

ADDENDUM #2
CONTRACT DOCUMENTS – Town of Narrows Sewer System
Electrical Improvements - Re-Bid
Addendum Date: February 6, 2023
Bid Due/Open Date: Changed to Monday February 13, 2023 3:00 P.M.

Changes to Contract Documents:

1. Contract Documents are revised such that the attached Minutes of the Pre-Bid Conference of February 1, 2023 are included. Questions presented at the Pre-Bid Conference are addressed in the minutes.
2. Contract Documents are revised such that the attached revised plan sheets E02, E20, E30, and E50 and the Transfer Switch Basis of Design (Kohler KCP) are included.
3. Contract Documents are revised such that the attached Revised Bid Sheet is included. Bids must be submitted using the attached Bid Sheet.
4. Contract Documents are revised such that the Bid Due/Opening date has been changed to Monday February 13, 2023 at 3:00 P.M.

END OF DOCUMENT

PRE-BID CONFERENCE MINUTES
01 February 2023, 9:00 A.M.
Modifications from Distributed Highlighted
Sewer System Electrical Improvements
Town of Narrows

Order of Business

- Review of Agenda
- Questions and Comments
- Site Visits

1. Introduction

- a. Sign-up sheet.
- b. Agenda distribution.
- c. Identification of Owner and Engineer.

Peed & Bortz, Project Manager	Martin Jansons	540-394-3214
Master Engineers, Design Engineer	Grant Beasley	343-846-1350
Peed & Bortz, Project Engineer	Jon McClure	540-394-3214
Town of Narrows, Town Manager	Terry Nicholson	540-726-2423
Town of Narrows, Public Works Director	John Davis	540-599-3670
Town of Narrows, Lead Operator	Cody Kast	540-599-5484

2. Scope of Work

Various electrical improvements at the Town Wastewater Treatment Plant and at five lift stations (460 Lift Station, Semco Lift station, Route 100 Lift Station, Salthouse, Route 61 Lift Station).

3. Scheduling

- a. Bid Opening: Sealed Bids will be received by the Narrows Town Manager, 210 Main Street, Narrows, VA 24124 or at tnicholson@townofnarrows.org Bids will be received until **3:00 P.M. (local standard time), February 10th, 2023 (Bid Opening date changed to February 13, 2023)**, and then publicly opened and read aloud at the Town of Narrows Meeting Room, same address as above. The Town is not responsible for electronic delivery anomalies and Bidders should verify email receipt.
- b. Award of Contract: See Instructions to Bidders Section 3.7 regarding evaluation of bids. Town of Narrows will make an award as soon as possible.
- c. Construction Time: Project shall be completed within 120 days of issuance of Notice to Proceed. Liquidated Damages in the amount of \$100 per day will be assessed if project completion is not met in this time frame. Extensions to this time frame may be considered in the event of documented supply chain related equipment delays.
- d. Bid form is located in the Contract Documents. Bid requires contractor license number. **A revised bid form will be issued by Addendum.**

5. Qualification Statement

Contractor shall provide a Contractor Qualification Statement upon request.

6. Insurance and Bonds

- a. Bonds – No bid bond **is required.**

- b. Standard Labor and Material Payment Bond – Paragraph 3.1, bonds are required.
 - c. Insurance Required – Section 5.0 of the Contract Documents outlines the insurance requirements for this project.
 - d. Bidders Obtain Complete Sets of Documents – Copies of the Contract Documents must be obtained at the office of Peed & Bortz, LLC, located at 20 Midway Plaza Drive, Suite 100, Christiansburg, VA, 24073. PDFs of the contract documents are available for no cost. Contact Jonathan McClure (P&B) at 540-394-3214 or jonathan@peed-bortz.com to request links for the documents.
7. Property, Easements, and Existing Utilities
- a. Property- All work will be performed on Town of Narrows Property. Coordinate all access and parking with Town Staff prior to commencing work.
 - b. Utility Downtime– If downtime of any lift station is required, coordinate with the Town at least 48 hours in advance. See questions and answer section for details on allowable downtime.
 - c. Permits –Contractor is responsible for applying for Giles County electrical permit, fees will be waived. Contractor is responsible for applying for Town of Narrows Floodplain Development permit. For each entity one permit will cover all locations.
8. Inspection
- a. The Owner will provide inspection services. Giles County Building Inspector will perform final inspection to close permits.
9. Comments and Questions:
- a. Questions are due before close of business February 2nd. Addendum to follow, which will include these minutes. All questions should be directed to: Peed & Bortz, LLC, attn. Jonathan McClure - jonathan@peed-bortz.com

Questions:

- Is Eaton an acceptable manufacturer for transfer switches?
 - Eaton is acceptable. See Specs E02, transfer switch must be able to provide load staggered starting. Basis of design to be provided.
- Can you elaborate on the set up at the Salt House? The 240V to 120/208V transformer is strange. This is a 3 phase transformer?
 - This is a 3-phase transformer acting in a buck-boost fashion. The output of the Owner's existing portable generator is 208V, but we need 240V at this location to run the pumps. The pumps are not rated for operation at 208V, so that is why the transformer is necessary.
- All Sites: What are the station and pump voltages?
 - Voltages are either 120/208V wye or 240V delta. The Salt House is the only site we are concerned with mismatched voltages between generator and pumps where we are requiring a transformer to remedy.

- Can you provide a spec for generator plug ins?
 - Generator plug-in shall match the existing one at the Main Plant. A spec for start signal connection at this location only is forthcoming.
- All Sites: What is the allowable downtime at each site?
 - All sites are weather dependent. Listed downtime assumes dry weather.
 - WWTP – Hour and a half. If temporary power is provided to the critical dosing pumps and chlorine pumps in the basement, plant can be down 24 hrs.
 - 460 Lift Station – Station can be down 4 hours.
 - Semco Station – At least one day, possibly two if coordinated with business.
 - Route 100 Lift Station – Two days downtime.
 - Salt House – 8 Hours daytime (7am-3pm), 12 if work is done overnight/off peak (8pm-8am).
 - Route 61 – 8 hours.
- Main Plant - Is a new CT required?
 - No. Existing service condition is to be grandfathered and no changes are necessary. Contractor will be responsible at all locations for coordinating with AEP for disconnect/reconnects where necessary.
- Main Plant – Can you provide critical pump information?
 - There are (2) EA 7.4 HP dosing pumps, and (1) EA dosing pump estimated at 30 HP. There are (2) EA ½ HP chlorine pumps. If Contractor provides for interim power to these pumps, main plant down time may be up to 24 hr (weather permitting). If not, maximum down time at the main plant is 1.5 hrs.
- 460 Lift Station – Why is the circuit breaker outside?
 - Relocate circuit breaker inside. See revised drawing E20.
- Semco Lift Station – Can we reuse existing conduit?
 - Yes, no need for new conduit. See revised drawing E30.
- Route 100 Lift Station – No Questions
- Salt House – Can we mount equipment on wall (structural and historical concerns) or we need to have equipment on struts off wall?
 - Equipment can be mounted on the wall.
- Salt House – Do we need a housekeeping pad for the transformer?
 - No. Mount transformer on wall with manufacturer-provided wall brackets. See revised drawing E50 for this and other height requirements for new equipment.

SPECIFICATIONS

REFERENCE STANDARDS

1. NATIONAL ELECTRICAL CODE (NFPA NO.70)NEC
2. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATIONNEMA
3. UNDERWRITERS LABORATORIES, INC.UL
4. UNIFORM FEDERAL ACCESSIBILITY STANDARDSUFAS
5. UNIFORM STATE BUILDING CODEVUSBC

260000- ELECTRICAL GENERAL REQUIREMENTS

- A. NAMEPLATES: SHALL BE CONSTRUCTED OF LAMINATED PHENOLIC WITH A BLACK CENTER CORE SANDWICHED BETWEEN WHITE LAYERS. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM LETTERS 3/8 INCHES HIGH, UNLESS INDICATED OTHERWISE ON DRAWINGS. FASTENERS SHALL BE SCREWS OR A NON-ADHESIVE TYPE FASTENER. INSTALL NAMEPLATES ON TRANSFER SWITCH.

260130 - REWORKING EXISTING SYSTEM

- A. DURING THE EXECUTION OF THE WORK OWNER WILL CONTINUE TO OCCUPY THE EXISTING BUILDING AND WILL THEREFORE REQUIRE CONTINUOUS OPERATION OF ALL EXISTING FACILITIES. SCHEDULE OUTAGES REQUIRED FOR CONSTRUCTION PURPOSES FOR THE SHORTEST PRACTICAL PERIODS OF TIME, AND THEN ONLY BY PRE-ARRANGEMENT WITH THE OWNER FOR SPECIFIC, MUTUALLY AGREEABLE PERIODS, AFTER EACH OF WHICH THE INTERRUPTION SHALL CEASE AND SERVICE SHALL BE RESTORED.

B. GROUNDING:

1. SERVICE ENTRANCE: JUST PRIOR TO BACK FEEDING THE EXISTING SERVICE ENTRANCE GEAR FROM THE NEW SERVICE ENTRANCE GEAR,

- a. DISCONNECT THE GROUNDING ELECTRODE CONDUCTORS THAT EXIST BETWEEN THE GROUND BUS OF THE EXISTING SERVICE ENTRANCE GEAR TO THE FOLLOWING WHERE EXTANT:

- a.a. GROUND ROD
- a.b. BUILDING GROUND COUNTERPOISE
- a.c. BUILDING COLD WATER SERVICE
- a.d. BUILDING STRUCTURE
- a.e. UFER GROUND
- a.f. OTHER METALLIC PIPING SYSTEMS WITHIN THE FACILITY.

- b. REMOVE THE REMOVABLE LINK BETWEEN THE NEUTRAL AND GROUND BUS OF THE EXISTING SERVICE ENTRANCE GEAR.

260200 - FIRE STOPPING SYSTEMS

- A. FIRE STOP MATERIALS SHALL BE 3M ELECTRICAL PRODUCTS DIVISION, CP25 SERIES; CSD SEALING SYSTEMS; INTERNATIONAL PROTECTIVE COATINGS CORPORATION, FS AND FST SERIES; NELSON FIRESTOP PRODUCTS

- B. INSTALL FIRE STOP MATERIALS AT ALL FLOOR PENETRATIONS AND PENETRATION OF FIRE-RATED WALLS.

260300 - RACEWAYS

- A. RIGID STEEL CONDUIT (RSC): LOW CARBON, HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE, WITH THREADED ENDS, MINIMUM SIZE 3/4" INCH. THREADED FITTINGS - CAST IRON OR ALLOY STEEL, GALVANIZED.

- B. ELECTRICAL METALLIC TUBING (EMT): HIGH STRENGTH GALVANIZED, 3/4" INCH MINIMUM SIZE, 4 INCH MAXIMUM SIZE.

- C. FLEXIBLE METAL CONDUIT: GALVANIZED, SINGLE STRIP.

- D. LIQUID TIGHT FLEXIBLE METAL CONDUIT: SEALTITE TYPE U.A. BY ANACONDA, LIQUATITE TYPE LA BY ELECTRI-FLEX COMPANY, TYPE GU BY INTERNATIONAL METAL HOSE COMPANY, OR SEALFLEX-U BY UNIVERSAL METAL HOSE COMPANY. FITTINGS SHALL BE THOMAS & BETTS SERIES 6000.

E. APPLICATION

1. INSTALL RIGID STEEL CONDUIT OUTDOORS AND IN AREAS SUBJECT TO PHYSICAL ABUSE. ELECTRICAL METALLIC TUBING MAY BE USED IN INDOOR AREAS WHERE IT ALREADY EXISTS.

2. INSTALL FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION INDOORS.

3. INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION OUTDOORS.

260400- NONMETALLIC RACEWAYS

- A. PVC SCHEDULE 40 CONDUIT DESIGNED FOR DIRECT BURIAL. USE WHEREVER UNDERGROUND CONDUIT IS REQUIRED. TRANSITION TO RSC BEFORE TRANSITIONING TO ABOVE GRADE.

260519 - WIRE, CABLE AND WIRING (SINGLE CONDUCTOR) (600 VOLTS MAX)

- A. CONDUCTOR CODING: COLOR CODE INSULATED CONDUCTORS IN ACCORDANCE WITH NEC.

- B. CONDUCTOR REQUIREMENTS: ALL CONDUCTORS SHALL BE COPPER. INSULATION SHALL BE TYPE THWN OR XHHW, RATED FOR 600 VOLTS, 75°C UNLESS OTHERWISE INDICATED.

- C. INSTALLATION: INSTALL ALL WIRING IN CONDUIT, MAXIMUM 40% FILL.

260526 - GROUNDING

A. CONDUCTORS

1. GROUNDING ELECTRODE CONDUCTORS SHALL BE BARE COPPER.
2. EQUIPMENT GROUNDING CONDUCTORS IN RACEWAYS SHALL BE INSULATED COPPER.

- B. INSTALL EQUIPMENT GROUNDING CONDUCTORS IN ALL RACEWAYS CONTAINING CONDUCTORS HAVING 100 VOLTS OR MORE TO GROUND.

- C. GROUND ALL ENCLOSURES.

- D. GROUND ROD SHALL BE COPPER CLAD STEEL, 10 FEET IN LENGTH AND 3/4" IN DIAMETER.

- E. ALL BONDS SHALL BE EXOTHERMIC.

260529 - SUPPORTING DEVICES

- A. THREADED MATERIALS SHALL BE STAINLESS STEEL. ALL OTHER MATERIALS SHALL BE GALVANIZED OR STAINLESS STEEL.

260533 - PULL AND JUNCTION BOXES

A. SHEET METAL BOXES

1. NEMA 1 BOXES SHALL HAVE THE FOLLOWING FEATURES:

- a. CONSTRUCTED OF CODE GAGE, HOT-ROLLED SHEET STEEL.
- b. REMOVABLE COVERS SUITABLE FOR SURFACE OR FLUSH MOUNTING AS APPLICABLE.
- c. FINISH: HOT-DIPPED GALVANIZED FINISH FOR BOXES 4 X 4 INCHES AND SMALLER. PAINT FOR BOXES LARGER THAN 4 X 4 INCHES.
- d. CADMIUM PLATED HARDWARE.
- e. MANUFACTURER AND TYPE: BOXES 4 BY 4 INCHES AND SMALLER: STEEL CITY 52141, 52151, AND 52171 SERIES, WITH 52-C SERIES COVERS. BOXES LARGER THAN 4 BY 4 INCHES: HOFFMAN BULLETIN A-90.

2. IN ADDITION, NEMA 3R SERIES BOXES SHALL HAVE THE FOLLOWING FEATURES:

- a. ACCEPTABLE MATERIALS: TYPE 5052 ALUMINUM, MINIMUM 0.080 INCH THICK.
- b. CONTINUOUSLY WELDED SEAMS.
- c. ROLLED LIP AROUND DOOR.

B. CONDUIT BODIES

1. WHERE OF SUFFICIENT SIZE, CONDUIT BODIES MAY BE USED IN LIEU OF PULL AND JUNCTION BOXES PROVIDED THEY MEET THE REQUIREMENTS OF THE NEMA STANDARDS REFERENCED ABOVE.

2. MATERIAL: CAST COPPER-FREE ALUMINUM.

3. FINISH: NATURAL.

4. HARDWARE: STAINLESS STEEL.

5. ACCEPTABLE MANUFACTURERS: APPLETON, CROUSE-HINDS, OR KILLARK.

- C. INSTALL NEMA 1 BOXES INDOORS. INSTALL NEMA 3R BOXES OUTDOORS.

- D. PROVIDE PULL AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED FOR CHANGES IN DIRECTION, AT JUNCTION POINTS, AND TO FACILITATE WIRE PULLING. PROVIDE ADDITIONAL BOXES AS REQUIRED SO THAT WIRE AND CABLE MANUFACTURER'S MAXIMUM RECOMMENDED PULLING TENSIONS ARE NOT EXCEEDED.

- E. SIZE BOXES IN ACCORDANCE WITH NEC UNLESS LARGER BOXES ARE INDICATED.

260544 - UNDERGROUND PULL BOXES

A. PRODUCTS

1. UNDERGROUND PULL BOXES SHALL BE CONSTRUCTED OF POLYMER CONCRETE CONSISTING OF A AGGREGATE MATRIX BOUND TOGETHER WITH A POLYMER RESIN.

2. INTERNAL REINFORCEMENT PROVIDED BY MEANS OF STEEL, FIBERGLASS OR A COMBINATION OF THE TWO.

3. ACCEPTABLE MANUFACTURERS: CDR SYSTEMS CORPORATION, QUAZITE DIVISION OF MMFG, OR OLDCASTLE.

262416 - PANELBOARDS

A. GENERAL

1. PANELBOARDS SHALL BE OF DEAD FRONT CONSTRUCTION UTILIZING THERMAL MAGNETIC CIRCUIT BREAKERS AND SHALL CONFORM TO THE REQUIREMENTS ESTABLISHED BY UL, NEMA AND THE NEC. EACH SHALL BE SUITABLE FOR ITS INTENDED APPLICATION AS SCHEDULED, CONSIDERING VOLTAGE, PHASE, FREQUENCY AND INTENDED SERVICE. ALL PANELBOARDS SHALL BE UL LISTED AND SHALL BE SO LABELED.

2. PANELS KNOWN AS "LOADCENTERS" WILL NOT BE ACCEPTED.

3. PANELBOARDS SHALL CONSIST OF CABINET OR BACK BOX, BUS ASSEMBLY, CIRCUIT BREAKERS, TRIM, AND ALL ACCESSORIES AS INDICATED AND REQUIRED. ALL CHARACTERISTICS SHALL BE AS SHOWN OR SCHEDULED ON THE DRAWINGS.

B. BUS

1. THE BUS ASSEMBLY SHALL CONSIST OF COPPER OR ALUMINUM BUS STRUCTURE, SECURED AND ARRANGED TO RECEIVE BREAKERS AS INDICATED.

2. ALL BUSSING SHALL BE DESIGNED IN ACCORDANCE WITH UL STANDARDS TO SUIT THE LOADING REQUIREMENTS AS SCHEDULED AND SHALL BE BRACED TO WITHSTAND MECHANICAL STRESSES CREATED BY FAULTS OF MAGNITUDE EQUIVALENT TO THE RATING OF BREAKERS INSTALLED.

3. CONSTRUCTION SHALL BE SUCH THAT THE BUS WILL NOT BE EXPOSED UPON REMOVAL OF TRIM.

4. NEUTRAL BUS: ALL PANELBOARDS SHALL BE PROVIDED WITH INSULATED SOLID NEUTRALS.

5. GROUND BUS: GROUNDING BARS WITH LUGS SHALL BE PROVIDED ON ALL PANELBOARDS. BUSES SHALL BE BONDED TO PANEL ENCLOSURE.

- C. MINIMUM SHORT CIRCUIT RATING: THE MINIMUM SHORT CIRCUIT RATING FOR THE PANELBOARD SHALL BE THE RATING OF THE DEVICE WITHIN THE ASSEMBLY HAVING THE LOWEST SHORT CIRCUIT RATING. MAXIMIZATION OF SELECTIVE TRIPPING COORDINATION IS THE INTENT OF THIS DESIGN. USE OF SERIES RATED EQUIPMENT WILL NOT BE APPROVED. RATING OF PANELBOARD SHALL BE ADEQUATE TO INTERRUPT CALCULATED FAULT CURRENT AVAILABLE.

- D. CIRCUIT BREAKERS SHALL BE THE BOLT-ON TYPE.

- E. ACCEPTABLE MANUFACTURERS: EATON, ABB/GENERAL ELECTRIC, SIEMENS, SQUARE D.

262815 - SAFETY SWITCHES AND ENCLOSED CIRCUIT BREAKERS (ECB'S)

A. GENERAL

1. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY DUTY TYPE (TYPE HD) WITH A QUICK-MAKE, QUICK-BREAK MECHANISM AND AN EXTERNAL PADLOCKABLE OPERATING HANDLE.

2. SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE AND HORSEPOWER RATED.

- B. WHERE OUTDOORS, ENCLOSURES SHALL BE NEMA 3R.

- C. BREAKERS SHALL HAVE A MINIMUM AIC RATING OF 22,000 AMPS.

- D. ACCEPTABLE MANUFACTURERS: EATON, ABB/GENERAL ELECTRIC, SIEMENS, SQUARE D.

- E. INSTALLATION: MOUNT SAFETY SWITCHES AND ECB'S SECURELY BETWEEN 3 AND 6 FOOT LEVELS ABOVE FLOOR, UNLESS OTHERWISE INDICATED ON DRAWINGS.

263216 - AUTOMATIC TRANSFER SWITCH

A. SERVICE ENTRANCE RATED SWITCH

4. THE TRANSFER SWITCH UNIT SHALL BE ELECTRICALLY OPERATED AND MECHANICALLY HELD. THE ELECTRICAL OPERATOR SHALL BE A SINGLE-SOLENOID MECHANISM, MOMENTARILY ENERGIZED. MAIN OPERATORS WHICH INCLUDE OVERCURRENT DISCONNECT DEVICES WILL NOT BE ACCEPTED. THE SWITCH SHALL BE MECHANICALLY INTERLOCKED TO ENSURE ONLY ONE OF TWO POSSIBLE POSITIONS, NORMAL OR EMERGENCY.

5. THE SWITCH SHALL BE POSITIVELY LOCKED AND UNAFFECTED BY MOMENTARY OUTAGES SO THAT CONTACT PRESSURE IS MAINTAINED AT A CONSTANT VALUE AND TEMPERATURE RISE AT THE CONTACTS IS MINIMIZED FOR MAXIMUM RELIABILITY AND OPERATING LIFE.

6. ALL MAIN CONTACTS SHALL BE SILVER COMPOSITION. SWITCHES RATED 600 AMPERES AND ABOVE SHALL HAVE SEGMENTED, BLOW-ON CONSTRUCTION FOR HIGH WITHSTAND CURRENT CAPABILITY AND BE PROTECTED BY SEPARATE ARCING CONTACTS.

7. INSPECTION OF ALL CONTACTS SHALL BE POSSIBLE FROM THE FRONT OF THE SWITCH WITHOUT DISASSEMBLY OF OPERATING LINKAGES AND WITHOUT DISCONNECTION OF POWER CONDUCTORS. A MANUAL OPERATING HANDLE SHALL BE PROVIDED FOR MAINTENANCE PURPOSES. THE HANDLE SHALL PERMIT THE OPERATOR TO MANUALLY STOP THE CONTACTS AT ANY POINT THROUGHOUT THEIR ENTIRE TRAVEL TO INSPECT AND SERVICE THE CONTACTS WHEN REQUIRED.

8. DESIGNS UTILIZING CIRCUIT BREAKERS OR CONTACTORS FOR TRANSFER OF POWER BETWEEN THE SOURCES ARE NOT ACCEPTABLE.

- B. THE CONTROLLER SHALL BE THE MICROPROCESSOR TYPE WITH MEMBRANE INTERFACE PANEL. DISPLAY SHALL BE INTEGRAL TO CONTROLLER FOR VIEWING ALL AVAILABLE DATA AND SETTING DESIRED OPERATIONAL PARAMETERS. OPERATIONAL PARAMETERS ALSO AVAILABLE FOR VIEWING AND CONTROL THROUGH COMMUNICATIONS INTERFACE PORT OR USB.

- C. CIRCUIT BREAKER: THE TRANSFER SWITCH SHALL BE THE SERVICE ENTRANCE TYPE HAVING A MOLDED CASE CIRCUIT BREAKER CONNECTED AHEAD OF THE NORMAL SOURCE TERMINALS. BREAKER SHALL BE ELECTRONIC TRIP WITH LSI SETTINGS.

- D. WITHSTAND RATING SHALL BE MINIMUM 42,000 AMPS.

- E. THE ENCLOSURE SHALL BE NEMA 3R RATED, LOCKABLE WITH A THERMOSTATICALLY-CONTROLLED STRIP HEATER. OBTAIN POWER FOR HEATER FROM LOAD LUGS OF SWITCH. FUSE UNGROUNDED CONDUCTORS.

F. DELAY FEATURES

1. AN ADJUSTABLE TIME DELAY OF 0 TO 6 SECONDS SHALL BE PROVIDED TO OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES AND DELAY ALL TRANSFER AND ENGINE STARTING SIGNALS. CAPABILITY SHALL BE PROVIDED TO EXTEND THIS TIME DELAY TO 60 MINUTES BY PROVIDING AN EXTERNAL 12 OR 24 VDC POWER SUPPLY.

2. A TIME DELAY SHALL BE PROVIDED ON TRANSFER TO THE EMERGENCY SOURCE, ADJUSTABLE FROM 0 TO 60 MINUTES, FOR CONTROLLED TIMING OF TRANSFER OF LOADS TO EMERGENCY.

3. A TIME DELAY SHALL BE PROVIDED ON RE-TRANSFER TO NORMAL. THE TIME DELAYS SHALL BE ADJUSTABLE FROM 0 TO 60 MINUTES. TIME DELAY SHALL BE AUTOMATICALLY BYPASSED IF THE EMERGENCY SOURCE FAILS AND THE NORMAL SOURCE IS TIME ACCEPTABLE.

4. A TIME DELAY SHALL BE PROVIDED ON SHUT DOWN OF ENGINE GENERATOR FOR COOL DOWN, ADJUSTABLE FROM 0 TO 60 MINUTES.

5. A TIME DELAY ACTIVATED OUTPUT SIGNAL SHALL ALSO BE PROVIDED TO DRIVE EXTERNAL RELAY(S) FOR SELECTIVE LOAD DISCONNECT AND RECONNECT CONTROL. THE CONTROLLER SHALL BE CAPABLE OF CONTROLLING A MAXIMUM OF 9 INDIVIDUAL OUTPUT TIME DELAYS TO STEP LOADS ON AFTER A TRANSFER OCCURS. EACH OUTPUT MAY BE INDIVIDUALLY PROGRAMMED FOR THEIR OWN TIME DELAY OF UP TO 60 MINUTES. EACH SEQUENCE SHALL BE INDEPENDENTLY PROGRAMMED FOR TRANSFERRING FROM NORMAL TO EMERGENCY AND TRANSFERRING FROM EMERGENCY TO NORMAL.

6. ALL TIME DELAYS SHALL BE ADJUSTABLE IN 1 SECOND INCREMENTS.

7. ALL TIME DELAYS SHALL BE ADJUSTABLE BY USING THE DISPLAY AND KEYPAD, WITH A REMOTE DEVICE CONNECTED TO THE COMMUNICATIONS INTERFACE PORT OR USB.

8. EACH TIME DELAY SHALL BE IDENTIFIED AND A DYNAMIC COUNTDOWN SHALL BE SHOWN ON THE DISPLAY. ACTIVE TIME DELAYS CAN BE VIEWED WITH A REMOTE DEVICE CONNECTED TO THE COMMUNICATIONS INTERFACE PORT OR USB.

F. WARRANTY SHALL BE TWO (2) YEARS.

- G. BASIS-OF-DESIGN IS KOHLER MODEL KCP, BUT OTHER ACCEPTABLE MANUFACTURERS ARE AUTOMATIC SWITCH COMPANY, RUSSELECTRIC, INC., ZENITH CONTROLS, INC, CATERPILLAR, GENERAC, AND EATON.

- H. COMMISSIONING AND TRAINING: CONTRACTOR SHALL PROVIDE A FACTORY-AUTHORIZED REPRESENTATIVE TO COMMISSION THE TRANSFER SWITCH AND TRAIN OWNER ON ITS OPERATION AND FEATURES, INCLUDING CONNECTION AND DISCONNECTION OF EXISTING PORTABLE GENERATOR SET. DURING COMMISSIONING, ALL DELAY SETTINGS SHALL BE SET PER OWNER INPUT.

264313 - SURGE PROTECTIVE DEVICES (SPD's)

- A. ACCEPTABLE MANUFACTURERS: EATON, EMERSON/ASCO, AND SQUARE D.

- B. UNIT OPERATING VOLTAGE - REFER TO DRAWINGS FOR OPERATING VOLTAGE AND UNIT CONFIGURATION.

- C. MAXIMUM CONTINUOUS OPERATING VOLTAGE (MCOV) - THE MCOV SHALL NOT BE LESS THAN 115% OF THE NOMINAL SYSTEM OPERATING VOLTAGE.

- D. SPD SHALL HAVE A MINIMUM SURGE CURRENT CAPACITY OF 150KA PER PHASE, 75KA PER MODE.

- E. THE SPD SHALL BE MAINTENANCE FREE AND SHALL NOT REQUIRE ANY USER INTERVENTION THROUGHOUT ITS LIFE. SPD'S CONTAINING ITEMS SUCH AS REPLACEABLE MODULES, REPLACEABLE FUSES, OR REPLACEABLE BATTERIES SHALL NOT BE ACCEPTED. SPD'S REQUIRING ANY MAINTENANCE OF ANY SORT SUCH AS PERIODIC TIGHTENING OF CONNECTORS SHALL NOT BE ACCEPTED. SPD'S REQUIRING USER INTERVENTION TO TEST THE UNIT VIA A DIAGNOSTIC TEST KIT OR SIMILAR DEVICE SHALL NOT BE ACCEPTED.

- F. ELECTRICAL NOISE FILTER: EACH UNIT SHALL INCLUDE A HIGH-PERFORMANCE EMI/RFI NOISE REJECTION FILTER. NOISE ATTENUATION FOR ELECTRIC LINE NOISE SHALL BE UP TO 50 DB FROM 10 KHZ TO 100 MHZ USING THE MIL-STD-220A INSERTION LOSS TEST METHOD. PRODUCTS UNABLE TO MEET THIS SPECIFICATION SHALL NOT BE ACCEPTED.

- G. SURGE COUNTER: THE SPD SHALL BE EQUIPPED WITH AN LCD DISPLAY THAT INDICATES TO THE USER HOW MANY SURGES HAVE OCCURRED AT THE LOCATION.

- H. EXTERNALLY MOUNTED DEVICES SHALL BE NEMA 3R AND MOUNTED AS CLOSE AS POSSIBLE TO DEVICE IT IS PROTECTING TO ENSURE OPTIMUM PERFORMANCE.

- I. WARRANTY: THE MANUFACTURER SHALL PROVIDE A FULL TEN (10) YEAR WARRANTY FROM THE DATE OF SHIPMENT AGAINST ANY SPD PART FAILURE WHEN INSTALLED IN COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND APPLICABLE NATIONAL AND LOCAL CODES.



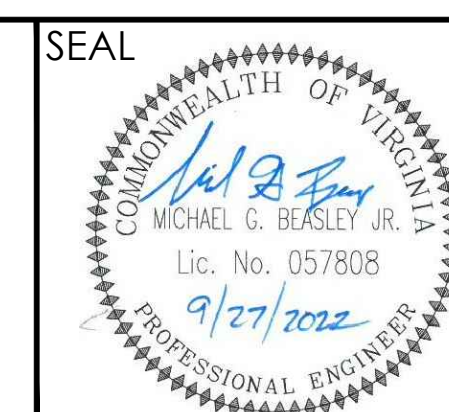
660-010
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

TOWN OF NARROWS SEWER IMPORVEMENTS

GILES COUNTY

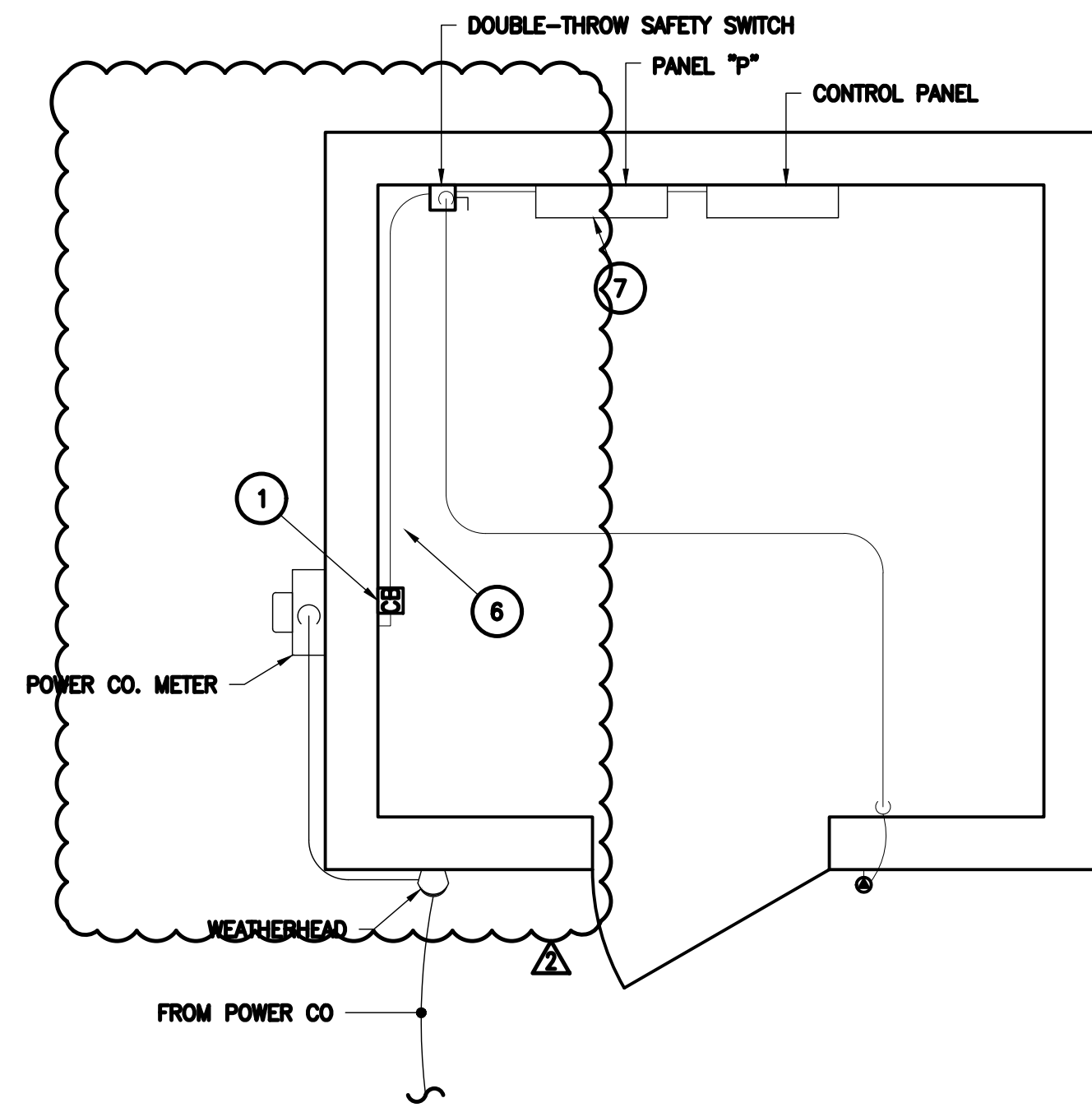
VIRGINIA



DRAWN BY:
JHR
REVIEW BY:
MGB
DATE:
27 SEP 2022
REVISION:
1 - 3 FEB 2023

SHEET DESCRIPTION:
ELECTRICAL
SPECIFICATIONS

E02

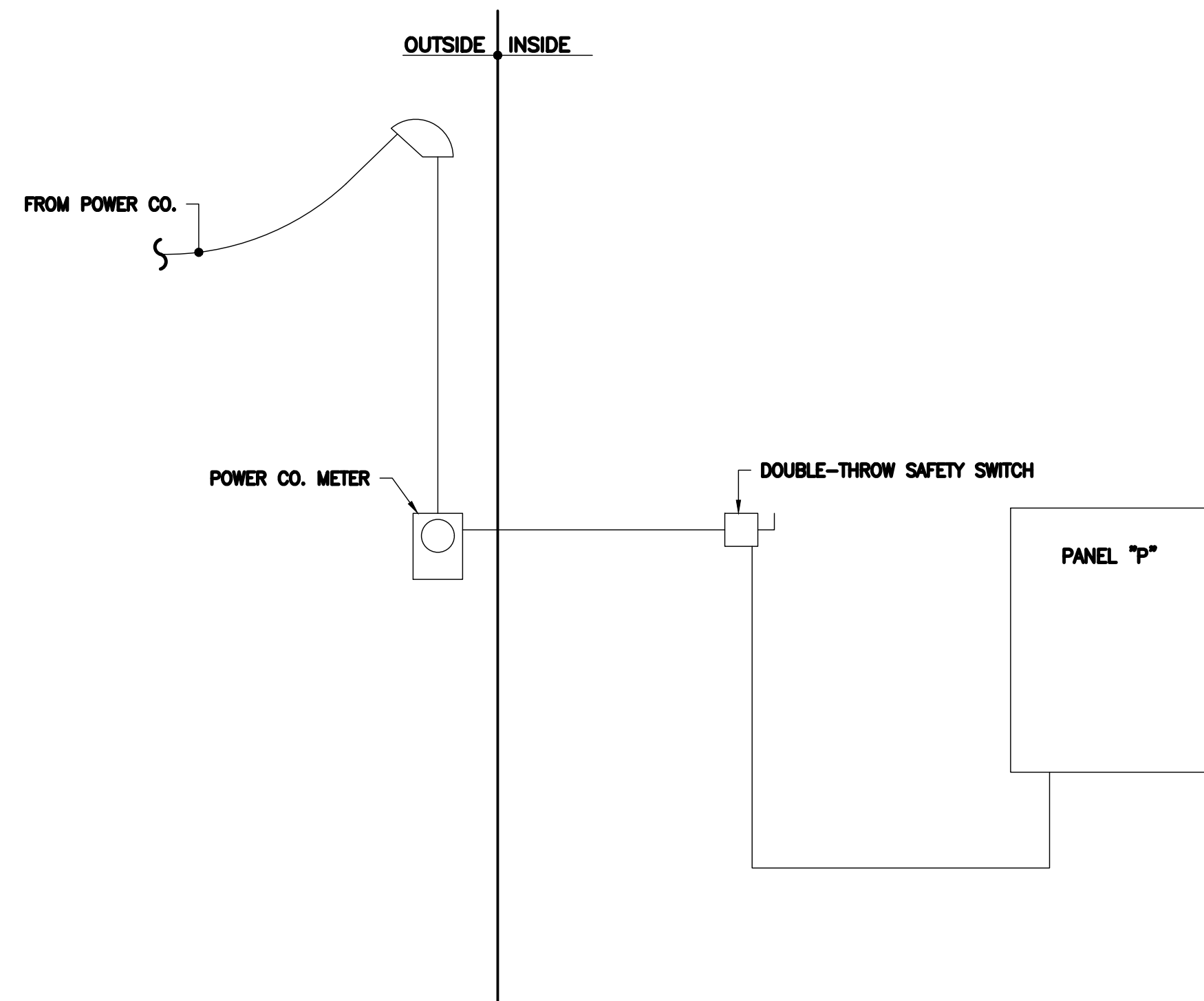


FLOOR PLAN - REWORKED

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

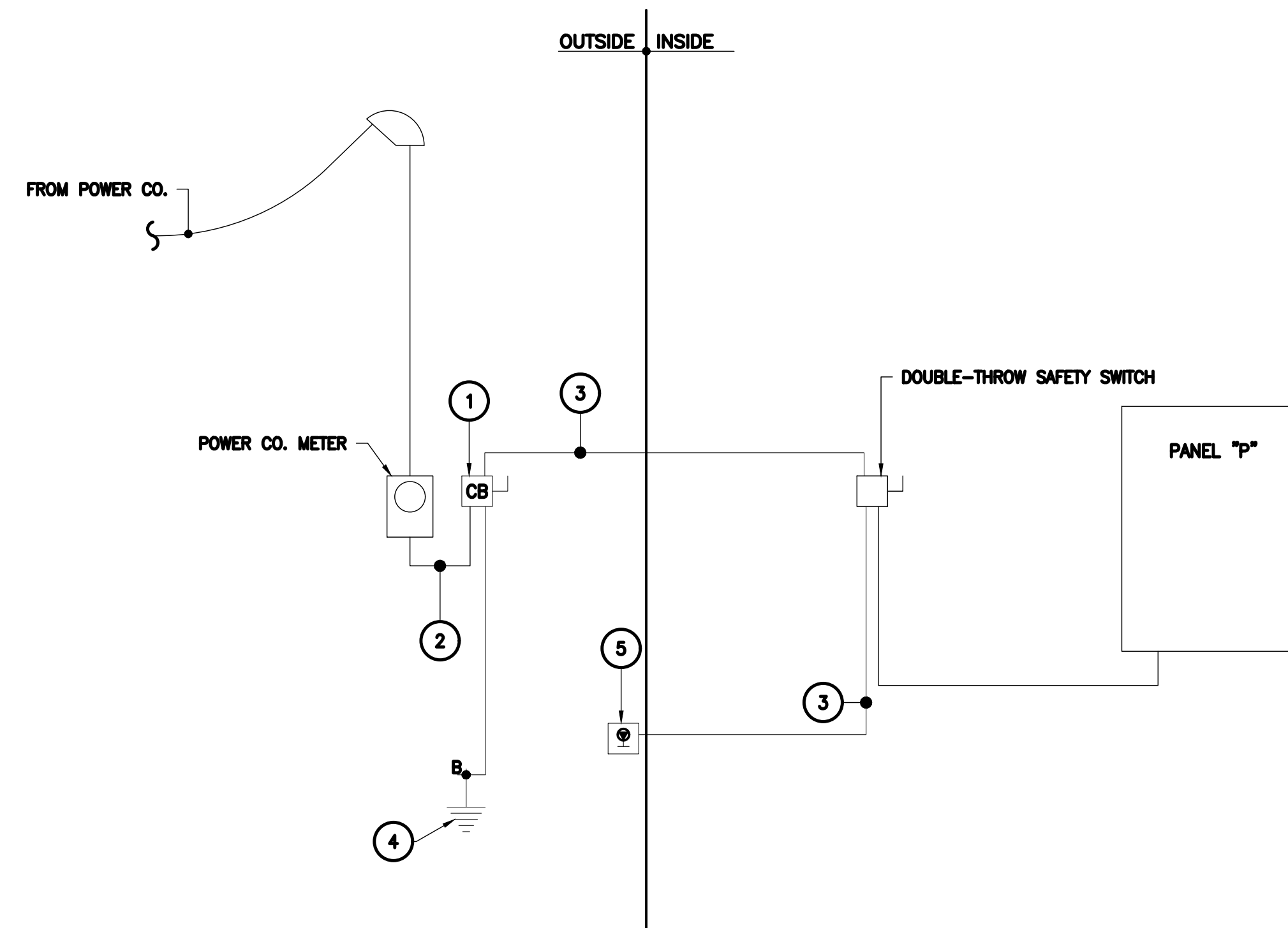
ONE LINE DIAGRAM KEY (SHEET E20)

- ① NEW, 3P, 208V, 100-AMP SE-RATED, INDIVIDUALLY ENCLOSED 100-AMP CIRCUIT BREAKER.
- ② 4 #2 - 1 1/2" C
- ③ 4 #2 & 1 #8 EGC - 1 1/2" C
- ④ MAKE NEUTRAL-TO-GROUND CONNECTION WITHIN BREAKER ENCLOSURE AND CONNECT TO EXISTING ELECTRODES WITH A MIN #8 GEC.
- ⑤ NEW GENERATOR CONNECTION BOX. MATCH PLUG ON EXISTING PORTABLE GENERATOR.
- ⑥ INSTALL NEW FEED FROM CIRCUIT BREAKER TO DOUBLE-THROW SWITCH.
- ⑦ SEPARATE NEUTRALS AND GROUNDS. INSTALL ADDITIONAL BUSBAR IF NECESSARY



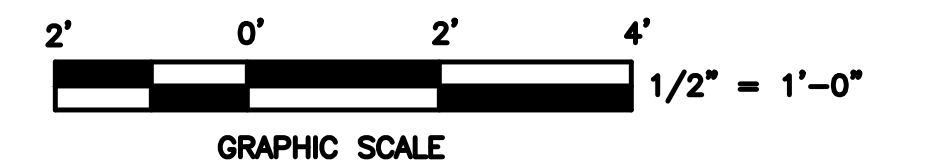
ONE LINE DIAGRAM - EXISTING

SCALE: NOT TO SCALE



ONE LINE DIAGRAM - REWORKED

SCALE: NOT TO SCALE



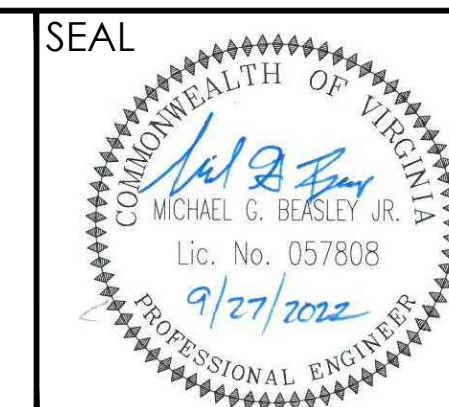
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

**TOWN OF NARROWS
SEWER IMPORVEMENTS**

GILES COUNTY

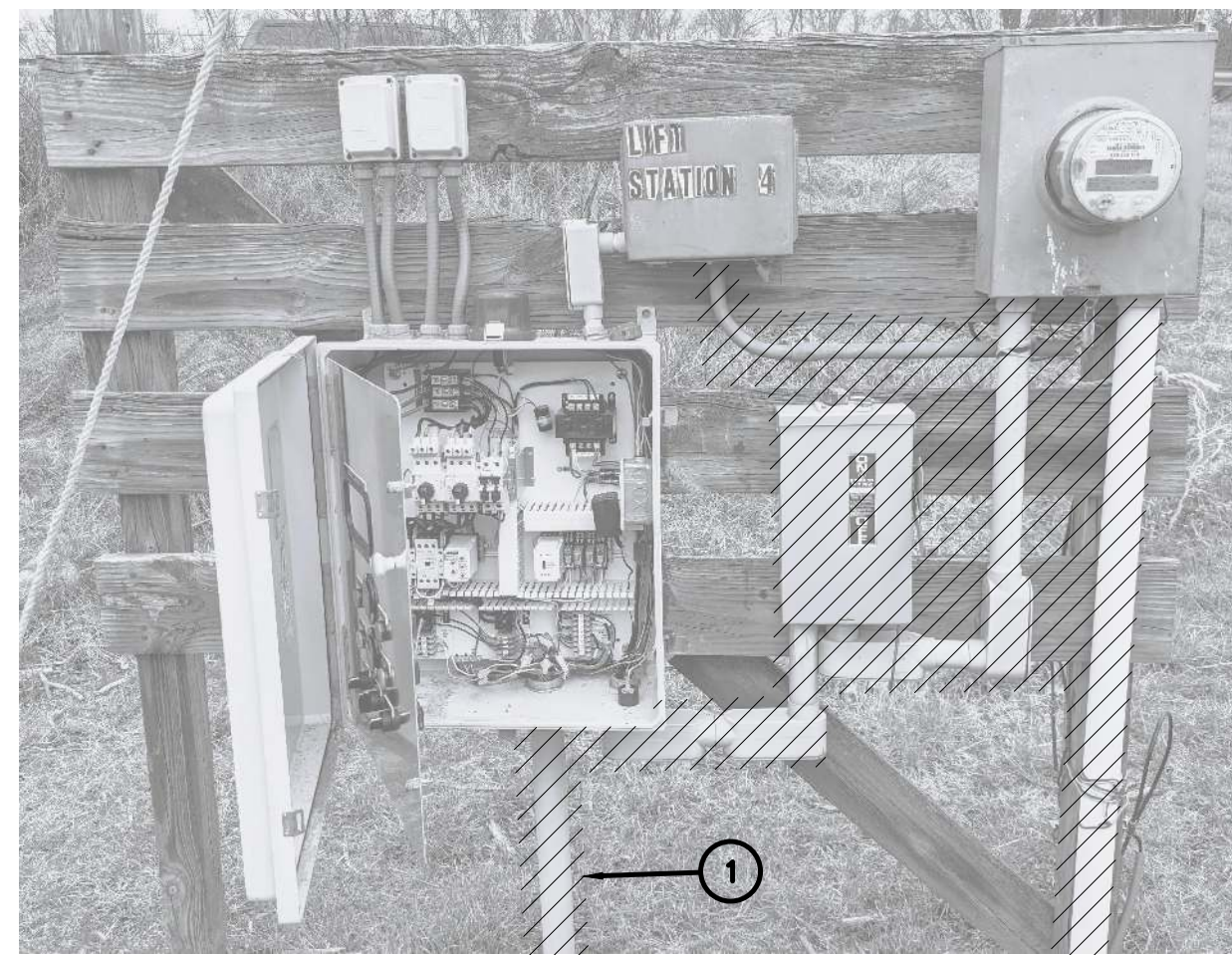
VIRGINIA



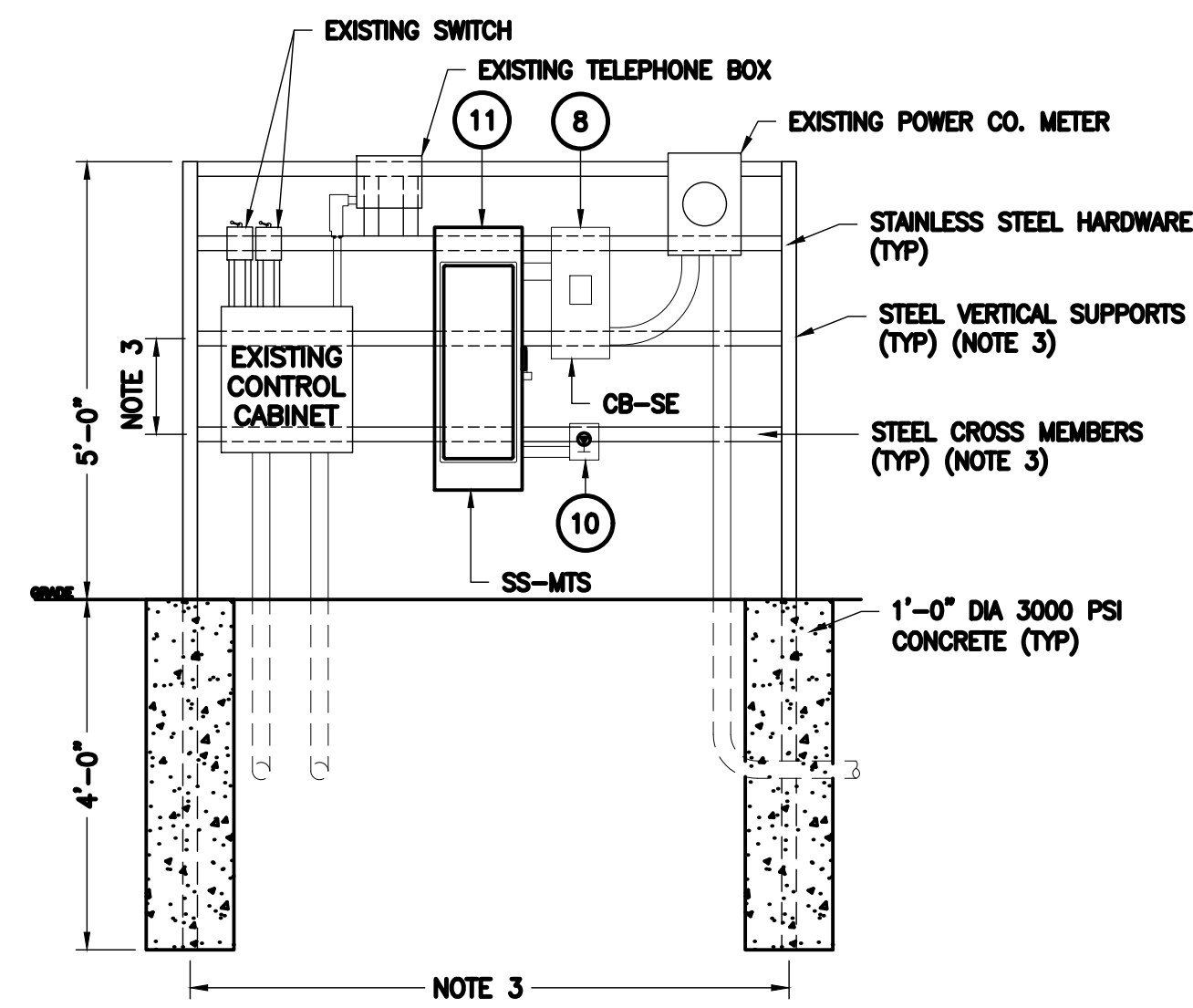
DRAWN BY: JHR
REVIEW BY: MGB
DATE: 27 SEP 2022
REVISION: 2 - 3 FEB 2023

SHEET DESCRIPTION:
460 LIFT STATION

E20



EQUIPMENT - EXISTING
SCALE: NOT TO SCALE



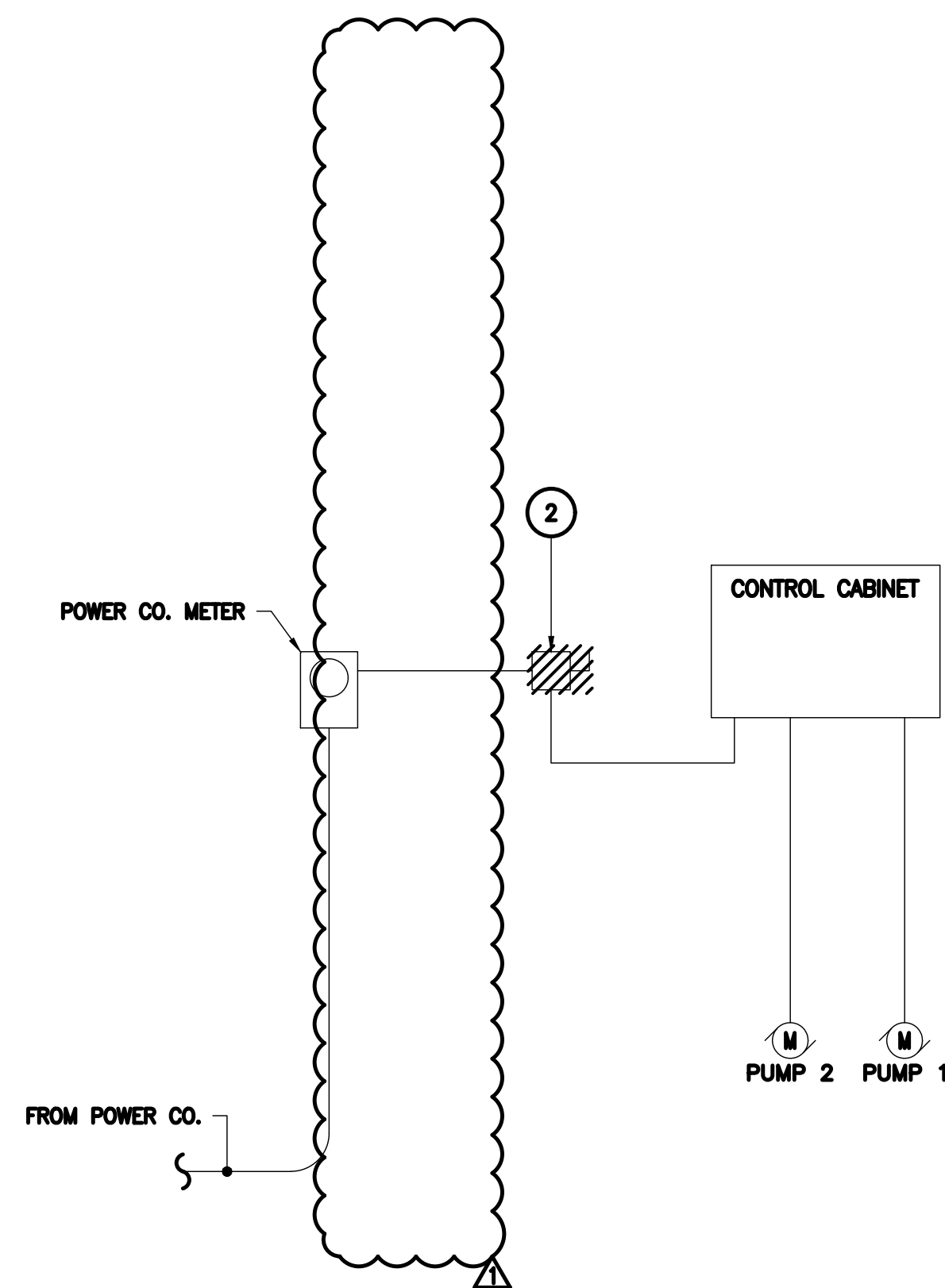
EQUIPMENT - REWORKED RACK ELEVATION
SCALE: NOT TO SCALE

NOTES (SHEET E30)

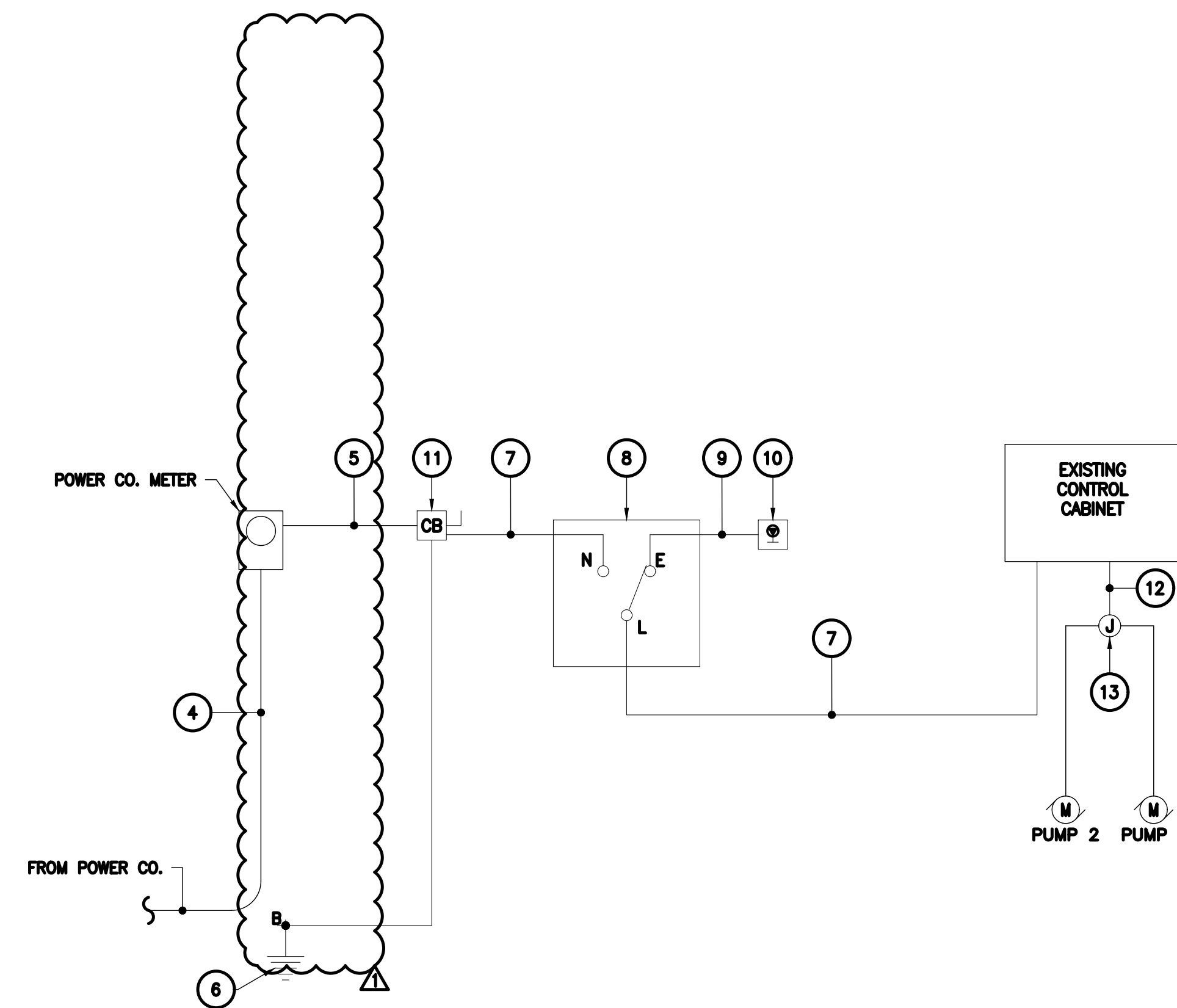
1. SEE EQUIPMENT - REWORKED RACK ELEVATION, THIS SHEET FOR CONDUIT ROUTING AND TERMINATION.
2. SIZE ACCORDING TO THE DIMENSIONS OF THE ACTUAL EQUIPMENT INSTALLED.
3. USE 14 GAUGE 1 5/8" X 1 5/8" GALVANIZED STEEL STRUT CHANNEL. CONNECTIONS AND MOUNTING HARDWARE SHALL BE IN ACCORDANCE WITH CHANNEL MANUFACTURER'S RECOMMENDATIONS AND STANDARDS.

KEYED NOTES (SHEET E30)

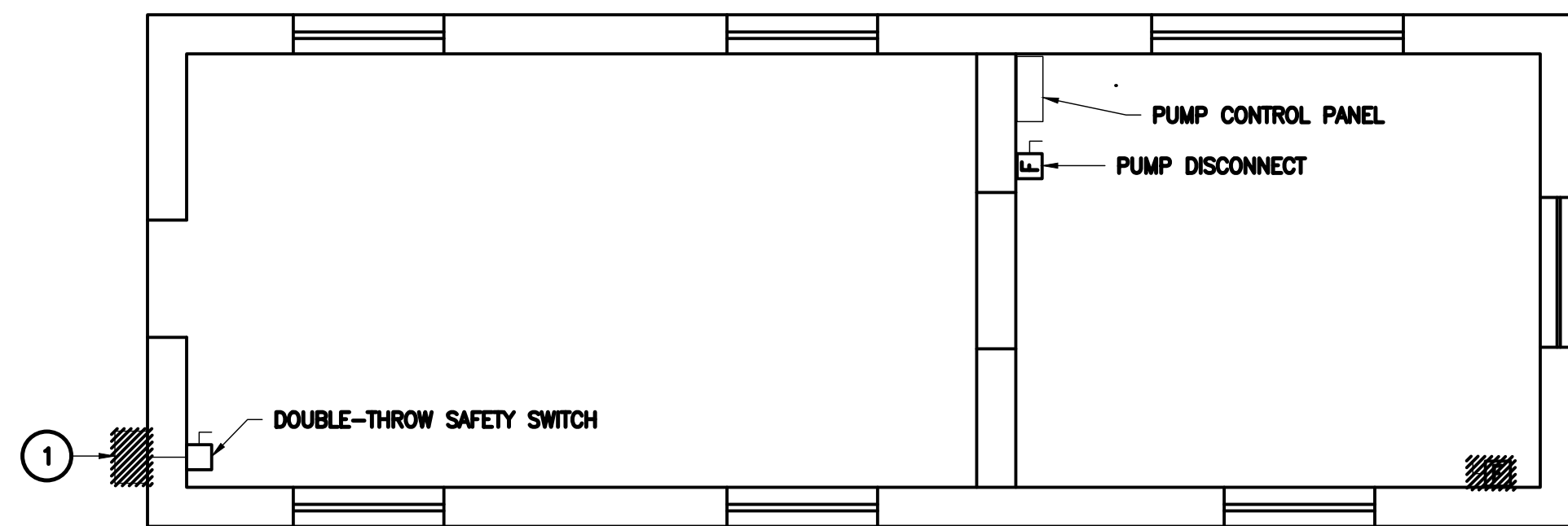
- 1 DEMO CONDUIT TO THE EXTENTS THAT IT CAN BE REROUTED TO THE NEW RACK LOCATION.
- 2 DEMO FUSED SAFETY SWITCH.
- 3 INSTALL NEW EQUIPMENT RACK SLIGHTLY IN FRONT OF EXISTING RACK. EQUIPMENT SHOWN NOT DEMOLISHED SHALL BE MOVED TO NEW RACK.
- 4 RE-ROUTE SERVICE ENTRANCE CONDUITS TO NEW RACK LOCATION. EXISTING WIRING MAY BE USED IF LENGTH ALLOWS. OTHERWISE, INSTALL NEW WIRING. COORDINATE WITH POWER COMPANY FOR DISCONNECT, METER RELOCATION AND RECONNECT. POWER COMPANY MAY REQUIRE CONTRACTOR TO PROVIDE NEW METER SOCKET.
- 5 4 #6 - 1" C
- 6 NEW 3/4" X 10'-0" COPPER-CLAD STEEL GROUND ROD. MAKE NEUTRAL-TO-GROUND CONNECTION WITHIN CB-SE AND CONNECT TO GROUND TOD WITH MIN. #8 EGC.
- 7 4 #6 & 1 #10 EGC - 1" C
- 8 NEW 60 AMP, 3P, HEAVY-DUTY, NEMA 3R, DOUBLE THROW SAFETY SWITCH.
- 9 4 #4 & 1 #6 EGC - 1 1/2" C.
- 10 NEW GENERATOR CONNECTION RECEPTACLE. MATCH PLUG ON EXISTING PORTABLE GENERATOR.
- 11 NEW 60 AMP, SERVICE-ENTRANCE-RATED NEMA 3R, INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER.
- 12 REUSE EXISTING CONDUIT AND WIRING FROM CONTROL CABINET TO WELL LOCATION. EXTEND AS NECESSARY TO JUNCTION BOX LOCATION.
- 13 NEW PUMP WIRING ABOVE-GRADE JUNCTION BOX. SEE DETAIL, SHEET E01.
- 14 INSTALL NEW JUNCTION BOXES BESIDE WET WELL COVER. INSTALL ONE BOX FOR POWER WIRING AND A SECOND FOR CONTROL WIRING. WIRING BETWEEN BACKBOARD AND JUNCTION BOX SHALL BE NEW. WIRING FROM JUNCTION BOX AND PUMPS MAY BE REUSED IF LENGTHS ALLOW. OTHERWISE, REPLACE. DEMOLISH JUNCTION BOX WITHIN EXISTING WET WELL.



ONE LINE DIAGRAM - REWORKED
SCALE: NOT TO SCALE

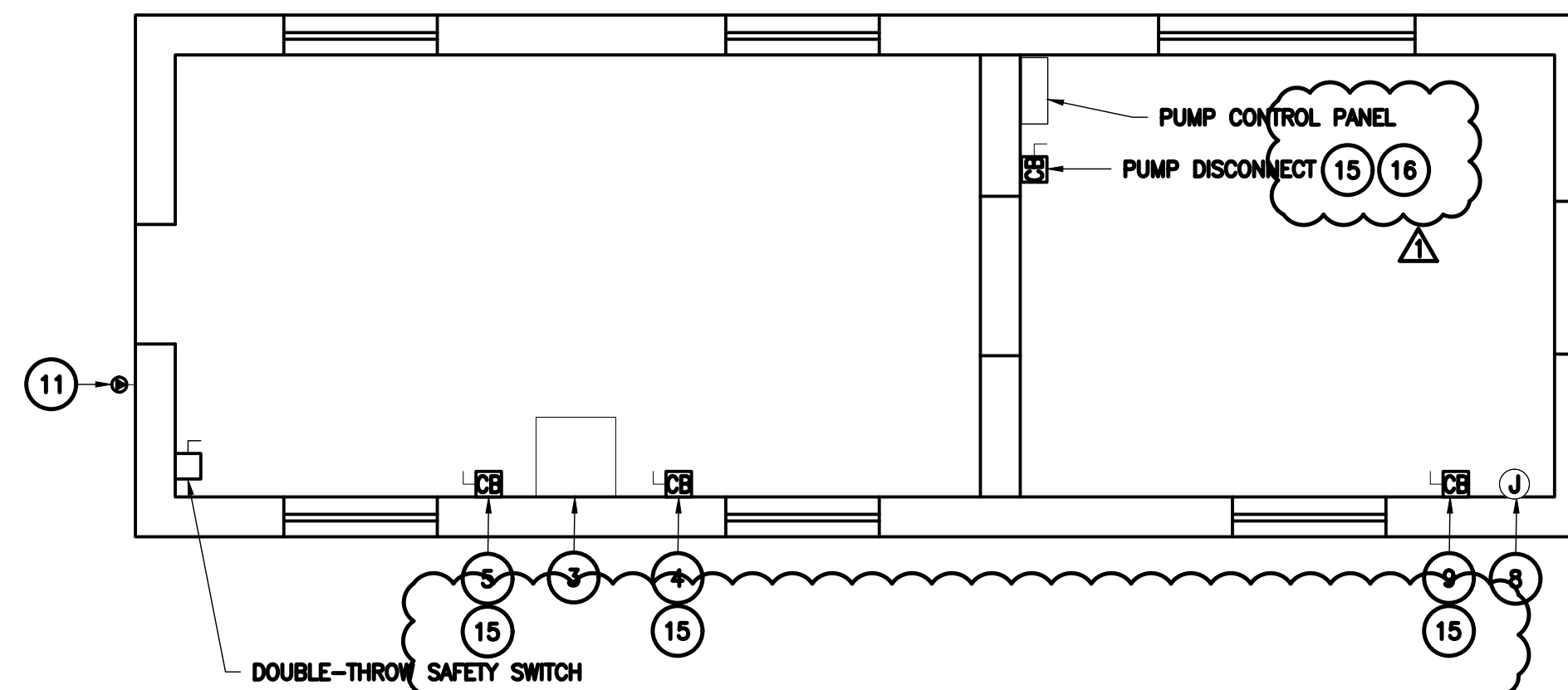


ONE LINE DIAGRAM - REWORKED
SCALE: NOT TO SCALE



FLOOR PLAN - EXISTING

SCALE: 1/4" = 1'-0"

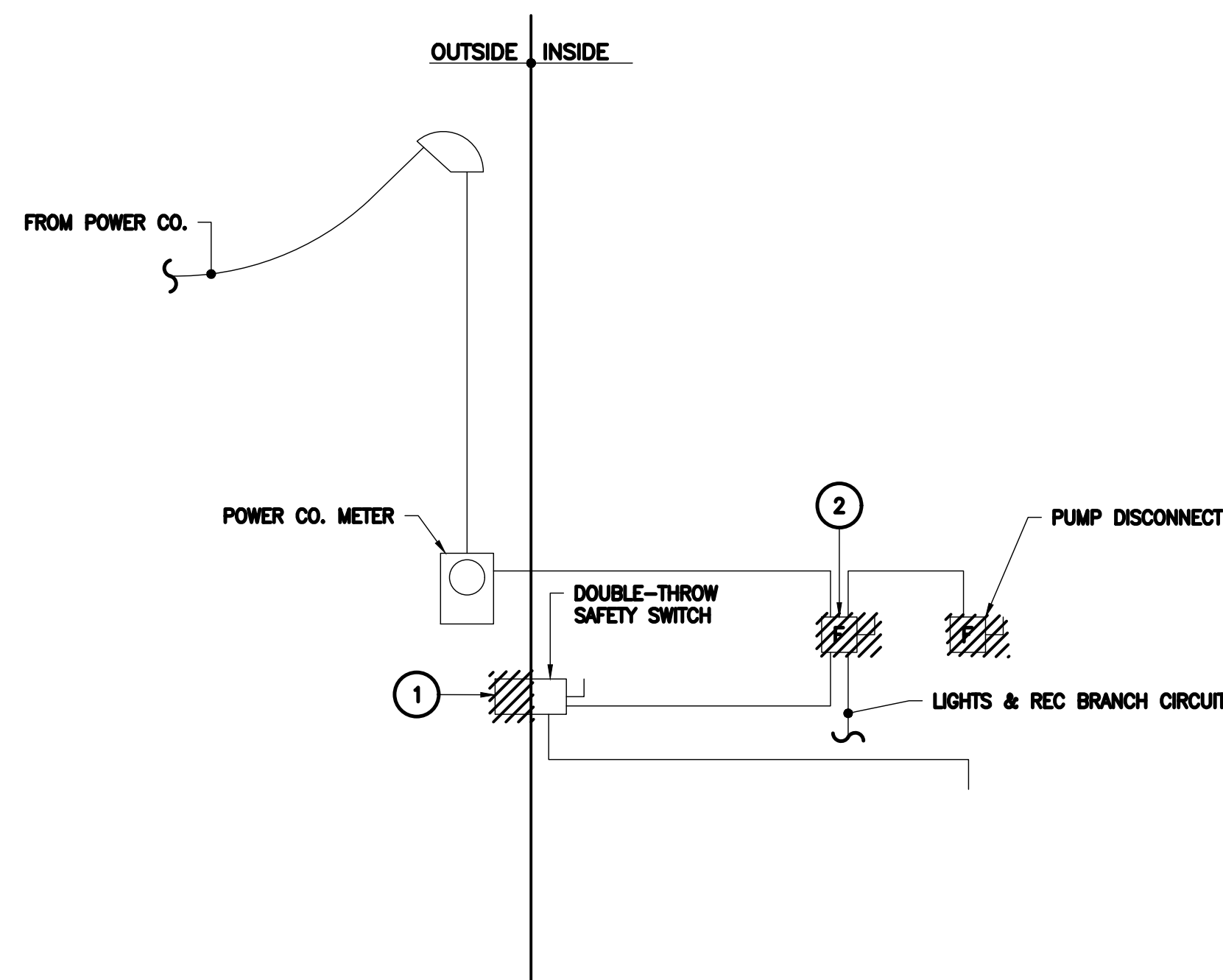


FLOOR PLAN - REWORKED

SCALE: 1/4" = 1'-0"

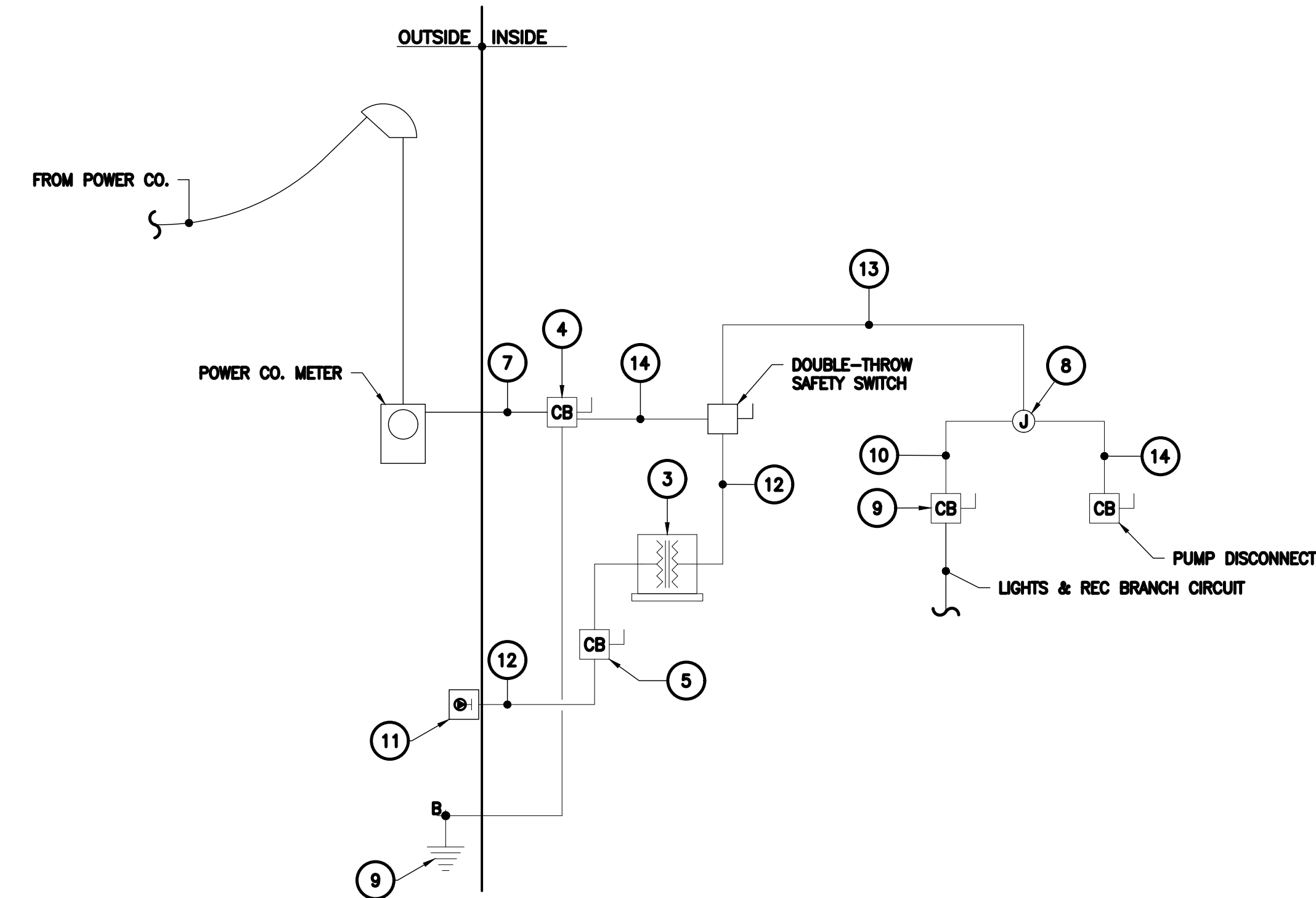
KEYED NOTES (SHEET E50)

- ① DEMOLISH EXISTING GENERATOR CONNECTION BOX.
- ② DEMOLISH EXISTING SAFETY SWITCH BOX. MAY REMAIN AS JUNCTION BOX.
- ③ NEW 50KVA TRANSFORMER. 240V PRIMARY, 120/208 SECONDARY. INSTALL WITH WALL BRACKET AS HIGH AS POSSIBLE.
- ④ NEW 200 AMP SERVICE-ENTRANCE RATED, INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER. LABEL AS SERVICE-DISCONNECT.
- ⑤ NEW 175A INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER.
- ⑥ MAKE NEUTRAL TO GROUND CONNECTION WITHIN BREAKER ENCLOSURE. CONNECT TO EXISTING ELECTRODES WITH MIN #2 EGC.
- ⑦ 4 #3/0 - 2" C
- ⑧ INSTALL DEADFRONT OVER EXISTING BOX IF RE-PURPOSING AS A JUNCTION BOX.
- ⑨ 20A, 2P INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER FOR LIGHTS AND RECEPTACLES.
- ⑩ MINIMUM 2 #12 & 1 #12 EGC - 3/4" C
- ⑪ NEW GENERATOR CONNECTION RECEPTACLE. MATCH PLUG ON EXISTING PORTABLE GENERATOR. INSTALL AT 6'-7" AFF.
- ⑫ 4 #2/0 & 1 #6 EGC - 2" C
- ⑬ EXTEND SERVICE CONDUCTORS IF RE-PURPOSING AS JUNCTION BOX, OTHERWISE EXTEND BRANCH CIRCUIT WIRING FOR LIGHTS AND RECEPTACLES.
- ⑭ 4 #3/0 & 1 #6 EGC - 2" C
- ⑮ INSTALL SUCH THAT THE OPERATING HANDLE IS 6'-7" AFF.
- ⑯ INSTALL NEW INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER TO REPLACE FUSED DISCONNECT.



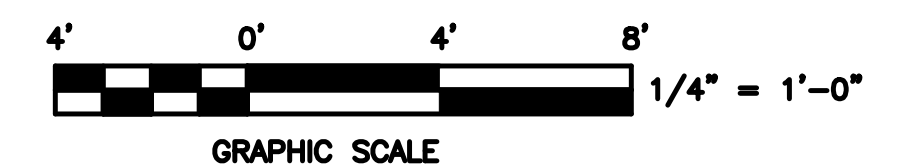
ONE LINE DIAGRAM - EXISTING

SCALE: NOT TO SCALE



ONE LINE DIAGRAM - REWORKED

SCALE: NOT TO SCALE



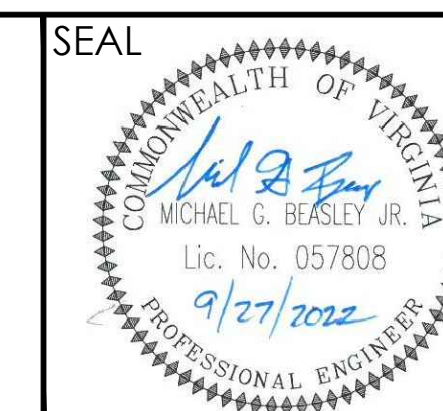
904 Lakeside Drive, Lynchburg, VA 24501
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**TOWN OF NARROWS
SEWER IMPORVEMENTS**

GILES COUNTY

VIRGINIA



DRAWN BY: JHR
REVIEW BY: MGB
DATE: 27 SEP 2022
REVISION: 1 - 3 FEB 2023

SHEET DESCRIPTION:
SALTHOUSE

E50

Automatic Transfer Switches Standard Any Breaker Rated



Available Controllers

- Decision-Maker® MPAC 1200
- Decision-Maker® MPAC 1500

Ratings

Model	Current	Voltage, Frequency
KCS	30- 4000 amps	208- 600 VAC 50/60 Hz
KCP	150- 4000 amps	
KCC	150- 4000 amps	

Transfer Switch Standard Features

- UL 1008 listed
file # E58962 (automatic), # E86894 (nonautomatic)
- CSA certification available
- IBC and OSHPD seismic certification available
- Available in 2, 3, or 4 pole configurations
- Integral solid neutral provides line-to-neutral monitoring
- Electrically operated, mechanically held mechanism
- High withstand and close-on ratings
- Design suitable for emergency and standby applications on all classes of load, 100% tungsten rated through 400 amps
- Silver alloy main contacts
- Gold-flashed engine start contacts rated 2 amps @ 30 VDC/250 VAC
- Front-accessible contacts for easy inspection
- Front-replaceable main and arcing contacts (800- 4000 amps)
- Reliable, field-proven solenoid mechanism
- Switching mechanisms lubricated for the expected life of the transfer switch
- Internal manual operating handle
- Main shaft auxiliary position-indicating contacts rated 10 amps @ 32 VDC/250 VAC
- NEMA type 1, 12, 3R, 4, and 4X enclosures available
- Standard one-year limited warranty. Extended limited warranties are available.

Standard-Transition Models (KCS)

- Standard-transition operation with either automatic or non-automatic control
- Standard-transition transfer time less than 100 milliseconds (6 cycles @ 60 Hz)
- Double-throw, mechanically interlocked design (break-before-make power contacts)
- Solid, switched, or overlapping (make-before-break) neutral

Programmed-Transition Models (KCP)

- Programmed-transition operation with either automatic or non-automatic control
- Programmed-transition operation provides a center OFF position that allows residual voltages in the load circuits to decay
- Programmable OFF time
- Double-throw, mechanically interlocked design (break-before-make power contacts)
- Solid or switched neutral

Closed-Transition Models (KCC)

- Closed-transition transfer switches operate with no power interruption during transfer and retransfer between two live sources
- Source parallel times are less than 100 milliseconds (6 cycles @ 60 Hz)
- Adjustable extended transfer time relay (ensure that the setting complies with applicable codes)
- Solid or switched neutral

Available Automatic Transfer Switch Controllers

Select one of the following controllers for your automatic transfer switch.

Decision-Maker® MPAC 1200 Controller



- LCD display, 4 lines x 20 characters, backlit
- Complete programming and viewing capability at the door using the keypad and LCD display
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”
- Programmable voltage and frequency pickup and dropout settings
- Programmable time delays
- Programmable generator exerciser
- Time-based load control
- Two programmable inputs and two programmable outputs
- Up to four I/O extension modules available
- Modbus communication standard
- RS-485 communication standard
- Ethernet communication optional

For more information about Decision-Maker® MPAC 1200 features and functions, see specification sheet G11- 127.

Decision-Maker® MPAC 1500 Controller



- LCD display, 4 lines x 20 characters, backlit
- Complete programming and viewing capability at the door using the keypad and LCD display
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”
- Programmable voltage and frequency pickup and dropout settings
- Programmable time delays
- Programmable generator exerciser
- Time-based load control
- Current-based load control (current-sensing kit required)
- Two programmable inputs and two programmable outputs
- Up to four I/O extension modules available
- Modbus communication standard
- RS-485 communication standard
- Ethernet communication standard
- Three-source system
- Prime power

For more information about Decision-Maker® MPAC 1500 features and functions, see specification sheet G11- 128.

Application Data

Environmental Specifications	
Operating Temperature	- 20°C to 70°C (- 4°F to 158°F)
Storage Temperature	- 40°C to 85°C (- 40°F to 185°F)
Humidity	5% to 95% noncondensing

Input and Output Connection Specifications	
Component	Wire Size Range
Main board I/O terminals	#12- 24 AWG
I/O module terminals	#14- 24 AWG

Auxiliary Position Indicating Contacts (rated 10 amps @ 32 VDC/250 VAC)			
Switch Rating, Amps	Number of Contacts Indicating Normal, Emergency		
	KCS	KCP	KCC
30- 230	2, 2	N/A	N/A
260- 600	8, 8	—	—
150- 600	—	8, 8	7, 7
800-1200	8, 8	8, 8	7, 7
1600- 4000	8, 8	7, 7	6, 6

Extended Transfer Time Adjustable Relay (Model KCC only)	
Power	12 or 24 VDC (customer-supplied)
Connections	12- 20 AWG
Output type	Relay contacts, DPDT (2 form C)
Rating	10 amps max. resistive at 240 VAC
Note: Customer-supplied shunt trip on emergency source circuit breaker is required.	

Source Synchronization Settings (Model KCC)		
Parameter	Default	Adjustment Range
Voltage differential	5%	0- 5%
Frequency differential	0.1 Hz	0- 0.3 Hz
Phase angle	10 deg.	0- 10 deg.

Cable Sizes

Note: Cable size data is subject to change. Refer to the transfer switch dimension drawings and wiring diagrams for planning and installation.

UL-Listed Solderless Screw-Type Terminals for External Power Connections				
Range of Wire Sizes, Copper or Aluminum ‡				
Model	Switch Rating, Amps	Normal, Emergency, and Load (per phase)	Neutral (3-pole)	Ground
KCS	30- 150	(1) #14 AWG to 4/0 AWG	(3) #14 to 4/0 AWG	(3) #6 to 3/0
	200	(1) #14 AWG to 4/0 AWG <i>Cu only</i>	(3) #14 to 4/0 AWG <i>Cu only</i>	(3) #6 to 3/0
	230 (208- 480 V)			
	230 (600 V)	(1) #4 AWG to 600 KCMIL or (2) 1/0 to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL
260- 400				
KCP KCC	150- 400	(1) #4 AWG to 600 KCMIL or (2) 1/0 to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL
KCS KCP KCC	600	(2) #2 AWG to 600 KCMIL	(6) #2 AWG to 600 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL
	800- 1000	(4) 1/0 AWG to 750 KCMIL	(12) 1/0 AWG to 750 KCMIL	
	1200 (NEMA 3R)			
	1200 (NEMA 1)	(4) 1/0 AWG to 750 KCMIL	(12) 1/0 AWG to 750 KCMIL	(3) #4 to 500 KCMIL
	1600- 2000 F † (NEMA 3R)	(6) 1/0 AWG to 750 KCMIL	(18) 1/0 AWG to 750 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL
	1600- 2000	(6) 1/0 AWG to 750 KCMIL	(18) 1/0 AWG to 750 KCMIL	(3) #4 to 500 KCMIL
	2600- 3000	(12) 1/0 AWG to 750 KCMIL	(36) 1/0 AWG to 750 KCMIL	
4000	(12) 1/0 AWG to 750 KCMIL	(36) 1/0 AWG to 750 KCMIL	(18) 1/0 AWG to 750 KCMIL	

† F = Front connected
‡ Use 75°C minimum Cu/Al wire for power connections.

Withstand and Close-On Ratings (WCR) Standard, Programmed, and Closed-Transition Models

Maximum current in RMS symmetrical amperes when coordinated with customer-supplied fuses or circuit breakers. All values are available symmetrical RMS amperes and tested in accordance with the withstand and close-on requirements of UL 1008. Application requirements may permit higher withstand ratings for certain size switches. Contact the factory for assistance.

Model	Switch Rating, Amps	Withstand Current Ratings in RMS Symmetrical Amperes								Short Time Ratings (sec.) ‡								
		Current-Limiting Fuses				Time-Based Rating *				480 V Max.				600 V Max.				
		480 V Max.	600 V Max.	Amps, Max.	Fuse Class	Time, sec.	240 V, Max	480 V, Max	600 V, Max	.13	.2	.3	.5	.1	.13	.3	.5	
KCS	30	100kA	—	300	J	0.025	10kA	10kA	10kA	—				—				
		200kA	35kA	200	J					—				—				
		35kA	35kA	200	RK1					—				—				
	70 104 150	200kA	35kA	200	J	0.025	10kA	10kA	10kA	—				—				
		35kA	35kA	200	RK1	0.025	10kA	10kA	10kA	—				—				
	200	200kA	—	200	J	0.025	10kA	10kA	—	—				—				
	230 (480V)	100kA	—	300	J	0.025	10kA	10kA	—	—				—				
230 (600V)	200kA	200kA	600	J	0.05	65kA	42kA †	35kA	7500A	—				—				
			800	L						—				—				
KCP KCC	150	200kA	200kA	600	J	0.05	65kA	42kA †	35kA	7500A	—				—			
				800	L	0.05	65kA	42kA †	35kA	7500A	—				—			
KCP	225	200kA	200kA	600	J	0.05	65kA	42kA †	35kA	7500A	—				—			
				800	L	0.05	65kA	42kA †	35kA	7500A	—				—			
KCS KCP KCC	260 400	200kA	200kA	600	J	0.05	65kA	42kA †	35kA	7500A	—				—			
				800	L	0.05	65kA	42kA †	35kA	7500A	—				—			
	600	200kA	200kA	600	J	0.05	65kA	42kA †	35kA	—	—				—			
				800	L	0.05	65kA	42kA †	35kA	—	—				—			
	800- 1200	200kA	200kA	1600	L	0.05	50kA	50kA	50kA	36kA	—		36kA	—				
	1600- 2000 F	200kA	200kA	2500	L	0.05	85kA	85kA	85kA	42kA	36kA	—						
	1600- 2000 S	200kA	200kA	3000	L	0.05	100kA	100kA	100kA	42kA	36kA	42kA	—					
2600 3000	200kA	200kA	4000	L	0.05	100kA	100kA	100kA	42kA	36kA	42kA	—						
4000	200kA	200kA	5000	L	0.05	100kA	100kA	100kA	85kA	65kA		65kA						

* Applicable to breakers with instantaneous trip elements.

† Applicable to 2-pole, 3-pole, and conventional 4-pole switches only. Overlapping neutral switches have “any” breaker ratings of 35kA, 0.050 seconds at 480 V.

‡ Short time ratings are provided for applications involving breakers that utilize trip delay settings for system selective coordination.

Ratings with Specific Manufacturers' Circuit Breakers

The following charts list power switching device withstand and close-on ratings (WCR) in RMS symmetrical amperes for specific manufacturers' circuit breakers. Circuit breakers are supplied by the customer.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers				
				Manufacturer	Type or Class	Max. Size, amps		
KCS	30	22,000	480	GE	THED	40		
		150,000		Square D	HR	250		
		125,000			HL	150		
		100,000			BJ, HJ	125		
		65,000			BG, HG	125		
		42,000			QG, QJ	90		
		25,000			HD	150		
		25,000			BD	125		
	70	22,000	480		GE	THED	90	
		85,000		Square D	HL, HR	150		
		50,000			BJ	125		
		35,000			HG, HJ	150		
		18,000			BG	125		
					BD, HD	125		
		25,000			600	Square D	HJ, HL, HR	150
		18,000					BJ	125
HG	150							
BG	125							
14,000	HD	150						
KCS	104	150,000	240	Square D	HR	250		
		125,000			HL	150		
		100,000			BJ, HJ	125		
		65,000			BG, HG	125		
		42,000			QG, QJ	125		
		25,000			HD	150		
					BD	125		
		22,000			480	GE	THED	150
		85,000	Square D	HL, HR		150		
		50,000		BJ		125		
		35,000		HG, HJ		150		
		18,000		BG		125		
				BD, HD		125		
		25,000		600		Square D	HJ, HL, HR	150
		18,000					BJ	125
					HG		150	
BG	125							
14,000	HD	150						
BD	125							

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers			
				Manufacturer	Type or Class	Max. Size, amps	
KCS	150	150,000	240	Square D	HR	250	
		125,000			HL	150	
		100,000			BJ, HJ	125	
		65,000			JG, JJ, JL, JR	200	
		42,000			BG, HG	125	
		25,000			QG, QJ	200	
		22,000			HD	150	
		22,000			BD	125	
		85,000	480	Square D	GE	THED	150
		50,000			HL, HR	150	
		35,000			BJ	125	
		25,000			HG, HJ	150	
		18,000			BG	125	
		25,000			JG, JJ, JL	200	
		18,000			BD, HD	125	
25,000	600	Square D	HJ, HL, HR	150			
18,000			BJ	125			
14,000			HG	150			
14,000			BG	125			
KCS	200 230	200,000	240	Square D	HD	150	
		125,000			BD	125	
		100,000			JR	250	
		65,000			JL	250	
		42,000			JJ	250	
		25,000			JG	250	
		25,000			QG, QJ	225	
		25,000	JD	250			
85,000	480	Square D	JL, JR	250			
30,000			JG, JJ	250			
18,000			JD	250			
KCS	230	42,000	600	Eaton/ Cutler Hammer	JGU, JGX, JGH	250	
					KDC	400	
					LDC, CLDC	600	
				GE	TBC4	400	
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600	
				Square D	HJ, HL, HG	150	
					KI, JJ, JL, JR, CF250L	250	
					CK400H, CK400HH, CJ400L	400	
					LI, MasterPact STR 28D, PK	600	
				Siemens /ITE	HJD, CFD6	250	
HHJD6, HHJXD6, CJD6, SCJD6	400						
HHL6, HHLXD6, CLD6, SCLD6, LNG, LPG, LGC*, LGU*, LGX*	600						

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers				
				Manufacturer	Type or Class	Max. Size, amps		
KCP KCC	150 225 §	65,000	240	GE	THQMV	225		
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600		
				Eaton/ Cutler Hammer	LDC, CLDC, HLD, CHLD	600		
				Siemens/ITE	HLD6, HLXD6	600		
				Square D	QG, QJ	250		
					LJ, LL, LR	600		
				50,000	480	Eaton/ Cutler Hammer	HFDE, FDC, FDCE	225
							NHH	250
		JDC, JGU, JGX	350					
		HKD, CHKD, KDC, HKDB, CHKDB, LHH	400					
		HLD, CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600					
		HMDLB, CHMDLB	800					
		GE	SEL, SEP			150		
			SFL, SFP, FEN, FEH			250		
			TBC4			400		
			FGN, FGH, FGL, FGP, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, TJL4V, TJL1S-6S, TBC6			600		
		Siemens/ITE	TB8			800		
			HDG, LDG			150		
			HFD, HFD6, HFXD, HFXD6, HHFD6, HHFXD6, CFD6, HFG, LFG			250		
			HJD, HJD6, HJXD, HJXD6, SHJD, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LJG, LLG			400		
		Square D	HLD6, HLXD6, HHL6, HHLXD6, CLD6, SHLD6, SCLD6, HLG			600		
			HJ, HL			150		
			KC, KI, CF250L, NSF250			250		
			CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400			400		
			LC, DJ, DL, LI, NSJ600			600		
			MasterPact STR 28D, PK, PJ, PL			800		
		Square D	JJ (Current Limiting)	250				
			JL (Current Limiting)					
			JR (Current Limiting)					
		42,000	600	Eaton/ Cutler Hammer	JGU, JGX, JGH	250		
					KDC	400		
					LDC, CLDC	600		
GE	TBC4			400				
	SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP			600				
Square D	HJ, HL, HG			150				
	KI, JJ, JL, JR, CF250L			250				
	CK400H, CK400HH, CJ400L			400				
	LI, MasterPact STR 28D, PK			600				
Siemens/ITE	HJD, CFD6			250				
	HHJD6, HHJXD6, CJD6, SCJD6			400				
	HHL6, HHLXD6, CLD6, SCLD6, LNG, LPG, LGC*, LGU*, LGX*			600				

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

§ KCP only

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers					
				Manufacturer	Type or Class	Max. Size, amps			
KCS KCP KCC	260	65,000	240	GE	THQMV	225			
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600			
				Eaton/Cutler Hammer	LDC, CLDC, HLD, CHLD	600			
				Siemens/ITE	HLD6, HLXD6	600			
				Square D	QG, QJ	250			
					LJ, LL, LR	600			
				50,000	480	Eaton/Cutler Hammer	Eaton/Cutler Hammer	HFDE, FDCE, HFD, FDC, LHH	225
								JDC, JGH, JGC, JGU, JGX	250
		HKD, HKDB, CHKD, CHKDB, KDC	400						
		HLD, CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*, NHH	600						
		MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, MDLB, CMDLB, HMDLB, CHMDLB	800						
		GE	SFL, SFP, FEN, FEH					250	
		GE	TBC4			400			
			TBC6, TJL4V, TJL1S-6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP			600			
			TBC8, TKL4V, TKH8S-12S, TKL8S-12S, SKH8, SKL8, SKP8, TB8			800			
		Siemens/ITE	Siemens/ITE			HFD6, HFXD6, HHFD6, HHFXD6, CFD6, HFG, LFG	250		
						HJD6, HJXD6, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LJG, LLG	400		
						HLD6, HLXD6, SHLD6, HHL6, HHLXD6, CLD6, SCLD6, HLG	600		
						LMD, LMD6, LMXD, LMXD6, HLMD, HLMD6, HLMXD, HLMXD6, MD, MD6, MXD6, HMG, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, LMG, MG	800		
		Square D	Square D			KI, KC, CF250L, NSF250	250		
						CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400	400		
						LC, DJ, DL, LJ, LL, LR, LI, NSJ600	600		
						CK800N, CK800NN, CK800H, CK800HH, MasterPact STR 28D, MJ, PK, PJ, PL	800		
						CK1000HL	1000		
		Square D	Square D			CK1200NN, CK1200HH	1200		
						JJ (Current Limiting)	250		
				JL (Current Limiting)	250				
		65,000 100,000 200,000	600	Eaton/Cutler Hammer	Eaton/Cutler Hammer	JR (Current Limiting)	250		
						JGJ, JGX	250		
						KDC	400		
				GE	GE	LDC, CLDC	600		
						TBC4	400		
TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600								
Siemens/ITE	Siemens/ITE			TBC8, TKL4V, TKL8S-12S, SKL8, SKP8	800				
				HJD, CFD6	250				
				HHJD6, HHJXD6, CJD6, SCJD6	400				
				HHL6, HHLXD6, CLD6, SCLD6	600				
Square D	Square D			HLMD6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG, LNG, LPG, LGC*, LGU*, LGX*	800				
				KI, JL, JR, JJ, CF250L	250				
		CK400H, CK400HH, CJ400L	400						
		LI	600						
		CK800H, CK800HH, MasterPact STR 28D, PK	800						

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers				
				Manufacturer	Type or Class	Max. Size, amps		
KCS KCP KCC	400	65,000	240	GE	THQMV	225		
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600		
				Eaton/ Cutler Hammer	LDC, CLDC, HLD, CHLD	600		
				Siemens/ITE	HLD6, HLXD6	600		
				Square D	QG, QJ	250		
					LJ, LL, LR	600		
				50,000	480	Eaton/ Cutler Hammer	JGH, JGC, NHH	250
							HKD, CHKD, KDC, HKDB, CHKDB, LHH	400
		CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600					
		MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, MDLB, CMDLB, HMDLB, CHMDLB	800					
		NGU	1600					
		GE	TBC4			400		
			TBC6, TJK4V, TJK1S- 6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP			600		
			TBC8, TKL4V, TKH8S- 12S, TKL8S- 12S, SKH8, SKL8, SKP8, TB8			800		
		Siemens/ITE	HFD6, HFXD6, HFG, LFG			250		
			HJD6, HJXD6, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LLG, LJG			400		
			HLD6, HLXD6, SHLD6, HHL6, HHLXD6, CLD6, SCLD6, HLG			600		
			LM6, LMXD6, HLM6, HLMXD6, MD6, MXD6, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, HMG, LMG			800		
		Square D	CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400			400		
			LC, DJ, DL, LJ, LL, LR, LI, NSJ600			600		
			CK800N, CK800NN, CK800H, CK800HH, MJ			800		
			CK1000HH			1000		
			PK, PJ, PL, MH, MasterPact STR 28D, CK1200HH			1200		
		42,000	600			Eaton/ Cutler Hammer	KDC	400
							LDC, CLDC, LGC*, LGU*, LGX*	600
						GE	TBC4	400
				TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600			
				TBC8, TKL4V, TKL8S- 12S, SKL8, SKP8	800			
				Siemens/ITE	HHJD6, HHJXD6, CJD6, SCJD6	400		
					HHL6, HHLXD6, CLD6, SCLD6	600		
HLM6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG	800							
LNG, LPG	1200							
Square D	CK400H, CK400HH, CJ400L			400				
	LI			600				
	CK800H, CK800HH			800				
			MasterPact STR 28D, PK	1200				

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KCS KCP KCC	600	65,000	240	GE	THQMV SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	225 600
				Eaton/Cutler Hammer	LDC, CLDC, HLD, CHLD	600
				Siemens/ITE	HLD6, HLXD6	600
				Square D	QG, QJ	250
					LJ, LL, LR	600
				50,000	480	Eaton/Cutler Hammer
		HLD, CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600			
		MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, NGU, MDLB, CMDLB, NF	800			
		GE	TBC6, TJL4V, TJL1S-6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP			600
			TBC8, TKL4V, TKH8S-12S, TKL8S-12S, SKH8, SKL8, SKP8, TB8			800
			SKL12, SK12P			1200
		Siemens/ITE	HLD6, HLXD6, SHLD6, HHLXD6, HHLXD6, CLD6, SCLD6, HLG, LLG		600	
			LMD6, LMXD6, HLMXD6, HLMXD6, MD6, MXD6, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, HMG, LMG		800	
			HND6, HNXD6, SND6, SHND6, ND6, NXD6, HNG, LNG, CND6		1200	
		Square D	LC, DJ, DL, LI, NSJ600		600	
			CK800N, CK800NN, MJ		800	
			MH, CK1200N, CK1200NN, CK1200H, CK1200HH, NT-H, NT-L1, NT-L, NT-LF, PK, PJ, PL		1200	
			CM2000HH	2000		
	CM2500HH		2500			
	42,000	600	Eaton/Cutler Hammer	JGC	250	
				TBC4	400	
				LDC, CLDC	600	
			GE	TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600	
				TBC8, TKL4V, TKL8S-12S, SKL8, SKP8	800	
				SKL12, SKP12	1200	
		Siemens/ITE	HHLXD6, HHLXD6, CLD6, SCLD6	600		
			HLMXD6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG	800		
			HND6, HNXD6, HNG, LNG, SHND6	1200		
		Square D	LI	600		
			CK800H, CK800HH	800		
			CK1000HL	1000		
	CK1200H, CK1200HH, NT-H, NT-L, NT-LF, NT-L1, MasterPact STR 28D, PK		1200			
	800 1000 1200	65,000	480	Eaton/Cutler Hammer	HLD, CHLD, LGH, LGC, LGU, LGX, LDC, CLDC	600
					HMDL, CHMDL, HMDLB, CHMDLB	800
					HND, CHND, NDC, CNDC, NF	1200
					NGH, NGC, NGU	1600
				RGH, RGC	2500	
				GE	TBC6, TJL4V, SGL, SGP6	600
			TBC8, SKL8, SKP8		800	
SKL12, SKP12, TKL4V			1200			
Siemens/ITE			HLXD6, HHLXD6, HHLXD6, CLD6, SHLD6, SCLD6, HLG, LLG	600		
			HMXD6, HMD6, SHMD6, HMG, LMG, CMD6, SCMD6	800		
			SHND6, CND6, HNXD6, HNG, LNG	1200		
			HPG, LPG, HPD, HPD6, CPD6, HPXD, HPXD6, SHPD, SHPD6	1600		
		HRD6, HRXD6	2000			
Square D		LI, LE LSI, LE LI, LX, LXI, LJ, LL, LR	600			
		MJ, ME, MX, CK800H, CK800HH	800			
		CK1000HL	1000			
		NT-L1, NT-L, NT-LF, NE, NX, CK1200H, CK1200HH, PJ, PL	1200			
		NW, RJ, RL	1600			
		PE, PX	2500			
		SES, SE, SEH (LS or LSI TRIP)	3000			
		SE (LI, LSI-E, and LI-E TRIP)	4000			
		MasterPact STR 28D	6300			
600		Eaton/Cutler Hammer	Tri-Pac NB	800		
	RDC		2500			
	Siemens/ITE	CND	1200			

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Weights and Dimensions

Note: Always use the transfer switch dimension drawing for planning and installation. Weights and dimensions may vary for different configurations. See your local distributor for dimension drawings.

Weights and dimensions are shown for NEMA Type 1 enclosures, NEMA Type 3R enclosures and open units. See the transfer switch dimension drawings for other enclosure types.

Model	Amps	NEMA Type	Poles	Wires	Dimensions mm (in.)			Weight kg (lb.)			Dimension Drawing
					Height	Width	Depth	2-Pole	3-Pole	4-Pole	
KCS	30-200	1, 3R	2,3,4	3, 4	791 (31)	450 (18)	314 (12.4)‡	28 (62)	30 (65)	31 (68)	ADV-8566
	230 (208-480V)		2,3,4	3, 4	1223 (48)	560 (22)	362 (14.3)‡	52 (115)	56 (123)	59 (131)	ADV-8568
	230 (600 V) 260-600		2,3,4	3, 4	1702 (67)	610 (24)	514 (20.2)‡	179 (395)	183 (403)	188 (414)	ADV-8570
	800		2,3,4	3, 4	1932 (76)*	864 (34)	515 (20.3)‡	220 (485)	231 (510)	238 (525)	ADV-8572
	1000	1	3,4	4	1932 (76)*	864 (34)	515 (20.3)‡	—	231 (510)	238 (525)	ADV-8572
	1200		3R	3,4	4	2286 (90)	963 (38)	688 (27.1)	—	356 (785)	379 (835)
	1600-2000F †	1	3,4	4	2286 (90)	963 (38)	688 (27.1)	—	472 (1040)	494 (1090)	ADV-8577
			3R	3,4	4	2286 (90)	940 (37)	869 (34.2)	—	356 (785)	379 (835)
	1600-2000	1	3,4	4	2286 (90)	963 (38)	1220 (48)	—	472 (1040)	494 (1090)	ADV-8579
			3R	3,4	4	2286 (90)	940 (37)	1434 (56.4)	—	472 (1040)	494 (1090)
	2600-3000	1	3,4	4	2286 (90)	963 (38)	1524 (60)	—	649 (1430)	679 (1495)	ADV-8581
			3R	3,4	4	2286 (90)	940 (37)	1738 (68.4)	—	649 (1430)	679 (1495)
4000	1	3,4	4	2311 (91)	1524 (60)	1836 (72.3)	—	975 (2149)	1056 (2328)	ADV-8583	
		3R	3,4	4	2529 (100)	1606 (63)	2310 (91)	—	1436 (3165)		1523 (3357)
KCS	30-200	Open Unit §	2,3,4	3, 4	787 (31)	445 (18)	296 (11.6)	8 (17)	9 (20)	11 (23)	ADV-7182
	230 (208-480V)		2,3,4	3, 4	1219 (48)	457 (18)	330 (13.0)	17 (37)	21 (45)	24 (53)	
	230 (600V) 260-600		2,3,4	3, 4	1422 (56)	610 (24)	362 (14.3)	31 (68)	34 (74)	36 (80)	
	800		2,3,4	3, 4	1829 (72)	864 (34)	508 (20)	68 (150)	78 (170)	90 (196)	
	1000		3,4	4	1829 (72)	864 (34)	508 (20)	—	78 (170)	90 (196)	
	1200		3,4	4	2210 (87)	965 (38)	584 (23)	—	78 (170)	90 (196)	
	1600-2000F †		3,4	4	2210 (87)	965 (38)	635 (25)	—	190 (420)	213 (470)	
	1600-2000		3,4	4	2286 (90)	965 (38)	1219 (48)	—	190 (420)	213 (470)	
	2600-3000		3,4	4	2286 (90)	965 (38)	1524 (60)	—	213 (470)	243 (535)	
KCP KCC	150-600	1, 3R	2,3,4	3, 4	1702 (67)	610 (24)	514 (20.2)‡	179 (395)	183 (403)	188 (414)	ADV-8570
	800	1, 3R	2,3,4	3, 4	1932 (76)*	864 (34)	515 (20.3)‡	220 (485)	231 (510)	238 (525)	ADV-8572
	1000	1, 3R	2,3,4	4	1932 (76)*	864 (34)	515 (20.3)‡	220 (485)	231 (510)	238 (525)	ADV-8572
	1200	1	3,4	4	2286 (90)	963 (38)	688 (27)	—	463 (1020)	485 (1070)	ADV-8574
		3R	3,4	4	2286 (90)	940 (37)	717 (28.2)	—	463 (1020)	485 (1070)	ADV-8575
	1600-2000F †	1	3,4	4	2286 (90)	963 (38)	688 (27)	—	533 (1175)	556 (1225)	ADV-8577
		3R	3,4	4	2286 (90)	940 (37)	869 (34.2)	—	533 (1175)	556 (1225)	ADV-8578
	1600-2000	1	3,4	4	2286 (90)	963 (38)	1220 (48)	—	533 (1175)	556 (1225)	ADV-8579
		3R	3,4	4	2286 (90)	940 (37)	1434 (56.4)	—	533 (1175)	556 (1225)	ADV-8580
	3000	1	3,4	4	2286 (90)	963 (38)	1524 (60)	—	735 (1620)	765 (1685)	ADV-8581
3R		3,4	4	2286 (90)	940 (37)	1738 (68.4)	—	735 (1620)	765 (1685)	ADV-8582	
4000	1	3,4	4	2311 (91)	1524 (60)	1836 (72.3)	—	975 (2149)	1056 (2328)	ADV-8583	
	3R	3,4	4	2528 (100)	1606 (63)	2310 (91)	—	1436 (3165)	1523 (3357)	ADV-8583	
KCP	150-600	Open Unit §	2,3,4	3, 4	1422 (56)	610 (24)	362 (14.3)	38 (84)	41 (90)	44 (96)	ADV-7182
	800		2,3,4	3, 4	1829 (72)	864 (34)	508 (20)	80 (175)	94 (205)	108 (235)	
	1000		2,3,4	4	1829 (72)	864 (34)	508 (20)	80 (175)	94 (205)	108 (235)	
	1200		2,3,4	4	2210 (87)	965 (38)	584 (23)	80 (175)	94 (205)	108 (235)	
	1600-2000F †		3,4	4	2210 (87)	965 (38)	635 (25)	—	252 (555)	274 (605)	
	1600-2000		3,4	4	2286 (90)	965 (38)	1219 (48)	—	252 (555)	274 (605)	
	2600-3000		3,4	4	2286 (90)	965 (38)	1524 (60)	—	300 (660)	329 (725)	
	2600-3000		3,4	4	2286 (90)	965 (38)	1524 (60)	—	300 (660)	329 (725)	

* Includes mounting feet
† F = Front connected
‡ On 30-1000 amp models, the NEMA type 3R enclosures have a security cover on the controller that extends 54 mm (2.1 in.) beyond the door.
§ Dimensions shown for open units are the minimum required enclosure size. Open unit weights are shipping weights for the contactor only.

Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- CSA C22.2 No. 178 certification available, file #LR58301
- EN61000-4-4 Fast Transient Immunity Severity Level 4
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- IEC Specifications for EMI/EMC Immunity:
 - CISPR 11, Radiated Emissions
 - IEC 1000-4-2, Electrostatic Discharge
 - IEC 1000-4-3, Radiated Electromagnetic Fields
 - IEC 1000-4-4, Electrical Fast Transients (Bursts)
 - IEC 1000-4-5, Surge Voltage
 - IEC 1000-4-6, Conducted RF Disturbances
 - IEC 1000-4-8, Magnetic Fields
 - IEC 1000-4-11, Voltage Dips and Interruptions
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- IEEE 472 (ANSI C37.90A) Ring Wave Test
- NEMA Standard ICS 10-2005, Electromechanical AC Transfer Switch Equipment
- NFPA 70, National Electrical Code
- NFPA 99, Essential Electrical Systems for Health Care Facilities
- NFPA 110, Emergency and Standby Power Systems
- Seismic certification in accordance with the International Building Code is available. (Accessory kit is required for seismic certification.)
 - IBC 2000, referencing ASCE 7-98 and ICC AC-156
 - IBC 2003, referencing ASCE 7-02 and ICC AC-156
 - IBC 2006, referencing ASCE 7-05 and ICC AC-156
 - IBC 2009, referencing ASCE 7-05 and ICC AC-156
 - IBC 2012, referencing ASCE 7-10 and ICC AC-156
- California OSHPD approval is available. (Accessory kit required.)
- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Standby Systems file #E58962 (automatic), #E86894 (nonautomatic)

Controller Accessories

See the controller specification sheets for more information.

Accessory Modules

- Alarm Module
- External Battery Supply Module
- Input/Output Module
- High-Power Input/Output Module

Controller Disconnect Switch

Ethernet Communications

(Standard with MPAC1500 controller)

Current Sensing Kit

Padlockable User Interface Cover

Supervised Transfer Control Switch

Transfer Switch Accessories

Accessories are available either factory-installed or as loose kits, unless otherwise noted.

CSA Certification

Digital Meter

- Measure and display voltage, current, frequency, and power
- 35 programmable alarms
- LCD display, 67 x 62.5 mm (2.65 x 2.5 in.)
- Pushbutton operation
- Password-protected programming menus
- Two digital inputs
- Two digital outputs
- Two Form A relay outputs
- Serial port for optional network connections
- Data logging
- Factory-installed

Engine Start Circuit Monitor

See Specification Sheet G6- 165.

Export Packaging

Extended Limited Warranties

- 2-year basic
- 5-year basic
- 5-year comprehensive
- 10-year major components

Heater, Anti-Condensation

- Hygrostat-controlled 120 VAC strip heater (customer-supplied voltage source required)
- 100 or 250 watts (sized for enclosure)
- Protective 15 Amp circuit breaker

Literature Kits

- Production literature kit (one set of literature is included with each transfer switch)
- Overhaul literature kit

Load Shed Kit

- Forced transfer from Emergency to OFF for programmed-transition or closed-transition models
- Customer-supplied signal (contact closure) is required for the forced transfer to OFF function
- Factory-installed and loose kits available

RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors Normal and Emergency source status and connection
- Monitors ATS common alarm
- Allows remote testing of the ATS
- For more information, see specification sheet G6- 139.

Surge Protection Device (SPD)

- SPD available for the normal source supply
- Surge protection reduces transient voltages to harmless levels
- Protection modes: L-L / L-N / L-G / N-G
- Replaceable phase and neutral cartridges for service
- Frequency: 50- 60 Hz
- Operating Temperature Range: - 40 to 176°F (- 40 to 80°C)
- Remote contacts for customer-supplied status indicators:
Contacts: 1 NO, 1 NC
Min Load: 12VDC / 10 mA
Max. Load: 250 VAC / 1 A
Wire Size (max.): 16AWG
- Fuse protection: 30 amps / 600 V
- UL 1449, 3rd Edition for Type 2 applications
- IEC 61-643-1, 2nd Edition T2/11
- See additional SPD specifications below

Seismic Certification

IBC Seismic Certification

- Certification depends on application and geographic location. Contact your distributor for details.
- Available for the KC model transfer switches with enclosures shown below:

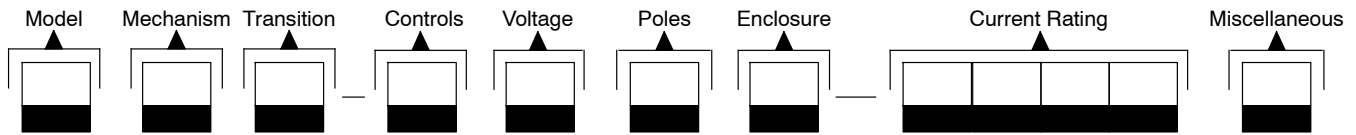
ATS Size, Amps	Enclosure, NEMA Type:				
	1	3R	4	4X	12
30- 1200	●	●	●	●	●
1600- 4000	●	●			

California OSHPD Approval

- Available for KC model transfer switches with NEMA 1 and NEMA 3R enclosures.

SPD Specifications								
Nominal Voltage (V ± 15%)	Max. Discharge Current (kA)	Phase	Poles	UL VPR 3rd Ed (L-N/N-G/L-G) (kV)	Limiting Voltage, (L-N/N-G/L-G) (kV)		Short Circuit Withstand Current (kA)	Maximum Continuous Operating Voltage (VAC)
					at 3kAmps	at 10kAmp		
240/120	40	Split	3	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
208/120	40	Wye	4	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
480/277	40	Wye	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 640
240/120	40	HLD	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 640
600/347	40	Wye	4	1.3 / 1.2 / 1.4	1.3 / 0.4 / 1.3	1.5 / 0.7 / 1.5	200	440 / 880

Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines characteristics and ratings as explained below.

Sample Model Designation: KCS-DNTA-0400S

Model

K: Kohler

Mechanism

C: Standard (Time-Based)

Transition

S: Standard

P: Programmed

C: Closed

Controller

A: Decision-Maker® MPAC 1200, Automatic

B: Decision-Maker® MPAC 1200, Non-Automatic

D: Decision-Maker® MPAC 1500, Automatic

F: Decision-Maker® MPAC 1500, Non-Automatic

Voltage/Frequency

C: 208 Volts/60 Hz

K: 440 Volts/60 Hz

D: 220 Volts/50 Hz

M: 480 Volts/60 Hz

F: 240 Volts/60 Hz

N: 600 Volts/60 Hz

G: 380 Volts/50 Hz

P: 380 Volts/60 Hz

H: 400 Volts/50 Hz

R: 220 Volts/60 Hz

J: 416 Volts/50 Hz

S: 400 Volts/60 Hz

Number of Poles/Wires

N: 2 Poles/3 Wires, Solid Neutral

T: 3 Poles/4 Wires, Solid Neutral

V: 4 Poles/4 Wires, Switched Neutral

W: 4 Poles/4 Wires, Overlapping Neutral

Enclosure

A: NEMA 1

D: NEMA 4

B: NEMA 12

F: NEMA 4X

C: NEMA 3R

G: Open Unit

Current, Amps

0030 0230 1200

0070 0260 1600

0104 0400 2000

0150 0600 2600

0200 0800 3000

0225 1000 4000

Connections

S: Standard

F: Front (1600 and 2000 amp only)

Note: Some selections are not available for every model. Contact your Kohler distributor for availability.

DISTRIBUTED BY:

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® Power Systems distributor for availability.

8.0 BID FORM – REVISED PER ADDENDUM 2

<u>Item</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Sub-Total</u>
1. Main Plant	LS	1	_____	_____
2. 460 Lift Station	LS	1	_____	_____
3. SEMCO Lift Station	LS	1	_____	_____
4. Route 100 Lift Station	LS	1	_____	_____
5. Salthouse	LS	1	_____	_____
6. Route 61 Lift Station	LS	1	_____	_____

TOTAL BID _____

Bidder/Co.: _____

Address: _____

Phone: _____

Email: _____

Contractor VA
 License No.: _____

Authorized
 Signature : _____

Title: _____

Date: _____