

## 7 Single-Family Service

### 7.1 Basic Requirements

The location of the service entrance on the Customer's premises is an important consideration. For clearance and location criteria, see Section 5.2, *Meter Clearances and Location Criteria*.

- Consult PGE to determine the point of attachment for overhead service drops, underground service laterals, and meter locations.
- Locate the service entrance and meter to make them more accessible from the PGE distribution line and convenient for the installation and maintenance of PGE meters.

The Customer will provide, install, and maintain all service equipment—including service entrance conductors for overhead service, conduit, enclosures, and meter sockets—to include rights of way and space for the installation and maintenance of PGE facilities. Follow these requirements:

- The Customer must not terminate the principal grounding conductor in the PGE sealed termination compartment.
- Customer wires installed in the meter socket must allow working space for the installation of PGE wires. Panel covers must be secured prior to inspection and energizing.
- See Section 6, *Underground Requirements* for underground and conduit requirements. For conduit requirements, see **Table 6-1**, *Conduit Requirements for Secondary Voltage Conductors*.
- The meter socket must not be used as a junction box.

#### 7.1.1 Residential Sockets

A single-phase, direct-connect residential socket that has a maximum current capacity of 125, 200, or 400 (320 continuous) amperes and is approved by ANSI, UL, EUSERC, and PGE may be used.

NOTE: All single-phase, 400 amp (320 amp continuous) sockets must have an approved manual link bypass.

Code-calculated loads greater than 320 amperes require current transformer metering. Contact PGE for information and requirements. See Section 10, *Commercial, Industrial, and Large Residential Services, 800 Amps or Lower*.

NOTE: For a 200 amp service, a bypass meter socket is approved—but not required—for single-family residential services. Consider a bypass meter socket if interruption of power during routine meter service would be a problem in the residence.

## 7.2 *Underground Service*

For preparation of underground service, the Customer must obtain approval and specifications from PGE for the proposed installation.

The Customer is responsible for recognizing potential surface and subgrade water flow that may allow water to enter into the Customer's electrical equipment. PGE will coordinate with the Customer to assist in preventing this water entry.

Customers who are adequately served by existing overhead distribution facilities, but want underground service, should contact PGE for details of its policy regarding a conversion. Special rules may apply in areas where local ordinances specify underground service.

PGE underground conductors will be installed as specified in Section 6.2, *Trenches Provided by the Customer* and Section 6.3, *Conduit* for underground service to residential premises. The Customer must furnish and install PGE-approved conduit.

The Customer is responsible for the cost of all trenches, conduits, vaults, excavation, backfill, and site restoration on the premises or within the confines of the subdivision to be served. This also includes costs for work outside the project to permit connection to PGE facilities.

PGE will install, own, and maintain the underground service lateral from its distribution line to the Customer's point of delivery.

### 7.2.1 **Underground Service Extension**

**Figure 7-1** shows a residential underground-approved combination meter socket for 100 and 200 amp maximum, single-phase service (EUSERC 301). The variable dimensions indicated in this figure are listed in **Table 7-1**.

**Figure 7-2** shows a residential underground-approved meter socket for 200 amp maximum, single-phase service (EUSERC 301A). The variable dimensions indicated in this figure are listed in **Table 7-1**.

**Figure 7-3** shows a residential underground approved meter socket for 400 amp maximum (320 amp continuous), single-phase service (EUSERC 302B).

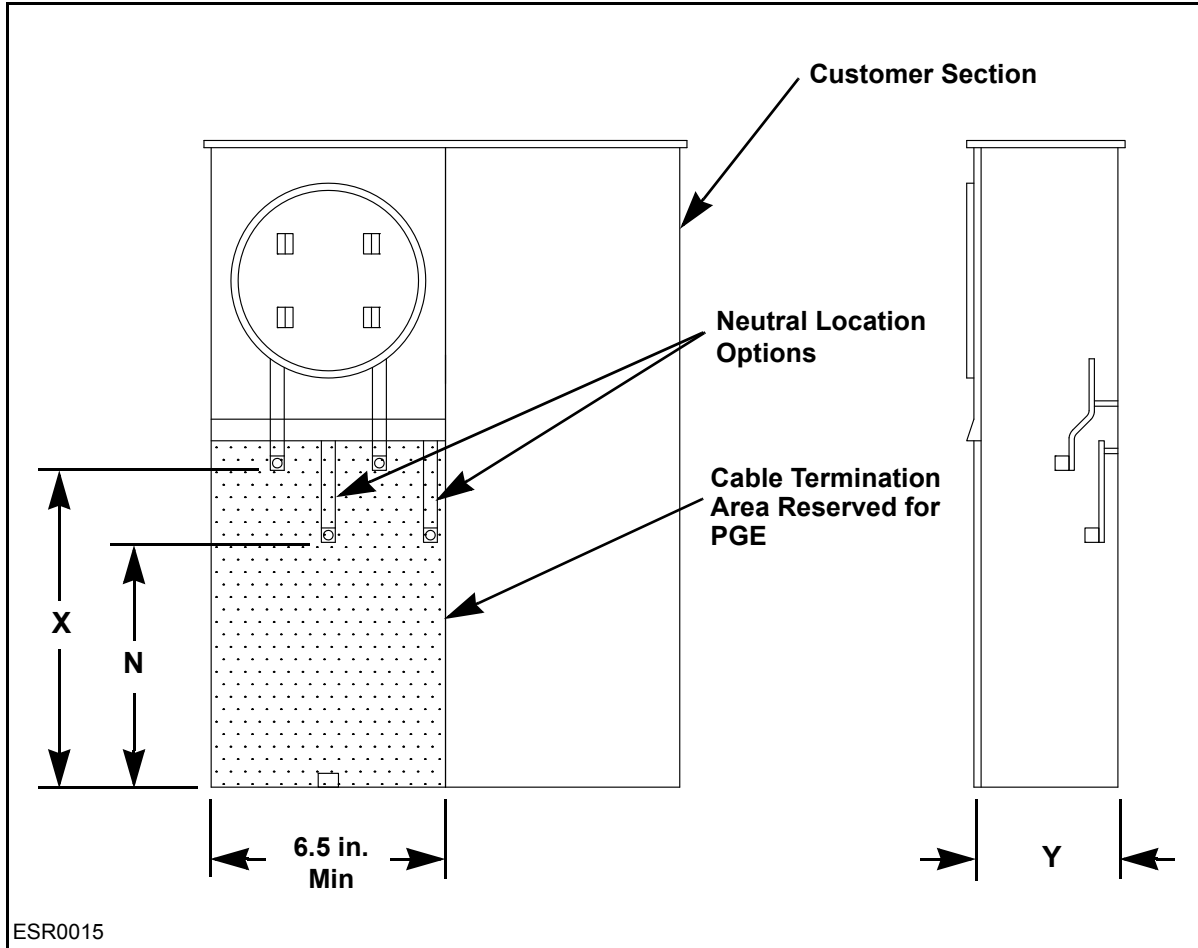
**Figure 7-4** shows a typical installation of an underground service extension to the house.

**Figure 7-5** shows a PGE-installed standoff bracket on the pole.

Follow these basic construction requirements for all underground service extensions.

- The Customer is responsible for the trench, backfill, compaction, surface restoration, and conduit as required for service extensions.

- Hubs are not approved for use on the concentric knockout of underground socket enclosures. Approved bushings, box adapters, or other conductor protection are required for these enclosures.
- The service entrance riser must be in line with the left side of the entrance knockout. (See **Figure 7-4.**) For detailed clearance requirements, see Section 5, *Clearances*.
- Customer-owned conductors cannot enter or pass through the PGE compartment in the meter socket except in a 320-amp meter socket.
- A ringless meter socket is not approved.
- The Customer will provide and install a PGE-approved meter socket. The point of delivery for residential customers must be located on the front of the building or no more than 10 feet back from the front corner. The Customer must contact PGE to determine the exact location of the meter socket.
- For 320 amp service or lower, 3-inch PVC Schedule 40 electrical conduit, with up to 270 degrees of bends can be used. All bends must have a 36-inch long sweep radius (factory-made only). Field heat bends are **not** acceptable.
- When the conduit extends to a PGE pole or handhole, consult PGE for the exact conduit location. PGE will install a bracket on the pole or mark the location on the pole for the conduit. There must be a minimum 8 inches between the pole and the backside of the conduit. See **Figure 7-5.**
- Attach the electrical label or permit to the meter base.
- The meter socket and conduit must be rigidly attached to the structure; 2- x 4-inch back supports are required. The meter socket and conduit must be plumb when inspected. PGE will determine the exact location of the meter. See **Figure 7-6.**
- Sleeves around conduit are required when passing through a paved area adjacent to a building foundation. These will prevent ground settling from pulling the conduit down.
- The riser elbow must be backfilled with a minimum 4-inch depth of 3/4-inch minus crushed rock that is tamped to avoid soil settling.
- Use factory bends with no more than 90 degrees of total bend to obtain a minimum depth of 36 inches while keeping the conduit flush against the house.
- No bends are allowed in the conduit riser between the meter socket and the underground sweep. If local codes do not allow conduit in the foundation or footing, a surface-mounted meter must be installed. See **Figure 7-6.**
- See **Figure 7-7** for the optional seismic footing design.



**Figure 7-1: Residential Underground Approved Combination Meter Socket for 100 and 200 Amp Maximum Single-Phase Service (EUSERC 301)**

The variable dimensions shown in the table below refer to the drawing in **Figure 7-2**.

**Table 7-1: Dimensions for Residential Underground Approved Meter Sockets for 100 and 200 Amp Maximum Single-Phase Service**

Amps	Dimension (inches)		
	N	X	Y
125	6	8	4
225	8.5	11	5

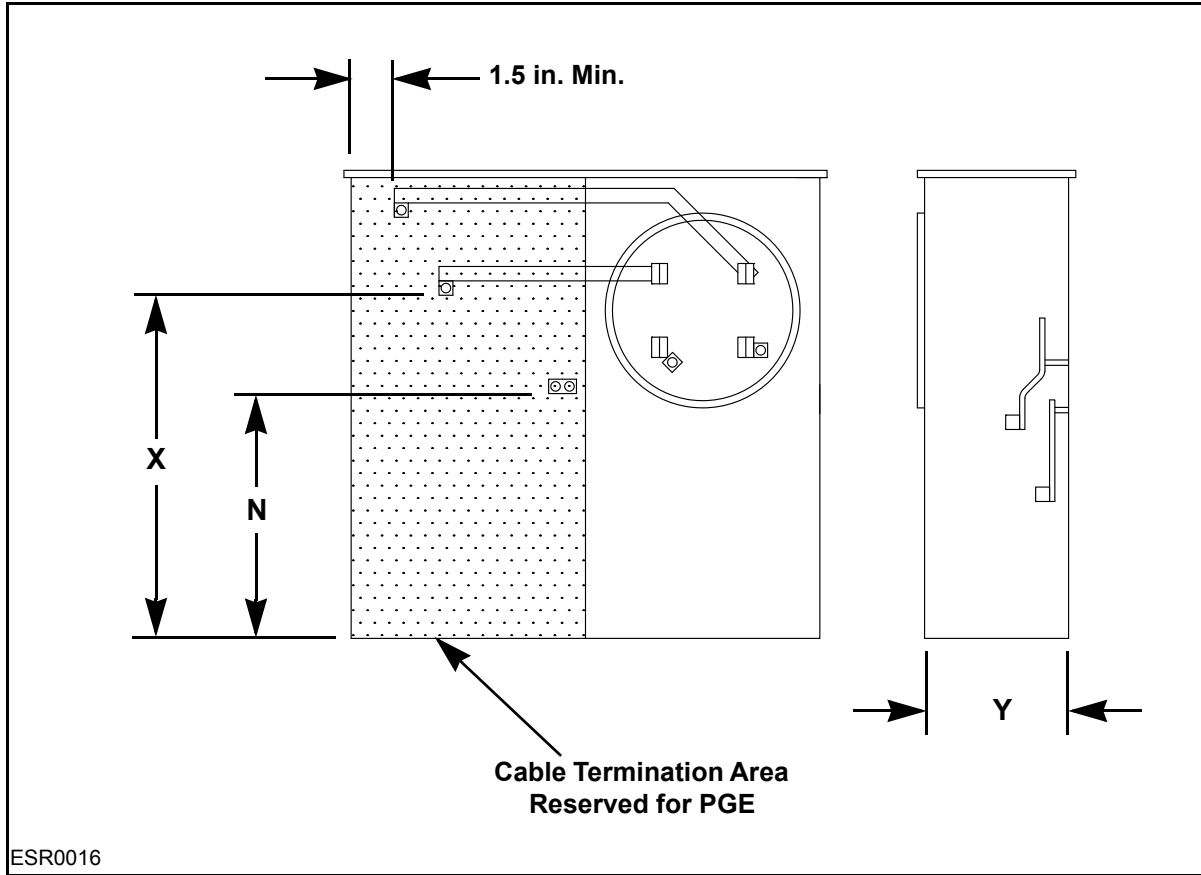
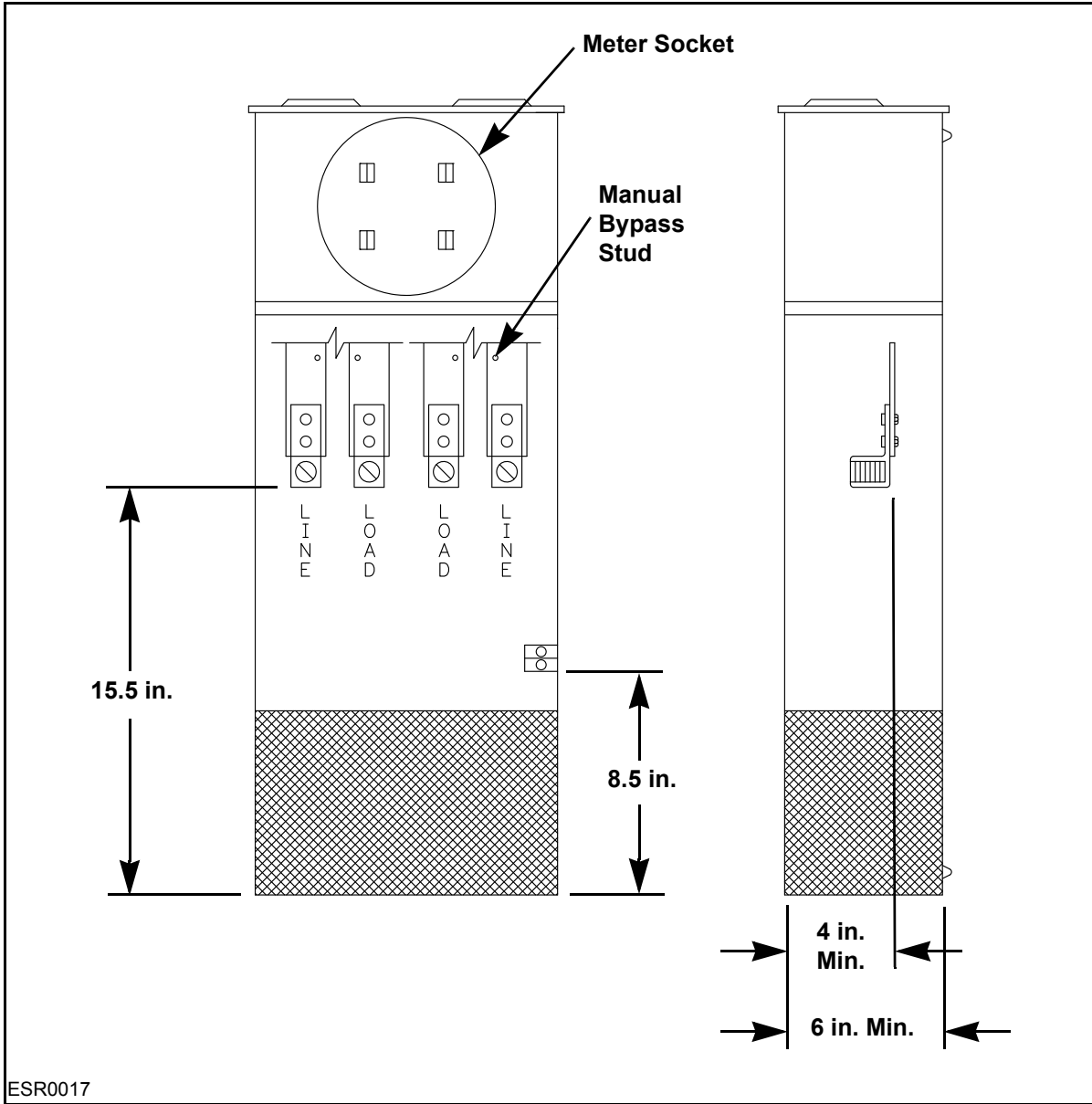


Figure 7-2: Residential Underground Approved Meter Socket for 200 Amp Maximum Single-Phase Service (EUSERC 301A)



**Figure 7-3: Residential Underground Approved Meter Socket for 400 Amp Maximum (320 Amp Continuous) Single-Phase Service (EUSERC 302B)**

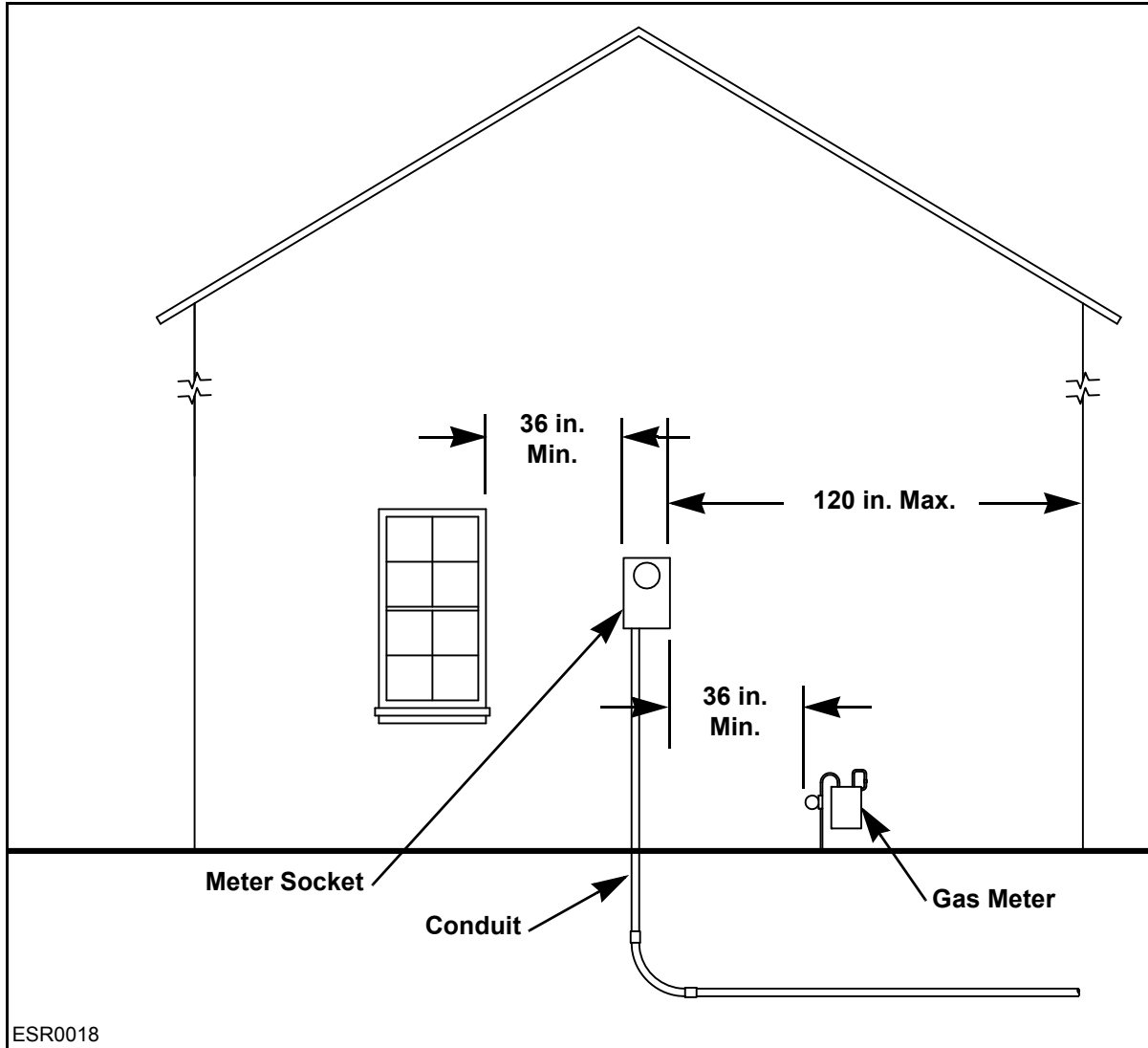


Figure 7-4: Underground Service Extension

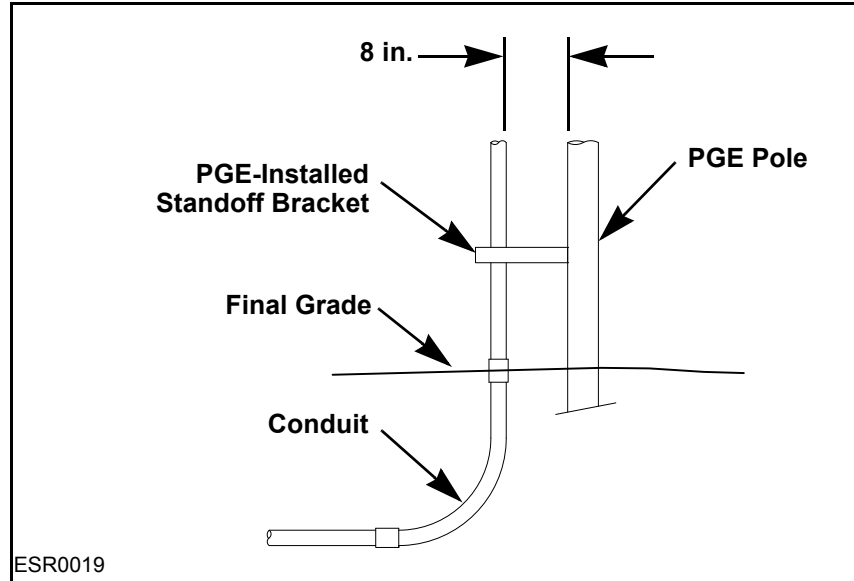


Figure 7-5: PGE-Installed Standoff Bracket

### 7.2.1.1 Surface-Mount Installation

The Customer will furnish and install the following for a surface-mount installation:

- An underground-type meter socket enclosure
- Conduit
- Utility easement (when required)
- Long radius sweep

The following requirements apply to a surface-mount installation such as that shown in **Figure 7-6**. They are in addition to the basic requirements described in Section 7.1.

- No bends are allowed in the conduit riser between the meter socket and the underground sweep. If local codes do not allow conduit in the foundation or footing, a surface-mounted meter must be installed.
- On a brick or concrete block siding, use a 1/4–20 x 3.25 lead sleeve expansion bolt in joint in place of a lag screw on an anchor strap.
- The conduit riser must be in line with the left side of the entrance knockout.
- A 3 inch-to-2.5 inch smooth-wall swedge reducer installed as close as possible to the meter socket may be used for 2 x 4 framing.
- See **Figure 7-7** for the optional seismic footing design.



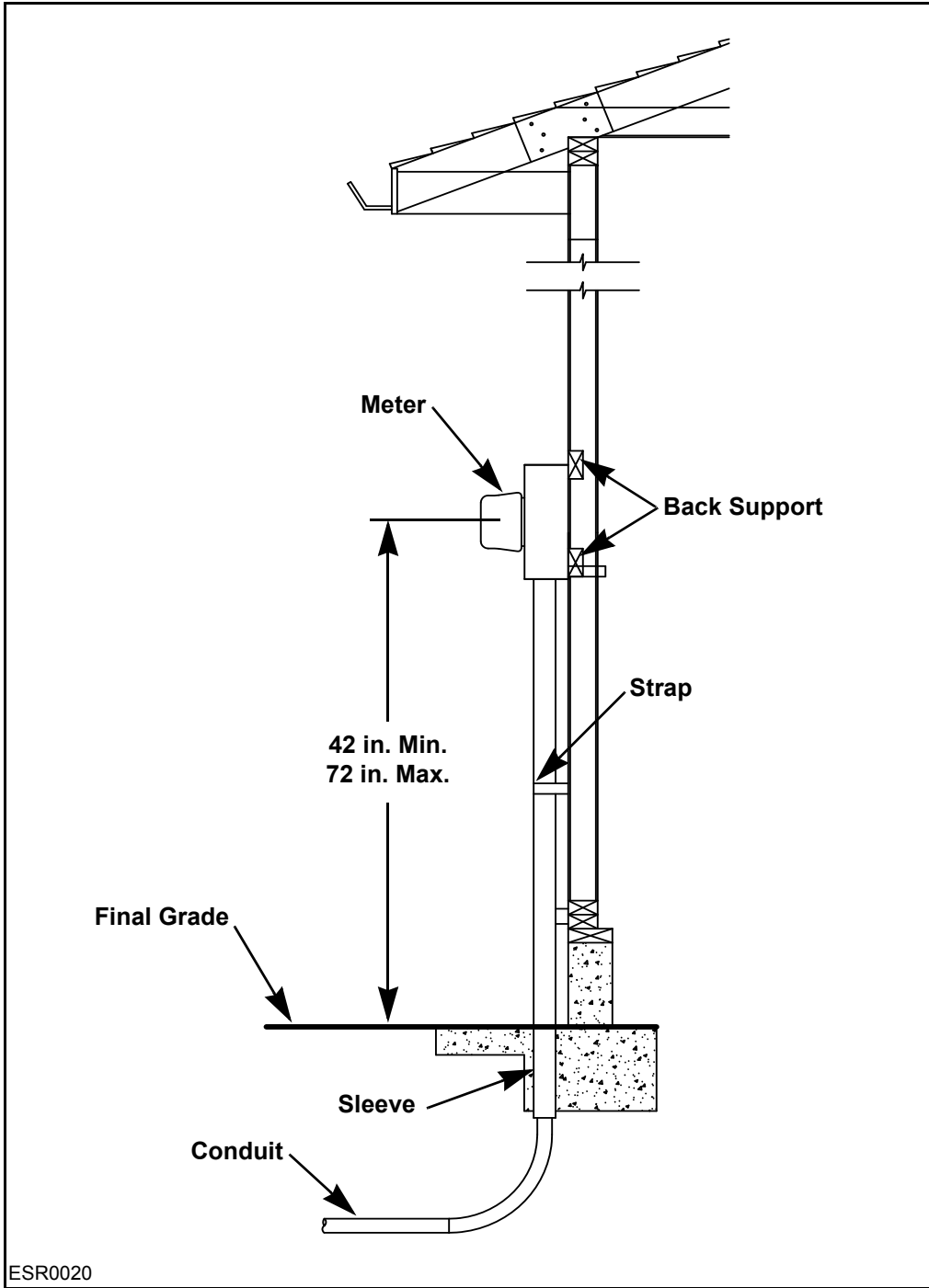
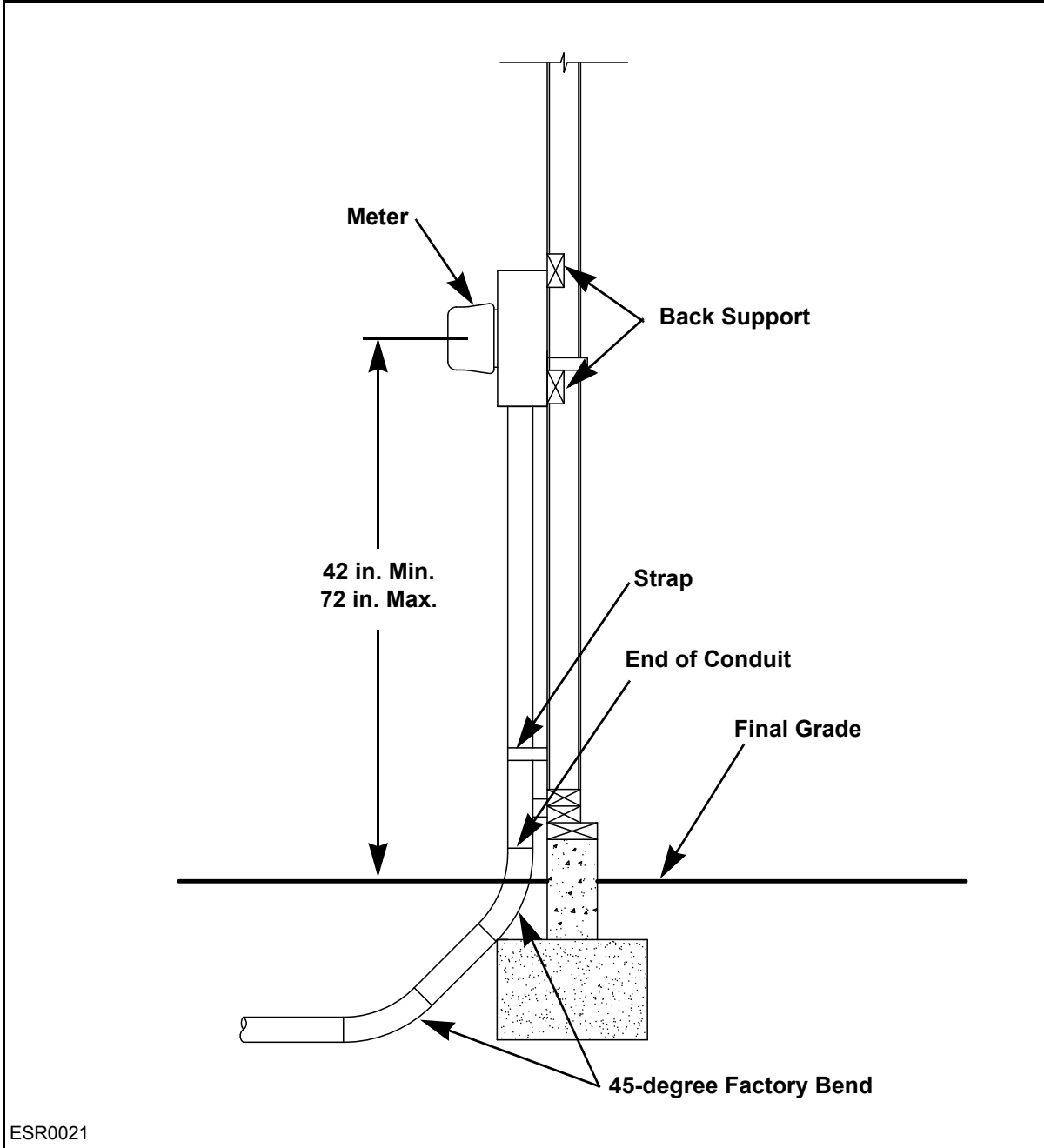


Figure 7-6: Surface-Mount Installation



**Figure 7-7: Seismic Footing Design**

### 7.2.1.2 Flush-Mount Installation

The following requirements apply to a flush-mount installation such as that shown in **Figure 7-8**. They are in addition to the basic requirements described in Section 7.1.

- No bends are allowed in the conduit riser between the meter socket and the underground sweep. See **Figure 7-8** for an installation with conduit in the foundation and footing.
- The conduit riser must be in line with the left side of the entrance knockout.

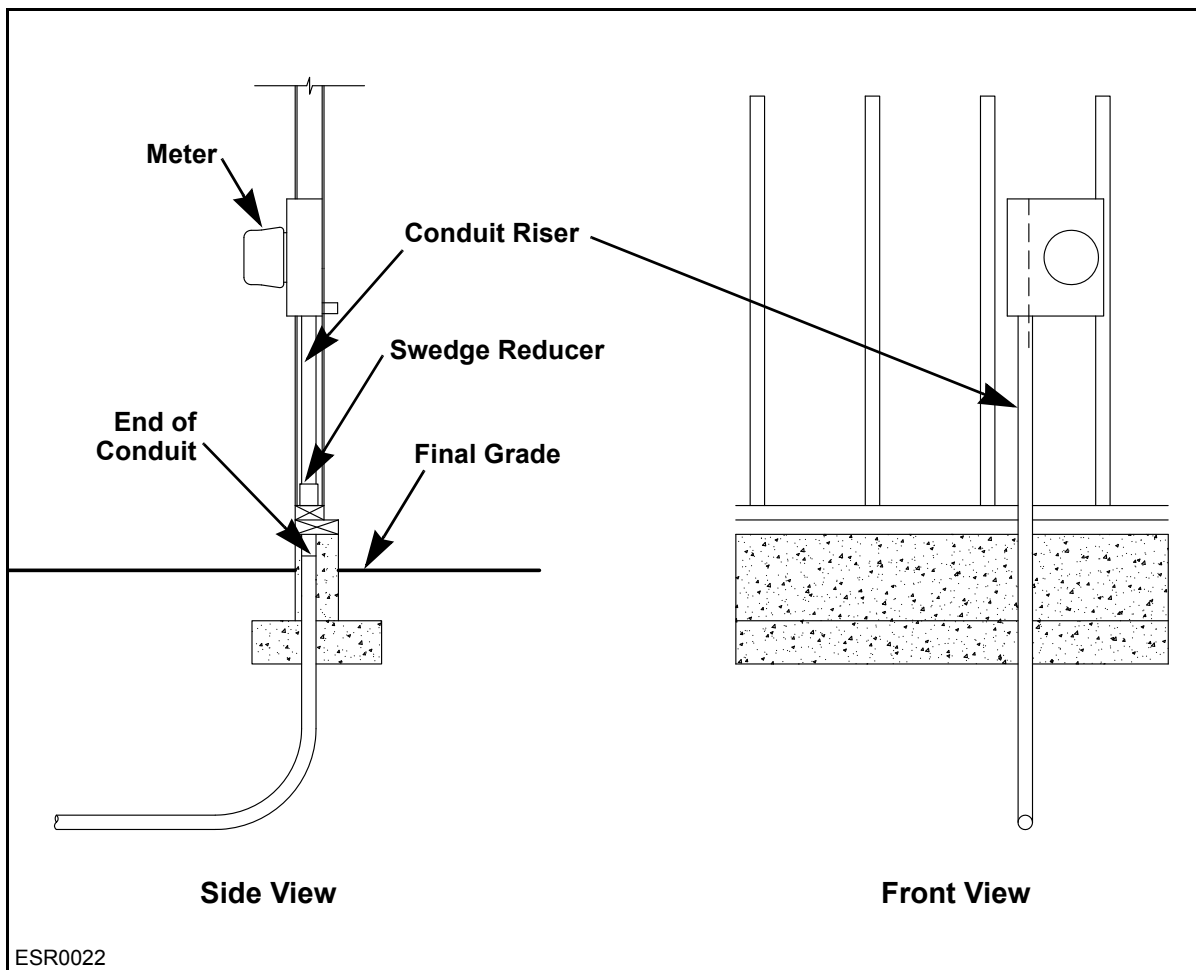
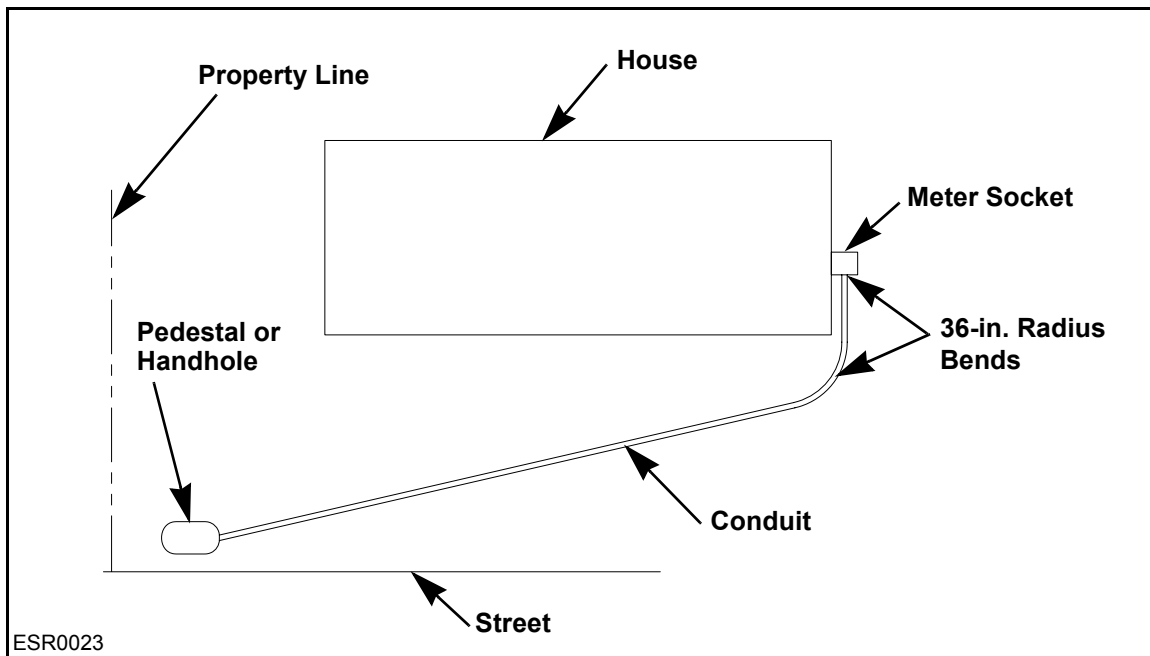


Figure 7-8: Flush-Mount Installation

## 7.2.1.3 Underground Conduit System for Long-Side Service

The following requirements apply to an underground conduit system for long-side service, such as that shown in **Figure 7-9**. They are in addition to the basic requirements described in Section 7.1.

- The customer is responsible for providing a continuous electrical conduit with pull string from the meter socket to the pedestal or handhole.
- Use a 500 pound-rated service pull string in the conduit.
- If the pedestal is energized, consult PGE before installing the conduit.



**Figure 7-9: Top View of an Underground Conduit System for Long-Side Service**

#### 7.2.1.4 Swedge Reducer for Meter Base Applications

A 3 inch-to-2.5 inch smooth-wall swedge reducer—installed as close as possible to the meter socket—may be used for 2 x 4 framing. See **Figure 7-10**.

When a conduit extends to a PGE pole or handhole, consult PGE for the exact conduit location. PGE will install a bracket on the pole or mark the location on the pole for the conduit. AS shown in **Figure 7-11**, there must be a minimum 8 inches between the pole and the backside of the conduit.



Figure 7-10: Swedge Reducer

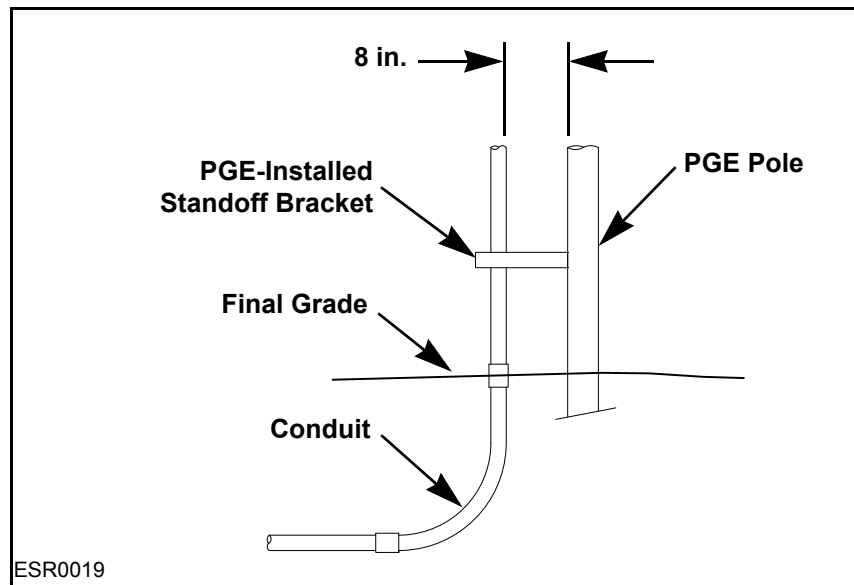


Figure 7-11: PGE-Installed Standoff Bracket

## 7.2.2 Secondary Splice Pedestal

These requirements apply when installing a secondary splice pedestal, such as the PF300 secondary splice pedestal shown in **Figure 7-12**. They are in addition to the basic requirements described in Section 7.1.

- Install the pedestal so that the ground level marker on the case is at the final grade.
- The pedestal must be installed level with the horizon.
- The latch on the lid must face toward the street.
- The lid must be secured with a five-sided Penta-head bolt.
- Use a minimum of 6 inches of 3/4-inch minus well-compacted crushed rock around and inside the base of the pedestal.
- The conduit stubs should be 2 inches minimum above the inside grade to prevent rocks and debris from falling into the conduit.
- Cover and mark conduits as follows:
  - S for source.
  - SVC for service.
  - ST for streetlight.
- Install 500-pound-rated pull string in the source conduit so that 6 feet of pull string extends beyond each end of the conduit.
- The source conduit must be on the field side of the pedestal.
- Elbows to be 36-inch radius.
- The Customer must install a 5/8-inch OD x 8-foot-long ground rod inside the secondary splice pedestal. (PGE will provide this ground rod.)

Install the ground rod as follows:

- Bury it a minimum of 7 feet, 9 inches deep.
- Make sure that the rod extends a minimum of 9 inches below the neutral bus behind the source conduit.
- Locate it as close to the back of the pedestal as possible.

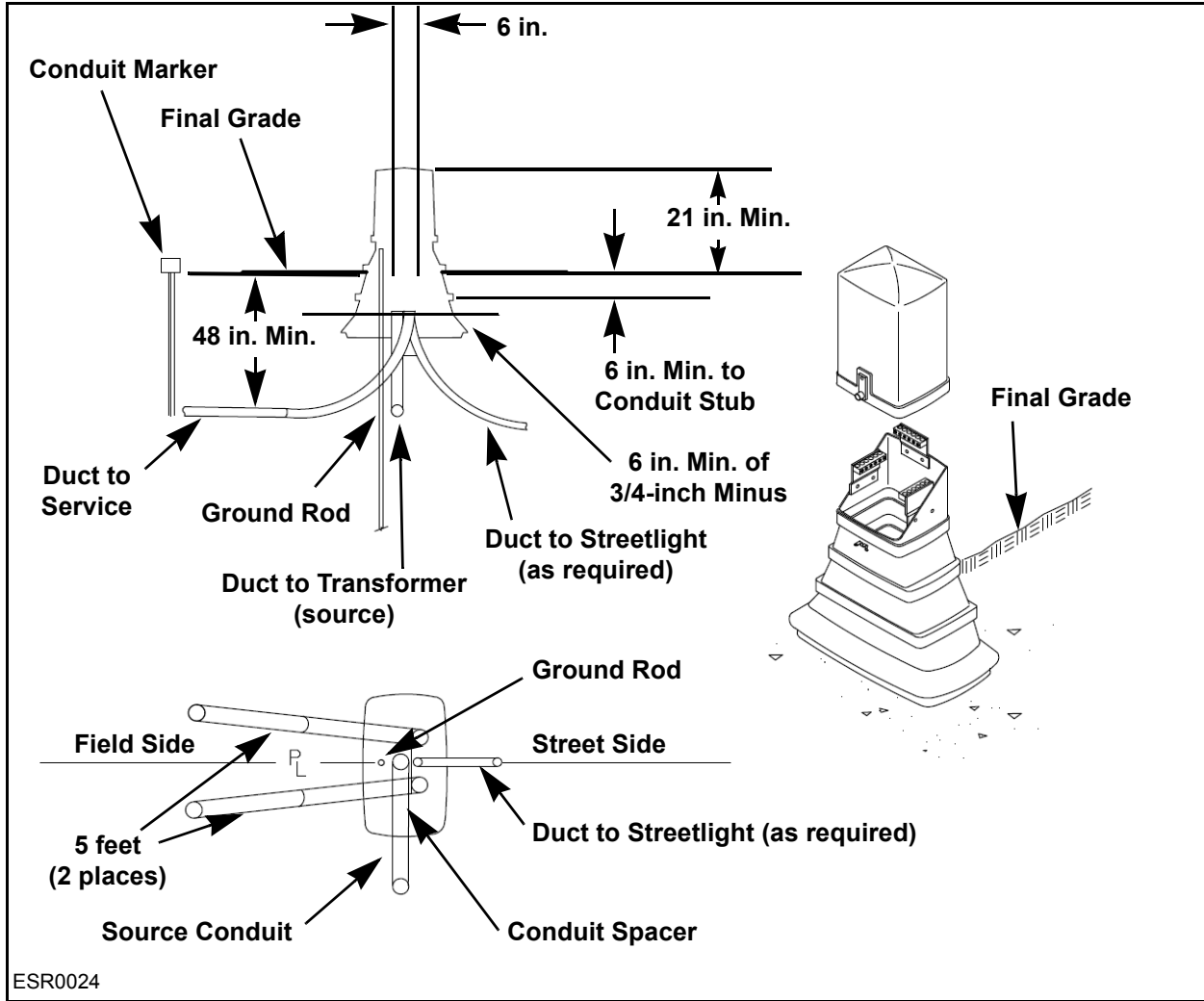


Figure 7-12: PF300 Secondary Splice Pedestal

## 7.2.3 Secondary Handhole

The following requirements apply when installing a secondary handhole, such as the 17 x 30 x 18-inch deep secondary handhole shown in **Figure 7-13**. (This particular handhole has a 21.75- x 34.75-inch polymer cover marked ELECTRIC. This size may vary with the manufacturer.) These requirements are in addition to the basic requirements described in Section 7.1.

- Contact PGE for approved manufacturers of secondary handholes.
- Mark, cap, and install 500-pound-rated pull string so that 6 feet of additional pull string extends beyond each end of the conduit.
- The trench depth at the handhole location must be appropriate for the sweep being used. Cutting of sweeps is prohibited.
- Use a minimum of 6 inches of well-compacted 3/4-inch minus backfill under the splice box, and 6 inches around the outside base.
- All secondary vaults (1730) must be installed on property lines within the utility easement, and the handhole must be set 2 inches above final grade or on the highside of the slope. Handholes set on a sidewalk must be set to grade. Alternate locations must be approved by PGE and noted on the drawing.
- The cost for relocation or adjustment of a 1730 vault will be the responsibility of the builder or developer requesting the move. PGE approval of installation will be based on final grade and location criteria set by the developer and his or her agent.
- For permanent service, use 3-inch Schedule 40 or fiberglass, 90-degree elbows with a 36-inch radius. Install to the proper depth for the sweep being used.
- The Customer must install a 5/8-inch OD x 8-foot-long ground rod inside the handhole. (PGE will provide this ground rod.)

Install the ground rod as follows:

- Bury it a minimum of 7 feet, 9 inches deep.
  - Ensure that the rod extends a minimum of 3 inches above grade inside the handhole.
  - Locate it behind the feed conduit.
- The lid must be installed with five-sided Penta-head bolts.



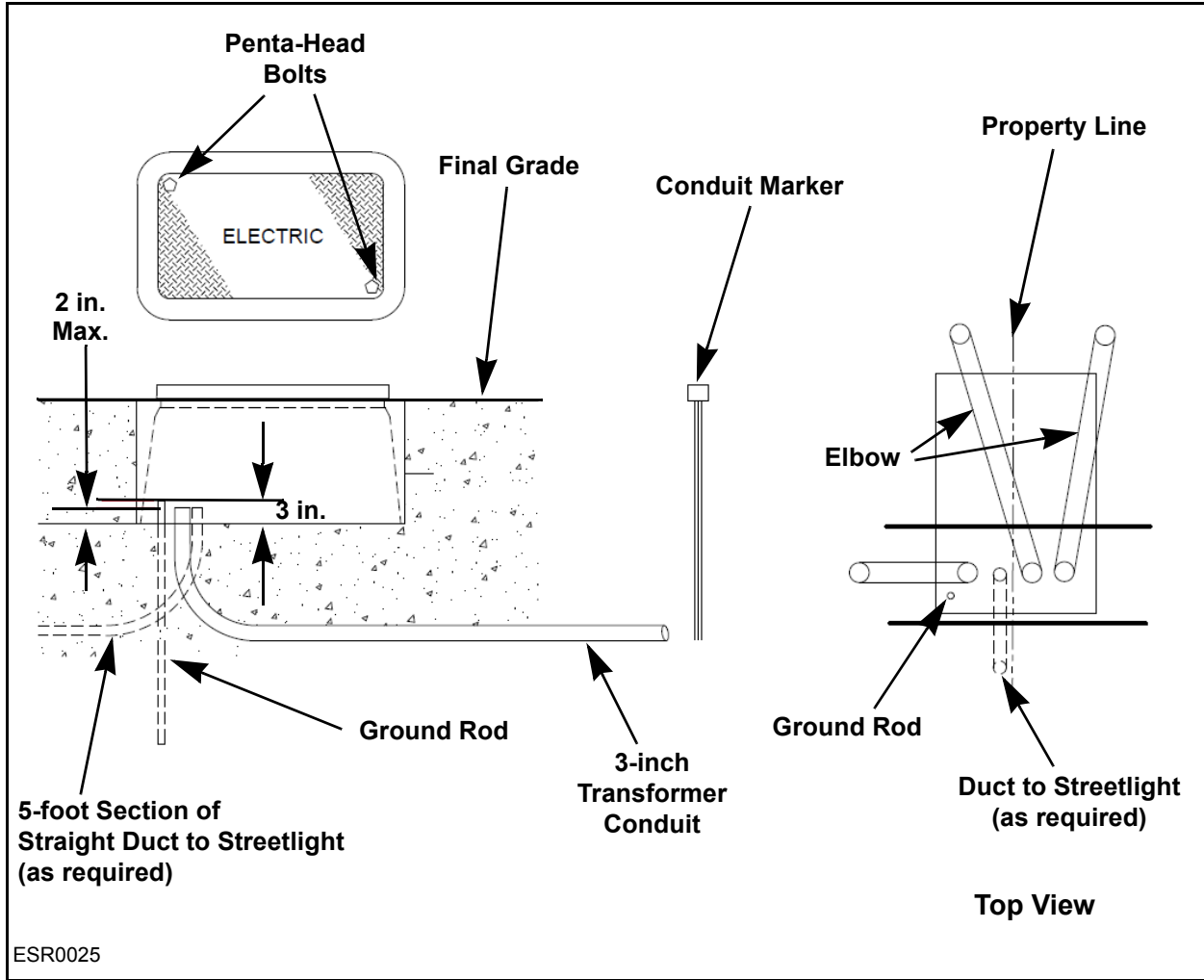


Figure 7-13: Secondary Handhole

## 7.2.4 Post-Mounted, Freestanding Residential Meter Pedestal

The following requirements apply when installing a post-mounted, freestanding residential meter pedestal such as the one shown in **Figure 7-14**. They are in addition to the basic requirements described in Section 7.1.

- A minimum 6- x 6-inch pressure-treated wood post owned by the Customer must be installed. Firmly tamp the earth around the post; dome the earth to allow for settling. A railroad tie is **not** an acceptable alternative to the 6- x 6-inch pressure-treated wood post.
- Use a strap to secure the conduit to the post.
- PGE will determine the exact location of the meter.
- The post must be installed a minimum of 7 feet from the service post.
- An electrical label or permit must be displayed on the meter base.
- The Customer will furnish and install the following:
  - An underground-type meter socket
  - Hardware for the 6- x 6-inch post
  - Conduit with pull string
  - Utility easement
  - A trench
  - A 5/8-inch OD x 8-foot-long galvanized ground rod (PGE can provide this ground rod)

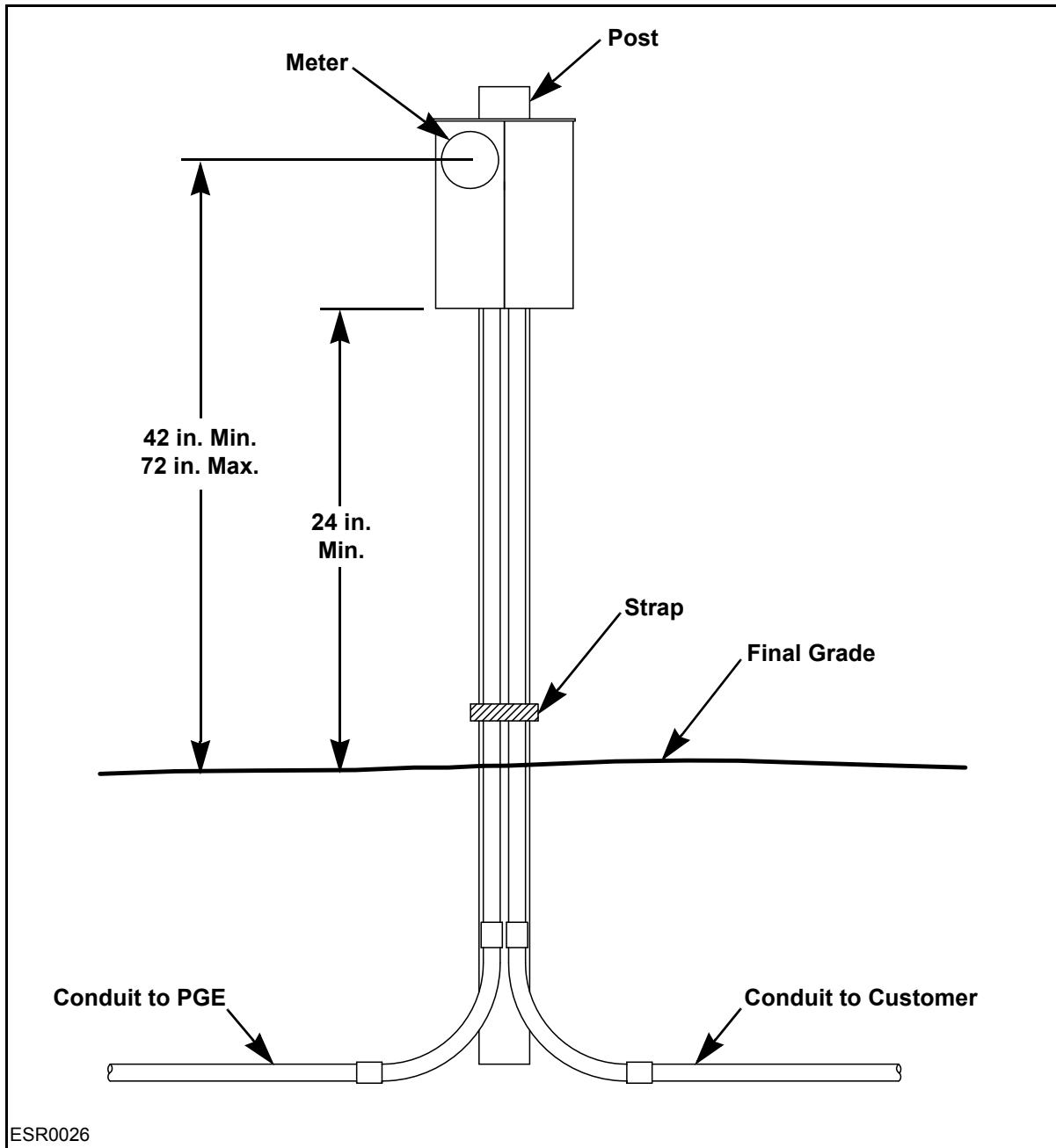


Figure 7-14: Post-Mounted, Freestanding Residential Meter Pedestal

## 7.3 Overhead Service

For Customers in an overhead service area, PGE will install an overhead service drop from the PGE distribution lines to the service entrance on the Customer's residence, building, or structure. PGE will also install underground service in an overhead area. (See Section 7.2, *Underground Service*, for requirements.)

Consult PGE for location of the meter socket before rewiring the service. See **Figure 5-2** in Section 5.2, *Meter Clearances and Location Criteria* for meter clearances for single-meter installations.

The Customer must provide a single attachment point within 2 feet of the weatherhead that can be reached with a single span of service drop cable from an adjacent PGE line. For service mounted on a customer-owned pole, locate the weatherhead within 2 feet of the top of the pole. The point of attachment must be high enough above the finished grade and in a proper position to provide minimum clearances as specified in **Table 5-1**, *Minimum Clearances for Service Drops, 750 Volts and Lower Based on NESC C2-2012*.

It is important to avoid overhang of a service drop above adjacent property, and to provide a service drop route without obstruction by buildings, trees, or other objects. Locate the point of attachment on the building wall that faces the nearest PGE line, or on a service mast capable of withstanding the tension of the service drop.

Extend and tie supports for service drops from and into the main structural members of the building. Extend the service mast through the roof on a typical single-story building unless adequate clearance exists at the gable end of the building. (See **Figure 5-4** in Section 5.2.5, *Residential Meter*.) The service entrance riser conduit for overhead installations must be a minimum Schedule 40 PVC.

Use a rigid metal pipe clamp for the point of attachment for a service mast. For attachment to a building, use a 3/8-inch eyebolt connected to a significant structural member, such as a rafter or roof plate. For a single-story building, the attachment must not be below the downhill slope of the roof or the rain gutters. Attachment to a fascia board is not permitted.

If a Customer encounters a problem in meeting these clearances, PGE will provide assistance in determining specific requirements that will comply with the codes.

NOTE: For residential overhead services, the house siding must be installed prior to energizing the service.

**Figure 7-15** shows a residential overhead approved meter socket for 100 amp, 200 amp (EUSERC 301 or 301A), and 400 amp (320 amp continuous) maximum, single-phase service (EUSERC 302B).

**Figure 7-16** shows a residential overhead approved meter socket for 100 and 200 amp maximum, single-phase service.

Figure 7-17 shows overhead service for surface- and flush-mounted metering.

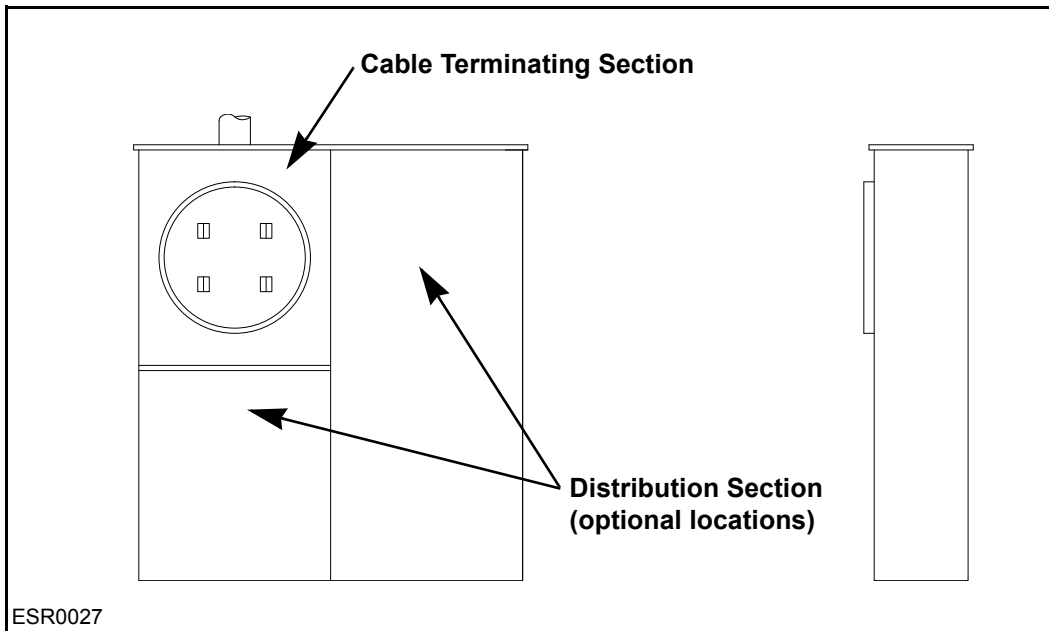


Figure 7-15: Residential Overhead Approved Meter Socket, 100, 200, and 400 Amps

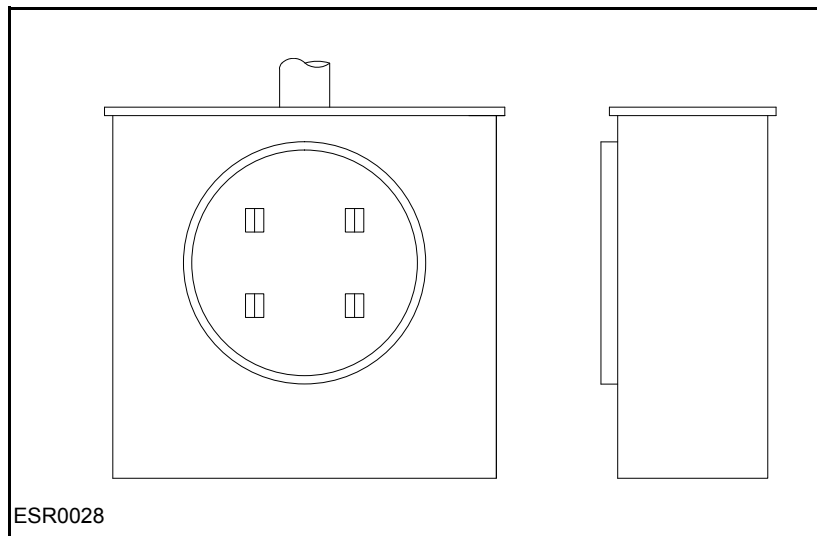


Figure 7-16: Residential Overhead Approved Meter Socket, 100 and 200 Amps

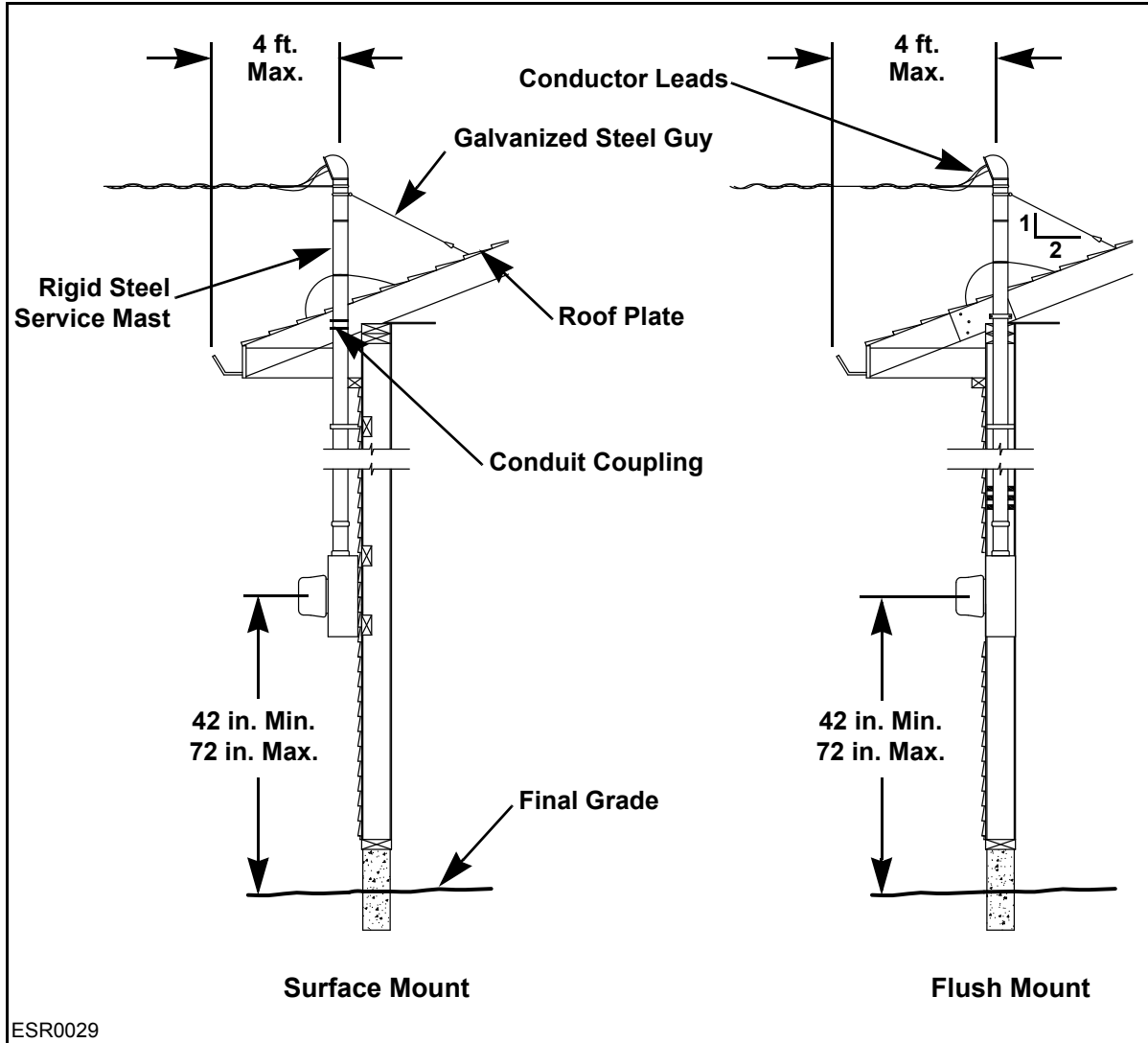
## 7.3.1 Surface- and Flush-Mount Installations

These requirements apply to surface- and flush-mount installations, such as the ones shown in **Figure 7-17**. They are in addition to the basic requirements described in Section 7.3.

- Allow 24-inch conductor leads for connection to the service drop.
- The guy must be 1/8-inch galvanized steel strand or larger.
- The service mast must be continuous rigid steel conduit and securely attached. See **Table 7-2** for guy requirements by mast size and for maximum height without guys.
- Mount the service mast on the side nearest the distribution pole. See Section 5, *Clearances*, for clearance requirements between the roof and the service line.
- On a brick or concrete block siding use a 1/4–20 x 3.25 lead sleeve expansion bolt in the joint in place of a lag screw on an anchor strap.
- PGE will determine the exact location of the meter socket for new and rewire installations.
- The Customer is responsible for providing a minimum 4- by 4-foot level workspace in front of all metering equipment. PGE will assist in determining the location of metering equipment.
- An electrical label or permit must be displayed on the meter base.
- Conduit coupling must not be installed above the roof line.
- The maximum distance between the center of the service mast and the edge of the roof or outer edge of the gutter is 4 feet.
- On a flush-mount installation the building face must not extend beyond the face of the meter box.

**Table 7-2: Guy Requirements by Mast Size**

Service Mast Rigid Steel Conduit Size	Service Size	Utility Service Length	Length of Unsupported Mast
2-inch	200 amps or less	Less than 100 feet	24 inches
3-inch	201 to 400 amps	Less than 80 feet	



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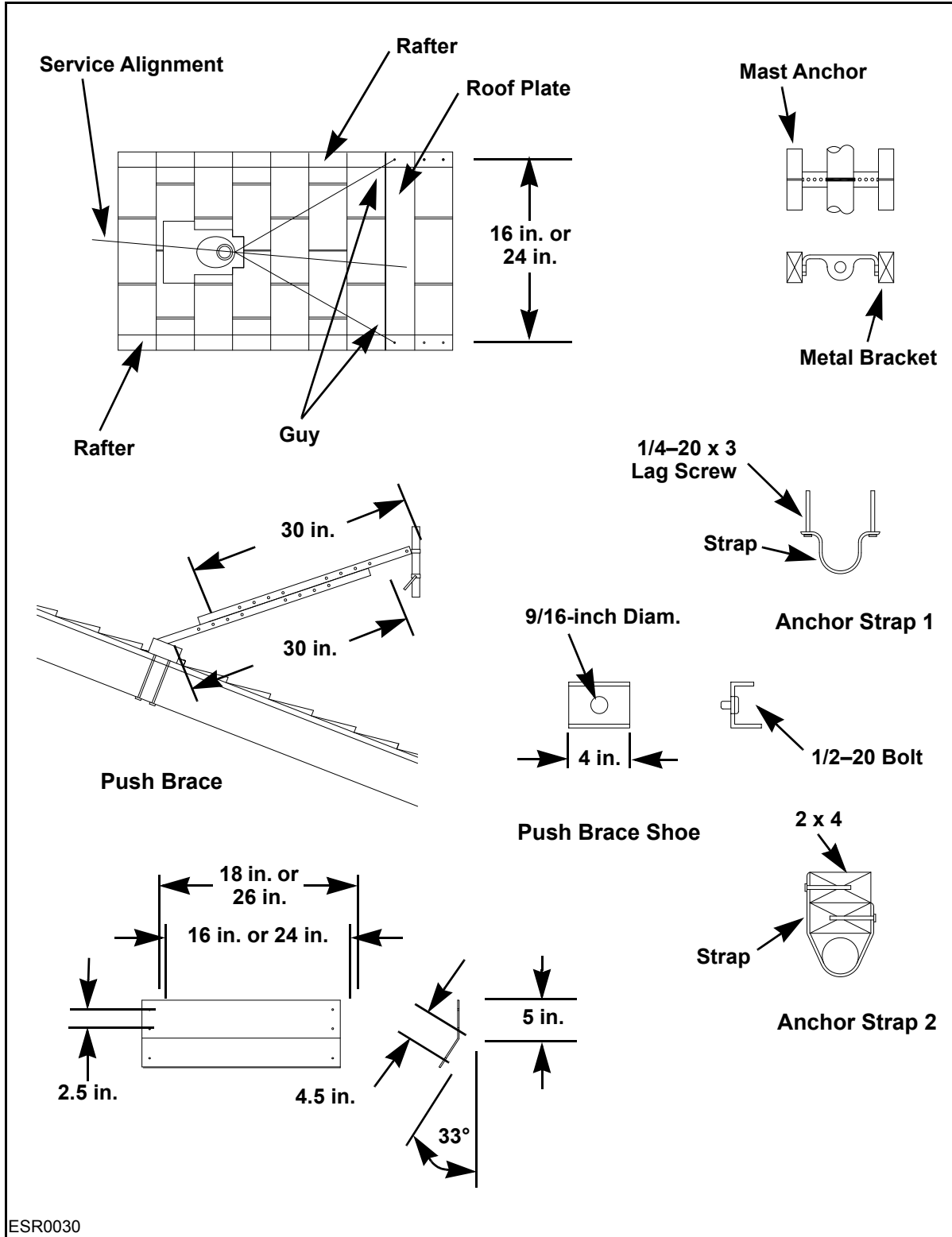
Figure 7-17: Overhead Service for Surface- and Flush-Mount Metering

## 7.3.2 Service Mast Guy and Anchor Requirements

These requirements apply to mast guys and anchors (see **Figure 7-17** and **Figure 7-18**). They are in addition to the basic requirements described in Section 7.3.

- Use 1/4–20 bolts to secure the roof plate, which is fitted between the shingles, to the rafters.
- The roof plate must be installed so that the service alignment extension falls between the guys.
- When using anchor strap 1, a 3/8-inch eyebolt and washer with a header block between the rafters is acceptable. An eye lag is not acceptable.
- Anchor strap 1 and anchor strap 2 must accommodate a 2-3/8-inch diameter service mast.
- Anchor strap 1 is made from 3/16- x 1-inch galvanized steel.
- Anchor strap 2 is made from two 2 x 4 studs, 3/16- x 1-inch galvanized steel, and two 1/4–20 x 3 lag screws or 1/4–20 bolts.
- Anchor strap 1 and anchor strap 2 each has a set screw.
- The maximum distance between the push brace and the weatherhead is 18 inches.
- When using a push brace, two braces are required.





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Figure 7-18: Service Mast Guys and Anchors

