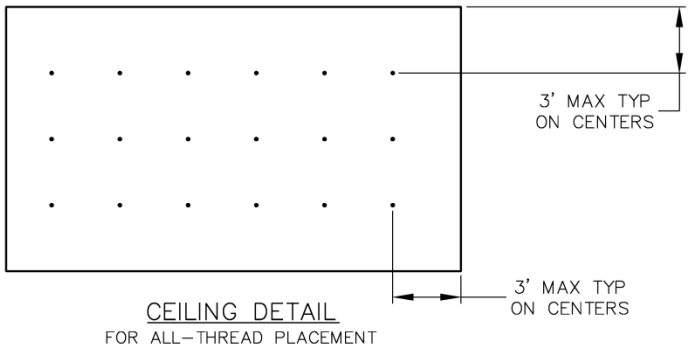
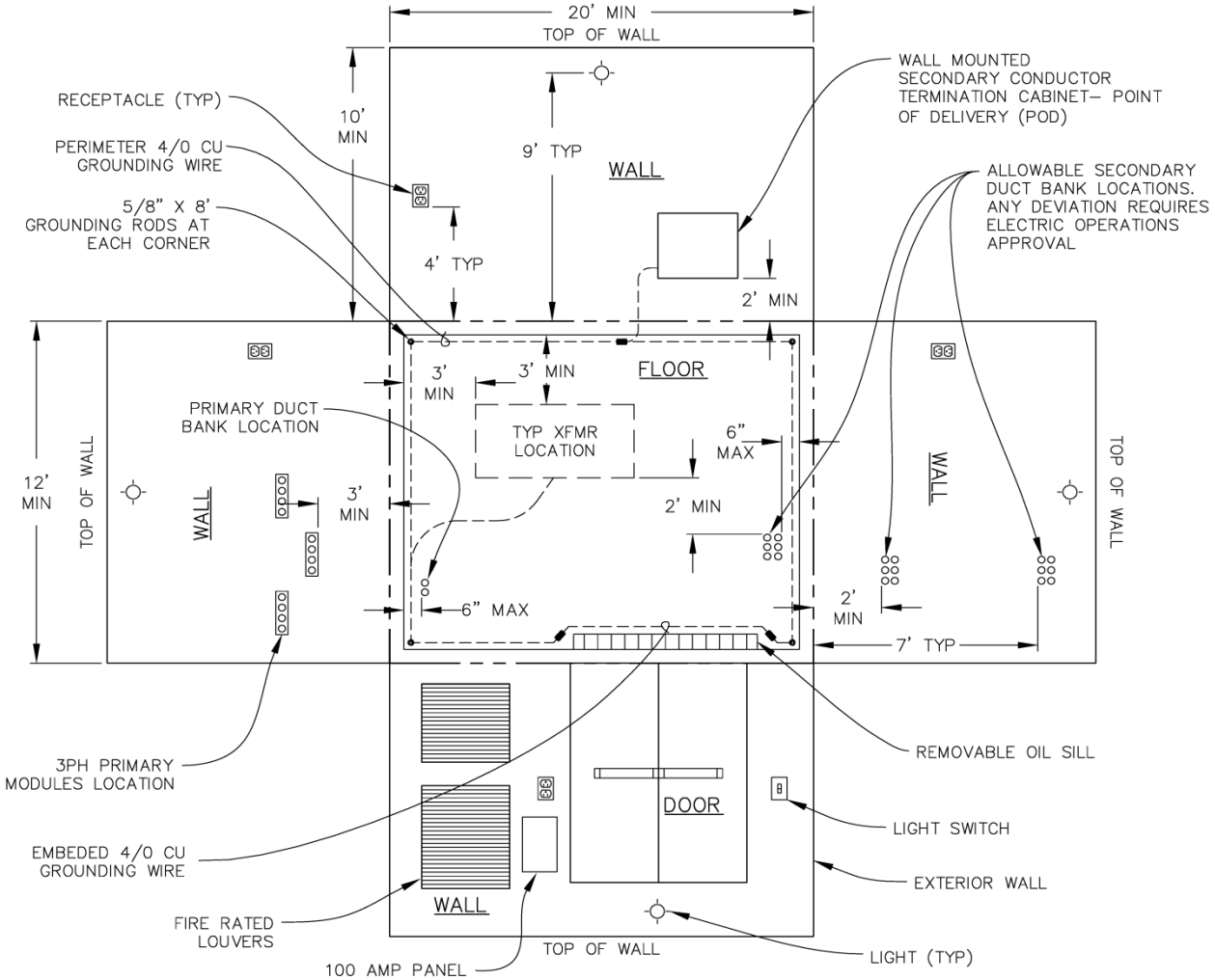


CEILING DETAIL
FOR ALL–THREAD PLACEMENT



EWEB ACCESS

1.0 SCOPE

1.1 This Standard is designed to provide Eugene Water and Electric Board (EWEB) customers/developers with Transformer Vault Room Requirements.

2.0 GENERAL INFORMATION

2.1 A Vault room refers to a room provided by the customer/developer to house EWEB owned transformers and associated equipment.

2.2 When a vault room is allowed, the customer/developer **SHALL** provide EWEB with construction plans and specifications prepared in accordance with this standard.

2.3 **PLANS WILL BE REVIEWED BY EWEB FOR THE PURPOSE OF DESIGN APPROVAL PRIOR TO CONSTRUCTION**.

2.4 It is critical to coordinate vault room location with EWEB during the earliest phase of the project.

2.5 This standard is the minimum EWEB requirements for service transformers of 750kVA and smaller. For service transformers larger than 750kVA, additional requirements may apply, including but not limited to a larger vault room, larger ventilation openings, and larger access doors.

2.6 The customer/developer is responsible to design and build this vault room per the requirements of the National Electrical Code (NEC) article 450 part lll, all other applicable codes and all additional requirements deemed necessary by EWEB.

2.7 The Point of Delivery shall be the load side of the secondary conductor termination cabinet. The customer shall provide, own, and maintain the service entrance conductors and associated conduit from the secondary conductor termination cabinet to the customer's service switchgear or main disconnect switch.

FOR THE PURPOSE OF THIS STANDARD, THE WORD "PROVIDE" WILL MEAN TO "FURNISH AND INSTALL".

3.0 QUALIFICATION FOR THE VAULT ROOM OPTION

3.1 A Padmount transformer located outside of the building it serves or an overhead transformer bank is the PREFERRED METHOD to supply 3 phase power to EWEB customers.

3.2 **EXCEPTIONS TO THIS WILL ONLY BE GRANTED BY EWEB WHEN ONE OF THE FOLLOWING CONDITIONS EXIST:**

3.2a The customer/developer service location is in the EWEB network systems area of service

3.2b The customer/developer has "Zero lot line" space constraints and no space is available to locate a pole or Padmount transformer.

4.0 TRANSFORMER VAULT MINIMUM REQUIREMENTS

VAULT LOCATION:

4.1 The Vault room **SHALL** be located on the ground floor and contain an exterior wall accessible by vehicle. This provides the best location for vault rooms in terms of ventilation and EWEB's access to install and maintain transformers and equipment.

4.2 Provide room with minimum dimensions shown. The transformer vault room and all floors subject to equipment loads **SHALL** be of adequate strength.

4.3 Only EWEB equipment **SHALL** be allowed inside vault room, no exceptions **SHALL** be granted: Equipment **NOT ALLOWED** in transformer vault room includes but is not limited to:

4.3a HVAC ducts for adjacent rooms

4.3b Water pipes, excluding fire sprinklers

4.3c Drain pipes

4.3d Conduit for equipment located outside of vault room

VAULT DOORS

4.4 Doors **SHALL** be located for easy access to EWEB maintenance equipments and trucks.

4.4a Double doors to be 4 feet wide by 8 feet high each.

4.4b Doors **SHALL** open to 180 degree swing.

4.4c Doors **SHALL** open out from vault into the EWEB access.

4.4d Door **SHALL** be re-keyed to EWEB locks prior to EWEB installing any equipment, contact Baird Safe & Lock Co. Inc. to re-key locks to a EWEB "dead bolt key".

4.4e Door **SHALL** be equipped with panic bars, pressure plates or other devices that are normally latched but open under simple pressure.

4.5 EWEB is will provide door warning stickers/signs.

4.0 TRANSFORMER VAULT MINIMUM REQUIREMENTS - CONT

VAULT LIGHTING AND RECEPTACLES

4.6 Provide vapor proof 200W incandescent lighting with glass globe and guard, Cooper Crouse-Hinds Vapor guard or equal as shown.

4.6a Provide light switch mounted on inside wall near doors as shown.

4.6b Provide one duplex ground fault circuit interrupter (GFCI) receptacle on each wall as shown.

PANELBOARD

4.6c 120/240 Volt single phase, 3 wire.

4.6d 60 amp 2 pole main breaker.

4.6e 20 amps, single pole breaker for lights.

4.6f 20 amp, single pole breaker for receptacles.

4.6g Two 20 amp, single pole breaker spares.

4.7 Provide conduit and conductors from panelboard to lights and receptacles.

4.8 Provide 1" EMT conduit from panelboard up wall, across ceiling to above secondary terminals of service transformer. Coordinate exact routing of conduit with EWEB Electric Operations.

4.9 EWEB will provide wires from panelboard to secondary terminals of service transformer in the conduit.

VENTILATION

4.10 Provide natural ventilation, ventilation fans are **NOT ALLOWED.**

4.11 Total area of ventilation opening **SHALL** be 20 square feet minimum. One half of the louvers **SHALL** be in an exterior wall a minimum of 24 inches above the floor and the remainder **SHALL** be in an exterior wall near the ceiling to provide efficient air circulation.

4.12 Louvers **SHALL** be equipped with fire dampers.

4.13 Customer/developer **SHALL** comply with minimum fire ratings.

OIL CONTAINMENT

4.14 Vault rooms must be designed to retain the entire volume of oil from the largest transformer installed in the vault room.

4.0 TRANSFORMER VAULT MINIMUM REQUIREMENTS - CONT

4.15 A removable water tight sill **SHALL** be installed below doors inside of the vault room entrance. The sill SHALL be a minimum of 4 inches tall and **SHALL** be installed after EWEB's transformers are placed in the vault room but before the vault room is energized.

4.16 The sill **SHALL** be painted caution yellow.

4.17 It is the customer/developers responsibility to ensure that all applicable Local, State and Federal requirements are met for oil containment.

GROUNDING

4.18 Provide copper-clad ground rods as shown.

4.19 Each rod **SHALL** be electrically connected to the building footing rebar with a minimum 2/0 bare stranded copper conductor.

4.20 Top of ground rods **SHALL** protrude above finished floor a minimum of 4 inches and a maximum of 6 inches and equipped with cap.

4.21 Embed 4/0 bare stranded copper conductor in floor below doors inside the vault room entrance with 2 foot long conductor tails at each end for EWEB connection. EWEB will provide and complete grounding loop at floor around perimeter of room and make connections to grounding rods and 4/0 conductor tails.

CONDUIT

4.22 All conduits that enter vault room through floor **SHALL** extend above finished floor a minimum of 6 inches.

4.23 All conduits entering vault room through a wall **SHALL** extend out of the wall 1 ½ inches +/- ½ inch and **SHALL** be grouted around conduit entrance flush with wall.

4.24 All service conduits entering vault **SHALL** be fire sealed on both ends.

4.25 Primary conduit **SHALL** be fire sealed in the vault room end of conduit only; EWEB crew will provide fire sealant for this application.

CONDUCTOR RACKING

4.26 Provide a minimum of 18 threaded inserts “all threads” couplers to accommodate ½” x 13 course thread rods in ceiling. EWEB will provide course thread rods at locations necessary to install conductor racking equipment.

4.27 Provide sufficient length of service cable to allow EWEB to rack cable along the vault wall/ceiling and connect to wall mounted secondary conductor termination cabinet, approx. 30 feet per conductor is required.

5.0 EWEB RESPONSIBILITY

5.1 EWEB will provide, own and maintain transformer, primary modules, primary conductor, grounding conductor for inside vault perimeter, wall mounted secondary conductor termination cabinet, ½“x 13 rods, cable racks and connections.

5.2 Customer shall pay EWEB 100% contribution in aid for labor, equipment and material provided by EWEB.