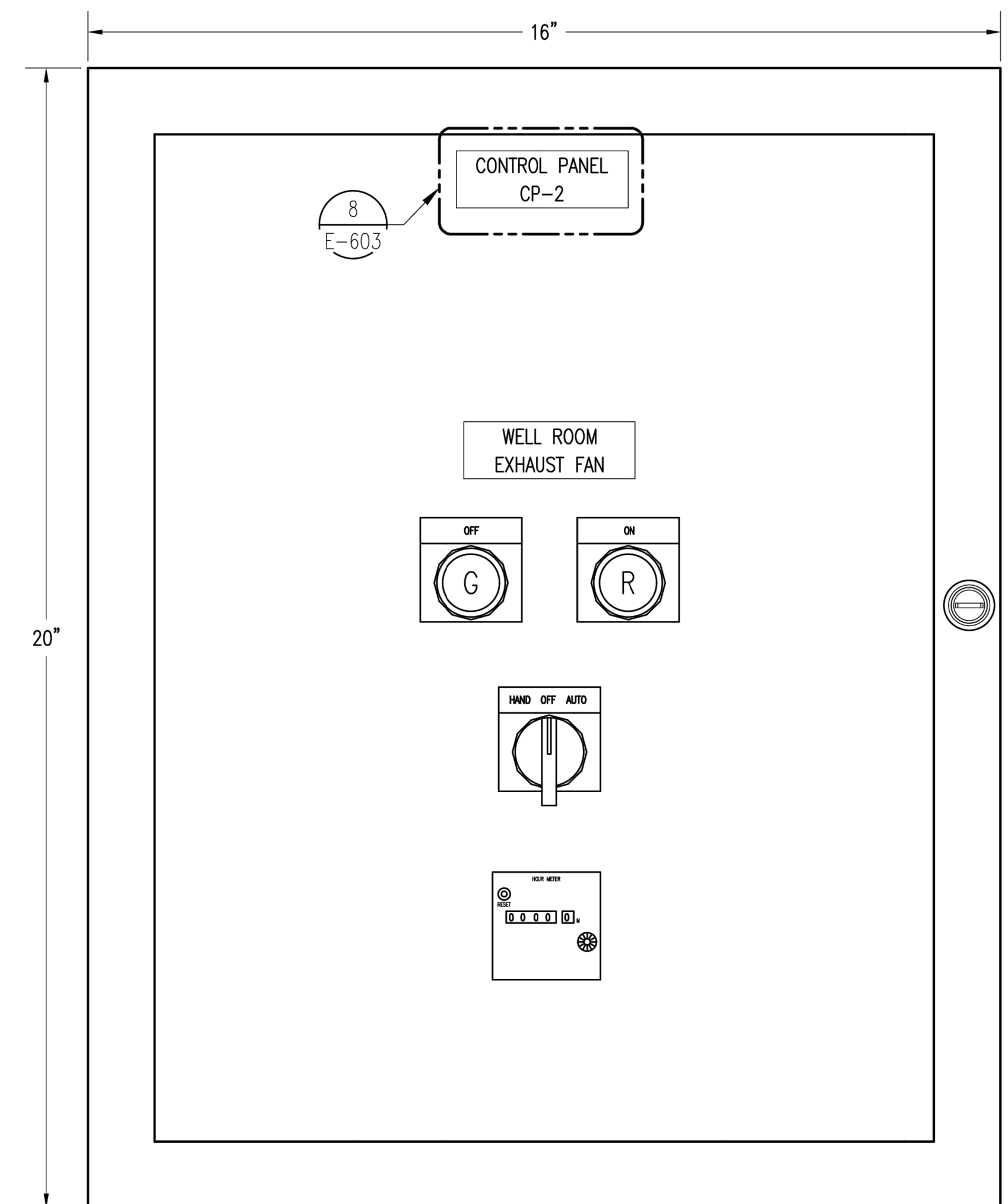
PRINCIPAL: D. ANDERSON, PE.  
 PROJECT MANAGER: M. CHANDLER, PE. PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 CP-1 ARRANGEMENT & I/O LIST

12200 NORTH 5600 WEST  
 CORNISH, UT 84308



PROJECT NUMBER	2019-0180
SHEET	38 OF 43
SHEET NUMBER	E-501



**GENERAL NOTES:**

1. ENCLOSURE DIMENSIONS SHOWN ARE APPROXIMATE AND SHALL BE MODIFIED AS REQUIRE BY THE CONTRACTOR FOR THE SELECTED COMPONENTS.
2. INTERNAL COMPONENT ARRANGEMENT NOT SHOWN AND SHALL BE PROVIDED BY THE CONTRACTOR.
3. TYPICAL WIRING DIAGRAM SHOWN ON E-207.

**SHEET KEYNOTES:**

1. NOT USED.

**CP-2 ARRANGEMENT**  
 SCALE: 6" = 1'-0"

File Path: M:\20.081 - Cornish Pitcher Well\Drawings\E-502.dwg Aug 05, 2022 - 8:19am

NO.	DATE	REVISION
1	8/5/2022	ADDENDUM NO. 1

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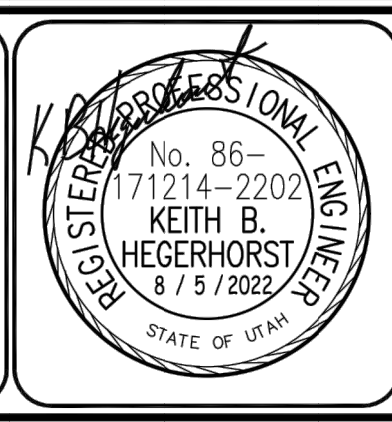
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 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

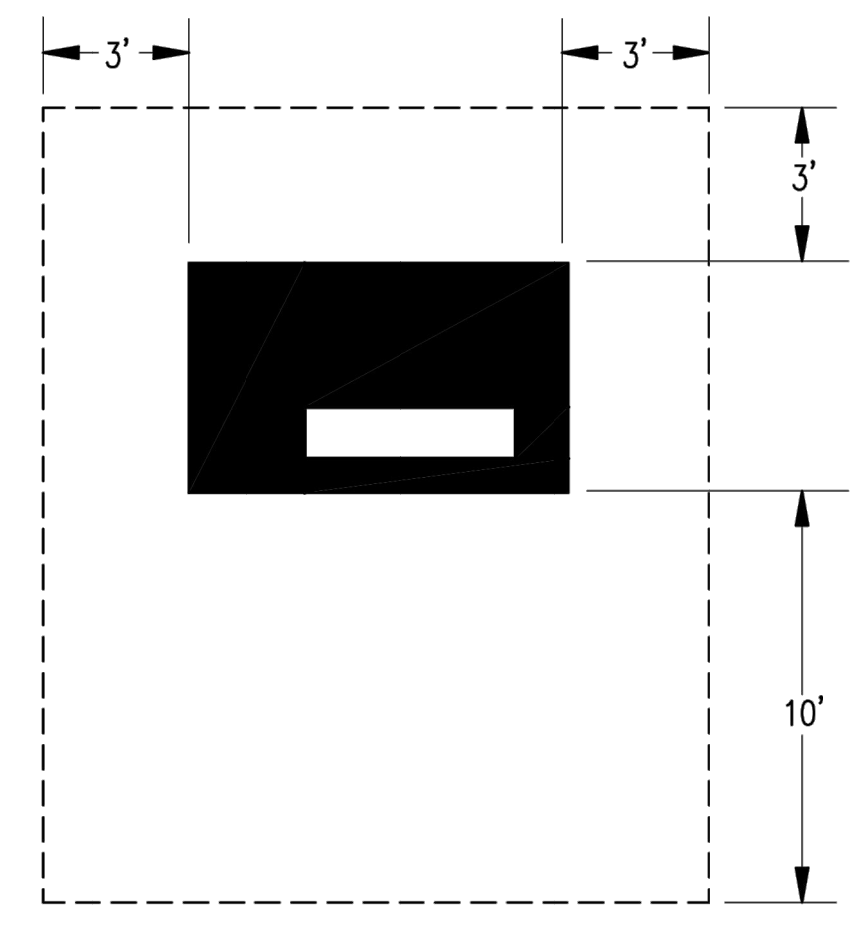
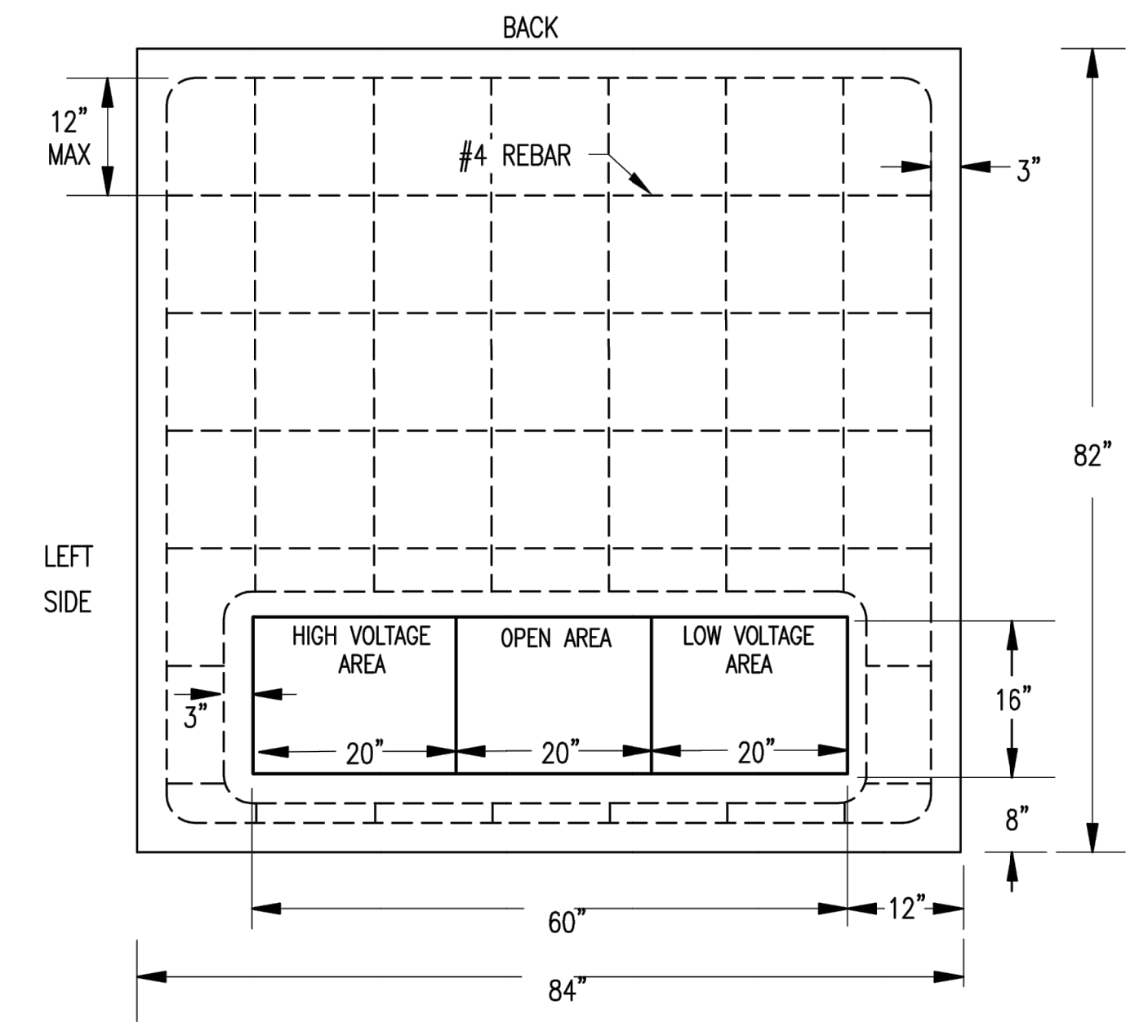
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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 CP-2 ARRANGEMENT

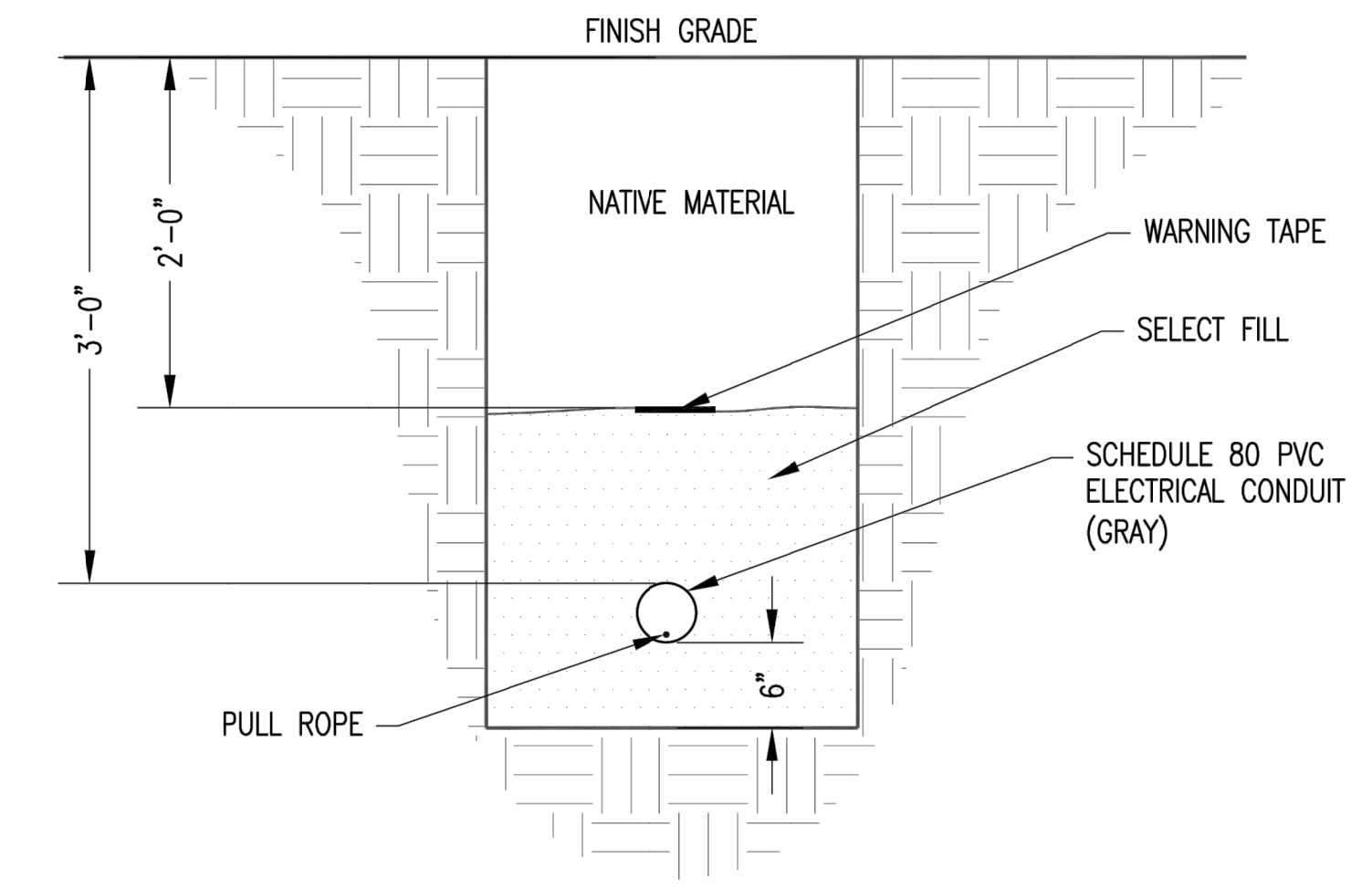
12200 NORTH 5600 WEST  
 CORNISH, UT 84308



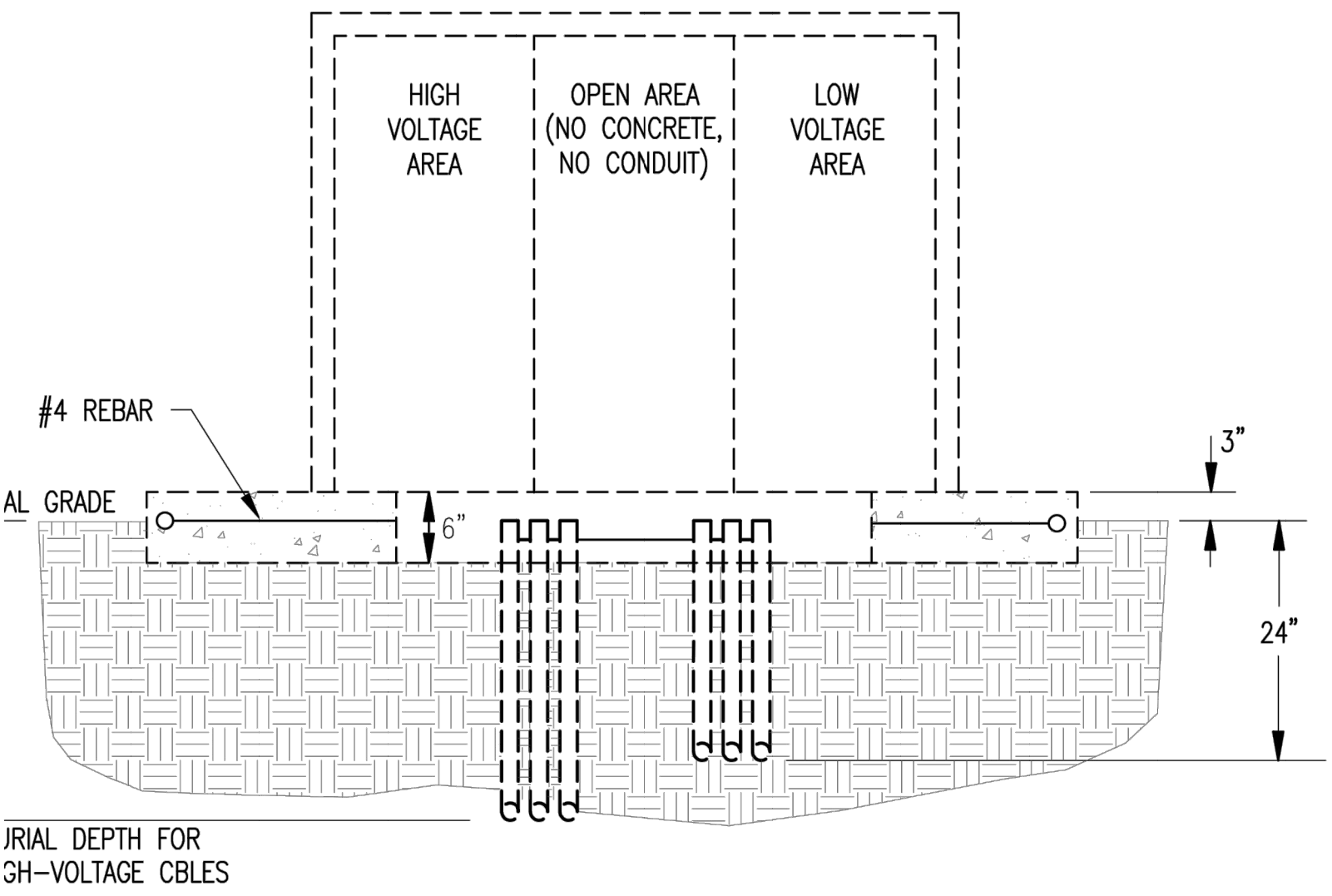
PROJECT NUMBER	2019-0180
SHEET	39 OF 43
SHEET NUMBER	E-502



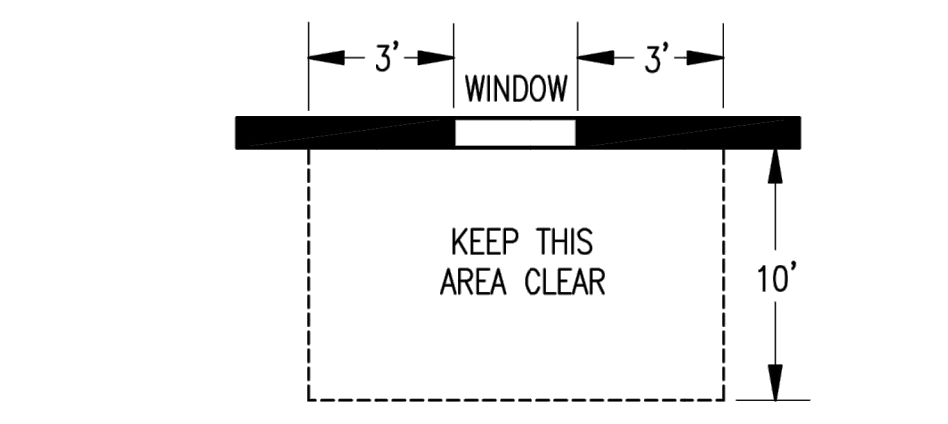
DETAIL "C"



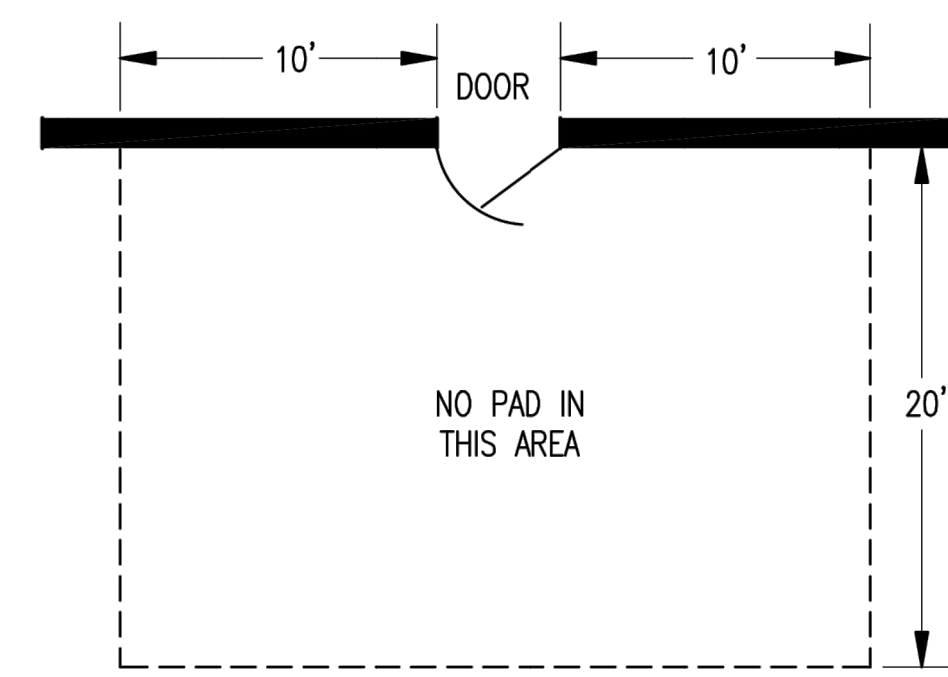
PRIMARY SERVICE TRENCH DETAIL  
 SCALE: 1" = 1'-0"



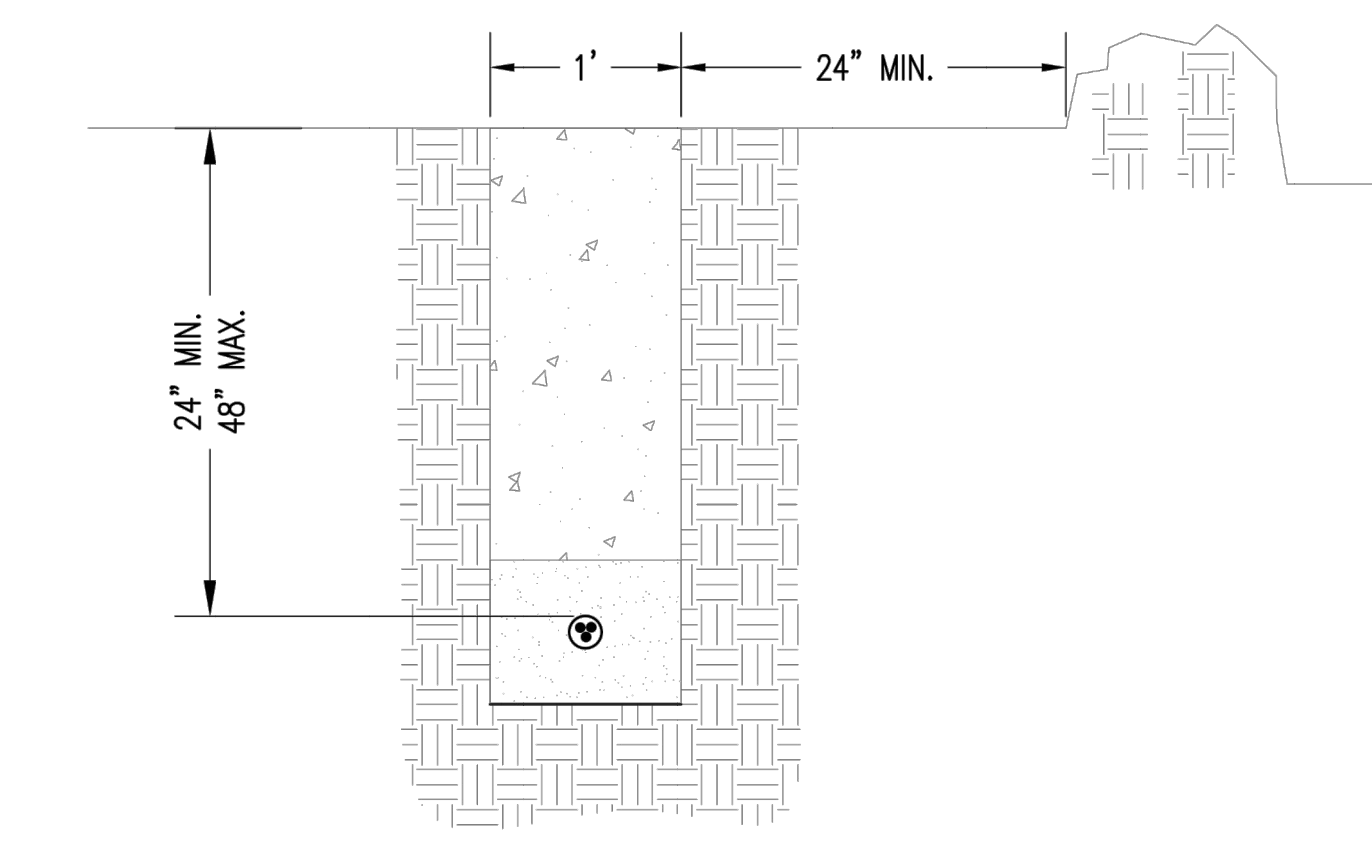
TRIAL DEPTH FOR  
 GH-VOLTAGE CBLES



DETAIL "A"



DETAIL "B"



SECONDARY SERVICE TRENCH DETAIL  
 SCALE: 1" = 1'-0"

GENERAL NOTES:

1. NOT USED.

SHEET KEYNOTES:

1. NOT USED.

NOTES:

1. **SITE PREPARATION:** ALL DIRT BENEATH THE PAD SITE MUST BE COMPACTED AND LEVEL PRIOR TO SETTING OR POURING THE PAD TO PREVENT SETTLING.
2. **CONCRETE:** SHALL BE MADE USING A STANDARD BRAND OF PORTLAND CEMENT. STEEL REINFORCEMENT SHALL BE #4 REBAR PLACED ACCORDING TO THE DRAWINGS. THE PAD MUST BE POURED AT LEAST THREE FULL DAYS PRIOR TO SETTING THE UNIT. CONCRETE MUST BE KEPT ABOVE FREEZING AT LEAST 72 HOURS AFTER POURING. THE FINISHED SURFACE MUST BE COMPLETELY FLAT AND LEVEL. ALL WORK MUST BE DONE TO HIGH QUALITY STANDARDS.
3. **PREFABRICATION:** THE PAD MAY EITHER BE CONSTRUCTED ON THE SITE OR PREFABRICATED ACCORDING TO SPECIFICATIONS. PREFABRICATED PADS SHALL BE SET LEVEL AND PLUMB.
4. **TRANSFORMER CONDUIT WINDOW LAYOUT:** LOW VOLTAGE CONDUITS SHALL BE FORMED AS TIGHTLY AS POSSIBLE AGAINST RIGHT SIDE OF THE OPENING AND SHALL IN NO CASE EXTEND FURTHER THAN 16" FROM THE RIGHT SIDE OF CONDUIT WINDOW ON THE PAD. NO MORE THAN 4 CONDUITS WILL BE USED ON THE LOW VOLTAGE SIDE. DO NOT PUT ANY CONCRETE IN OR UNDER THE CONDUIT WINDOW. USE DIRT TO SEPARATE CONDUITS. BELL ENDS ARE REQUIRED FOR ALL METAL CONDUITS BUT NOT FOR PLASTIC CONDUIT.

RMP TRANSFORMER PAD  
 SCALE: 3/4" = 1'-0"

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NO.	DATE	BY	DESCRIPTION
1	8/5/2022	KBH	ADDENDUM NO. 1

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 PROJECT MANAGER: M. CHANDLER, PE. PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

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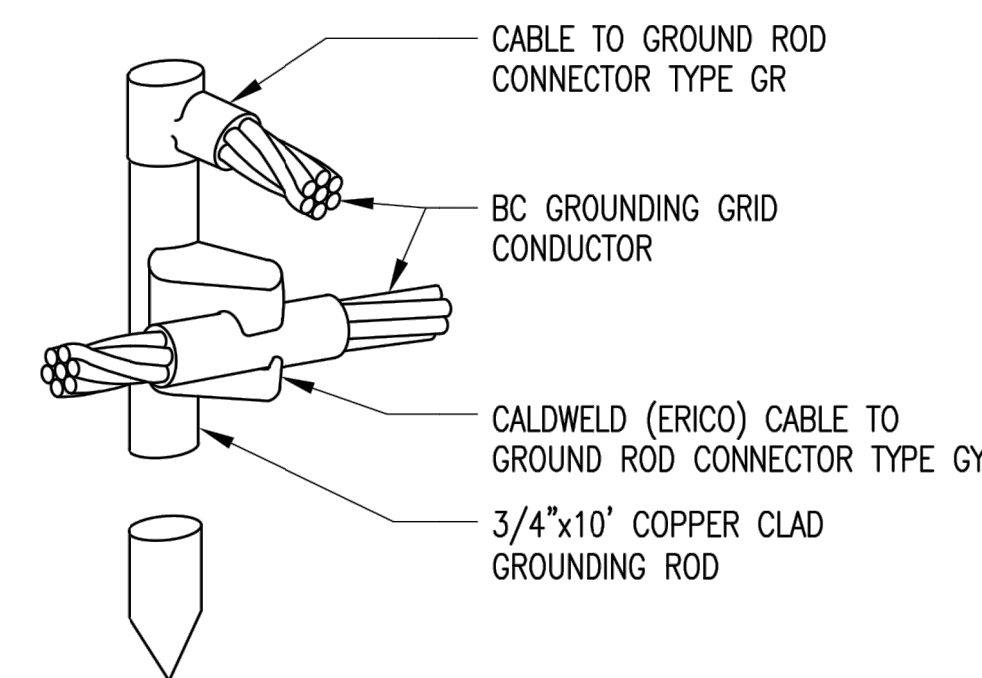
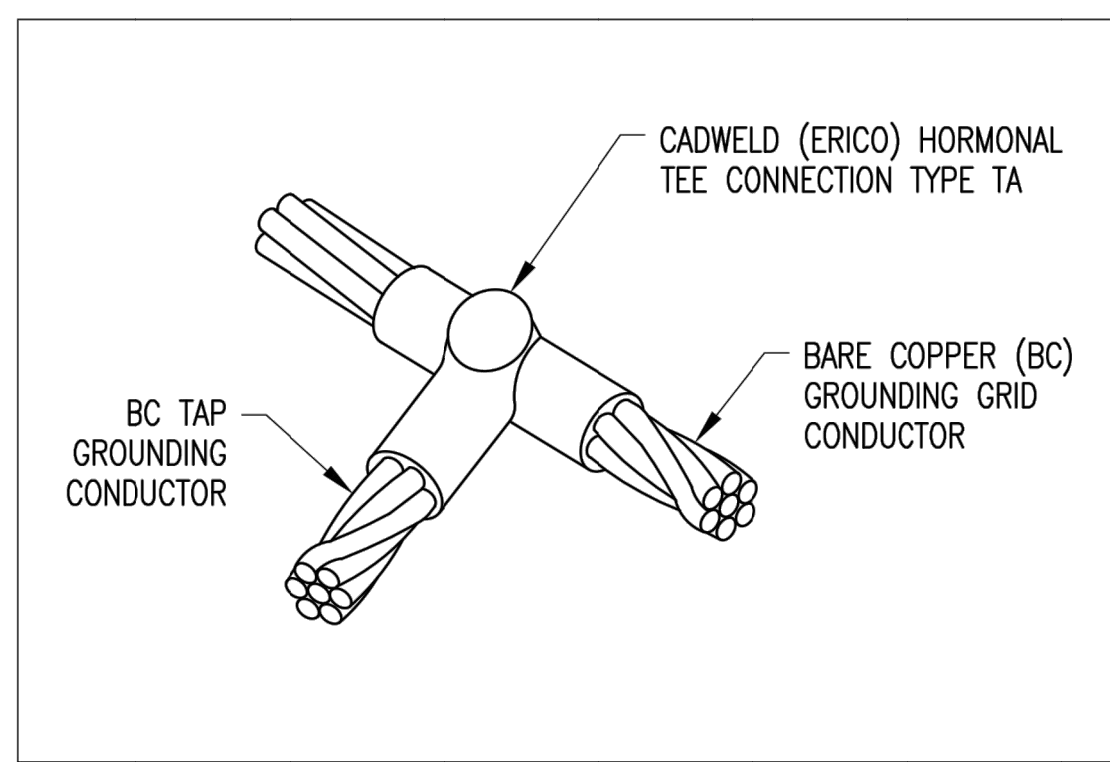
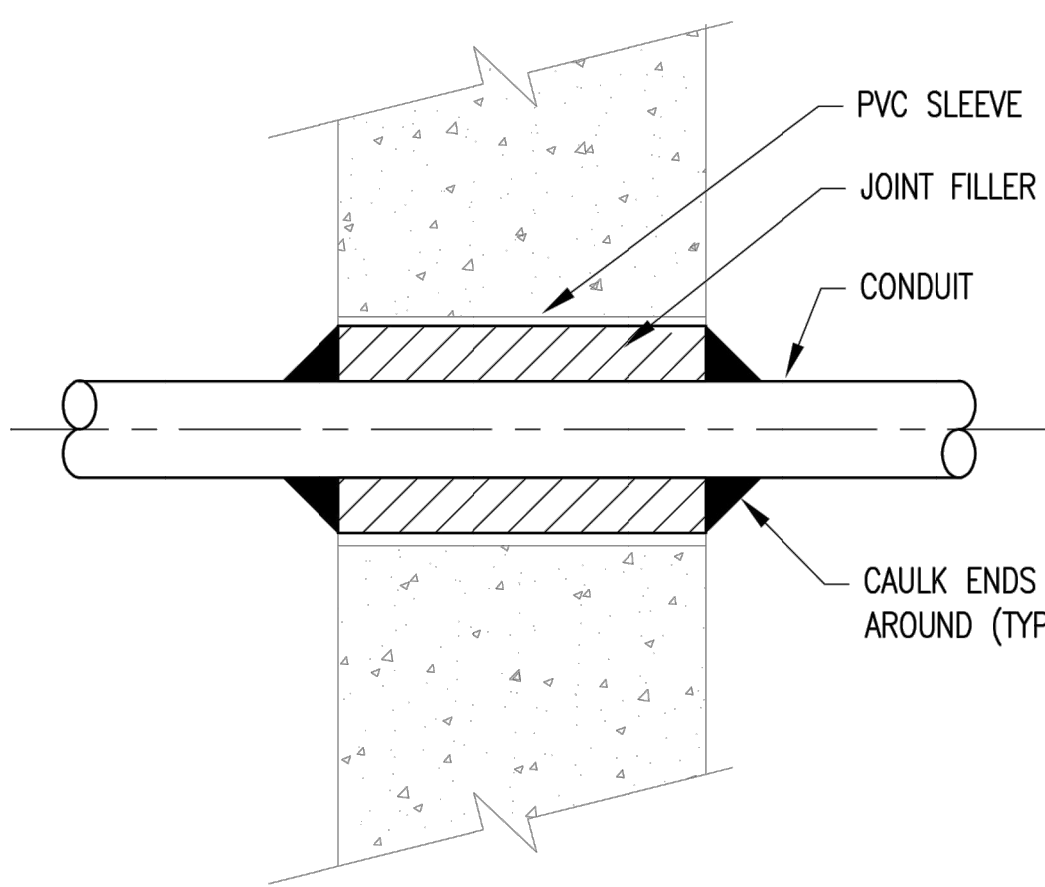
CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 ELECTRICAL DETAILS SHT. 1

12200 NORTH 5600 WEST  
 CORNISH, UT 84308



PROJECT NUMBER	2019-0180
SHEET	40 OF 43
SHEET NUMBER	E-601

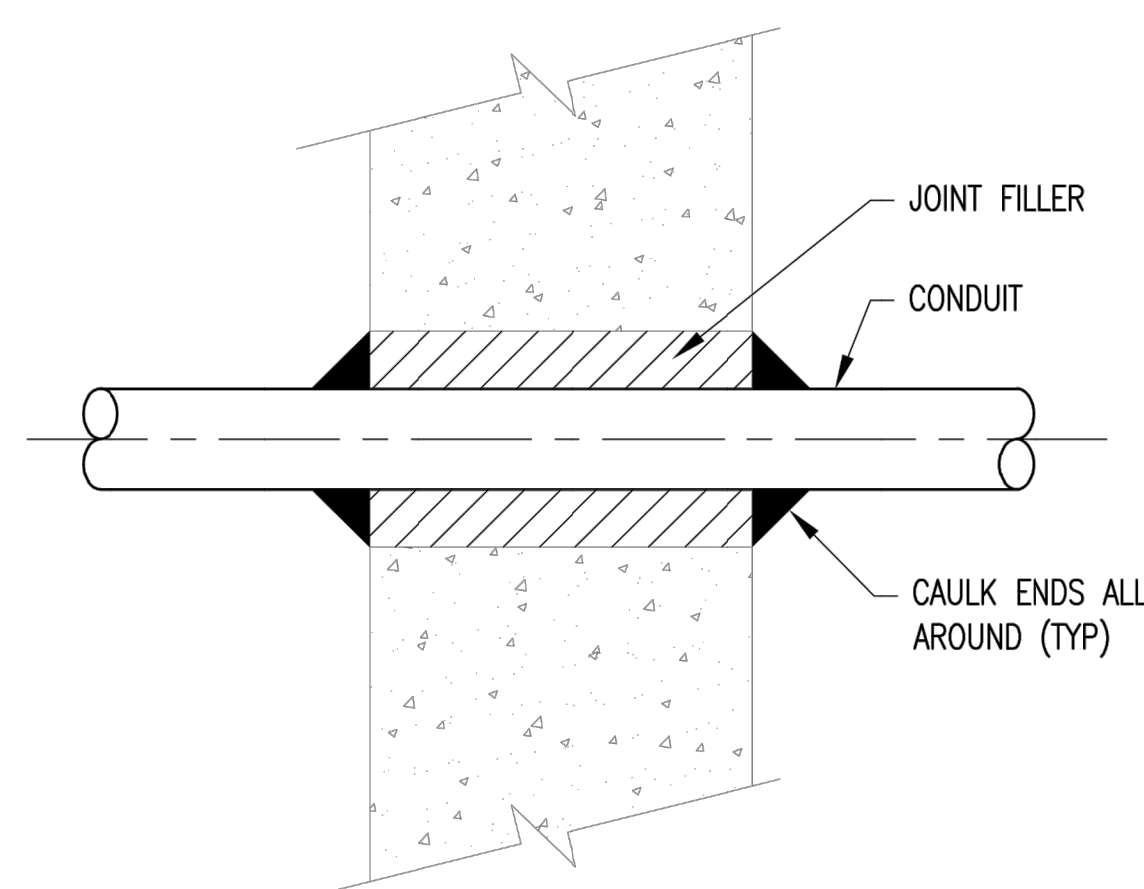




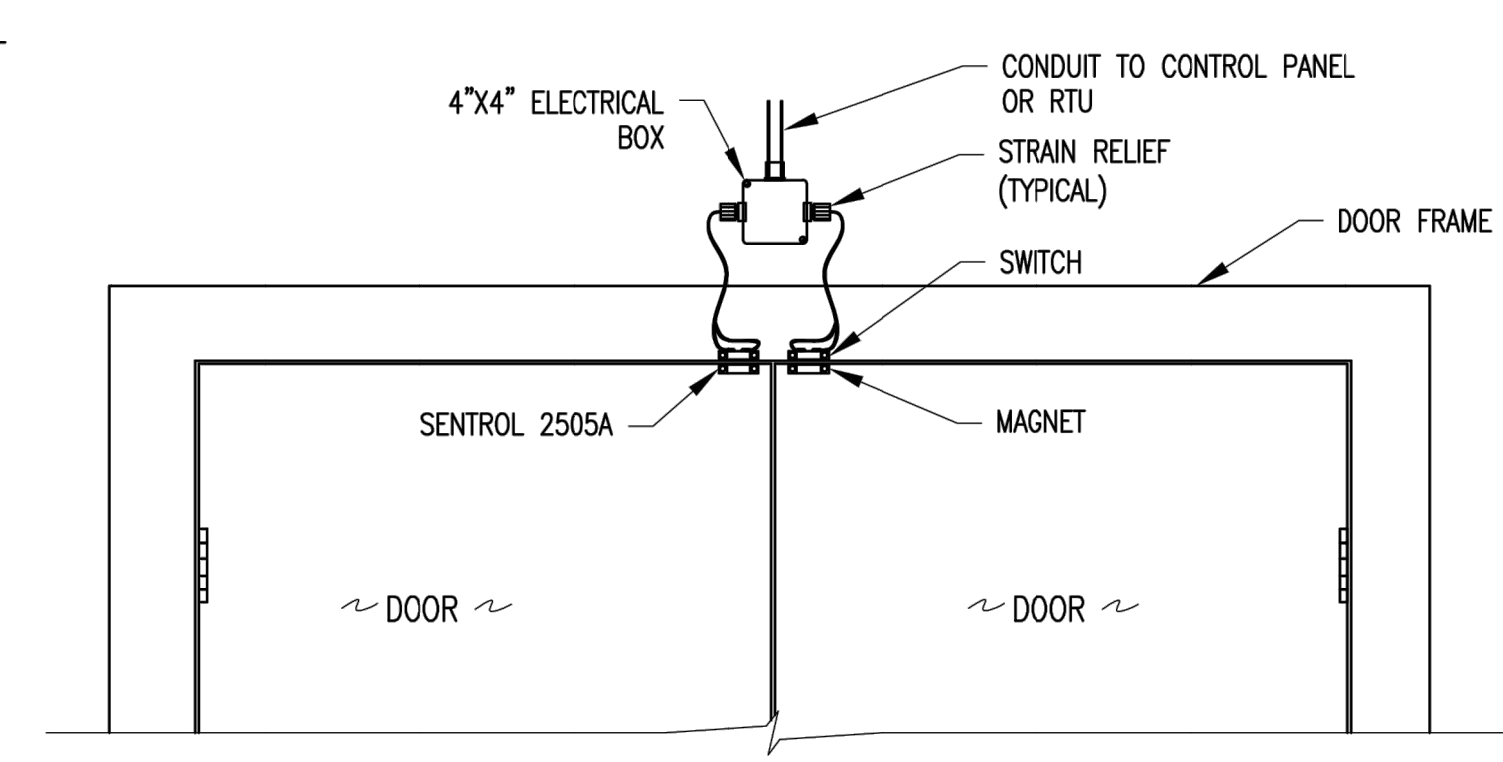
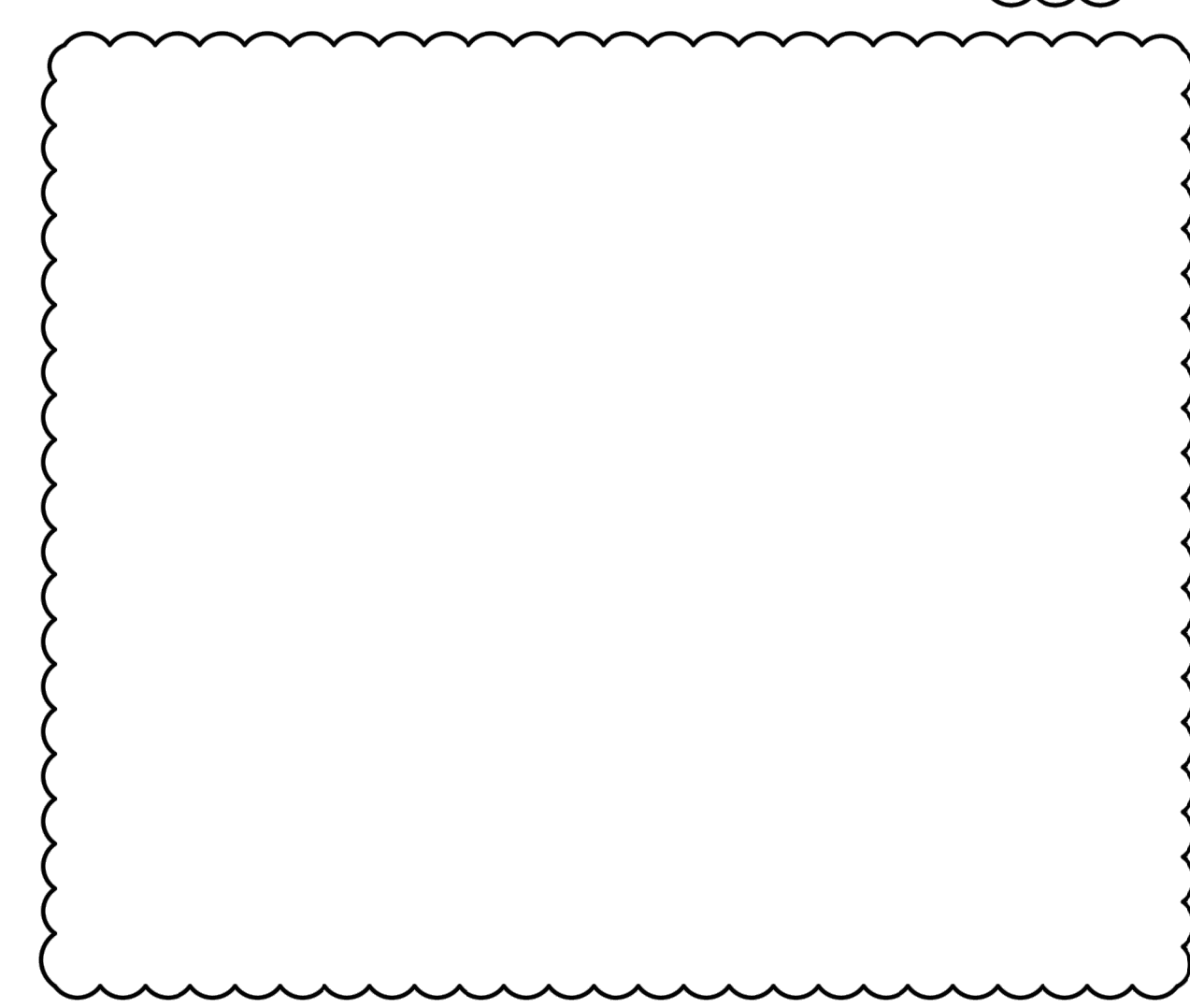
1 CONDUIT PENETRATION THRU NEW WALL  
 SCALE: 3" = 1'-0"

2 GROUNDING TAP  
 SCALE: 1" = 1'-0"

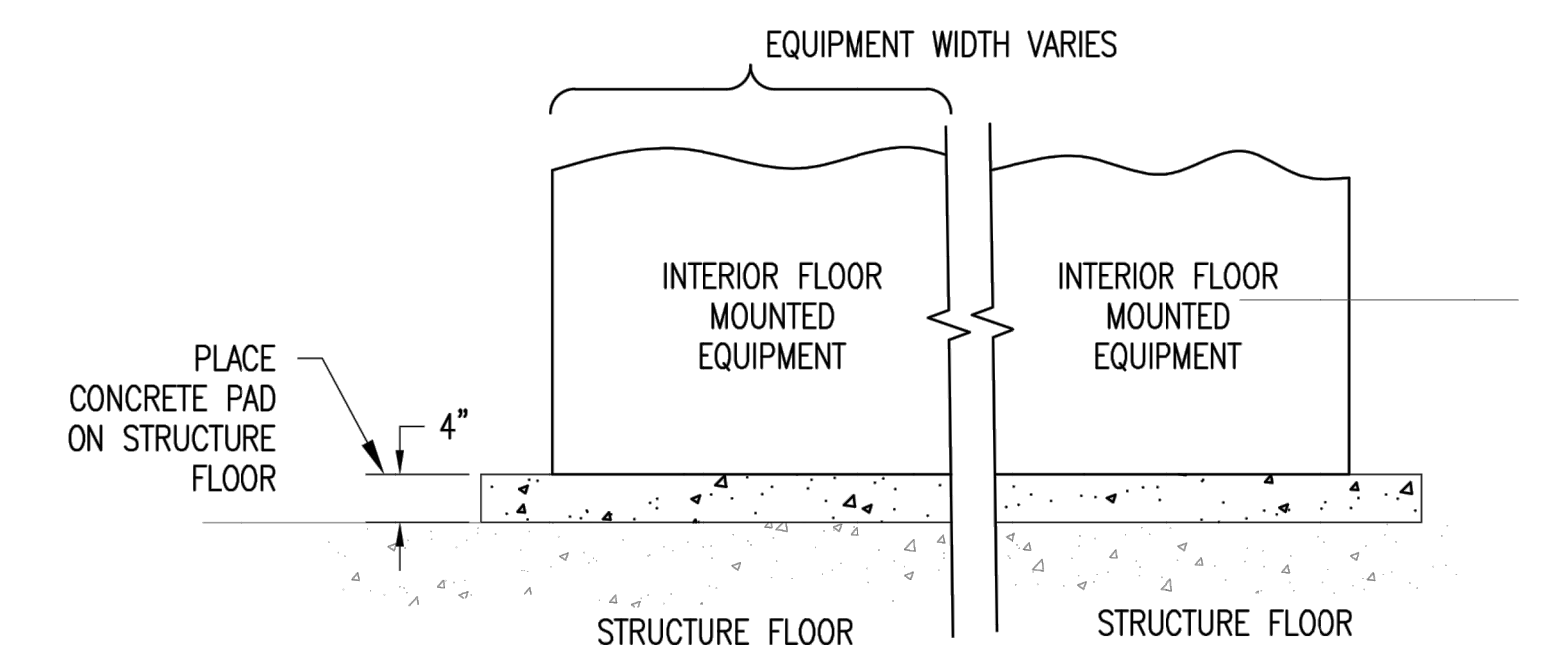
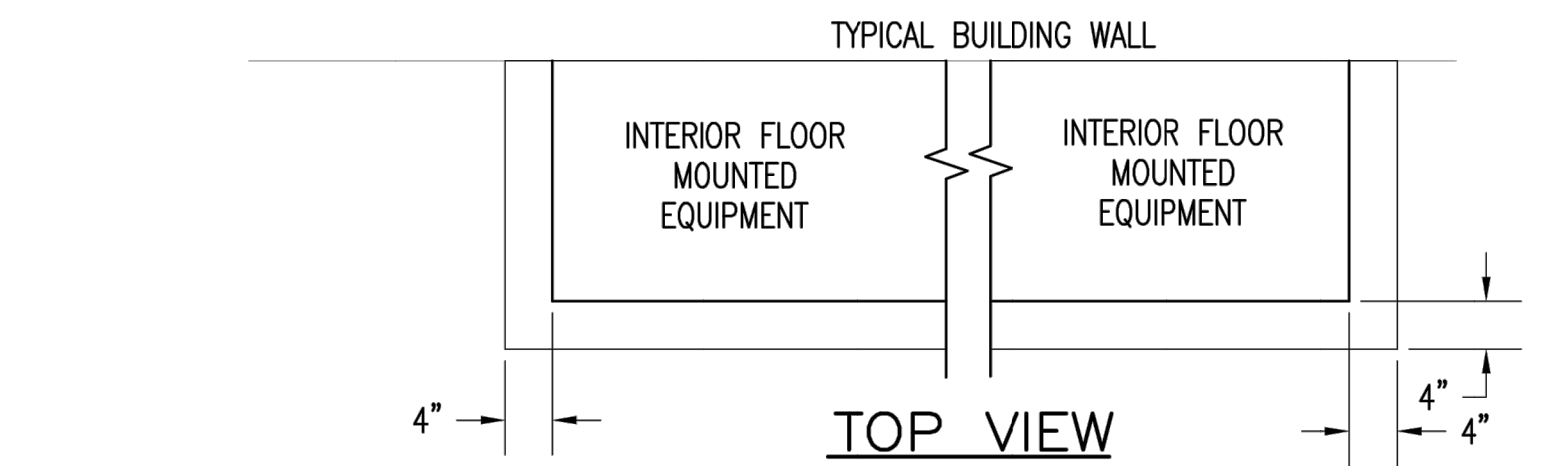
3 GROUND ROD CONNECTION  
 SCALE: 6" = 1'-0"



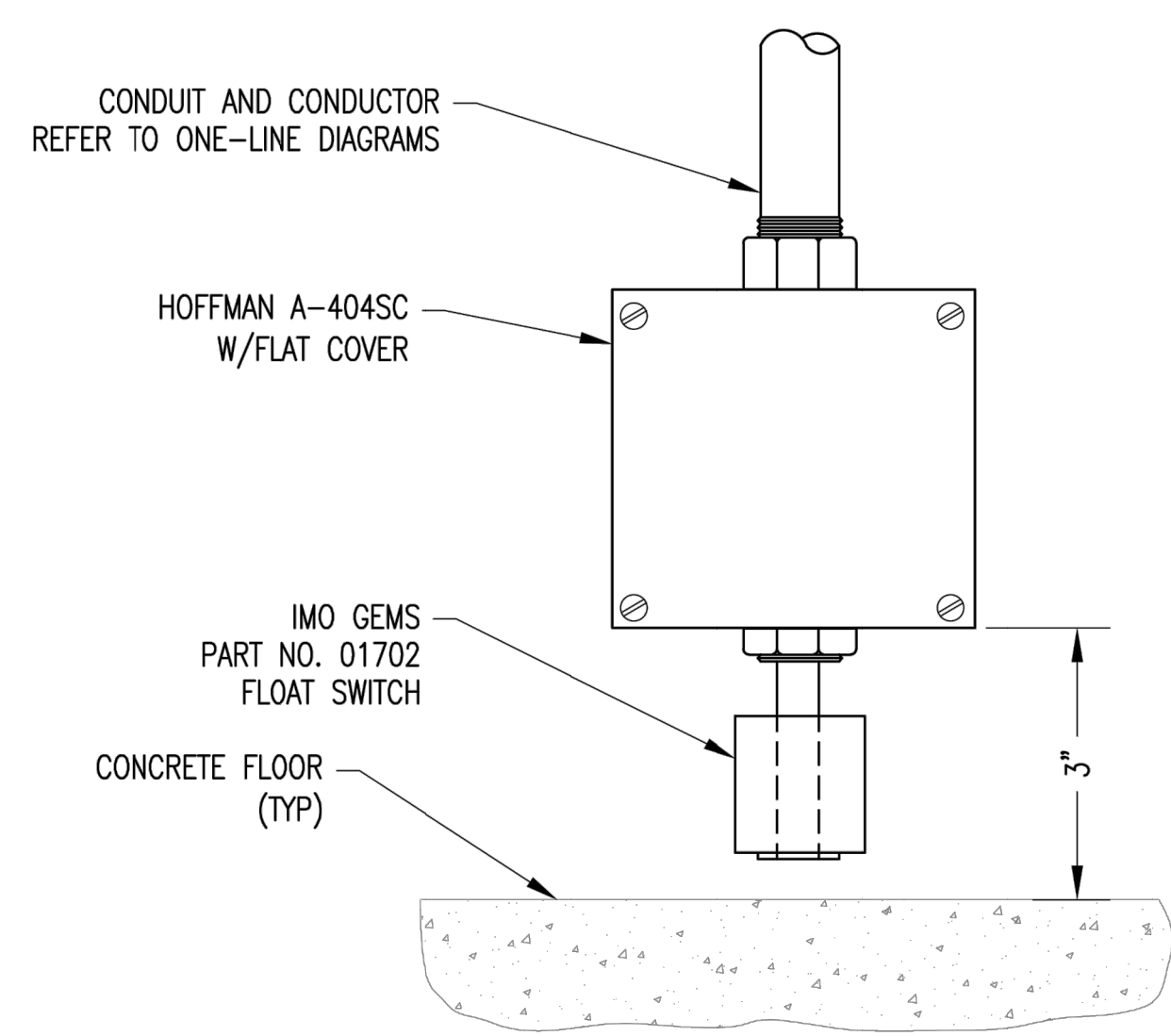
4 CONDUIT PENETRATION THRU EXISTING WALL  
 SCALE: 3" = 1'-0"



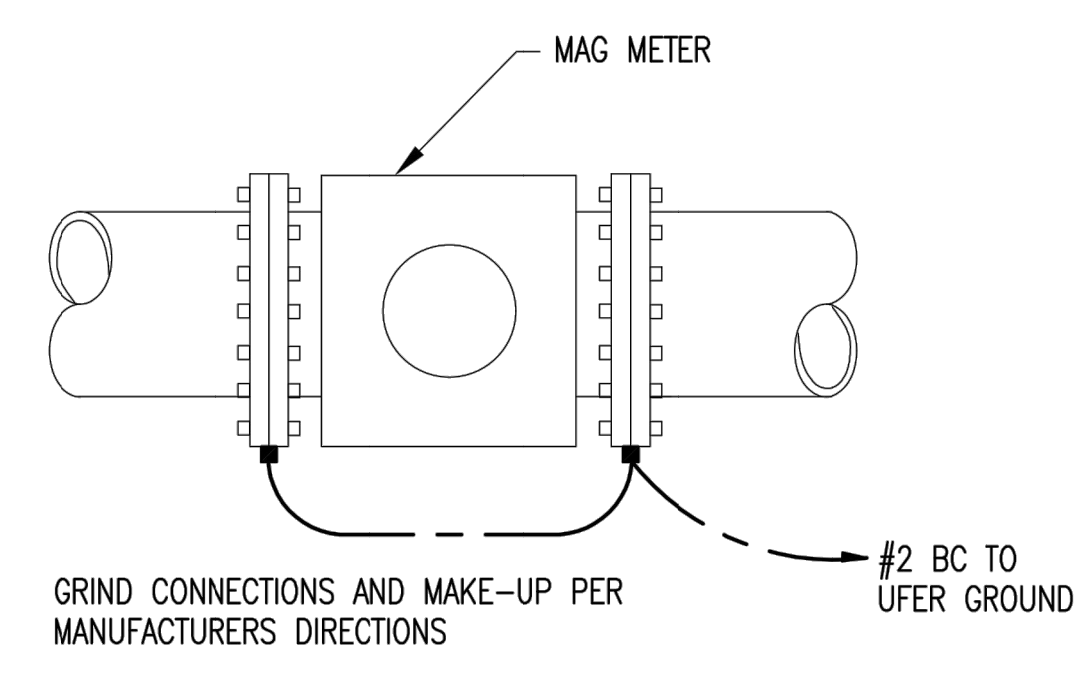
6 DOUBLE DOOR POSITION SWITCH  
 SCALE: 1" = 1'-0"



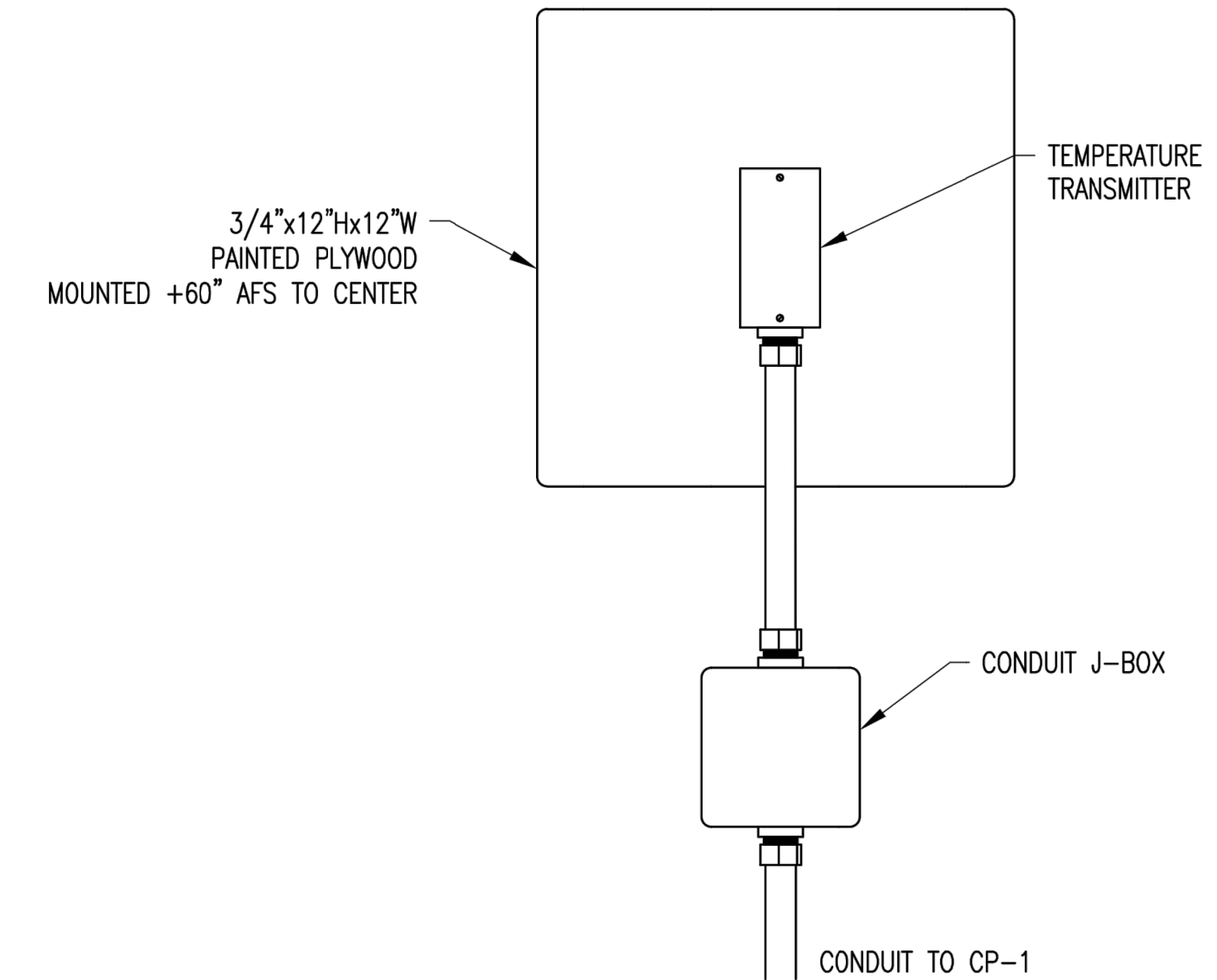
7 EQUIPMENT CONCRETE HOUSEKEEPING PAD  
 SCALE: 3/4" = 1'-0"



8 FLOOR FLOOD SWITCH  
 SCALE: 6" = 1'-0"



9 TYPICAL MAG METER GROUNDING  
 SCALE: 1 1/2" = 1'-0"



10 TEMPERATURE TRANSMITTER  
 SCALE: 3" = 1'-0"

File Path: M:\20.081 - Cornish Pitcher Well\Drawings\E-602.dwg Aug 05, 2022 - 8:16am

NO.	DATE	DESCRIPTION
1	8/5/2022	ADDENDUM NO. 1

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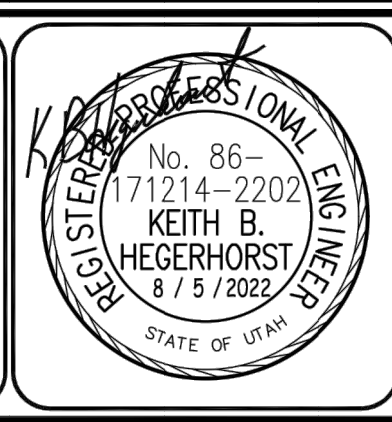
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 PROJECT MANAGER: M. CHANDLER, PE, PG. CFM.  
 CHECKED BY: C. HATCH  
 DRAWN BY: GILLIAN SORENSON  
 DESIGNED BY: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

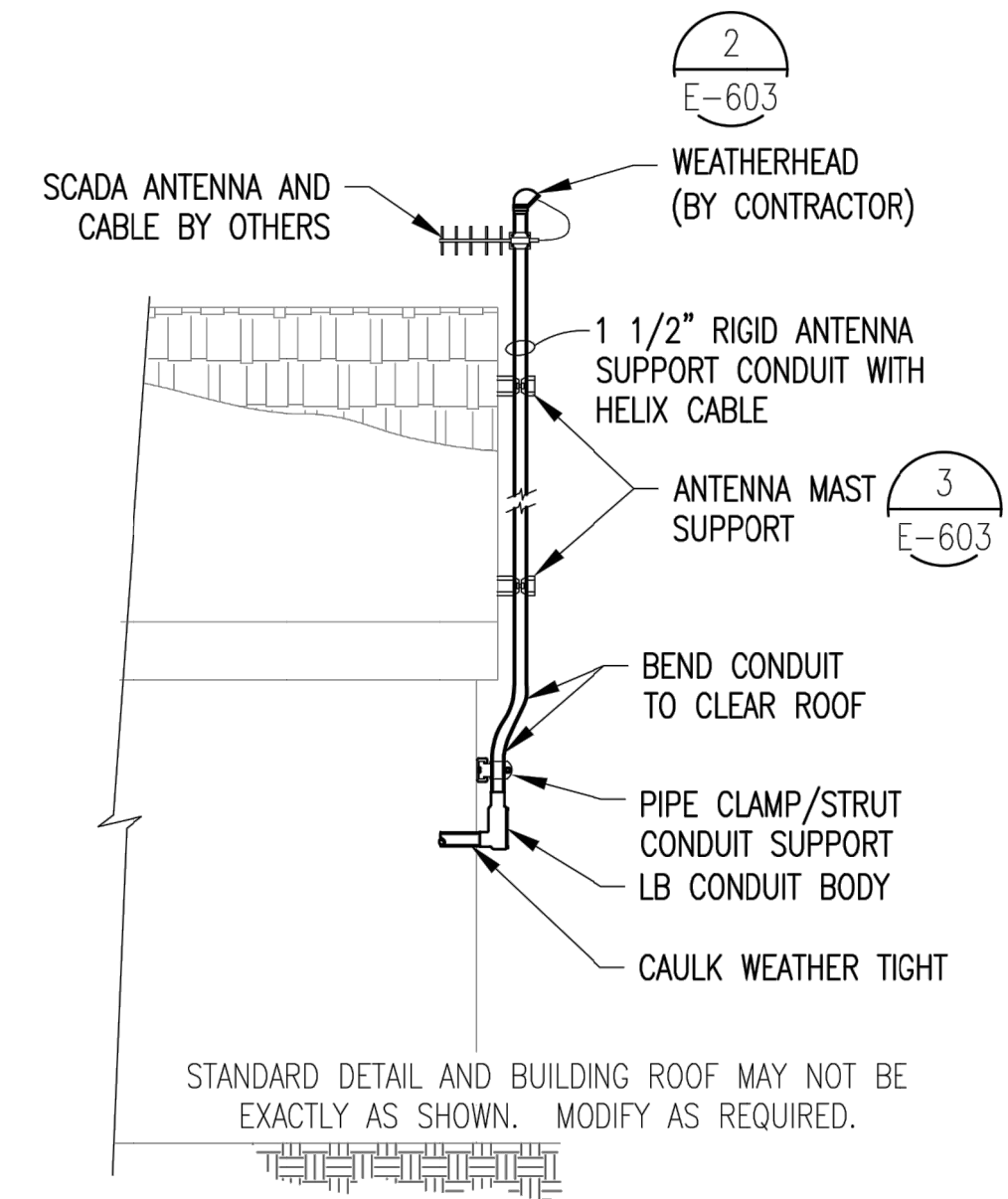
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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 ELECTRICAL DETAILS SHT. 2

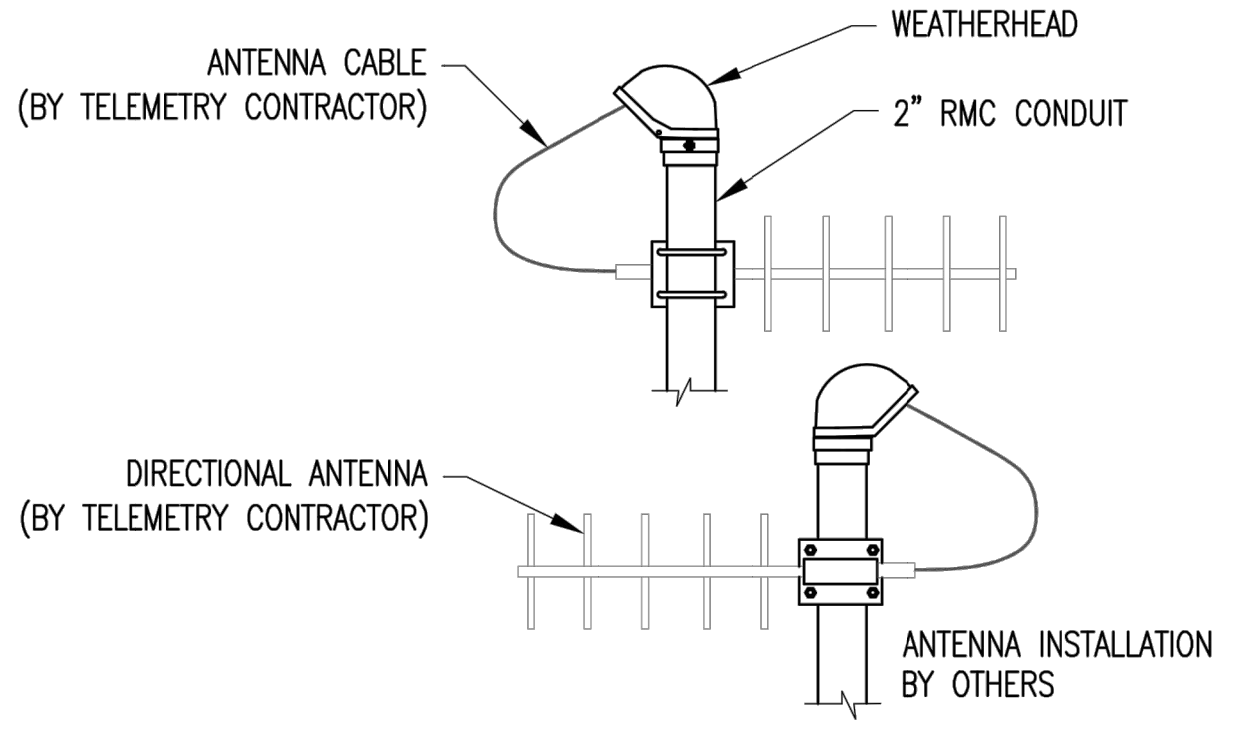
12200 NORTH 5600 WEST  
 CORNISH, UT 84308



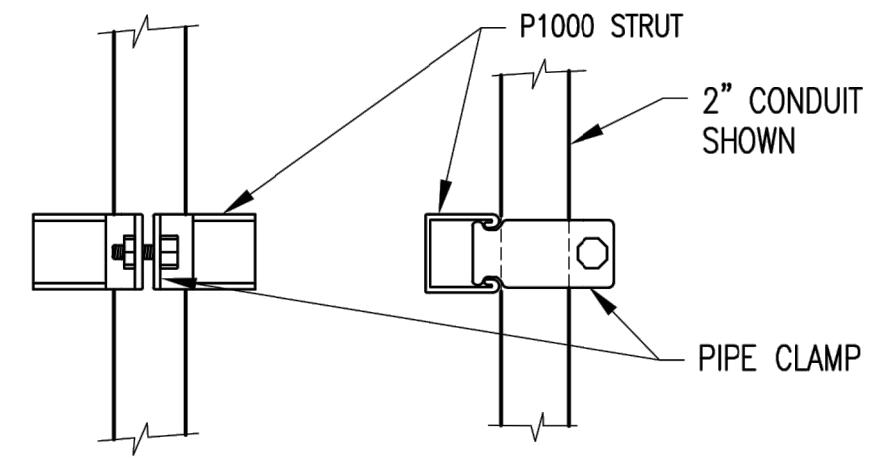
PROJECT NUMBER	2019-0180
SHEET	41 OF 43
SHEET NUMBER	E-602



**1 SCADA ANTENNA SUPPORT INSTALLATION**  
 SCALE: 1/2" = 1'-0"



**2 SUPPORT WEATHERHEAD**  
 SCALE: 1 1/2" = 1'-0"

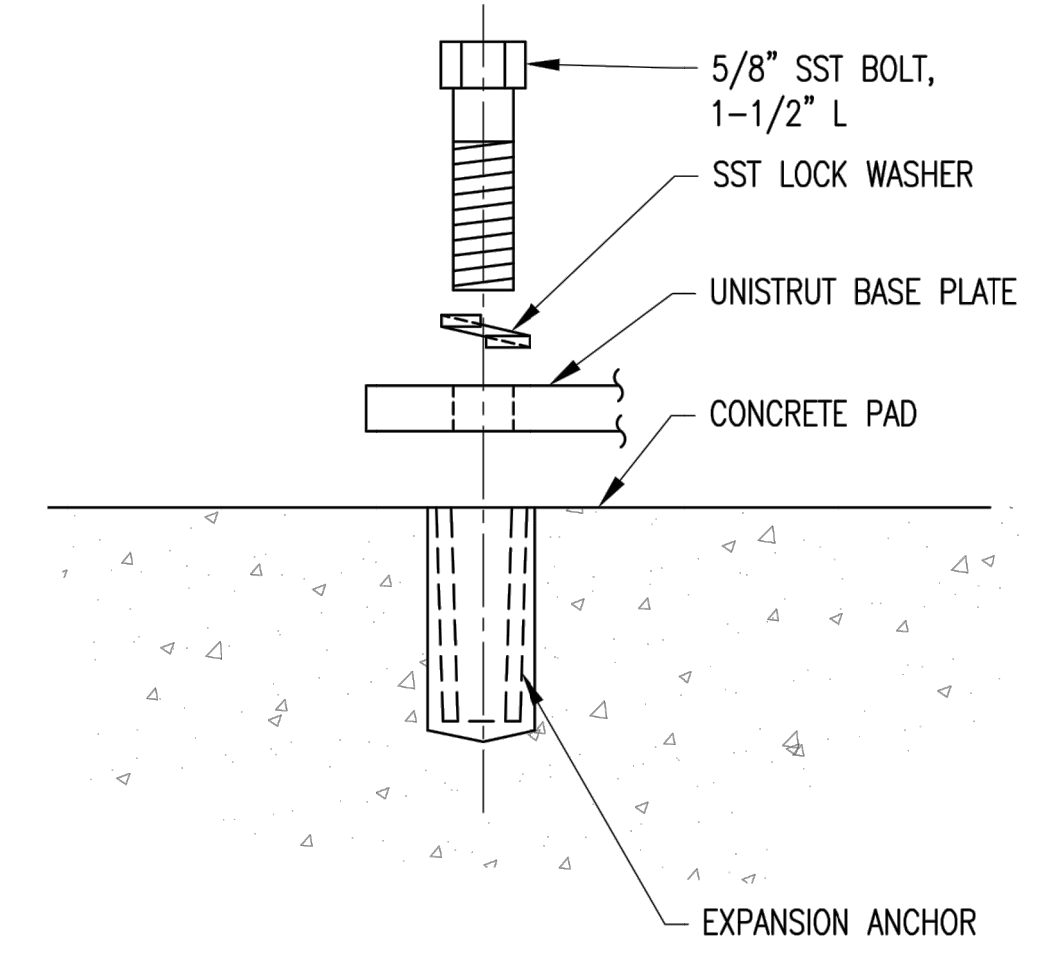


**CONDUIT PIPE CLAMPS\***

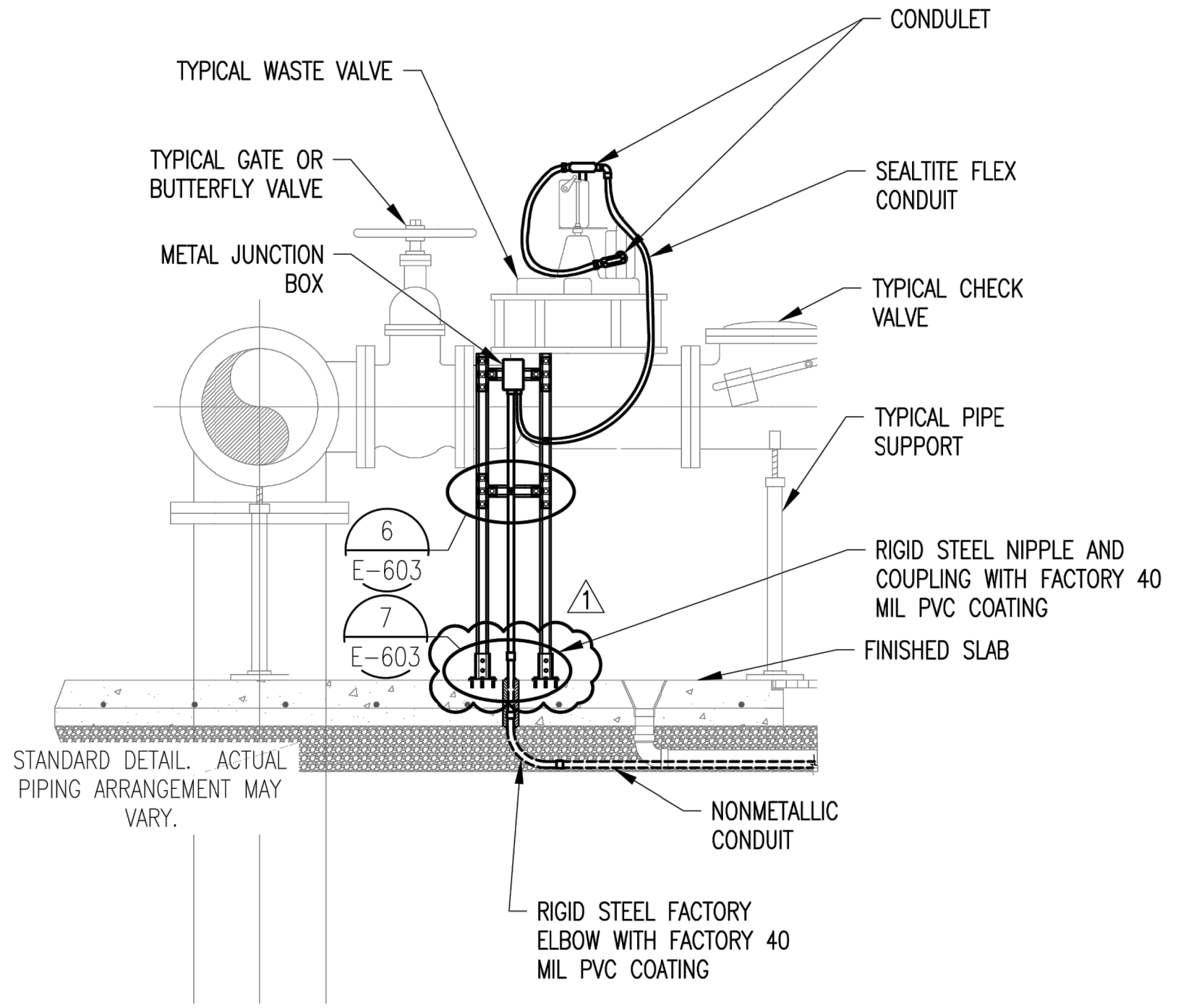
SIZE	EMT	RGS	EMT/RGS
1/2"	P1426	P1111	-
3/4"	P1427	P1112	P1212
1"	P1428	P1113	P1213
1-1/4"	P1429	P1114	P1214
1-1/2"	P1430	P1115	P1215
2"	P1431	P1117	P1217
2-1/2"	P1118	P1118	-
3"	P1119	P1119	-
3-1/2"	P1120	P1120	-
4"	P1121	P1121	-

\* = SUPPLIED WITH SLOTTED HEAD SCREW AND NUT

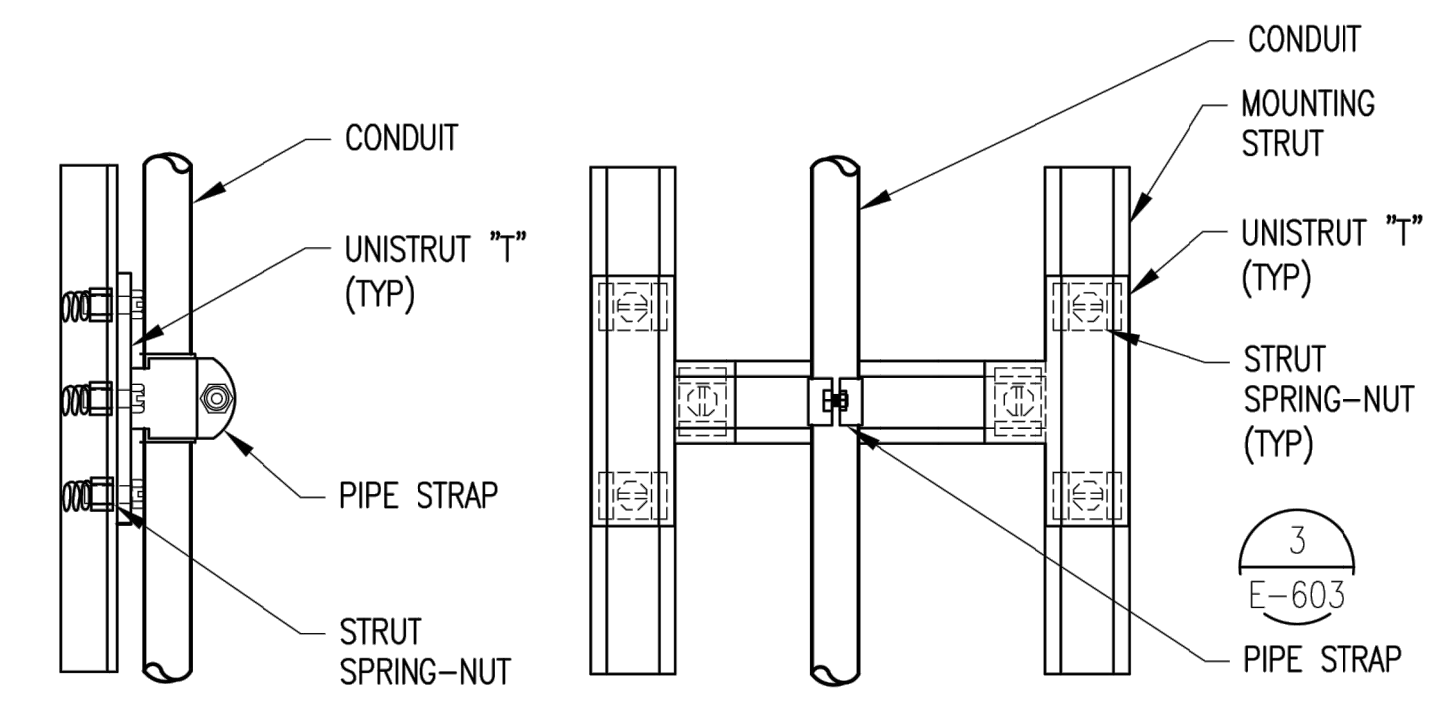
**3 CONDUIT SUPPORT CLAMP**  
 SCALE: 3" = 1'-0"



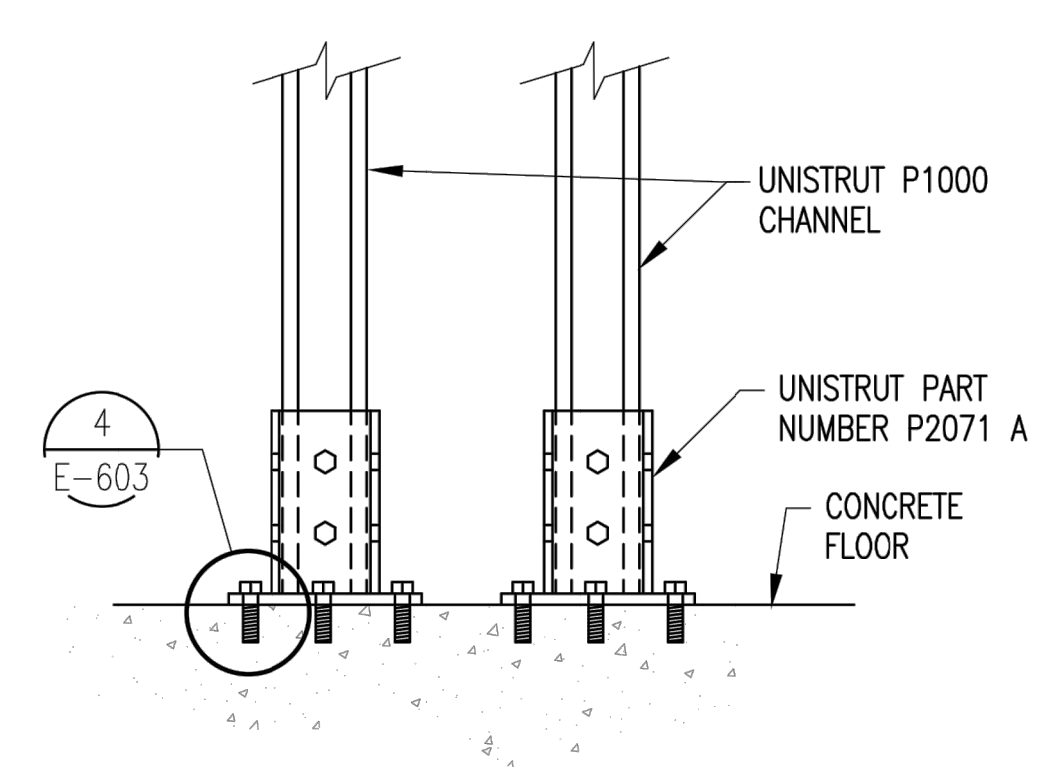
**4 BASE ANCHOR DETAIL**  
 SCALE: 6" = 1'-0"



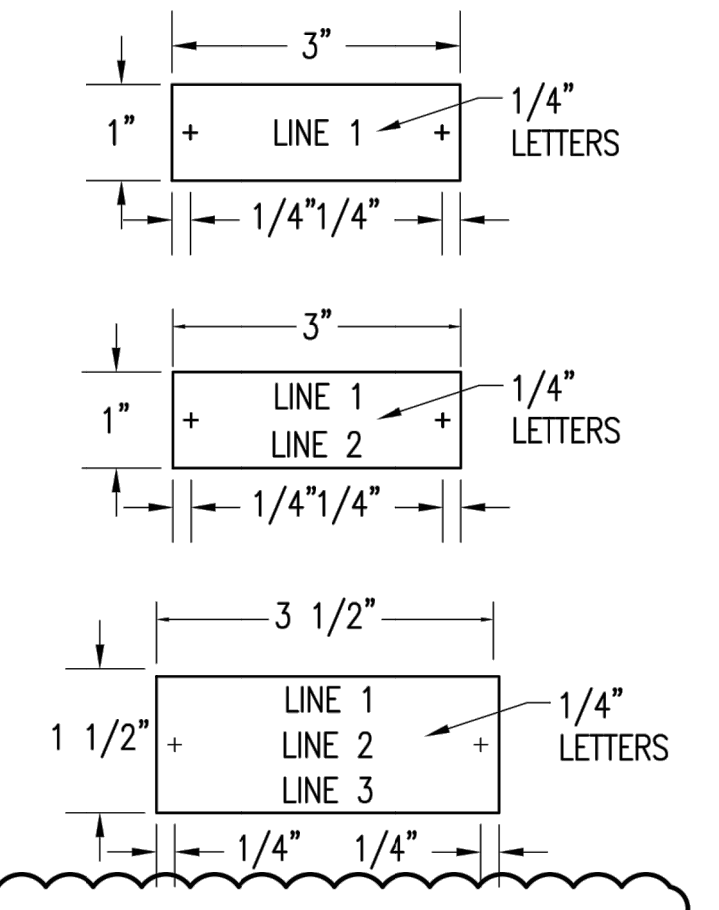
**5 CONDUIT SUPPORT DETAIL**  
 SCALE: 3/4" = 1'-0"



**6 CONDUIT SUPPORT BRACKET**  
 SCALE: 3" = 1'-0"



**7 SUPPORT BASE**  
 SCALE: 3" = 1'-0"



**8 NAMEPLATE DETAIL**  
 SCALE: 6" = 1'-0"

File Path: M:\20.081 - Cornish Pitcher Well Drawings\E-603.dwg Aug 05, 2022 - 8:16am

RECORD OF REVISIONS

NO.	DATE	DESCRIPTION
1	8/5/2022	ADDENDUM NO. 1

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 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JULY 8, 2022

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CORNISH TOWN CORP  
 PITCHER WELL HOUSE  
 ELECTRICAL DETAILS SH. 3

12200 NORTH 5800 WEST  
 CORNISH, UT 84308

PROJECT NUMBER: 2019-0180  
 SHEET: 42 OF 43  
 SHEET NUMBER: E-603

REGISTERED PROFESSIONAL ENGINEER  
 No. 86-171214-2202  
 KEITH B. HEGERHORST  
 8 / 5 / 2022  
 STATE OF UTAH