

CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT

PURCHASE SPECIFICATION

FOR

**SWITCHGEAR,DISTRIBUTION,URD,3PH,600A,15KV,
DEADFRONT,PADMOUNT,AIR INSULATED**

DATE	PREPARED BY	CHANGE SUMMARY	APPROVAL
07/31/01	Steve Booher	Revision	
6/07/04	Steven Booher	Revision	Leonard Hough
02/23/07	Ted Schoenberg	Revision	Ted Schoenberg
2/08/11	Arthur Gonzalez	Revision	
8/31/16	Lee Emmick, PE	Revision - Update to Current Standard	
12/7/16	Lee Emmick, PE	Revision - Update to create generic spec, Attachments	Michael Pittman, PE
7/07/17	Michael Pittman, PE	Changed Utilinet series 3000 IWR-U3100 radio to Utilinet Integrated Wangate Radio (IWR), Series IV	Michael Pittman, PE
09/26/17	Obaid Rehman	Changed Utilinet integrated Wangate Radio ,Series IV to Sierra Wireless RV50X	

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein. Retain for future reference.

1.0 SCOPE AND CLASSIFICATION

1.1 Scope

1.1.1 The City of Austin Electric Utility, hereinafter referred to as Austin Energy (AE), requires a qualified manufacturer to supply 15 kV, 95 kV BIL, 600A outdoor padmounted distribution class switchgear. The switchgear shall comply with this specification with standard options as listed on an adder basis.

1.2 Classification

1.2.1 The padmounted switchgear will be installed on a 12.47 kV, solidly grounded-neutral, and underground distribution system. The switchgear shall have totally self-contained switching that shall provide fault protection for distribution systems serving industrial and commercial customers.

2.0 APPLICABLE SPECIFICATIONS

2.1 The padmounted switchgear shall conform to or exceed the applicable requirements of ANSI, IEEE, IEC, NESC, and NEC including, but not limited to, the following standards and codes, latest revision:

2.1.1 NESC Section 381G - Design, Pad-Mounted Equipment

2.1.2 NEC Article 110-9 - Load Interrupters

2.1.3 IEEE C57.12.28 – Standard for Pad-Mounted Equipment – Enclosure Integrity

2.1.4 IEEE C37.60 – Standard Requirements for Overhead, Padmounted, Dry Vault and Submersible Automatic Circuit Reclosers and Fault Interrupters for Alternating Current systems up to 38 kV

2.1.5 IEEE 37.71 – Standard for the three-phase, manually operated, subsurface and vault load-interrupting switches for Alternating Current systems

2.1.6 IEEE C37.74 - Standard Requirements for Subsurface, Vault, and Padmounted Load-Interrupter Switchgear and Fused Load-Interrupter Switchgear for Alternating Current Systems up to 38 kV

- 2.1.7 IEEE C37.100.1 - Standard of Common Requirements for High Voltage Power Switchgear Rated Above 1000 V.
- 2.1.8 IEEE 386 – Standard for separable insulated connector systems for power distribution systems above 600V
- 2.1.9 ANSI Z535 – Standard for Design, Evaluation, and Use of Safety Signs, Colors, and Symbols
- 2.1.10 AWS D1.1 – Steel Structural Welding Code

3.0 FUNCTIONAL REQUIREMENTS

- 3.1 The padmounted switchgear shall include but not be limited to the following features:
- 3.2 Design
 - 3.2.1 Dry Type, Deadfront System design with hot stick operable connectors.
- 3.3 Switchgear Rating
 - 3.3.1 Nominal Voltage: 14.4 kV
 - 3.3.2 BIL: 95.0 kV
 - 3.3.3 Continuous Amperes: 600 A
 - 3.3.4 RMS Asymmetrical Amperes: 12,500 A
 - 3.3.5 Two-time Duty-Cycle Fault-Closing: 12,500 A
 - 3.3.6 Fuse Rating
 - 3.3.6.1 Fuse, Maximum Amperes: 200 A

3.4 External Side Operator

- 3.4.1 There shall be an external side operator for manual operation of the switchgear. The external operator shall be pad-lockable in the open or closed position. There shall be provisions for motor operation of the switchgear.

3.5 Connectors

- 3.5.1 Elbow connectors shall be operable from the standing position. There shall be parking stands for elbow connectors. The elbows shall match the bushings.

3.6 Bushings and Bushing Wells

- 3.6.1 Bushings and bushing well interfaces shall conform to ANSI/IEEE Standard 386 (ANSI Standard C119.2).
- 3.6.2 Switch terminals shall be equipped with 600 ampere rated bushings that include removable threaded studs.
- 3.6.3 Fuse terminals shall be equipped with 200 ampere bushing inserts.

3.7 Load Interrupting Switch

- 3.7.1 600A, 3-pole group-operated load interrupter switches shall be in accordance with ANSI C37.72. The interrupter switches in combination with the power fuses shall safely withstand the effect of closing, carrying, and interrupting all possible currents up to the assigned maximum short-circuit rating, in accordance with NEC Article 110-9.
- 3.7.2 The fuse handling system shall allow fuse replacement without the operator being exposed to any live parts.
- 3.7.3 Operator shall be able to complete access to the fuse holder using only a hook-stick.
- 3.7.4 Switch position and visible break shall be seen via window. Window shall be unbreakable and mar-resistant.

3.8 Fuse Mountings

- 3.8.1 The switchgear shall have fuse mountings that will accommodate the use of industry standard power fuse refill units. Fuses refill units include, but are not limited to:
 - 3.8.1.1 16816 - FUSE REFILL UNIT FOR SWITCHGEAR 175E AMP SML-4Z HOLDER (S&C #252275R4)
 - 3.8.1.2 16815 - FUSE REFILL UNIT FOR SWITCHGEAR 125E AMP SML-4Z HOLDER (S&C #252200R4)

- 3.8.1.3 16824 - FUSE REFILL UNIT FOR SWITCHGEAR 200 AMP SML-4Z HOLDER (S&C #252300R4)
- 3.8.1.4 18016 - FUSE REFILL UNIT FOR SWITCHGEAR 80E AMP SML-4Z HOLDER (S&C #252125R4)
- 3.8.1.5 18015 - FUSE REFILL UNIT FOR SWITCHGEAR 50E AMP SML-4Z HOLDER (S&C #252075R4)
- 3.8.1.6 18014 - FUSE REFILL UNIT FOR SWITCHGEAR 40E AMP SML-4Z HOLDER (S&C #252060R4)
- 3.8.1.7 18013 - FUSE REFILL UNIT FOR SWITCHGEAR 25 AMP SML-4Z HOLDER (S&C #252040R4)
- 3.8.1.8 16809 - FUSE REFILL UNIT FOR SWITCHGEAR 150E AMP SML-4Z HOLDER (S&C #252250R4)
- 3.8.1.9 16808 - FUSE REFILL UNIT FOR SWITCHGEAR 100E AMP SML-4Z HOLDER (S&C #252150R4)

3.8.2 16807 - FUSE REFILL UNIT FOR SWITCHGEAR 65E AMP SML-4Z HOLDER (S&C #252100R4) Fuse holders shall be supplied with each switchgear.

3.9 Load-Side Compartment

- 3.9.1 The load-side compartment shall be isolated from the line-side (source) compartment and shielded from the elements.
- 3.9.2 Load-side wiring, except for short lengths such as at terminal blocks and secondaries of sensing devices, shall be grounded.

3.10 The switchgear configuration shall be provided as requested on the bid sheet.

3.11 Remote Supervisory

3.11.1 Switchgear provided with remote supervisory capability shall be able to report on status of fault interrupters, load break switches, and voltage and current sensors and alarms.

3.11.1.1 Refer to section 3.13 for details on communications.

3.12 Remote Supervisory with automated switching

3.12.1 The source transfer control shall be a micro-processor based unit, which can be programmed to perform specific control operations, as directed by settings programmed into the device at the factory and in the field. The remote function shall have the capability of complete switching operations from a remote location. Control shall be field selectable either remote or manual operation via toggle switch and push button. The control shall not operate remotely when the switch is in the manual operation mode.

3.12.2 Switchgear shall have the following remote control functions:

3.12.2.1 All remote control functions shall work only when the Auto mode control function is enabled. When the remote control function is in manual mode no remote control shall operate.

3.12.2.2 Open command from remote control will cause the closed switch to open and automatic transfer functions will be disabled.

3.12.2.3 Close command from remote control will re-enable automatic transfer functions causing the preferred source to close, unless that source is unavailable, which will result in the back-up source closing.

3.12.3 Indicator Lights & Test Keys

3.12.3.1 The indicator light emitting diodes (LED) and test keys shall perform the following functions including but not limited to:

3.12.3.2 Source Voltage

3.12.3.2.1 Light Emitting Diode (LED) indicator lights shall be furnished for indicating the presence of acceptable voltage on each phase of the medium voltage source.

3.12.3.3 Test Keys

3.12.3.3.1 Test keys shall be furnished for simulating loss of voltage on each of the two (2) sources, as well as for checking the functioning of the indicator lamps, display, and keypad.

3.12.3.3.2 Test keys shall be provided for simulating an overcurrent condition on each source.

3.12.3.4 A light-emitting diode (LED) lamp shall be furnished for indicating that the control is in the automatic mode, the operation selector for each operator is in the operating position, and all control circuitry is properly connected for automatic transfer Diagnostics & Events Log

3.12.3.5 The control shall include built-in diagnostics for analyzing system events. The device shall automatically record system status and source-transfer control status every time a control operation occurs.

3.12.3.6 All operations shall be indicated by the illumination of the light emitting diode (LED) indicator lights and shall be available for display by means of a dedicated event key.

3.13 COMMUNICATIONS

3.13.1 Communications Card

3.13.1.1 Communications shall be provided to permit local downloading of system events, records, operating characteristics and voltage, current, time – related operating parameters and settings from the control to a personal computer using a standard USB type A connection. One connecting cable shall be included with each unit.

3.13.2 Remote Supervisory Communications

3.13.2.1 The remote communication and control equipment shall include voltage sensors, current sensors, self-contained 120 volt 60 hertz power source, DC battery charger with battery, Sierra Wireless RV50X, antenna, surge arrester, and connecting cables (or Standards Engineer approved equal), surge protector and a microprocessor-based programmable remote terminal unit (RTU), SEL 700GT relay for communication and event recording.

3.13.2.2 The switchgear shall communicate using DNP 3.0 protocol.

3.13.2.3 The Remote Terminal Unit shall be pre-programmed to control or report the following:

3.13.2.3.1 Open/Close for both preferred and alternate source

3.13.2.3.2 Transfer between both alternate and preferred source

3.13.2.3.3 Remote or manual control position

3.13.2.3.4 Source voltage 1 available

3.13.2.3.5 Source voltage 2 available

3.13.2.3.6 Control voltage for switch operation

3.13.2.3.7 Switch source position

3.13.2.3.8 Three phase current and voltage both preferred and alternate source

3.13.2.3.9 Auto-transfer indication

3.13.2.3.10 Battery condition – overcharge or undercharge alarm

3.13.2.3.11 Over-Current lockout alarm

3.13.2.3.12 Loss of control power

3.13.2.3.13 Fault Indication

3.13.2.4 Provision shall be made to accept Fiber Optic cable using a standard type ST connection for both transmit and receive functions. A third party adapter may be used with Standards Engineering approval.

3.14 Supplemental Sensing and Relaying

3.14.1.1 Provide SEL relays, as required for supplemental protection including, but not limited to, ANSI functions: 25, 27, 32, 59, 81

3.14.1.2 Supplemental relays to provide trip functions and shall be connected to spare contacts to enable tripping of fault interrupters.

3.14.1.3 Relays to be provided in an external NEMA-3R enclosure. All connections to relay shall use weatherproof standardized separable connectors through metering blocks with shorting jumpers provided as needed.

3.15 Automatic Source Transfer Switch (As Required)

3.15.1 Manual/Automatic Transfer Selection

3.15.1.1 The source-transfer control shall have a selector switch for choosing manual or automatic operating mode. In the manual mode, local electrical trip-open and trip-closed operation by means of pushbuttons shall be enabled, while automatic switching shall be inhibited.

3.15.1.2 The source-transfer control and interrupter switches shall be driven by stored energy switch operators and shall provide fully automatic two-way source transfer with the ability to connect either of the two (2) radial feeders to the Padmount Switchgear's main bus.

3.15.1.3 In auto mode the source-transfer control shall monitor the condition of both power sources and initiate automatic switching with open transition when the preferred source voltage has been lost or reduced to a user defined predetermined level, for a user defined period of time sufficient to confirm that the loss is not transient. The switch associated with the preferred source shall be automatically opened and the alternate-source switch shall then be automatically closed, restoring power to the load.

3.15.1.4 The source-transfer control shall be completely factory assembled, tested, and be ready for installation. The source-transfer control shall not require any external wiring or control power.

3.15.1.5 Two-way source transfer shall provide for both automatic and manual re-transfer to the preferred source when normal voltage returns for a preset time.

3.15.1.6 In the automatic return mode, the control shall provide either open transition (non-paralleling) or closed transition (paralleling) on re-transfer, as field-programmed.

3.15.1.7 A selector switch shall be furnished for choosing manual or automatic operating mode. In the manual mode, local electrical open and closed operation by means of push buttons shall be enabled while automatic switching shall be inhibited.

3.15.2 Two-Time Duty-Cycle Fault-Closing

3.15.2.1 The source-transfer control shall be able to cause the switch to be closed twice, remain operable and be able to carry and interrupt rated currents.

3.15.3 Unbalance Detection

3.15.3.1 The switchgear shall have the capability to initiate an automatic transfer, when there is a 3 \emptyset -voltage unbalance because one (1) or two (2) phases of a source are open.

3.15.3.2A field-programmable unbalance detection feature shall initiate automatic switching on detection of source-side open-phase conditions at the same system voltage level as the switchgear, whether caused by utility-line burndown, broken conductors, single-phase switching, equipment malfunctions, or single-phasing resulting from blown source-side fuses. The control shall continuously monitor the negative-sequence voltage to detect any unbalance present as a result of an open-phase condition. Automatic switching shall occur when the system unbalance exceeds a predetermined unbalance-detect voltage for a period of time sufficient to confirm that the condition is not transient.

3.15.3.3The reference voltage level, which will be used to determine an unbalance condition, shall be field programmable.

3.15.4 Overcurrent Lockout

3.15.4.1The source-transfer control shall have a lockout mode, which will prevent a transfer operation that would close the source switch into a fault.

3.15.4.2A light emitting diode (LED) indicator for the lockout condition, a reset key for manually resetting the lockout condition, and three current sensors for each source shall be provided.

3.15.4.3A means shall be furnished for manually resetting the overcurrent-lockout feature from a remote location.

3.15.4.4The reference current level, which will be used to determine an overcurrent, shall be field programmable.

3.15.5 Micro-Processor Functional Requirements

3.15.5.1The source transfer control shall be a micro-processor based unit, which can be programmed to perform specific control operations, as directed by settings programmed into the device at the factory and in the field.

3.15.5.2The settings for the micro-processor control unit shall include the following:

3.15.5.2.1Source-transfer control's operating characteristics

3.15.5.2.2Voltage, current and time-related parameters

3.15.6 Keypad Entry

3.15.6.1The micro-processor control unit shall have the capability to have the settings entered with a keypad. This keypad shall be readily accessible in the field and shall be located in the front of the control panel.

3.15.7 Remote Indication

3.15.7.1 Remote shall be capable of monitoring for the presence or absence of both source voltages, manual or automatic operating mode, status of ready indicator, "event" indicator, and overcurrent lockout.

3.15.8 Visual Display

3.15.8.1 The display for the entry and review of the settings shall be a liquid-crystal display (LCD) with backlighting. The liquid-crystal display (LCD) shall provide a means for viewing the operating characteristics and operating parameters, which have been programmed into the micro-processor control unit.

3.15.8.2 When not being used to show menu information the display shall show any messages regarding light emitting diode (LED) function (on or off).

3.15.9 Menu Driven Settings

3.15.9.1 The micro-processor control unit shall have menu driven settings for the operating characteristics and operating parameters.

3.15.10 Access Code

3.15.10.1 There shall be provisions for use of access codes, to prevent unauthorized changes to the operating characteristics and operating parameters of micro-processor control unit. Each item shall be protected by an access code; the correct access code shall be entered before an item can be altered.

3.16 Motor Operators and Controls

3.16.1 Motor operators shall be furnished for the switches as noted on the bid sheet

3.16.2 Each motor operator shall have its own control board, located within the low-voltage compartment/enclosure.

3.16.3 The control board shall have push buttons for locally operating the switches between the closed, open, and grounded positions.

3.16.4 Each control board shall have position indicating light emitting diode (LED) lamps to show the closed, open, and grounded state of the motor operator.

- 3.16.5 Each motor operator control board shall have a non-resettable, four-digit-minimum operation counter, which will only increment on a closed-to-open transition.
- 3.16.6 Each motor operator control board shall have an adapter for a portable remote control device, which will allow the user to activate the motor operator at a maximum distance of 50 feet from the gear. The adapter and device shall be provided with each gear. Each device shall be packaged in its own watertight case for ease of transportation and protection of the device.
- 3.16.7 No decoupling or any adjustments shall be required to manually operate a motor operator.
- 3.16.8 Removing the motor operator for decoupling shall be a simple, quick process requiring only standard tools.
- 3.16.9 Only one local/remote switch shall be required for the entire switchgear.
- 3.16.10 The motor operator shall be watertight. Each unit shall be submersion-tested to verify that water under pressure does not enter the operator housing.
- 3.16.11 It shall not be possible for the motor operator to be changed from the closed position directly to the grounded position using local push-button or remote control. The grounded position shall be directly accessible only from the open position.
- 3.16.12 A mechanical interlock shall be provided to prevent a decoupled motor operator from being incorrectly recoupled.
- 3.16.13 An integral means shall be provided for testing the position indicating lamps on the motor controls.
- 3.16.14 Controls shall be easy to operate with or without 25-kV high-voltage rubber gloves and protectors.

4.0 PHYSICAL REQUIREMENTS

4.1 Switchgear Enclosure

- 4.1.1 The switchgear enclosure shall be in accordance with ANSI C57.12.28.
- 4.1.2 The roof of the switchgear enclosure shall be crowned for proper water drainage.

- 4.1.3 The inside surface of the switchgear roof shall have a coating of "no-drip" compound to prevent condensation.
 - 4.1.4 The switchgear shall be painted inside and out Munsell No. 7GY3.29/1.5 green.
 - 4.1.4.1 The switchgear shall be painted with rust-resistant paint. The paint shall have a minimum dry film thickness of 3 mils.
 - 4.1.4.2 The paint coating system shall be in compliance with ANSI C57.12.28.
 - 4.1.4.3 Coal-tar epoxy coating, or any tar-based coating, shall not be accepted.
 - 4.1.4.4 Austin Energy will check the paint thickness of the switchgear upon receipt. Switchgear that have a paint thickness less than 3 mils shall be rejected. The Vendor shall be required to replace the rejected switchgear with new switchgear compliant with the specification described herein. The cost for replacement of the switchgear shall be borne by the Vendor.
 - 4.1.5 A painted, carbon-steel non-compartment eighteen inch base spacer shall be assembled to the enclosure. The bottom of the base spacer shall have a closed-cell material applied to the entire underside bottom flange. The material shall insulate the bottom flange from the concrete foundation to help protect against corrosion. The base shall have 90-degree flanges, turned inward and welded at the corners, for bolting to the concrete pad.
 - 4.1.6 The switchgear shall be of a standing, outdoor type construction. The cabinet shall be constructed of 11-gauge sheet steel (minimum), continuous-welded construction. Structural frame and bolted sheet metal are not acceptable. All structural joints and butt joints shall be welded, and the external seams shall be ground flush and smooth.
 - 4.1.7 All hinge pins and parking stands shall be stainless steel. Hinges shall be stainless steel or extruded aluminum.
 - 4.1.8 Permanent lifting provisions shall be painted steel or stainless steel.
 - 4.1.9 The enclosure shall have (1) 19/64" holes drilled for each cable termination compartment (1 for each 3 phase compartment for a total of 4 holes for the entire switchgear), 24" from the bottom of the enclosure. The holes shall be equally spaced and shall have a field removable plug so that the hole may accommodate a fault indicator light. The plug shall be designed so that if the plug is not removed the integrity of the enclosure still complies with IEEE C57.12.28.
- 4.2 Blade and Contact Mechanism
- 4.2.1 On the switch side, the opening and closing operation of the switchgear shall be performed with a blade-and-contact mechanism. There shall be one blade for each phase. Each blade shall be one piece, made of hard-drawn copper, with silver-clad contact surfaces on both sides.

4.2.2 The blades shall have lateral insulating braces that shall provide proper alignment and support for the blades during the opening and closing action of the switchgear.

4.3 Door Latching System

4.3.1 The door latch assembly shall have no protruding handles and shall be in accordance with ANSI C57.12.28.

4.3.2 Three-Point Latching

4.3.2.1 The latching mechanism, when operated, shall latch all points at the same time to preclude partial latching.

4.3.2.2 A pentahead socket wrench or tool shall be required to actuate the mechanism to unlatch the door and, in the same motion, recharge the spring for the next closing operation.

4.3.2.3 The latching mechanism shall have provisions for padlocking that incorporate a means to protect the padlock shackle from tampering and that shall be coordinated with the latches such that:

4.3.2.3.1 It shall not be possible to unlatch the mechanism until the padlock is removed.

4.3.2.3.2 It shall not be possible to insert the padlock until the mechanism is completely latched closed.

4.4 Exterior Doors

- 4.4.1 All doors shall have provisions for padlocking.
- 4.4.2 The doors shall have positive locking action, such that the doors cannot be locked until all latches are securely engaged.
- 4.4.3 No automatic latching doors will be permitted. The doors shall be manually latched to prevent the possibility of the door closing and trapping any loose clothing or human extremities in the latched door.
- 4.4.4 All doors shall provide unrestricted access for operation of the equipment. Door retainers shall be provided to secure the door in the open position and to prevent any inadvertent closing into the enclosure.
- 4.4.5 Once secured, the doors shall be opened only by unlocking the padlock and unlatching the latching mechanism with a pentahead socket wrench or tool.
- 4.4.6 A non-corrosive operating diagram (schematic) shall be affixed to the inside door of both open sides of the unit.

4.5 Ground-Connection Pads and Rods

- 4.5.1 Ground-connection pads shall be provided in each termination compartment.
- 4.5.2 The ground-connection pad shall be constructed of ¼-inch-thick, galvanized or stainless steel and have a NEMA 2-hole pattern for ground connectors. The momentary rating of the ground studs shall equal or exceed the short-circuit ratings of the padmounted gear.
- 4.5.3 An easily accessible ground rod made of 3/8-inch copper shall run the entire width of both door openings.

4.6 Interrupter Switches and Power Fuses

- 4.6.1 The interrupter switches and power fuses shall be enclosed within an inner, grounded compartment for electrical isolation.

4.7 Interconnecting Buswork

- 4.7.1 The interconnecting buswork shall consist of continuous one-piece, copper or aluminum bar, with no intermediate splices. Flexible braid or cable is not acceptable.
- 4.7.2 Bus and interconnections shall withstand the stresses associated with short-circuit currents up through the maximum rating of the padmounted gear.

4.8 See Section [10](#), Attachment 1 for switchgear one-line diagrams

4.9 See Section [10](#), Attachment 2 for pad configuration details

5.0 TESTING AND INSPECTION

5.1 Quality Assurance

5.1.1 Switchgear Drawings: Two hardcopy sets as well as soft copies of final as-built drawings shall be provided with each system.

5.1.1.1 One hardcopy set of final as-built drawings shall be included in each switchgear compartment as well as instruction manuals and an adapter cable for field programming the control from a 25 pin personal computer.

5.2 Testing

5.2.1 The switchgear shall be tested in accordance with all applicable sections of IEEE as outlined in Section 2.0. 100% production testing shall be performed.

5.2.1.1 Austin Energy reserves the right to visit the manufacturing facility and observe the switch undergoing construction and testing. This visit shall be at no charge to Austin Energy. Advance notice of at least two weeks shall be given to Austin Energy before the start of testing.

5.2.2 The apparatus bushings shall be tested in accordance with IEEE 386.

5.2.3 Three (3) copies of certified test reports shall be furnished to Distribution Standards Engineering prior to shipment.

5.2.4 The manufacturer shall be completely and solely responsible for the performance of the basic switch components as well as the complete integrated assembly as rated.

6.0 NAMEPLATES, DIAGRAMS, AND LABELS

6.1 The information on the stainless steel or aluminum nameplate, ratings label, and connection diagram shall remain legible throughout the operational life of the padmounted switchgear.

6.2 Nameplate

- 6.2.1 The stainless steel or aluminum nameplate shall be provided showing all data as specified by ANSI C37.74 Section 9.11 and C37.60 Section 9.7 and shall also include the Austin Energy Purchase Order Number.
 - 6.2.2 The padmounted switchgear shall be provided with a stainless steel or aluminum nameplate indicating the manufacturer's name, catalog number, model number, date of manufacture, serial number, rated maximum voltage, rated impulse withstand voltage, rated continuous current, rated load interrupting current, rated momentary current, and Austin Energy purchase agreement number.
- 6.3 Ratings Label
- 6.3.1 The inside of each door shall be provided with a ratings label indicating the following:
 - 6.3.1.1 Voltage rating
 - 6.3.1.2 Main bus continuous rating
 - 6.3.1.3 Short-circuit ratings (amperes, RMS symmetrical and MVA 3Ø symmetrical at rated nominal voltage)
 - 6.3.1.4 Type of fuse and its ratings, including duty-cycle fault-closing capability
 - 6.3.1.5 Interrupter switch ratings, including duty-cycle fault closing capability and amperes, short-time, rms (momentary, asymmetrical and one-second, symmetrical)
- 6.4 Connection Diagram
- 6.4.1 A three-line connection diagram shall be provided on the inside of both doors, showing the interrupter switches, fuses, and bus.
- 6.5 The warning and danger labels shall be in accordance with NEMA 260, ANSI Z535, NESC, and NEC
- 6.5.1 A label stating the type of fuse mounting in the padmounted switchgear shall be attached to each fuse door.
 - 6.5.2 A label stating "DANGER-HIGH VOLTAGE BEHIND PANEL" shall be attached to each fuse door barrier.
 - 6.5.3 The inside of each door shall have a "DANGER-HIGH VOLTAGE-KEEP OUT-QUALIFIED PERSONS ONLY" sign.
 - 6.5.4 A warning label with the fuse removal/installation instructions shall be attached to the inside of the latching compartment doors that open to the fuse panels.
 - 6.5.5 A door latching warning label shall be attached to the inside of the latching compartment doors.

7.0 OTHER REQUIREMENTS

- 7.1 The manufacturer shall provide a one-time, on-site, free training session(s) on operation, maintenance and all control systems of products new to Austin Energy within 4 weeks of delivery.

8.0 ORDERING INFORMATION

- 8.1 Switchgear configuration shall be provided as required on the bid sheet.
- 8.2 This specification serves as a starting point for the basic design of the switchgear. Each bidder is required to meet this specification. Once the bid is awarded the manufacturer will provide a list of all available options for the switchgear with an add price for each item.
- 8.3 A complete list of configurations is not possible. When ordering, AE will call out the specifics of the switchgear on the order. Each item on the order shall be listed as a line item with an add/deduct price.
- 8.4 Ordering Information
- 8.4.1 Switchgear configuration shall be provided as requested on the bid sheet.
- 8.4.2 Remote Supervisory Indication and Control per Section 3.11 and 3.12
- 8.4.3 Communications Package per Section 3.13
- 8.4.4 Supplemental Sensing and Relaying per Section 3.14
- 8.4.5 Automatic Source Transfer Switch (As Required) per Section 3.15
- 8.4.6 Motor Operators and Controls per Section 3.16

9.0 Austin Energy Item Numbers

- 9.1 19954 – ATO w/ (1) 200A Fused way and (2) 600A switches (Figure 2)
- 9.2 19955 – ATO w/ (2) 200A Fused ways and (2) 600A switches (Figure 3)
- 9.3 1303 – (2) 200A Fused ways and (2) 600A switches (Figure 3)
- 9.4 1302 – (3) 200A Fused ways and (1) 600A switch (Figure 5)
- 9.5 16000 – (4) 600A switches (Figure 6)
- 9.6 1934 – (1) 200A Fused ways and (3) 600A Switches (Figure 4)

10.0 ATTACHMENTS

ATTACHMENT 1

DEADFRONT PADMOUNTED SWITCHGEAR ONE-LINE DIAGRAMS

FIGURES 1 THROUGH 6

ATTACHMENT 1

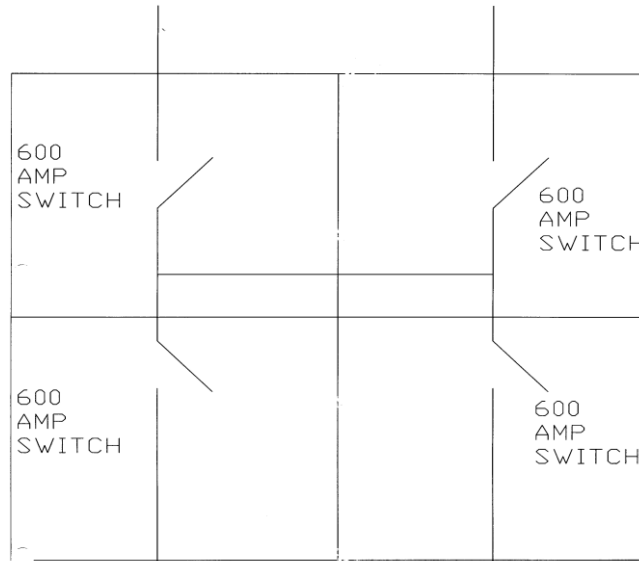
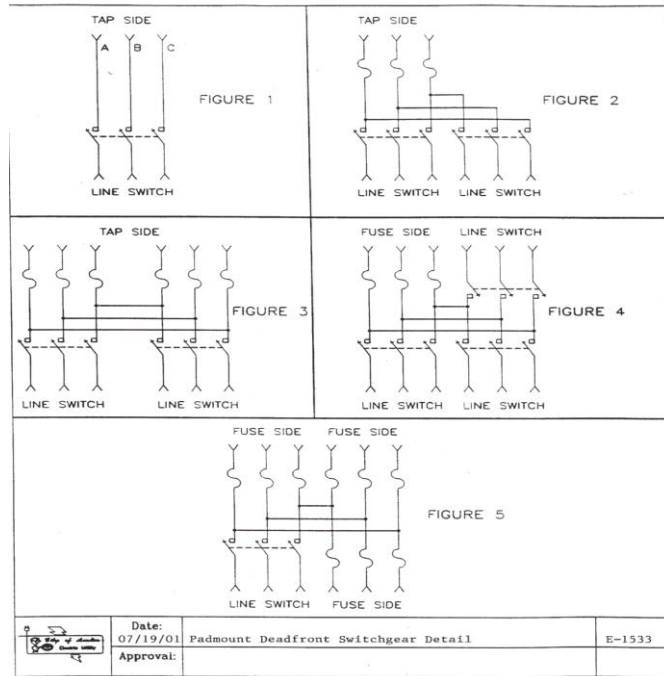

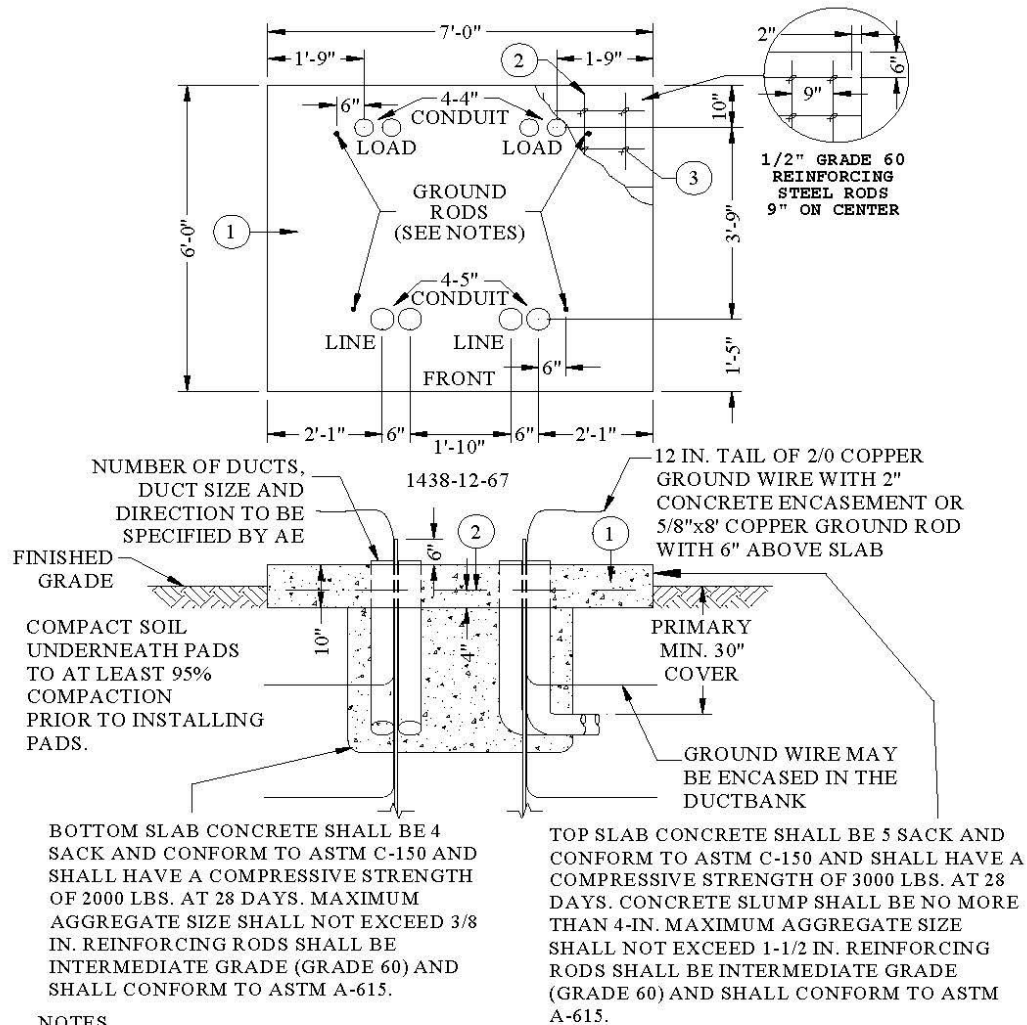


FIGURE 6
 4-600 AMP SWITCH POSITIONS

ATTACHMENT 2
SWITCHGEAR CIVIL DETAILS

1438-12	CIVIL PADS, CLEARANCES AND BARRIERS SWITCHGEAR PAD 3PH PME-9	 Rev: 10/22/15
Sheet 1 of 2		
03/06/06		

1438-12 SWITCHGEAR PAD 3PH PME-9




BOTTOM SLAB CONCRETE SHALL BE 4 SACK AND CONFORM TO ASTM C-150 AND SHALL HAVE A COMPRESSIVE STRENGTH OF 2000 LBS. AT 28 DAYS. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 3/8 IN. REINFORCING RODS SHALL BE INTERMEDIATE GRADE (GRADE 60) AND SHALL CONFORM TO ASTM A-615.

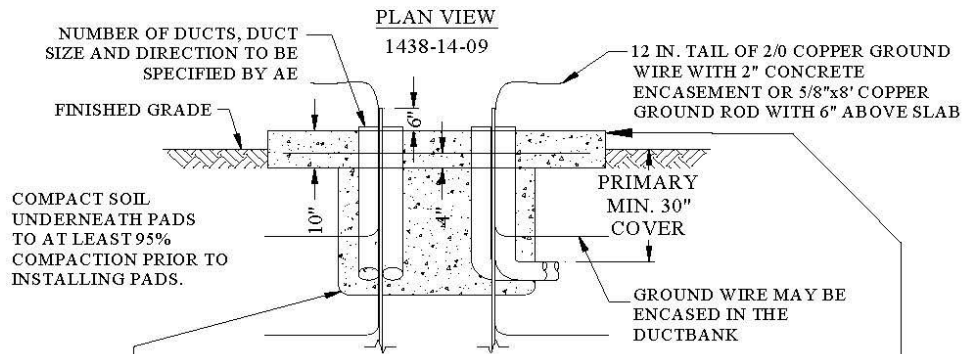
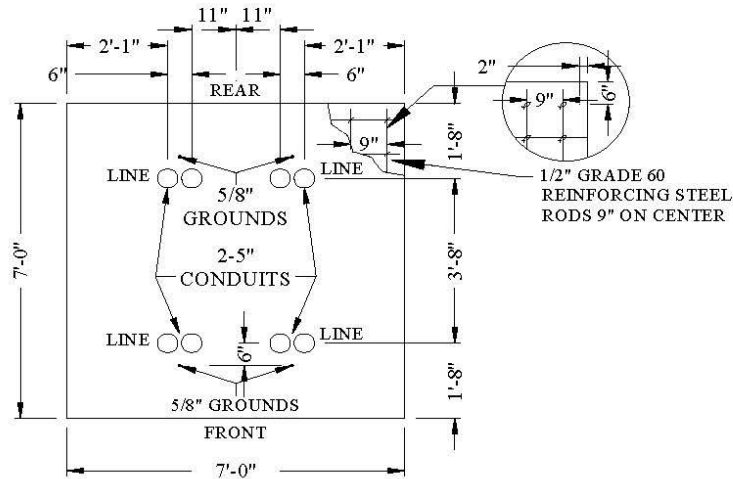
TOP SLAB CONCRETE SHALL BE 5 SACK AND CONFORM TO ASTM C-150 AND SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 LBS. AT 28 DAYS. CONCRETE SLUMP SHALL BE NO MORE THAN 4-IN. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 1-1/2 IN. REINFORCING RODS SHALL BE INTERMEDIATE GRADE (GRADE 60) AND SHALL CONFORM TO ASTM A-615.

NOTES

1. 35' OF 2/0 STRANDED BARE SOFT-DRAWN, TINNED COPPER GROUND WITH 2" CONCRETE ENCASEMENT OR 5/8"x8'-0" CU. COPPERWELD GROUND ROD. (SEE GROUNDING DETAIL 1488-10 AND 1488-20).
2. STEEL BARRIER POSTS WILL BE REQUIRED WHENEVER SWITCHGEAR PAD IS INSTALLED WITHIN 4' OF A TRAFFIC AREA. (SEE BARRIER POST DETAIL DRAWING FOR CONSTRUCTION DETAILS AND CLEARANCE REQUIREMENTS.)
3. 90 DEG. (24" RADIUS (MIN.)) CONDUIT BEND SHALL BE COMPLETELY CONCRETE ENCASED.
4. CONCRETE SHALL BE 5 SACK, CLASS A, 3/4 IN. TO 1-1/2 IN. AGGREGATE.
5. BELL ENDS SHALL BE 1" ABOVE SLAB.

1438-14	CIVIL	
Sheet 1 of 2	PADS, CLEARANCES AND BARRIERS	
03/06/06	SWITCHGEAR PAD 3PH PME-10	
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1438-14 SWITCHGEAR PAD 3PH PME-10




ELEVATION

BOTTOM SLAB CONCRETE SHALL BE 4 SACK AND CONFORM TO ASTM C-150 AND SHALL HAVE A COMPRESSIVE STRENGTH OF 2000 LBS. AT 28 DAYS. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 3/8 IN. REINFORCING RODS SHALL BE INTERMEDIATE GRADE (GRADE 60) AND SHALL CONFORM TO ASTM A-615.

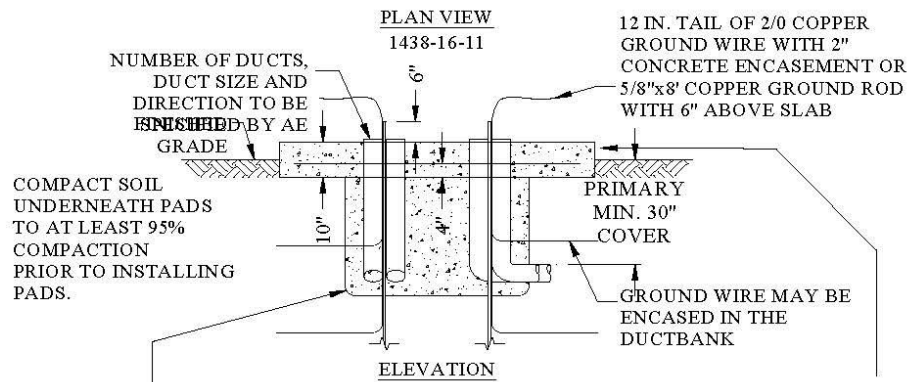
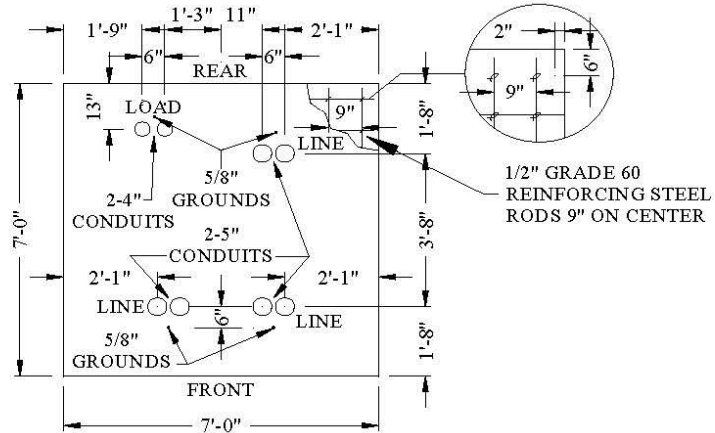
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NOTES

- 35' OF 2/0 STRANDED BARE SOFT-DRAWN, TINNED COPPER GROUND WITH 2" CONCRETE ENCASEMENT OR 5/8"x8'-0" CU. COPPERWELD GROUND ROD. (SEE GROUNDING DETAIL 1488-10 AND 1488-20).
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- CONCRETE SHALL BE 5 SACK, CLASS A, 3/4 IN. TO 1-1/2 IN. AGGREGATE.
- BELL ENDS SHALL BE 1" ABOVE SLAB.

1438-16	CIVIL	
Sheet 1 of 2	PADS, CLEARANCES AND BARRIERS	
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1438-16 SWITCHGEAR PAD 3PH PME-11



NUMBER OF DUCTS, DUCT SIZE AND DIRECTION TO BE FINISHED BY AE

COMPACT SOIL UNDERNEATH PADS TO AT LEAST 95% COMPACTION PRIOR TO INSTALLING PADS.

BOTTOM SLAB CONCRETE SHALL BE 4 SACK AND CONFORM TO ASTM C-150 AND SHALL HAVE A COMPRESSIVE STRENGTH OF 2000 LBS. AT 28 DAYS. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 3/8 IN. REINFORCING RODS SHALL BE INTERMEDIATE GRADE (GRADE 60) AND SHALL CONFORM TO ASTM A-615.

12 IN. TAIL OF 2/0 COPPER GROUND WIRE WITH 2" CONCRETE ENCASEMENT OR 5/8"x8" COPPER GROUND ROD WITH 6" ABOVE SLAB


PRIMARY MIN. 30" COVER

GROUND WIRE MAY BE ENCASED IN THE DUCTBANK

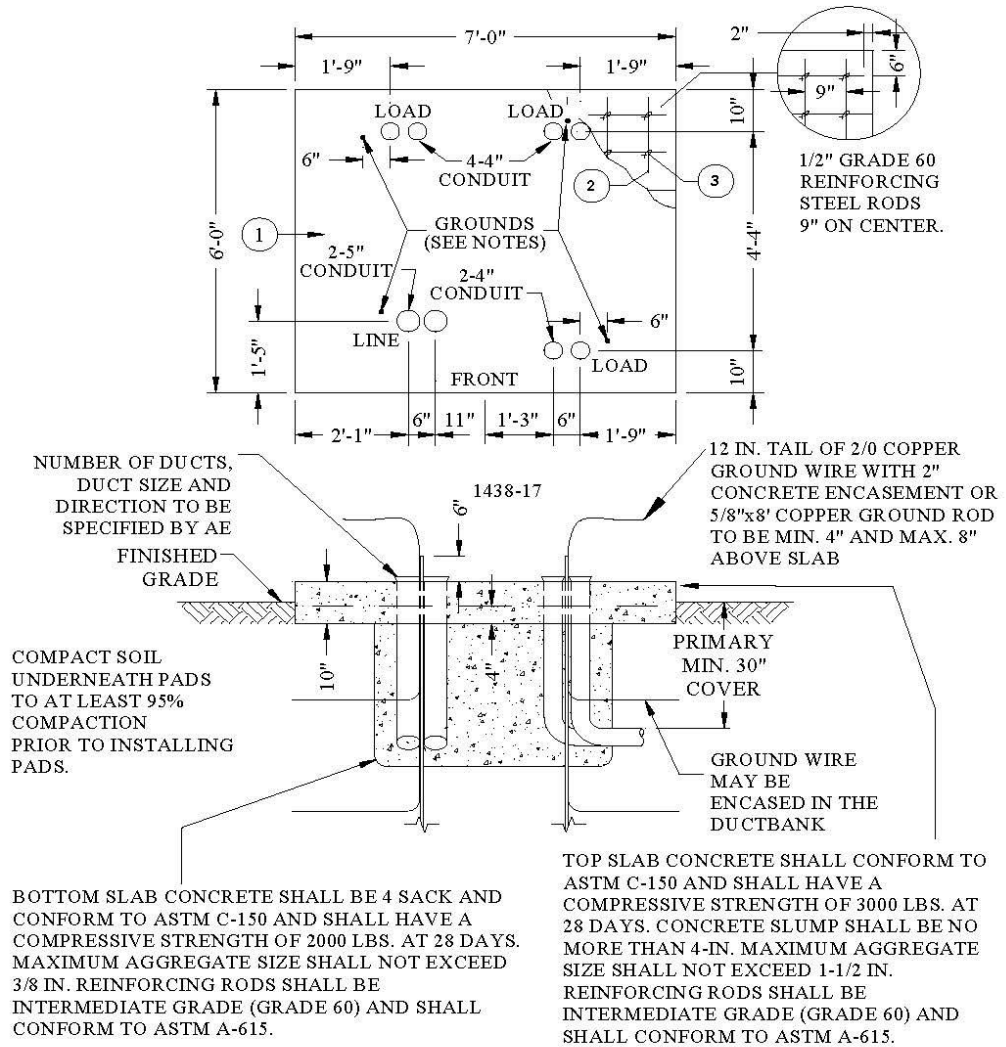
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4. CONCRETE SHALL BE 5 SACK, CLASS A, 3/4 IN. TO 1-1/2 IN. AGGREGATE.
5. BELL ENDS SHALL BE 1" ABOVE SLAB.


1438-17	CIVIL PADS, CLEARANCES AND BARRIERS	
Sheet 1 of 2	SWITCHGEAR PAD 3PH PME-12	Rev: 10/22/15
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1438-17 SWITCHGEAR PAD 3PH PME-12

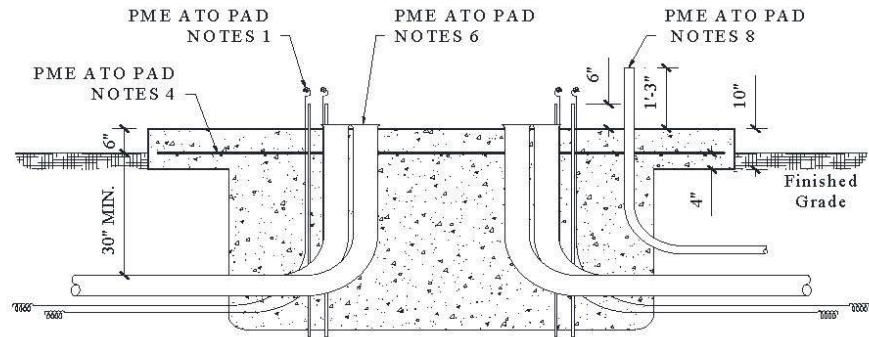
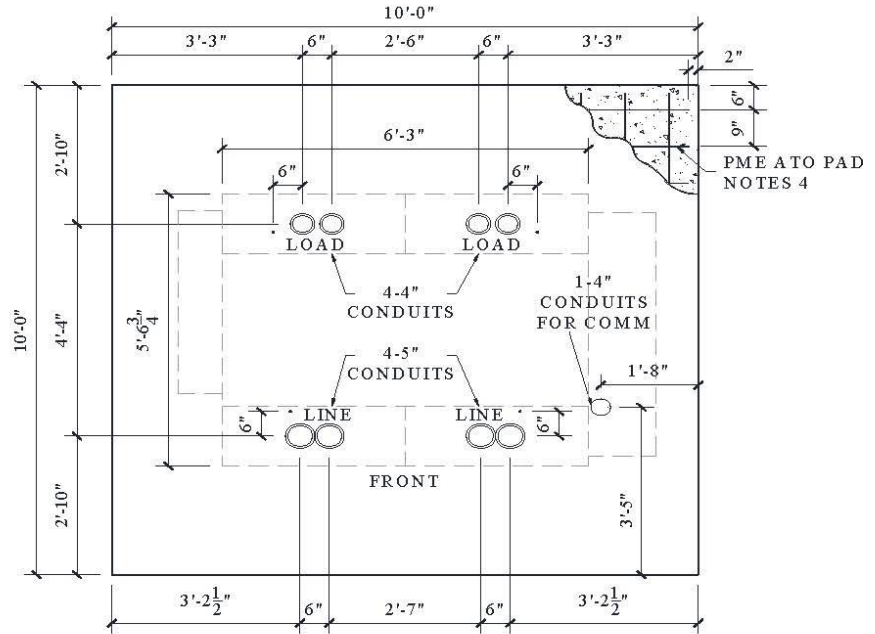


NOTES

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 Rev: 10/22/15	CIVIL PADS, CLEARANCES AND BARRIERS PAD PME ATO SWITCHGEAR	1438-44
		Sheet 1 of 1
		9/11/05

1438-44 PAD PME ATO SWITCHGEAR



REFER TO PME ATO PAD DETAIL NOTES ON SECTION 1438-XX FOR DETAILS ON PME ATO SWITCHGEAR CONCRETE PAD CONSTRUCTION.