



**DOCUMENT 00 90 01
ADDENDUM #3**

Project: Provo City Airport Pump Station PROVOENG202320542

Date: Friday, December 2, 2022
Bid Date: Thursday, December 15, 2022
Bid Time: 10:00 a.m.

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 00 43 00 – Bid Schedule

Delete and replace this section with the version attached. APCO Inc. will provide the CP-1 Main control panel and associated programming and engineering labor.

Section 11 31 00 – Open Screw Pump Equipment

Paragraph 2.01.A – Add the following language at the end of the sentence of Paragraph 2.01.A:

The screw pump assemblies shall include all necessary equipment and appurtenances as manufactured by Lakeside Equipment Corporation of Bartlett, Illinois, **Epic International, Inc of Ashland, Virginia**, or equal.

Project Drawings

Sheet E301

Delete and replace this sheet. Changes to the Power One-Line Diagram, Instrumentation and Control One-Line Diagram, and Table CP2. Added General Note #2. Changed Sheet Keynote #4.

Sheet E304

Delete and replace this sheet. Changes to the RVSS controls. Changed Sheet Keynote #2. Fixed General Note #2.

Sheet E401

Delete and replace this sheet. Added more information the electrical conduit and power from Provo shown in Sheet Keynote #1.

Sheet E402

Delete and replace this sheet. Add electrical conduit to be sent to CP-2. Electrical conduits from Main Service Disconnect and Utility Meter.

Attachments:

1. Section 00 43 00 – Bid Schedule
2. Section 11 31 00 – Open Screw Pump Equipment
3. Sheets E301, E304, E401, E402

END OF ADDENDUM

DOCUMENT 00 43 00
BID SCHEDULE

PART 1 GENERAL

1.1 DOCUMENT INCLUDES

- A. Price schedules.
- B. Measurement and payment provisions.

1.2 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as Project.

1.3 REFERENCES

- A. APWA 01 29 00: Payment Procedures.
- B. Document 00 52 00: Agreement.

1.4 SCHEDULES TO BE ADDED TO THE AGREEMENT

- A. This document will be added to the Agreement by reference.

PART 2 PRICE SCHEDULES

SCHEDULE A - BASE BID

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1.01	Mobilization	LS	1	\$	\$
1.02	Survey	LS	1	\$	\$
1.03	Erosion Control	LS	1	\$	\$
1.04	Clearing and grubbing	LS	1	\$	\$
1.05	Earthwork Excavation and disposal	CY	7,405	\$	\$
1.06	Earthwork Fill and processing	CY	750	\$	\$
1.07	Install 24" RCP	LF	315	\$	\$
1.08	Pump Station and Appurtenances	LS	1	\$	\$
1.09	Install Screw Pumps and Components	LS	1	\$	\$
1.10	Concrete (Basin Floor, Access Road, and Weir)	SY	2,275	\$	\$
1.11	9" Riprap	CY	80	\$	\$
1.12	Fencing and Gate	LF	1,001	\$	\$
1.13	Install Sump Pump	LS	1	\$	\$
1.14	Install 18" RCP	LF	44	\$	\$
1.15	Install Headgate Structure	LS	1	\$	\$
1.16	Install Pump Station Electrical	LS	1	\$	\$
1.17	<u>Install Electrical Line In Levee</u>	LS	1	\$	\$
1.18	<u>APCO Programming</u>	LS	1	\$ 69,269	\$ 69,269
Total of All Unit Price Base Bid Items					\$
Total Unit Price Base Bid (in words): _____					

PART 3 MEASUREMENT AND PAYMENT

3.1 GENERAL

- A. Units of measurement are listed above in the price schedule(s).
- B. See measurement and payment procedures in APWA Section 01 29 00.
- C. ENGINEER will take all measurements and compute all quantities.
- D. CONTRACTOR will verify ENGINEER's measurements and computations.
- E. CONTRACTOR will provide all equipment, workers, and survey crews to assist ENGINEER in making measurements.
- F. Frames and covers damaged by CONTRACTOR will be replaced at no additional cost to OWNER.
- G. If ENGINEER determines an existing frame or cover needs to be replaced, a new frame or cover will be either provided by OWNER or CONTRACTOR. A frame and cover supplied by CONTRACTOR will be paid for by using prices agreed to in a Change Order.
- H. CONTRACTOR responsible for the preservation of neighboring facilities not being demolished, if damage occurs during construction proper restoration of all damage is required at no additional cost. All are included in the Bid Item.
- I. Description of Bid Items: The work generally consists of the following, which are numbered according to the bid schedule found in Part 2 of Section 00 43 00 – Bid Schedule

1. Mobilization

Measurement: Lump sum.

Payment: Includes mobilization, demobilization, installation of temporary facilities, construction fencing, all bonds, insurances, permits and fees, traffic control, public outreach, coordination, quality control and testing of materials, preparation of project schedule, project identification sign, final cleanup and project closeout, and all other items not specifically called for in any other Bid item or called for in the plans and specifications or is customary, incidental or appurtenant to performance of a complete project. Payments will be made on according to the following schedule:

Percent of Original Contract Amount Earned	Percent of Mobilization to be Paid
5%	40%
15%	20%
40%	30%
50%	10%

2. Survey

Measurement: Lump sum.

Payment: Includes all surveying activities necessary to control the many phases of work required to construct a project to the lines and grades shown, specified, or established. Includes making all supporting computations and field notes required for control of the work and as necessary to establish the exact position, orientation, and elevation of the work from control stations including furnishing and setting construction stakes and marks, reference marks, and additional control stations.

3. Erosion Control

Measurement: Lump sum.

Payment: Costs associated with all labor, materials and equipment required to implement the storm water pollution prevention plan as identified in the project drawings throughout the duration of the project. Cost shall also include the submittal and permit costs associated with obtaining a storm water permit for general construction activities from the Utah Department of Environmental Quality, as well as installation and maintenance of BMPs including silt fences, gravel wattles, inlet barriers, construction exit and concrete washout.

For purposes of payment, Erosion Control shall be paid for on a complete basis as summarized in the following table.

Partial Payment	Percent of Amount Paid	When Paid
1 st	30%	With 1 st Pay Request
2 nd	30% (up to 60% total)	When contract is at least 60% complete
3 rd	40% (up to 100% total)	When contract is at least 95% complete

4. Clearing and Grubbing

Measurement: Lump sum.

Payment: This work consists of clearing, grubbing, removing, and disposing of vegetation, debris, and other objects within the construction limits except for vegetation and objects that are designated to be preserved, protected, or removed in accordance with the requirements of other provisions of these specifications.

5. Earthwork Excavation and Disposal

Measurement: Cubic Yards.

Payment: Quantities will be rounded to the nearest cubic yard. This item includes all excavation at the site including all excavation, grading, and smoothing, as shown in the drawings and hauling excess cut material and properly disposing of said material at an offsite location. Of the total excavation quantity of 8,155 cubic yards, it is estimated that 7,405 cubic yards will be disposed of offsite and 750 cubic yards will

remain onsite as fill material (part of Bid Item No. 6).

6. Earthwork Fill and Processing

Measurement: Cubic Yards.

Payment: Includes all fill placement at the site including all placement grading, smoothing, processing, filtering, scarifying the existing ground surface prior to placement and ensuring a solid contact and connection between each lift, and placement of fill. Provide testing results of each lift to the Owner and Engineer.

7. Install 24" RCP

Measurement: Linear Feet.

Payment: This item includes all excavation, dewatering of trench, stabilization, furnishing and installing pipe, approved bedding, installation of reinforced concrete cradle beneath embankment, backfill, and compaction, restoration of disturbed areas to equal or better condition, and compaction testing. Payment will be made on the actual linear feet of 24" RCP installed, for work complete and in place in accordance with the project plans and specifications.

8. Install Pump Station and Appurtenances

Measurement: Lump sum.

Payment: Includes all materials, transportation, equipment, labor and other items required for the completion of the work including placing and compacting engineered fill, construction of footings, foundations, walls, floors, bays, basins, pedestals, grating, etc. of the pump station building in accordance with the plans and specifications.

9. Install Screw Pumps and Appurtenances

Measurement: Lump sum.

Payment: Includes furnishing and installing spiral screws, lower bearing assemblies, upper bearing assemblies, drive assemblies, belts and sheaves, motors, flexible couplings, deflection plates, automatic lubrication systems, grouting materials, anchor bolts, shop surface preparation, painting, and all appurtenances pertaining to the manufacturer's instructions and installation requirements in accordance with the plans and specifications.

10. Concrete (Basin Floor, Access Road, and Weir)

Measurement: Square Yards.

Payment: Includes all construction, compaction, and placement of base course, forms, rebar, and concrete work on the access road in accordance with the plans and specifications.

11. Install 9" Riprap

Measurement: Cubic Yards.

Payment: Includes all labor, materials, transportation, placement, compaction, and other items associated with the construction of the channel, chute, and spillway riprap in the locations shown on the plans and in accordance with the details and cross sections: Payment covers production, shipment, quality control testing and verification of riprap requirements. Payment also covers placement, shaping, and grading of rip rap to the designated thickness and depth to approved final grade.

12. Fencing and Gate

Measurement: Linear Feet.

Payment: Includes excavating or drilling post holes, drilling and installing for bolts/anchors, mounting bracket plates, epoxy, hardware, fence posts, caps, placing concrete to anchor posts, rails, tension bars for fencing and gates.

13. Install Sump Pump

Measurement: Lump sum.

Payment: Includes furnishing and installing submersible pump, ductile iron pipe, fittings, thrust blocks, including excavation, compaction, backfill around piping, coring, connecting, and grouting all piping in the sump basin and the pump station walls in accordance with the Drawings and Specifications.

14. Install 18" RCP

Measurement: Linear Feet.

Payment: This item includes all excavation, dewatering of trench, stabilization, furnishing and installing pipe, approved bedding, installation of reinforced concrete cradle beneath embankment, backfill, and compaction, restoration of disturbed areas to equal or better condition, compaction testing, testing. Payment will be made on the actual linear feet of 18" RCP installed, for work complete and in place in accordance with the Drawings and Specifications.

15. Install Headgate Structure

Measurement: Lump Sum.

Payment: Includes excavation, backfill and compaction, furnishing, installing, compacting structural fill, hauling and disposing of waste materials, furnishing and installing all grating, headgates, pre-cast concrete structure, coring, connecting, and grouting all piping in accordance with the Drawings and Specifications.

16. Install Pump Station Electrical

Measurement: Lump sum.

Payment: Includes all materials, transportation, equipment, labor and other items required for the completion of the work including furnishing and installing all control panels, RTU, panelboard, transformers, motor controllers, level transmitter,

conduit, lighting, electrical to pumps, service disconnects, etc., and any other appurtenances required to complete the pump station and sump pump electrical components in accordance with the Drawings and Specifications.

17. **Install Electrical Line In Levee**

Measurement: Lump sum.

Payment: Includes all materials, transportation, equipment, labor and other items required for the completion of the work including furnish and install all power conduit, electrical lines, etc., and any other appurtenances required to complete the electrical power line in the levee in accordance with the drawings and specifications.

18. ***APCO Programming***

Measurement: Lump sum.

Payment: Includes control panel design, control panel fabrication, PLC programming, OIT programming, SCADA integration and HMI programming, testing and commissioning, and any other appurtenances required to complete the electrical programming in accordance with the drawings and specifications.

END OF SECTION



**SECTION 11 31 00
OPEN SCREW PUMP EQUIPMENT**

PART 1 GENERAL

1.01 SUMMARY

A. The CONTRACTOR shall furnish, install and place in satisfactory operating condition open screw pump assemblies and appurtenances as shown on the Drawings and described in the Specifications.

B. Related Sections

1. General Conditions, Supplementary Conditions, and General Requirements sections apply to work of this Section.

1.02 REFERENCES

- A. American Institute of Steel Construction (AISC)
- B. American Society of Testing and Materials (ASTM)
- C. American Society of Civil Engineers (ASCE)
- D. American Welding Society (AWS)
- E. Steel Structures Painting Council (SSPC)

1.03 SYSTEM DESCRIPTION

A. Each screw pump shall be furnished complete with spiral steel flighted screw, upper and lower stub shafts, upper and lower support bearings, flow deflection plates, parallel-shaft gear reducer, flexible coupling, V-belts and sheaves, drive motor, automatic lower bearing lubrication system, and all necessary anchorage parts.

B. Design parameters for each unit:

1. Number of Pumps	2
2. Pump Capacity, gal/min	11,222
3. Lift, feet	21
4. Pump Diameter, inches	80
5. Number of Flights	3
6. Flight Thickness, inches	0.3125
7. Torque Tube Diameter, inches	36
8. Torque Tube Wall Thickness, inches	0.5
9. Maximum Rotational Speed, rev/min	31
10. Minimum Gear Reducer Torque Rating, inch-lb	294,184
11. Motor Size, hp	100



1.04 SUBMITTALS

- A. Unless named in the specifications, all equipment manufacturers who intend to bid on the Section 11310 equipment shall submit to the ENGINEER not less than fourteen (14) days prior to the bid date a complete pre-qualification package. The pre-qualification package shall include but not be limited to the following:
1. List of twenty (20) U.S. installations of similar type equipment comparable to the units specified.
 2. The term "installations" shall mean individual projects/contracts. Multiple equipment units for a project will be considered as one (1) installation toward meeting the experience requirements. Installations shall be only those in the United States (fifty states). The installation shall include, but not be limited to, the following:
 - a. Name and location of installation.
 - b. Name of person in direct responsible charge for the equipment.
 - c. Address and phone number of person in direct responsible charge.
 - d. Month and year the equipment was placed in operation.
 - e. Brief description of equipment.
 3. A complete set of drawings, specifications, catalog cut-sheets, and detailed descriptive material. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification.
 4. Structural and mechanical screw pump computations. The computations shall clearly indicate the following design parameters:
 - a. Brake horsepower at the maximum capacity and lift.
 - b. Required reducer torque at the maximum capacity and lift.
 - c. Radial bearing load and thrust bearing load at the maximum capacity and lift.
 - d. Bearing center distance.
 - e. Maximum screw deflection at the maximum capacity and lift.

These design calculations shall be certified by the manufacturer and signed by a Professional Engineer.
 5. Detailed information shall be submitted for all items such as hardware, motors, reducers, and bearings.
 6. Vendor data shall be furnished to confirm the torque rating of the drive.
 7. List showing materials of construction of all components.
 8. Manufacturer's recommended spare parts.



9. Information on equipment field erection requirements including total weight of assembled components and weight of each sub-assembly.
10. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period, including all buy-out items.
11. Process equipment electrical requirements and schematic diagrams.
12. Complete list of deviations from the drawings and specifications.

1.05 QUALITY ASSURANCE

- A. In order to assure uniform quality, ease of maintenance and minimal parts storage, it is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single manufacturer. The equipment manufacturer shall, in addition to the CONTRACTOR, assume the responsibility for proper installation and functioning of the equipment.
- B. The Contract Documents represent the minimum acceptable standards for the screw pump equipment for this project. All equipment shall conform fully in every respect to the requirements of the respective parts and sections of the drawings and specifications. If not named, equipment which is a "standard product" with that manufacturer shall be modified, redesigned from the standard mode, and shall be furnished with special features, accessories, materials of construction or finishes as may be necessary to conform to the quality mandated by the technical and performance requirements of the specifications.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. The screw pump assemblies shall include all necessary equipment and appurtenances as manufactured by Lakeside Equipment Corporation of Bartlett, Illinois, **Epic International, Inc of Ashland, Virginia**, or equal.

2.02 SPIRAL SCREW

- A. Spiral screw shall be fabricated of ASTM A36 steel. Each spiral screw shall have an outside diameter as noted in paragraph 1.03.B.4. with the number of flights as noted in paragraph 1.03.B.5. Flights shall be die formed and shall have a minimum thickness as noted in paragraph 1.03.B.6. Flights shall be helical shaped and continuously welded on both sides to the torque tube. There shall be no more than one flight butt weld per pitch, and all flight butt welds shall be full penetration joints.
- B. Each torque tube shall have a minimum diameter as noted in paragraph 1.03.B.7. with a minimum wall thickness as noted in paragraph 1.03.B.8. so that screw deflection shall not be greater than the bearing center distance divided by 2,000. Calculations for deflection and bearing loads shall be based on the dead weight of the screw plus the full weight of liquid being pumped. Decreased loading from buoyance effects shall not be considered in the design calculations.
- C. The torque tube shall be sealed water tight with a welded steel plate at each end. All surfaces of the end plates mating with the bolted stub shafts shall be finish machined while the pump is supported between centers in a lathe after welding to the support tube and after all flight welding is complete to assure alignment and parallelism.



- D. A solid steel upper drive shaft and lower stub shaft fitted with machine faced steel plate flange shall be fastened to the upper and lower ends of the fabricated spiral screw with ASTM A325 high-strength bolts.
- E. The screw shall be placed in a lathe and the flights shall be ground to a true radius.

2.03 LOWER BEARING ASSEMBLY

- A. The lower bearing assembly shall be a cam-type with a pressure grease lubricated bronze sleeve bearing pressed onto the shaft and shall carry the radial load of the screw. No thrust load shall be carried by the lower bearing.
- B. The bronze sleeve shall rotate with the lower stub shaft in a bearing housing containing a minimum of two (2) spring loaded lip seals at the top of the bearing assembly. The seals shall be arranged so that one seal excludes wastewater and contaminants from the bearing and the other holds the grease in the bearing. The use of less than two lip seals will not be acceptable.
- C. The bearing assembly shall permit precise angular (vertical) and lateral (horizontal) field adjustment to eliminate misalignment between the upper and lower bearings without the use of shims. Bearing assembly shall accommodate all static and operating deflections of the screw. Bearings with fixed or rigid shafts and housings shall not be acceptable.
- D. The bearing assembly shall be supplied with a split non-rotating shield installed between the housing and rotating screw for operation of the shaft and seals.
- E. The bearing assembly shall accommodate thermal expansion and contraction of the screw within the bearing housing on fully lubricated surfaces not subject to corrosion or seizure.
- F. The bottom of the bearing housing shall be fitted with an inspection plate that can be removed for inspection of the lower bearing without disassembly of the lower stub shaft or bearing housing.
- G. The use of roller or ball bearings will not be acceptable.
- H. There shall be a flow through grease system with grease entering the lower part of the housing and passing across the full face of the bearing sleeve to the upper seals, then to a grease collection container for confirmation the bottom bearing is receiving grease from the automatic lubrication system.

2.04 UPPER BEARING ASSEMBLY

- A. The upper stub shaft shall extend through a grease lubricated upper bearing assembly which shall consist of a split housing fitted with dual bearings, lower spring loaded lip seal, bearing spacer and upper spring loaded lip seal.
- B. All of the thrust load from the pump shall be carried by a spherical roller thrust-type bearing assembly and the upper screw pump radial load shall be carried by a spherical roller bearing. A single dual-purpose bearing will not be acceptable.
- C. The two bearings (radial and thrust) shall be positioned in the bearing housing so that the pressure center of the thrust bearing and radial bearing intersects the axis of the screw at the same point to provide true self-alignment in all planes.



- D. Both radial and thrust bearings shall be rated at a minimum of 100,000 hours AFBMA L10 theoretical design life, based on the dead weight of the screw plus the full weight of the liquid being pumped.
- E. Upper stub shaft shall be grooved and positively locked into the upper bearing assembly by a split collar and locking halter ring. Use of threaded nuts to lock bearings and shafts for support of thrust loading will not be acceptable.
- F. A split bearing housing shall be provided to allow removal of the cover for inspection of the bearings without removal of the stub shaft or the entire bearing assembly.

2.05 DRIVE ASSEMBLY

- A. The drive assembly shall be designed and constructed for a maximum screw rotational speed as noted in paragraph 1.03.B.9. The drive assembly shall consist of a parallel-shaft gear reducer, belts, sheaves, motor, and coupling.
- B. The gear reducer shall be a parallel-shaft, triple reduction, foot-mounted unit suitable for outdoor operation. Gear reducer sizing shall be based on the latest AGMA standards using a minimum 1.5 service factor based on the maximum torque requirements of the screw or a minimum 1.25 service factor based on motor horsepower, whichever is greater. The minimum gear reducer torque rating shall be as noted in paragraph 1.03.B.10.
- C. The gear reducer housing shall be manufactured from high quality cast iron accurately machined for perfect alignment of all shafts and gearing. The gear reducer housing shall be furnished complete with an air breather, drain plug, dipstick or oil level indicator, and an inspection cover. All casting joints shall be precision ground to ensure an oil-tight and dust-proof housing.
- D. The gearing shall be high quality allow steel, hobbed and ground for maximum accuracy. All shafts shall be supported by roller-type anti-friction bearings.
- E. The gearing and bearings shall be automatically splash or force feed lubricated. Force feed lubrication systems shall include a shaft-driven oil pump and all necessary piping integral mounted on the gear reducer. Oil cooling shall be accomplished by convection and shall not require an external cooling source.
- F. The low-speed and high-speed shafts shall be provided with spring loaded lip seals suitable for inclined mounting.
- G. A backstop shall be mounted on the high-speed shaft to prevent reverse rotation of the screw.

2.06 BELTS AND SHEAVES

- A. Power transmission from the motor to the reducer shall be by means of a set of V-belts and sheaves. Belts and sheaves shall be designed with a 1.5 service factor based on full motor horsepower.
- B. Sheaves shall be two section units for both drive and driven sheaves and shall consist of a tapered split shaft bushing with three tapped holes to which the sheave is attached by three cap screws. Changing sheaves shall not require a wheel puller.
- C. Belts and sheaves shall be covered with a fabricated steel belt guard in accordance with OSHA standards.



2.07 MOTOR

- A. Each unit shall be driven by an 1,800 rpm, 3 phase, 60 Hertz, 460 volt, horizontal, ball bearing, continuous duty, constant speed, Design B, normal starting torque, totally enclosed fan cooled foot-mounted motor with leads to gasketed conduit box for outdoor operation.
- B. Motor horsepower shall be as noted in paragraph 1.03.B.11.
- C. Motor shall be mounted on a fabricated steel plate which provides adjustment of belt slack.

2.08 FLEXIBLE COUPLING

- A. The upper stub shaft of the screw pump shall be connected to the drive assembly by a flexible coupling.
- B. Coupling shall be designed for a 1.5 service factor, based on brake horsepower and shall be keyed and bored to suit the reducer slow speed shaft and the screw pump upper stub shaft.
- C. The flexible coupling shall be covered with a removable guard in accordance with OSHA standards.

2.09 DEFLECTION PLATES

- A. A flow deflection plate shall be provided to curve around the upper section on the uptake side of the screw to deflect the liquid as the screw rotates.
- B. The flow deflection plate shall be fabricated of not less than $\frac{3}{16}$ -inch steel plate complete with stiffeners where required and galvanized steel anchors on 2-foot centers at the bottom edge.
- C. The deflection plate top edge shall have adjustable galvanized steel anchors at not more than 8-foot centers.

2.10 AUTOMATIC LUBRICATION SYSTEM

- A. Each screw pump shall be furnished with a positive pressure, automatic lubrication pump and $\frac{3}{8}$ -inch minimum diameter stainless steel grease line.
- B. The automatic lubrication pump shall provide grease lubricant to the lower bearing assembly with provisions at the pump to manually charge the grease line.
- C. Each lubrication pump shall be adjustable and shall provide 6 ounces per day at the minimum setting and 17 ounces per day at the maximum setting (nominal). Grease reservoir shall hold a minimum of 11 pounds of lubricant.
- D. The lubricant pump shall consist of an eccentric piston pumping element, a check valve and shall have a one-third ($\frac{1}{3}$) horsepower, TEFC, ball bearing, 460 volt, 60 Hz, 3 phase, gear motor connected to the lubricator by a flexible coupling.
- E. A centrifugal switch shall be furnished as an integral component of the grease pump and interlocked with the screw pump drive system. When the screw pump is required to operate, the lubrication pump motor shall switch on. As the lubrication pump motor reaches full speed, the centrifugal switch shall close, energizing the screw pump drive motor. If the grease pump motor stops the centrifugal switch shall open, de-energizing the screw pump drive motor. The centrifugal switch shall be rated for not less than 3 amps at 120 VAC, resistive.



- F. The lubrication system shall be factory assembled on a steel base plate. The coupling shall have a removable metal coupling guard in accordance with OSHA standards.
- G. Grease shall be recovered in a stainless steel collection container with two (2) ¼-inch holes located 1-inch from the top of the container to allow liquid to drain out of the container.

2.11 GROUTING MATERIALS

- A. Equipment manufacturer shall furnish a radius screed for the CONTRACTOR to place the finishing grout in the trough with the screw after the unit has been installed.
- B. Equipment manufacturer shall furnish to the CONTRACTOR one (1) set of grouting sheave(s) and belts to operate the screw at a reduced speed for grouting the trough with the screw pump drive.

2.12 ANCHOR BOLTS

- A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment. Anchor bolts, hex nuts, and washers shall be galvanized steel unless noted otherwise. Anchor bolts shall be J-type embedded, or L-type embedded. Expansion-type anchors will not be acceptable.
- B. Anchor bolts shall be set by the CONTRACTOR. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

2.13 SHOP SURFACE PREPARATION AND PAINTING

- A. All fabricated carbon steel or cast iron components for submerged service shall be near-white blast cleaned per SSPC-SP10 and given a 2.5 to 3.5 mil dry film thickness coat of Tnemec Series 1 Omnithane Primer.
- B. All fabricated carbon steel or cast iron components for non-submerged service shall be commercial blast cleaned per SSPC-SP6 and given a 2.5 to 3.5 mil dry film thickness coat of Tnemec Series 1 Omnithane Primer.
- C. Electric motors, speed reducers, and other self-contained or enclosed components shall be supplied with the manufacturer's standard finish coating.
- D. Apply rust preventative compound to all machined, polished, and nonferrous surfaces which are not to be painted.

2.14 SOURCE QUALITY CONTROL

- A. All structural steel components shall be fabricated in the United States and shall conform to the requirements of the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" published by the American Institute of Steel Construction. Except where specifically indicated otherwise, all plates and structural members shall have a minimum thickness of ¼-inch.
- B. The equipment manufacturer's shop welds and welding procedures shall be in accordance with the requirements of the latest edition of ANSI/AWS D1.1 "Structural Welding Code - Steel" published by the American Welding Society.

PART 3 - EXECUTION

3.01 FIELD PREPARATION AND PAINTING

- A. Finish painting and field preparation shall be performed as specified in Section .



- B. The CONTRACTOR shall touch-up all shipping damage to the paint as soon as the equipment arrives on the job site.
- C. Prior to the assembly all stainless steel bolts and nut threads shall be coated with a non-seizing compound by the CONTRACTOR.

3.02 INSTALLATION

- A. The manufacturer shall schedule three (3) trips to the project site for start-up assistance and inspection of installed equipment for proper operation as noted in Paragraphs 3.02.B and 3.04.A.
- B. After the CONTRACTOR has installed the equipment and the units are capable of being operated, the equipment manufacture shall furnish a qualified representative for a minimum of five (5) man days (up to 60 hours) to inspect the equipment and to supervise field testing and startup for the CONTRACTOR.

3.03 OPERATOR TRAINING

- A. Provide operator training for OWNER'S personnel after the system is operational. Training shall take place while manufacturer's representative is at the job site for equipment inspection.

END OF SECTION

ELECTRICAL UTILITY INSTALLATION

UTILITY INFORMATION

UTILITY COMPANY:	PROVO CITY POWER
UTILITY COMPANY CONTACT:	
CONTACT INFORMATION: PHONE:	
WORK ORDER NUMBER:	

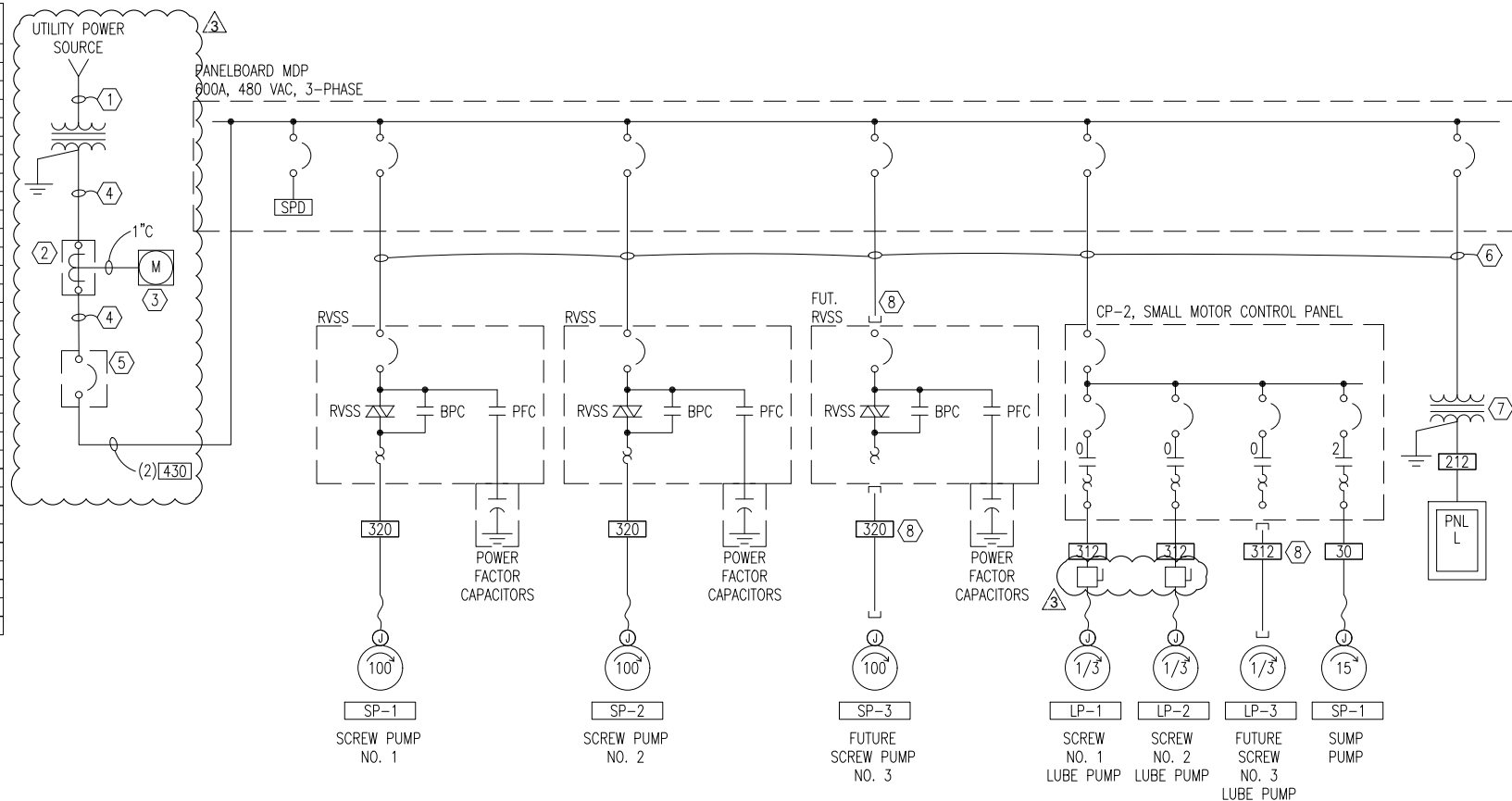
SERVICE PRIMARY	SUPPLIED BY:	INSTALLED BY:
PRIMARY TRENCHING/BACKFILL	CONTRACTOR	CONTRACTOR
PRIMARY CONDUIT	CONTRACTOR	CONTRACTOR
PRIMARY CONDUCTOR	UTILITY COMPANY	UTILITY COMPANY

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	CONTRACTOR
SECONDARY CONDUIT	CONTRACTOR	CONTRACTOR
SECONDARY CONDUCTOR	CONTRACTOR	CONTRACTOR

METERING EQUIPMENT	SUPPLIED BY:	INSTALLED BY:
METER	UTILITY COMPANY	UTILITY COMPANY
METER SOCKET	CONTRACTOR	CONTRACTOR
COMBO METER/MAIN	-	-
CURRENT TRANSFORMER ENCL.	CONTRACTOR	CONTRACTOR
MAIN SERVICE DISCONNECT	CONTRACTOR	CONTRACTOR
CT ENCL. TO METER SOCKET WIRING	UTILITY COMPANY	UTILITY COMPANY
CT ENCL. TO METER SOCKET CONDUIT	CONTRACTOR	CONTRACTOR

MAIN SERVICE DISCONNECT	SUPPLIED BY:	INSTALLED BY:
CIRCUIT BREAKER	CONTRACTOR	CONTRACTOR
FUSED DISCONNECT SWITCH	-	-



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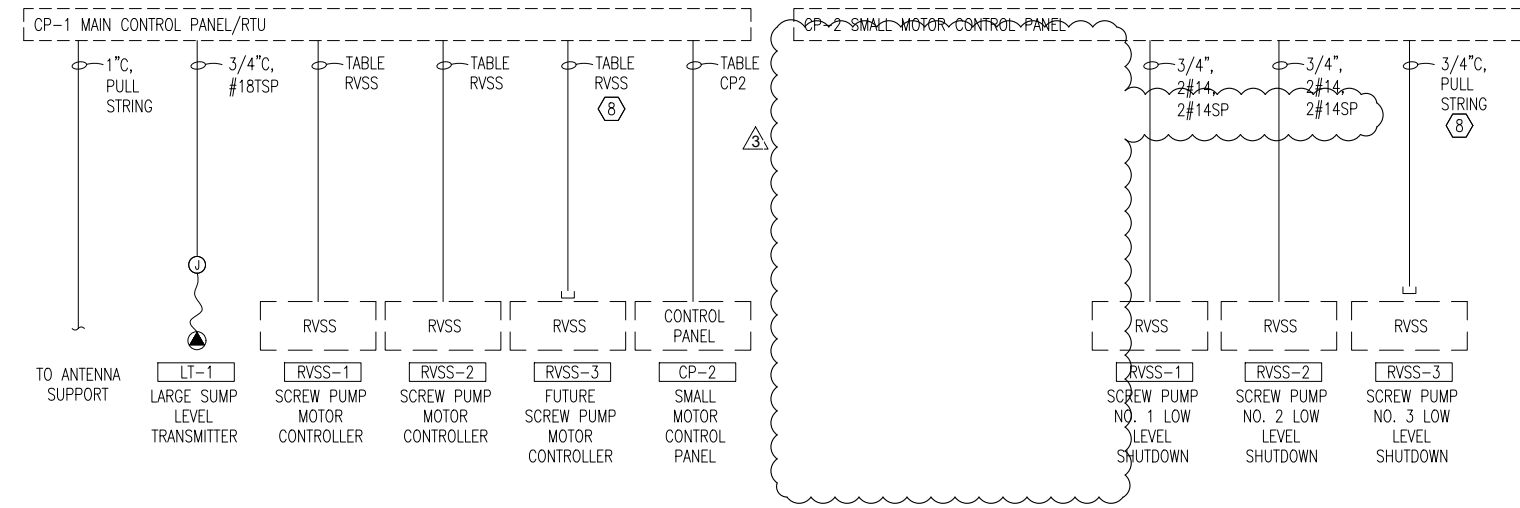
GENERAL NOTES:

- ALL ELECTRICAL ENCLOSURES INSTALLED OUTDOORS SHALL BE LOCKABLE.
- REFER TO THE UTILITY INSTALLATION TABLE FOR CONTRACTOR AND UTILITY RESPONSIBILITIES.

SHEET KEYNOTES:

- 4" C. CONDUCTORS BY UTILITY COMPANY.
- CT ENCLOSURE: 600A, 480 VAC, 3-PHASE, NEMA 3R ENCLOSURE.
- UTILITY METER SOCKET: PROVIDE AS REQUIRED BY UTILITY COMPANY.
- (2) 3" C, WITH 4-350KCMIL, #1G. CONTRACTOR SHALL INCLUDE TERMINATING CONDUCTORS ON BOTH ENDS.
- MAIN SERVICE DISCONNECT: 480 VAC, 600A, 3-PH, 4-W, LOCKABLE NEMA 3R ENCLOSURE. LABEL AS "MAIN SERVICE DISCONNECT" AND AS REQUIRED BY NEC 110.24.
- REFER TO PANELBOARD SCHEDULE FOR CIRCUIT ID, THEN REFER TO THE CONDUIT/CONDUCTOR TABLE ON E201 FOR THE WIRE AND CONDUIT REQUIREMENTS.
- TRANSFORMER L: 3 KVA, PRI: 480 VAC, SEC: 120;/240 VAC, 1-PHASE.
- INSTALL ONLY CONDUIT WITH PULL STRING. DO NOT INSTALL CONDUCTORS FOR FUTURE EQUIPMENT. PROVIDE PERMANENT CAP (NO DUCT TAPE.)
- INSTALL CONDUCTORS FOR FUTURE EQUIPMENT. LEAVE 48-INCHES INSIDE ENCLOSURE AND LABEL EACH CONDUCTOR.

1 POWER ONE-LINE DIAGRAM
 SCALE: 1" = 1'-0"



2 INSTRUMENTATION AND CONTROL ONE-LINE DIAGRAM
 SCALE: 1" = 1'-0"

TABLE CP2 (CP-1 TO CP-2)

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1" C	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	FUT. LUBE PUMP NO. 3 HOA IN AUTO
	1	#14	FUT. LUBE PUMP NO. 3 HOA IN HAND
	1	#14	FUT. LUBE PUMP NO. 3 ON
	1	#14	LUBE PUMP NO. 1 HOA IN AUTO
1" C	1	#14	LUBE PUMP NO. 1 HOA IN HAND
	1	#14	LUBE PUMP NO. 1 ON
	1	#14	LUBE PUMP NO. 2 HOA IN AUTO
	1	#14	LUBE PUMP NO. 2 HOA IN HAND
	1	#14	LUBE PUMP NO. 2 ON
	7	#14	SPARE
	3/4" C	-	-

TABLE RVSS (CP-1 TO RVSS)

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1" C	1	#14	_INPUT COMMON
	1	#14	_OUTPUT COMMON
	1	#14	SCREW PUMP HOA IN HAND
	1	#14	SCREW PUMP HOA IN AUTO
	1	#14	SCREW PUMP ON
1" C	1	#14	SCREW PUMP RVSS FAILED
	1	#14	SPARE
3/4" C	-	-	SPARE

File Path:\N\21.030 - Provo Storm Water PS Drawings\E301.dwg Nov 25, 2022 - 1:55pm

REV#	BY	DATE	DESCRIPTION
1	KBH	11/21/22	ADDENDUM # 3

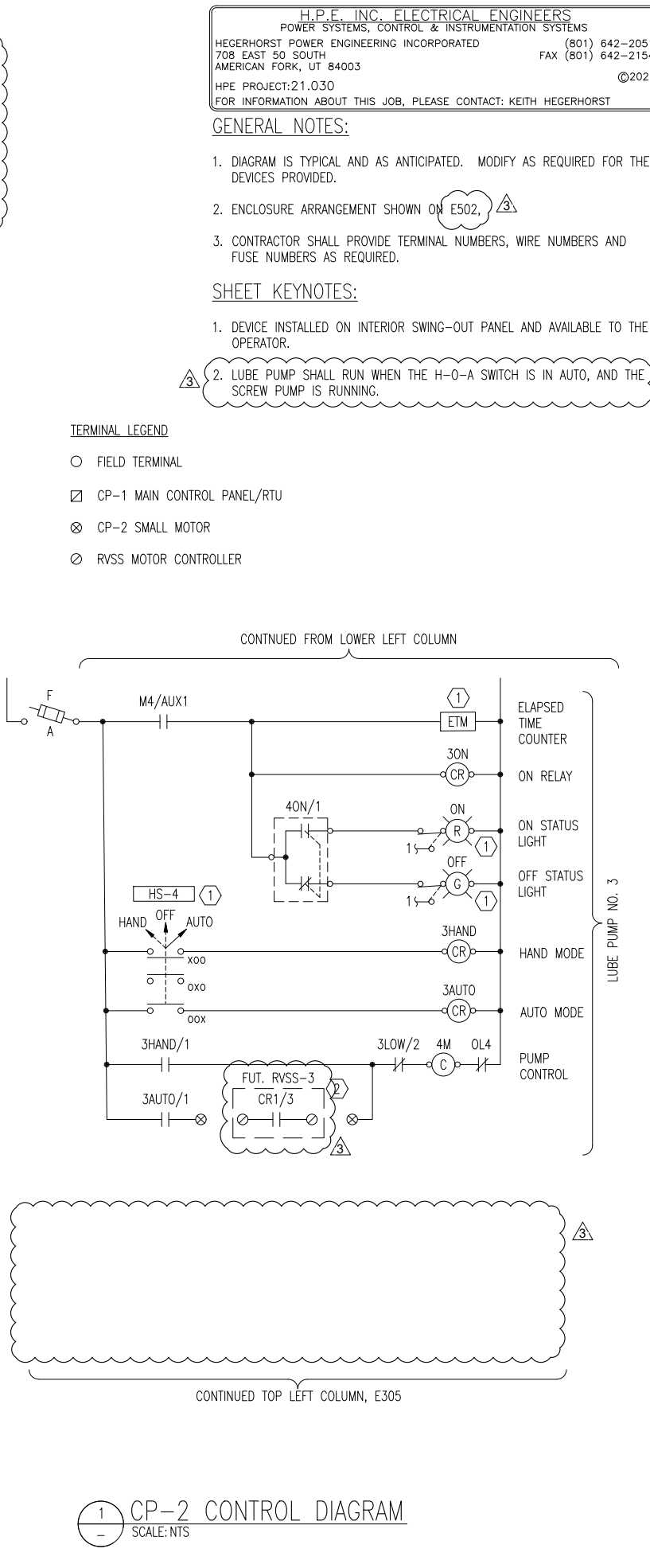
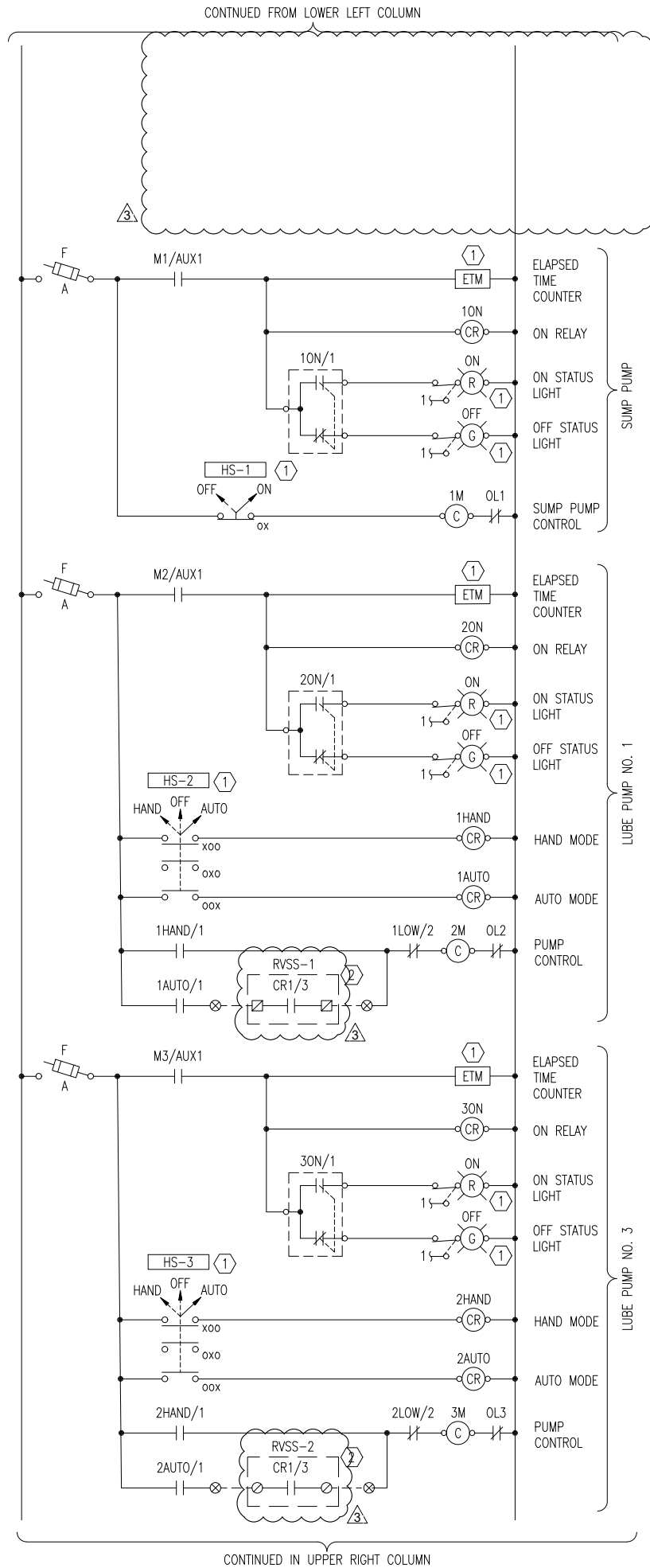
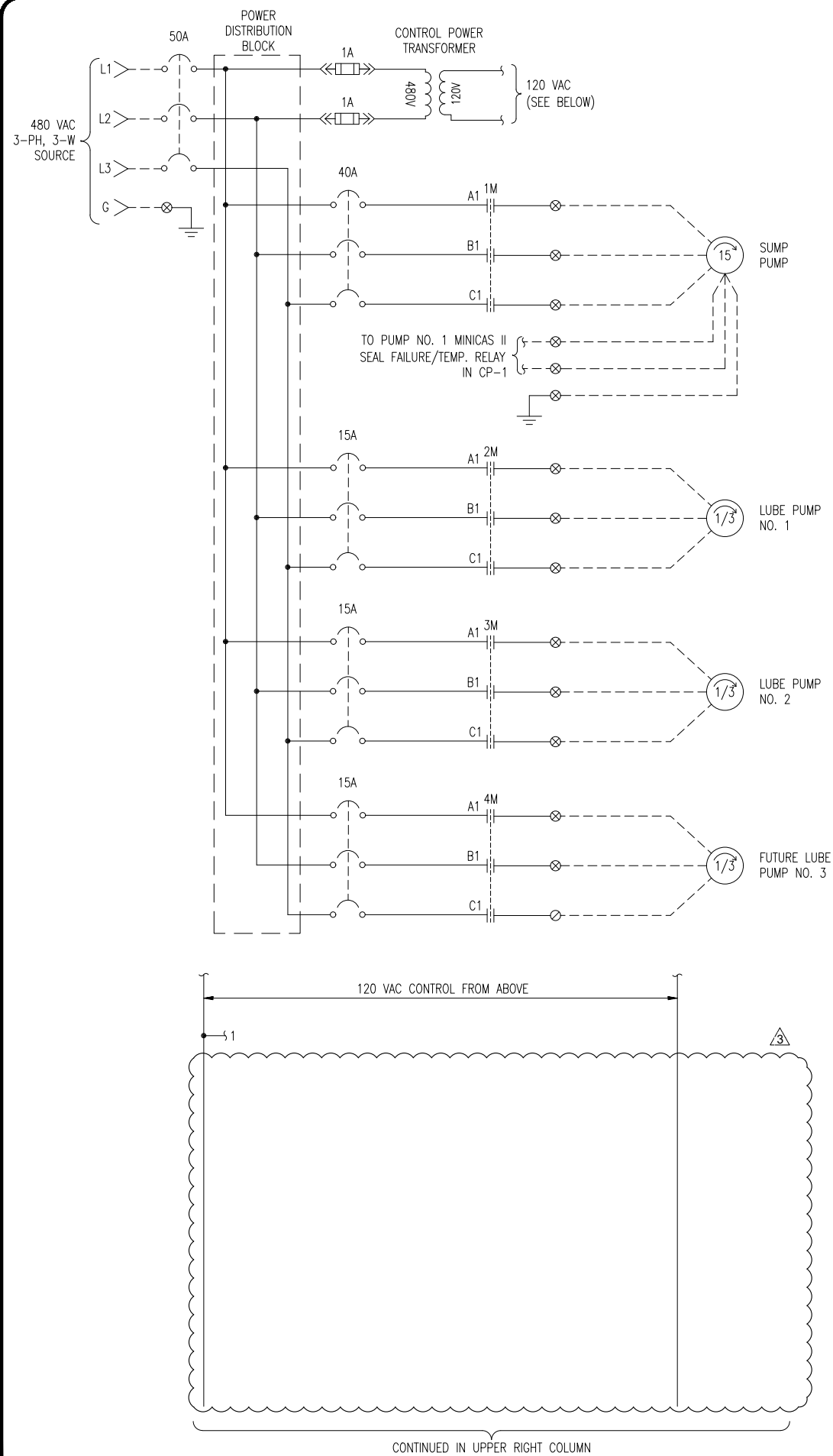


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PROVO CITY
 PROVO AIRPORT PUMP STATION
 ONE-LINE DIAGRAMS

PROJECT NUMBER: 2019-0033
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GENERAL NOTES:

1. DIAGRAM IS TYPICAL AND AS ANTICIPATED. MODIFY AS REQUIRED FOR THE DEVICES PROVIDED.
2. ENCLOSURE ARRANGEMENT SHOWN ON E502.
3. CONTRACTOR SHALL PROVIDE TERMINAL NUMBERS, WIRE NUMBERS AND FUSE NUMBERS AS REQUIRED.

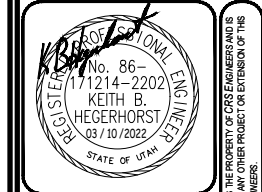
SHEET KEYNOTES:

1. DEVICE INSTALLED ON INTERIOR SWING-OUT PANEL AND AVAILABLE TO THE OPERATOR.
2. LUBE PUMP SHALL RUN WHEN THE H-O-A SWITCH IS IN AUTO, AND THE SCREW PUMP IS RUNNING.

- TERMINAL LEGEND**
- FIELD TERMINAL
 - ☒ CP-1 MAIN CONTROL PANEL/RTU
 - ⊗ CP-2 SMALL MOTOR
 - ⊙ RVSS MOTOR CONTROLLER

1 CP-2 CONTROL DIAGRAM
 SCALE: NTS

REV#	BY	DATE	DESCRIPTION
1	KBH	11/21/22	ADDENDUM # 3

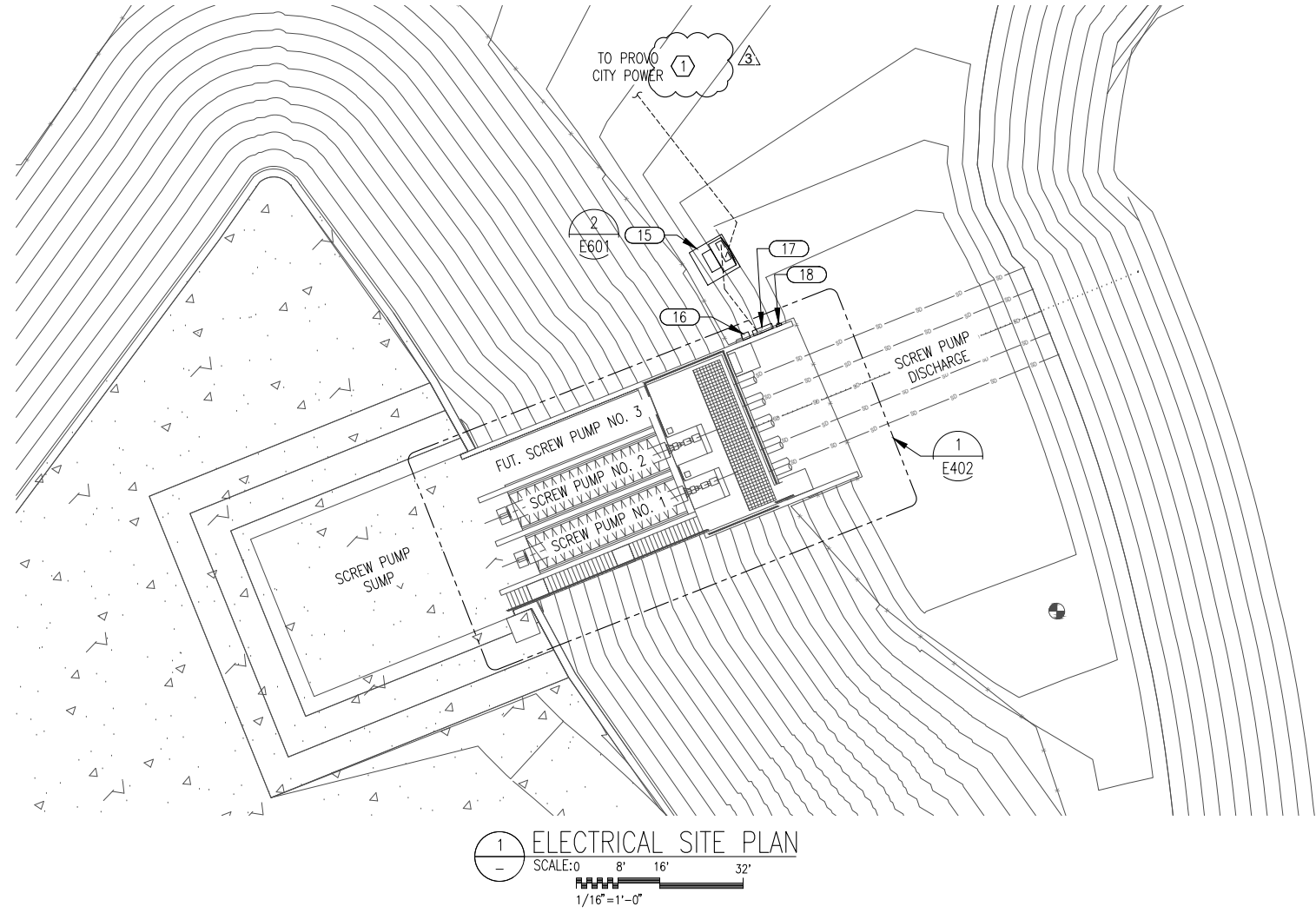


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PROVO CITY
 PROVO AIRPORT PUMP STATION
 CP-2 TYPICAL CONTROL DIAGRAM, SHT.

PROJECT NUMBER: 2019-0033	SHEET OF 32	SHEET NUMBER E304
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ISSUE DATE: OCT 4, 2020
 DRAWN BY: G. SORENSON
 CHECKED BY: K. HEGERHORST
 PROJECT MANAGER: M. CHAMBER, PE



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PROVO STORM WATER SITE LIST (E401)

DRAWING ID	TAG	DESCRIPTION	LOCATION
15	XFMR	UTILITY TRANSFORMER	OUTSIDE
16	MSD	MAIN SERVICE DISCONNECT	OUTSIDE
17	CTE	METERING CT ENCLOSURE	OUTSIDE
18	MS	METER SOCKET	OUTSIDE

GENERAL NOTES:

- REFER TO ONE-LINE DIAGRAM AND/OR PANELBOARD SCHEDULES FOR CIRCUIT ID, THEN REFER TO THE CONDUIT/CONDUCTOR TABLE FOR THE WIRE AND CONDUIT REQUIREMENTS.
- NOT USED

SHEET KEYNOTES:

- INCLUDE 100-FT OF TRENCHING, PROVIDE AND INSTALL CONDUIT WITH PULL TAPE FROM PROVO CITY POWER SOURCE TO THE UTILITY TRANSFORMER. EXACT LOCATION OF POWER SOURCE TO BE DETERMINED DURING CONSTRUCTION.

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PROVO CITY
 AIRPORT PUMP STATION
 ELECTRICAL SITE PLAN

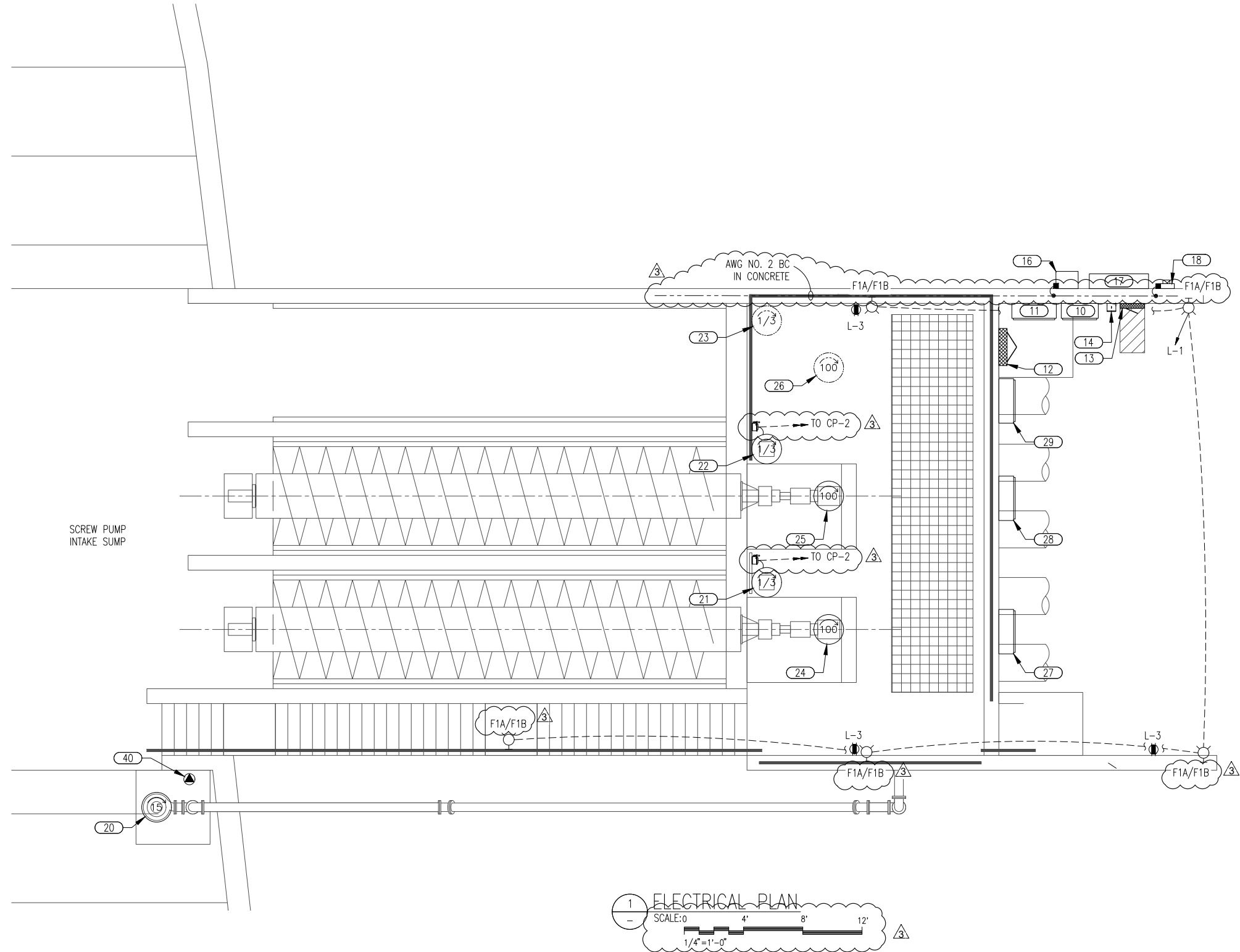
PROJECT NUMBER: 2019-0033	SHEET OF 35 41	SHEET NUMBER: E401
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 PROJECT MANAGER: M. CHAMBER, PE

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LIFT STATION ELECTRICAL LIST (E402)

DRAWING ID	TAG	DESCRIPTION	LOCATION
10	CP-1	MAIN CONTROL PANEL/RTU	OUTSIDE
11	CP-2	SMALL MOTOR CONTROL PANEL	OUTSIDE
12	MDP	PANELBOARD MDP	OUTSIDE
13	PNL-L	PANELBOARD L	OUTSIDE
14	XFMR-L	TRANSFORMER L	OUTSIDE
16	MSD	MAIN SERVICE DISCONNECT	OUTSIDE
17	CTE	METERING CT ENCLOSURE	OUTSIDE
18	MS	METER SOCKET	OUTSIDE
19	UM	UTILITY METER	OUTSIDE
20	SP-1	SUMP PUMP	OUTSIDE
21	LP-1	LUBE PUMP	OUTSIDE
22	LP-2	LUBE PUMP	OUTSIDE
23	LP-3	LUBE PUMP	FUTURE
24	SP-2	SCREW PUMP	OUTSIDE
25	SP-3	SCREW PUMP	OUTSIDE
26	SP-4	SCREW PUMP	FUTURE
27	RVSS-1	MOTOR CONTROLLER	OUTSIDE
28	RVSS-2	MOTOR CONTROLLER	OUTSIDE
29	RVSS-3	MOTOR CONTROLLER	FUTURE
40	LT-1	LEVEL TRANSMITTER	OUTSIDE



1 ELECTRICAL PLAN
 SCALE: 0 4' 8' 12'
 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO ONE-LINE DIAGRAMS ON E301 OR PANELBOARD SCHEDULES ON E201 FOR CIRCUIT ID, THEN REFER TO CONDUIT/CONDUCTOR TABLE ON E102 FOR THE WIRE AND CONDUIT REQUIREMENTS.
- INSTALL EXTERIOR OUTLETS AT +16" AFS AND PROVIDE IN-SERVICE WEATHER PROOF COVER.

SHEET KEYNOTES:

- FIELD LOCATE LUBE PUMP DISCONNECTS. COORDINATE LOCATION WITH OWNER DURING CONSTRUCTION.

REV#	BY	DATE	DESCRIPTION
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PROVO CITY
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 ELECTRICAL POWER PLAN

PROJECT NUMBER: 2019-0033
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 SHEET NUMBER: E402

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