

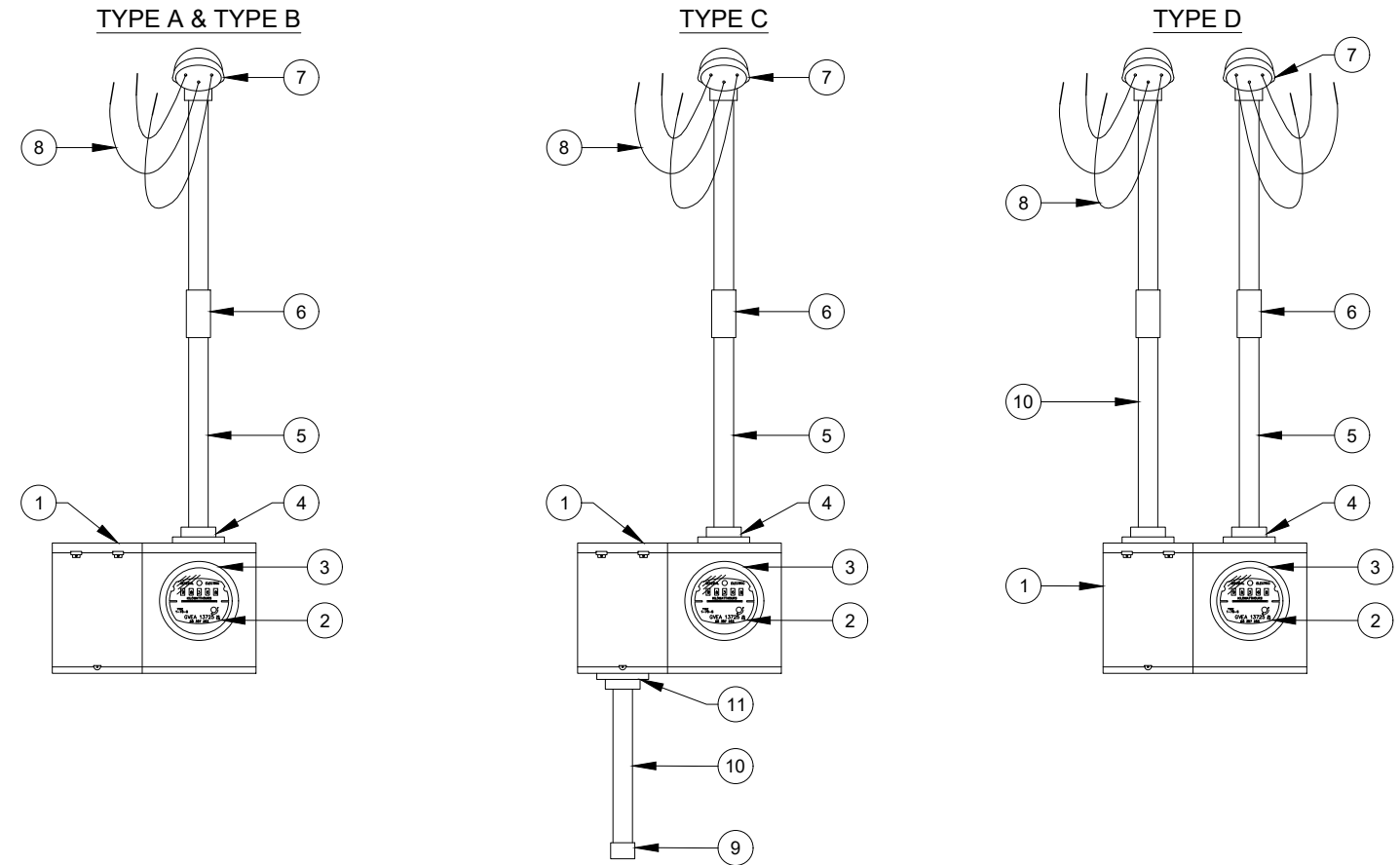
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Construction Guide For Overhead Residential Service Assembly

REVISED 03/2020



| MATERIAL LIST | | | | |
|---------------|---------------------------------------------------|--------------|------------|------------|
| ITEM | DESCRIPTION | TYPE A&B QTY | TYPE C QTY | TYPE D QTY |
| 1 | RING STYLE COMBINATION SERVICE ENTRANCE ENCLOSURE | 1 | 1 | 1 |
| 2 | METER (OWNED & INSTALLED BY GVEA) | 1 | 1 | 1 |
| 3 | SCREW TYPE RETAINING RING | 1 | 1 | 1 |
| 4 | BOLT-ON OR MYERS-TYPE HUB | 1 | 1 | 2 |
| 5 | RIGID OR IMC CONDUIT | * | * | * |
| 6 | GALVANIZED CONDUIT COUPLING | * | * | * |
| 7 | WEATHER HEAD | 1 | 1 | 2 |
| 8 | COPPER CONDUCTOR | * | * | * |
| 9 | CONDUIT BUSHING | - | 1 | - |
| 10 | CONDUIT FOR CUSTOMER'S CONDUCTOR | - | * | * |
| 11 | THREADED HUB OR BONDING BUSHING | - | 1 | - |

*Quantity/Length determined by installation requirements.

NOTE:
 The information in this handout provides general guidelines for the installation of service equipment to meet the requirements of GVEA. It is the owner's responsibility to make sure that the service is also installed to meet all applicable city, borough, and State of Alaska codes, as well as the National Electrical Code (NEC) and National Electrical Safety Code (NESC).

Instructions by Item Number

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- ① **COMBINATION SERVICE ENTRANCE ENCLOSURE**
All service enclosures shall be NEMA 3R outdoor type.

Meter enclosure must be sealable and have hubs and hub covers that are not removable from exterior of enclosure.

Combination service entrance enclosure shall be listed by a nationally recognized testing laboratory as suitable for use as service equipment and must be on GVEA list of approved service equipment.

MAIN BREAKER

Standard size is 100A, 200A, or 300A. Other sizes may be used upon prior approval. Fault current conditions may require Amp Interrupting rating above 10,000A. Check with a GVEA Construction Services Representative.

NEUTRAL BUS

The neutral bus shall be directly or indirectly effectively bonded to enclosures in accordance to NEC 250.92. Install separate grounding lug in enclosure if neutral bus is not directly bonded to enclosure. Factory supplied neutral bus bonding means are subject to approval. Use of a single screw to bond grounding block to enclosure is not sufficient unless part of a U.L. rated assembly.

Per NEC 250.96 and 250.12, paint must be removed from surfaces in contact with grounding fittings. Exposed metal at ground points must be protected with conductive corrosion inhibitor.

Neutral bus must have three lugs for connection of the ground, neutral, and equipment grounding electrode.

- ② **METER AND SOCKET**
Conductors shall be run according to manufacture specifications.

All conductors shall be securely fastened to their respective terminals and shall be arranged in a manner which shall not interfere with the installation of the meter.

Meter socket for a 300A self-contained service must have a lever bypass and the upper right-hand jaw must be reduced or have an anti-inversion clip installed to prevent the insertion of a 200A meter.

Meter will be supplied and installed by GVEA.

- ③ **SCREW TYPE RETAINING RING**
A screw-type retaining ring will be supplied by GVEA. The snap-on aluminum sealing ring commonly supplied with item 1 is not acceptable.

- ④ **BOLT-ON OR MYERS-TYPE HUB**
Hubs must be rated rain tight. Myers type threaded hubs approved for bonding by a nationally recognized testing laboratory are acceptable for bonding conduit to enclosures.

Standard locknuts or sealing locknuts are not acceptable for bonding at service equipment.

Where a bolt-on hub is used, it must be made by the same manufacturer as the service entrance enclosure. A bolt-on hub must be used on enclosures designed for use with bolt-on hub.

- ⑤ **GALVANIZED RIGID OR INTERMEDIATE METAL CONDUIT**
Conduit shall be rigid metal conduit (RMC) or intermediate metal conduit (IMC) and sized in accordance with Wire/Conduit Size Table on next page.

All service entrance masts that extend above the roof line must be a minimum 2" RMC or IMC.

This conduit is to be continuous. No junction boxes are permitted. Conduit bodies may be used with prior approval.

- ⑥ **GALVANIZED CONDUIT COUPLING**
Threadless couplings or connectors are not allowed in service mast. All approved couplings must be below roofline. Coupling may not be required if one 10'-0" piece of conduit provides required height.

- ⑦ **WEATHER HEAD**
Must be the correct size for the conduit on which it is installed.

- ⑧ **COPPER CONDUCTOR** Phase conductors shall be insulated with type XHHW or RHW insulation. See Wire/Conduit Size Table for minimum wire sizes.

GVEA requires the neutral to be the same wire size as the phase conductors.

Neutral may be uninsulated. If neutral is insulated, GVEA requires type XHHW or RHW insulation. GVEA requires insulated wire marked with white tape.

Grounding electrode conductor shall be #4 Cu (#2 Cu for 300A self-contained services) in accordance with GVEA requirements. Grounding electrode conductor shall be installed in one continuous length without a splice or joint, unless spliced only by irreversible compression-type connectors listed for the purpose or by an exothermic welding process.

See Wire/Conduit Size Table for requirements for 100A, 200A, or 300A service sizes.

LEAVE MINIMUM 1'-6" TAILS out of weather head for connection to GVEA system.

- ⑨ **CONDUIT BUSHING**
Install bushing appropriately sized for the conduit.

- ⑩ **CONDUIT FOR CUSTOMER'S CONDUCTOR**
Install appropriate size and type based on NEC.

- ⑪ **GROUNDING HUB OR CONDUIT BONDING BUSHING**
Hubs must be rated rain tight. Myers type threaded hubs approved for bonding by a nationally recognized testing laboratory are acceptable for bonding conduit to enclosures and may be substituted for conduit bonding bushings.

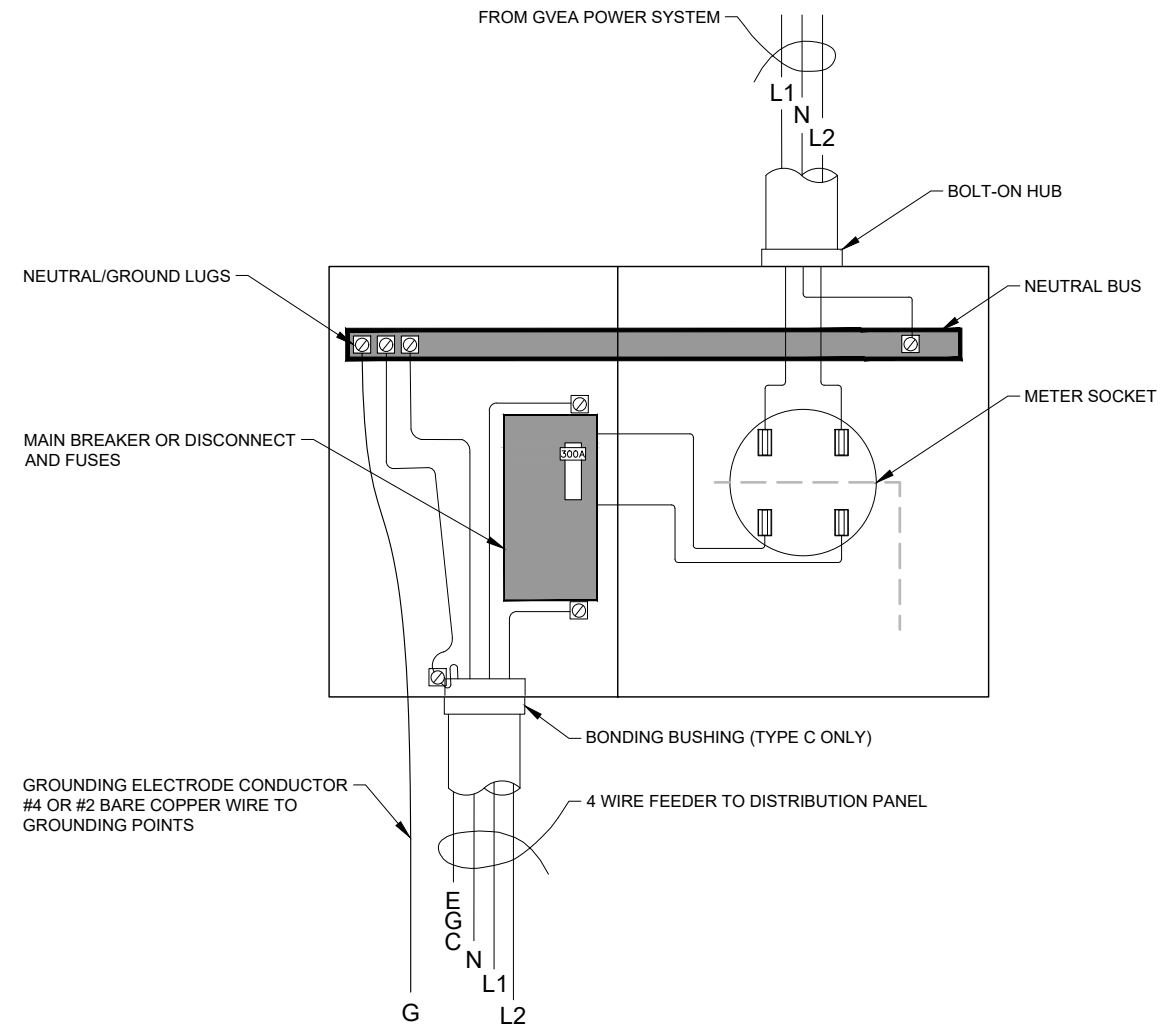
Standard locknuts or sealing locknuts are acceptable when used with a bonding bushing.

Where a bolt-on hub is used, it must be made by the same manufacturer as the service entrance enclosure. A bolt-on hub must be used on enclosures designed for use with a bolt-on hub.

Connection Detail - Service Assembly

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VIEW OF COMBINATION SERVICE ENTRANCE ENCLOSURE WITH COVERS REMOVED
TYPE A & B SHOWN, CONNECTIONS FOR TYPES C & D ARE SIMILAR
NOTE: SEE NATIONAL ELECTRICAL CODE (NEC) FOR MORE INFORMATION



LEGEND:

| | | |
|-------|-------------------------------|-------------------------------------------------------------------------------|
| EGC | Equipment Grounding Conductor | Green or Bare Wire |
| G | Grounding Electrode Conductor | Green or Bare Wire |
| L1,L2 | Phases | Black Wires |
| N | Neutral | Bare Wire (in mast only) or Black Wire with White Tape Wrapped Around Ends |

WIRE/CONDUIT SIZE TABLE

WIRE SHALL BE COPPER

| SERVICE SIZE | MINIMUM WIRE SIZE (XHHW OR RHW) | MINIMUM CONDUIT WIRE (RMC OR IMC) | MINIMUM GROUNDING ELECTRODE CONDUCTOR SIZE | MINIMUM EQUIPMENT GROUNDING CONDUCTOR SIZE |
|--------------|---------------------------------|-----------------------------------|--------------------------------------------|--------------------------------------------|
| 100 Amp | #2 Copper | 1 1/4" * | #4 Copper | #8 Copper |
| 200 Amp | #3/0 Copper | 2" | #4 Copper | #6 Copper |
| 300 Amp | 300 kcmil Copper | 2" | #2 Copper | #4 Copper |

*See instructions for item #5 regarding masts above roof line.