

Power Pedestal Description and Applications

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1. General

1.1 Purpose This practice provides information about the uses and applications of the power pedestal (AC power transfer switch).

1.2 Filing Instructions and Supersedures File this practice in numerical order in your GTE Telephone Operations practices set.

This practice supersedes and cancels:

- All policies, procedures, general instructions, letters, and memoranda which address this subject.
- Any document which provides information contrary to the information contained in this practice.

1.3 Responsibility This practice was published by the GTE Telephone Operations Administrative Services Department. For more information about this practice, contact the GTE Telephone Operations Headquarters Protection Engineering Department.

1.4 Disclaimer This practice was prepared solely for the use of GTE Telephone Operations. It must be used only by its employees, customers, and end users when installing, operating, maintaining, and repairing GTE Telephone Operations' equipment, facilities, and services. Any other use of this practice is forbidden. The information contained in this practice may not be applicable in all circumstances and is subject to change without notice. By using this practice the user agrees that GTE Telephone Operations will have no liability (to the extent permitted by applicable law) for any consequential, incidental, special, or punitive damages that may result.

2. Overview

2.1 Definitions The following chart defines the acronyms and terms used in this practice.

| Acronym or Term | Definition |
|-----------------|---|
| Bonding | The permanent joining of metallic parts to form an electrically conductive path that will assure: <ul style="list-style-type: none">• Electrical continuity.• The capacity to conduct safely any current likely to be imposed. |
| CEV | Controlled Environment Vault |
| Conductor | Material, usually in the form of wire, cable, or bar, suitable for carrying an electric current. |
| DLC | Digital Loop Carrier |

(continued)

2. Overview, continued

2.1 Definitions, continued

| Acronym or Term | Definition |
|----------------------|--|
| Effectively Grounded | Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent hazardous voltages from building up. |
| EGC | Equipment Grounding Conductor |
| Enclosure | A housing/cabinet. |
| Equipment Enclosure | A housing/cabinet for telecommunications electronic equipment, consisting of a: <ul style="list-style-type: none">• Weatherproof housing.• Equipment/component section. Equipment enclosures: <ul style="list-style-type: none">• May be pole- or pad-mounted.• Generally house any of the following:<ul style="list-style-type: none">- Switching equipment.- Carrier electronics.- Remote terminals. |
| FITL | Fiber In The Loop |
| FOT | Fiber Optic Terminal |
| WI-C | Fiber To The Curb |
| Ground | A conducting connection whether intentional or accidental between any electrical circuit or equipment and the earth, or to some body that serves in place of the earth. |
| Ground Electrode | One or more conductors in direct contact with the earth for the purpose of providing a connection with the earth. |
| Ground Grid | A mesh of horizontal bare conductors and ground electrodes providing a common grounding system and voltage equalization for: <ul style="list-style-type: none">• Electrical devices.• Metallic structures. |

(continued)

2. Overview, continued

2.1 Definitions, continued

| Acronym or Term | Definition |
|---------------------|---|
| Grounding Conductor | A conductor that is used to: <ul style="list-style-type: none">• Establish a ground.• Connect a device, equipment, wiring system, or another conductor with the ground electrode(s). |
| Grounding System | The combination of conducting elements by which all equipment is connected to the earth. |
| HDT | Host Digital Terminal |
| Hut | An enclosed walk-in structure with a controlled environment. |
| KO | Knockout |
| Main Bonding Jumper | The connection between the grounded circuit conductor (neutral) and the EGC at the main service panel, consisting of one of the following: <ul style="list-style-type: none">• Wire.• Busbar.• Screw. |
| NEC | National Electrical Code |
| NRTL | Nationally Recognized Testing Laboratory |
| OSP | Outside Plant |
| PSB | Product Standardization Bulletin |
| RDT | Remote Digital Terminal |
| Remote Terminal | The location at which there is a transition between a telecommunications carrier facility and the local lines serving customers. |
| T&P | Transmission and Protection |
| Transfer Switch | A device used for transferring one or more load conductor connections, by either manual or automatic means, from one power source to another. |

2. Overview, continued

2.2 References

The following chart provides sources of supplementary information relating to this practice. The documents could be required for performing certain tasks.

| See... | For Information About... |
|-----------------------|--|
| 007-015-006 | Digital Loop Carrier Provisioning |
| 743-200-070 | Emergency Generators Engineering Application |
| 745-622-070 | Controlled Environment Vaults – Engineering Guidelines |
| 795-805-072 | AC Service Grounding Engineering Applications |
| 795-805-075 | Remote Electronic Serving Area Grounding Systems Engineering Considerations |
| 830-000-000 | Engineering Directives – Preparation and Handling |
| 887-000-001 | Procedures to Request Exceptions from Protection Practice |
| 887-600-072 | Engineering Methods for Measuring Electrode Ground Systems |
| 887-795-070 | Lightning Protection Systems – Risk Assessment Guidelines – Engineering Considerations |
| 938-360-010 | Outside Plant Engineering of Digital Loop Carrier Systems |
| ANSI/NFPA 70 * | National Electrical Code |

* Published by the National Fire Protection Association, Quincy, MA.

2.3 Ordering Information

The PSBs listed in the following chart contain ordering information for power pedestals (AC transfer switches).

| PSB* | Item |
|--------|-------------------------------|
| 3440.6 | Power Pedestal (Lorain R-TEC) |
| 5016 | Power Pedestal (Evergood) |

* PSBs are published by the GTE Telephone Operations Standardization Management Department.

NOTE: The **manufacturer includes with each power pedestal a complete set of installation instructions, which supplement the information in this practice.**

2. Overview, continued

- 2.4**
Ordering
Responsibilities
- OSP Engineering is responsible for ordering power pedestals, using Account 2232.21 -Digital Circuit Equipment.
- The Administrator – T&P is responsible for verifying that the:
- Correct power pedestal has been:
 - Selected.
 - Ordered.
 - Power pedestal and equipment enclosure(s) are properly bonded and grounded.
 - Installation does not violate requirements of:
 - me NEC.
 - OR**
 - Any local electrical code.
 - Unsafe or substandard conditions (if any) are rectified. Notify and coordinate with the following responsible parties
 - Installers.
 - OSP Engineers.
 - Regional T&P Support.

3. Description

- 3.1**
Introduction
- The power pedestal:
- Provides a standard power arrangement and emergency generator receptacles to facilitate service restoration during periods of commercial AC power outages.
 - Supplies AC power to the remote terminal.
 - Provides a manual transfer for the AC power breaker to the emergency receptacle breaker in order to supply backup power from a portable generator.

The transfer switch in the power pedestal is a Walking Beam Interlock switch that allows AC power from either the commercial source or the portable generator, but not both.

- 3.2**
Power Pedestal
Description
- Power pedestals are weatherproof enclosures containing:
- AC service disconnect.
 - AC distribution circuit breakers (load center).
 - AC power transfer switch (mechanical interlock).
 - Emergency generator receptacle.
 - Surge arrester.
 - 120 volt(15 ampere) utility receptacle.

3. Description, continued

3.3 Advantages

Power pedestals offer the following advantages over previously used configurations:

- Standard:
 - Power configuration.,
 - Emergency generator receptacles.
- Elimination of generator backfeed.
- Single emergency generator access at sites with multiple remote equipment enclosures.
- Elimination of the need to enter DLC cabinets during inclement weather to access AC power equipment.
- 15-amp utility receptacles with ground fault breakers.
- Fully tested NRTL-listed enclosures.

CAUTION: Any changes in the internal wiring might void the NRTL listing. Consult with a manufacturer's representative before making any changes in the factory wiring.

- Remote alarming capabilities.
- Indicator lamps.

3.4 Options

Power pedestals are available with the following options:

- Choice of color (green, brown, or ivoryBeige).
- Meter (right side, left side, none).
- Mounting (pole, wall, pad).
- Extender plates.
- Cord sets.
- Reusable templates (pad footprint).
- Meter kits.

NOTE: Select the appropriate meter kit option for the type of meter to be used. Available meters are:

- **Durham 200 amp.**
- **Milbank 100 and 200 amp.**
- **Milbank Commercial 100 and 200 amp.**

The type of power meter that will be ordered with the power pedestal should be coordinated with the serving electric utility.

3.4.1 Residential Meter

A residential meter does not have any test bypass features. When the meter is pulled from the meter base, the electrical circuit is disconnected and there is no continuity through the meter base.

3.4.2 Commercial Meter

A commercial meter has a test bypass feature. When the meter is pulled from the meter base, the electrical circuit is not-disconnected and there is continuity through the meter base.

4. Applications

4.1 Introduction

The following chart summarizes the different model configurations, which are fully described in the PSBs listed in Section 2.3.

| COMMERCIAL Size (Amps) | EMERGENCY Size (Amps) | Plug | GRPEIL Model Number | RJBT Model Number |
|---------------------------|--------------------------|------|------------------------|----------------------|
| 60 | 30 | HU | PEI 5MB | 63MBG |
| 100 | 30 | HU | I-2715 | 13s00x |
| 100 | 100 | CH | I-I-AR | 11 S00X |
| 200 | 100 | CH | 2-I -AR | NA |
| 200 | 200 | CH | 2-2-AR | 22soox |

NOTE: HU = Hubbell
CH = Crouse-Hinds
NA = Not Available

See Exhibit 1 for the GTE-standard emergency receptacle layouts.

4.2 Selecting Power Pedestals

The ampere capacity of the power pedestal main disconnect switch and the emergency generator receptacle must be large enough to serve the:

- Ultimate number of equipment enclosures at the site.
AND
- Associated ancillary equipment (FOT, channel banks, etc.) for that site.

To select a power pedestal:

1. Determine the required amperage capacity using the power drain for all of the equipment being installed at the site.
2. Select the model from the appropriate PSB (PSB 3440.6 or 5016). See Section 4.3 for more information_

As a guideline, all single pad mounted electronic system sites (sites having no projected growth for 10 years) should have 1 **00/30** ampere power pedestals and multiple system sites should have **100/100** ampere power pedestals. The following power pedestal installations are exceptions and must have 200/200 ampere power pedestals:

- E-Metro with one to three cabinets.
- EX-Metro with one to three cabinets.
- DMSI-800 with two to three cabinets.

4. Applications, continued

4.3 Power Pedestal Applications

Power pedestals are intended to be used with AC-powered telecommunications equipment located in CEVs and equipment enclosures, such as:

- . DLC.
- . FTTC HDT/RDT
- Network power hubs.
- Fiber optic hubs.
- Carrier equipment.
- Multiplexers.

NOTE: Power pedestals might also be used with huts and small buildings. The following chart explains the applications of particular power pedestals.

| The Following Type of Power Pedestal... | Is Recommended for Use with... |
|---|---|
| Small (60/30) | Small, pole-mounted DLCs (96 lines or less), such as the: <ul style="list-style-type: none">• S-24DU.. MLC-24. |
| Large | Large DLCs, such as the: <ul style="list-style-type: none">• 914.• DMS-1.. SLC-5.• 1218. |

5. Installing a Power Pedestal

5.1 Power Pedestal Location

Power pedestals can be located in:

- Huts and small buildings.
- Equipment enclosures and CR/s.

5.1.1 Huts and Small Buildings

When used at huts and small buildings, mount the power pedestal on the side of the structure.

5.1.2 Equipment Enclosures and CEVs

For equipment enclosures and CEVs, the power pedestal can be located on or away from the enclosure pad. For small DLCs, pole mount the power pedestal.

NOTE: Treat the AC panel in the equipment enclosure or CEV as a branch panel to avoid violations of the NEC. Disconnect the main bonding jumper in the equipment enclosure or CEV.

The local electrical contractor and the Administrator – T&P must verify that the installation does not violate the:

- **NEC.**
- OR
- **Local electrical codes.**

When locating power pedestals in equipment enclosures and CEVs, coordinate the size of the power pedestal and equipment enclosure/CEV breakers.

5.2 Service Panels

This section clarifies the differences among service panels.

5.2.1 Power Pedestal

The main service disconnect panel in the power pedestal has a:

- Neutral (N) busbar that may be insulated from the enclosure.
- Ground (G) busbar that is bonded or connected to the enclosure.

NOTE: The **safety grounds** or “**green wire**” grounds (**EGC**) terminate at the **G busbar**.

me NEC:

- Requires that both busbars (N and G) be connected (common bonded) through the main bonding jumper (sized per Article 250 - 94) at the main panel.
- Allows the use of a green screw in the N busbar to terminate the **EGC** (refer to Article 250-79).

5. Installing a Power Pedestal, continued

5.2

Service Panels, continued

5.2.2 Branch Panels

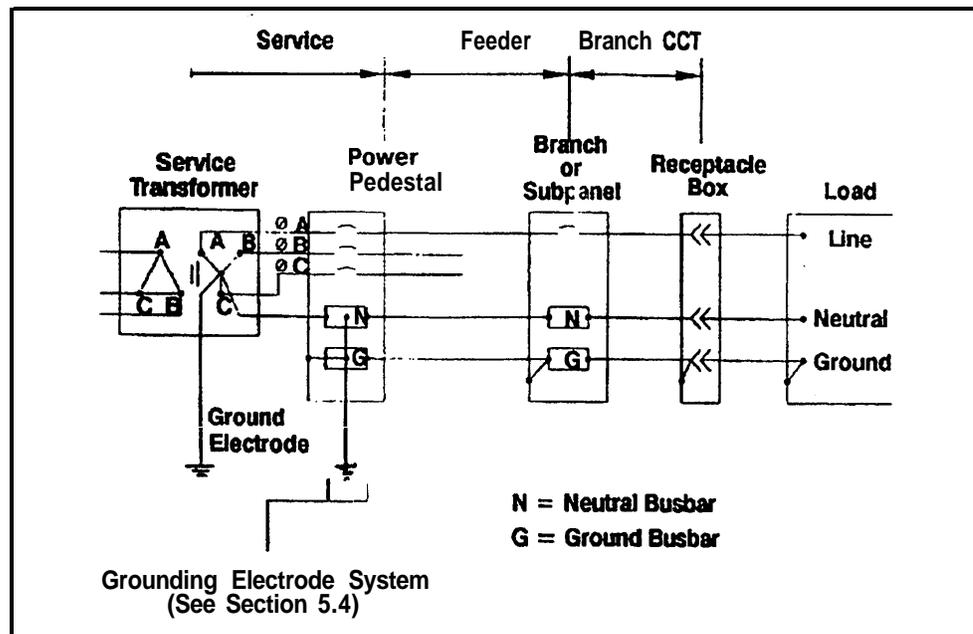
All electrical panels (in the hut, CEV, or equipment enclosure) except the power pedestal:

- Must be treated as branch panels.
- Must have:
 - N busbars isolated from the enclosures.
 - G busbars bonded or connected to the enclosures.

Some branch panels may also have a dedicated, isolated G busbar feeding the isolated (orange) outlets.

NOTE: There must **not** be any connections between the different busbars in the branch panels.

See the following branch panel illustration.



5. Installing a Power Pedestal, continued

5.3 Installation Methods

The four most common methods of installing **power** pedestals are described in the following chart.

| Installation Method | Description |
|-----------------------------------|---|
| Pole Mounting (see Section 5.3.1) | <ul style="list-style-type: none">• Pole mounting the power pedestal away from the equipment enclosure.• Running conduit to the equipment enclosure. |
| Wall Mounting (see Section 5.3.2) | Positioning the power pedestal near the equipment enclosure: <ul style="list-style-type: none">• Using the pole-mounting KOs in the rear of the cabinet. OR <ul style="list-style-type: none">• Placing a short U-shaped piece of conduit from the bottom of the power pedestal to the bottom of the equipment enclosure. |
| Pad Mounting (see Section 5.3.3) | <ul style="list-style-type: none">• Pouring a separate pad, then running conduit to the remote terminal structure for the subfeed. OR <ul style="list-style-type: none">• Extending the pad of the remote terminal to accommodate the power pedestal. |
| Enclosure Attachment | Mounting the power pedestal directly on the equipment enclosure. This method reduces flexibility at multiple enclosure sites. |

5.3.1 Pole Mounting

For pole-mounting applications, simply use the optional pole-mounting kit. Mounting instructions are included with each kit.

5. Installing a Power Pedestal, continued

5.3 Installation Methods, continued

5.3.2 Wall Mounting

For wall-mounting applications, perform the following procedures (see Exhibit 2).

| Step | Wall Mounting a Power Pedestal |
|------|--|
| 1 | Punch out the KOs in the back of the equipment enclosure. |
| 2 | Place the gaskets over the KOs in the back of the equipment enclosure. |
| 3 | A. Insert the bolts through the equipment enclosure. B. Attach the bolts to the wall. |

NOTE: Order a bottom cover, from the power pedestal manufacturer, for the equipment enclosure if one is not in place.

5.3.3 Pad Mounting

For pad-mounting applications, perform the following procedures (see Exhibit 3).

NOTE: Use 3000 psi reinforced concrete for the pad.

Using the Template

The template is used to:

- Position the ducts.
- Hold the J-bolts in the correct place while the concrete pad is drying.

The J-bolts are mounted in the template in the four ½-inch (1.3-cm) holes, using the provided nuts.

Setting the J-Bolts

To set the four J-bolts or anchor bolts, perform the following procedures.

| Step | Setting the J-Bolts |
|------|---|
| 1 | Thread one nut on the bolt. |
| 2 | Insert the bolt (threads first) through the template. |

(continued)

5. Installing a Power Pedestal, continued

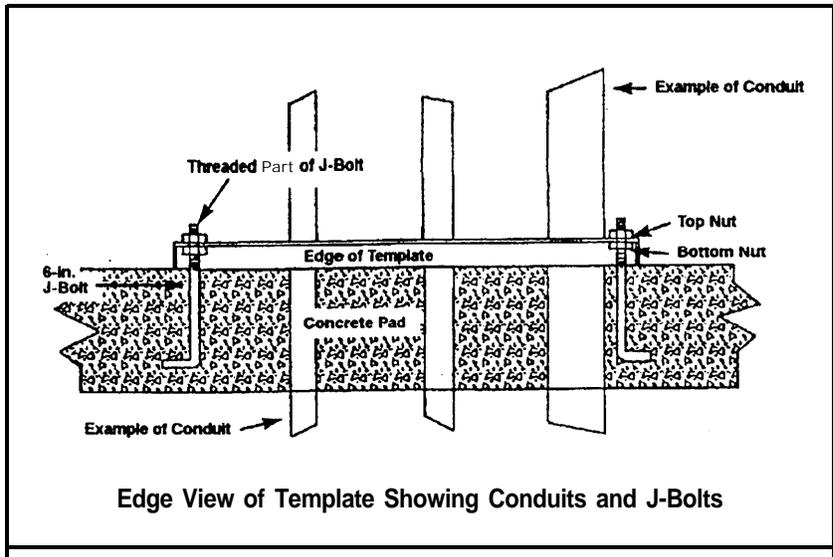
5.3 Installation Methods, continued

53.3 Pad Mounting, continued

Setting the J-Bolts, continued

| Step | Setting the J-Bolts |
|------|---------------------|
|------|---------------------|

- 3 Thread the second nut on the bolt locking the J-bolt onto the template, as shown in the following illustration.



- 4 Align the bottom of the threaded bolt section with the bottom edge of the template by adjusting the nuts.
- 5
- A. Lower the template and J-bolts over the conduits.
 - B. Push the template and J-bolts into the wet concrete of the pad until the bottom edge of the template is flush with the surface of the concrete.
- 6 Once the pad has partially set up:
- A. Remove the top nuts to lift the template off the conduits and bolts.
 - B. Leave the four J-bolts in place with the threaded ends exposed as posts.
- NOTE: Some minor troweling of the concrete surface might be required.**
-

5. Installing a Power Pedestal, continued

5.3 Installation Methods, continued

5.3.6 Mounting, continued

Setting the Power Pedestal

After completing the procedures for setting the J-bolts, perform the following procedures to set the power pedestal in the concrete pad.

| Step | Setting the Power Pedestal |
|------|--|
| 1 | Position the power pedestal so that the mounting holes on the bottom of the pedestal align over and onto the threaded posts. |
| 2 | Reattach the nuts to anchor the unit. |
| 3 | Place the gasket seal between the pad and the power pedestal aluminum housing to prevent any chemical corrosive action between the housing and the concrete pad. |

Incoming Power Conduit

The 2½-inch (6.4-cm) conduit inside the power pedestal (see Exhibit 3) attaches to the conduit carrying the incoming AC commercial service (buried power drop). The electrician must:

- Mount the power meter (when equipped) to the weatherproof hub on top of the cabinet (see Exhibit 4).
- Drill another hole to bring the AC line into the main disconnect.

5.4 Typical Grounding

See Exhibit 5 for a typical method of grounding power pedestals. Refer to GTE Telephone Operations Practices 795-805-072 and 795-805-075 for additional grounding information.

If the power pedestal ground electrode is within 6 feet (2m) of the ground ring (Lead 1), they should be bonded together via Lead 6. One end of Lead 6 should be capable of quick disconnection during testing of Lead 1.

5. Installing a Power Pedestal, continued

5.5 Power Meter

Some electric utilities require placement of a meter and disconnect (On/Off) switch away from the power pedestal/any other equipment enclosure.

In these cases, the electric utility might place a ground electrode at the base of the meter pole, depending on the practices of the particular company.

In this application, the electrician:

- Takes the hot and neutral conductors to the power pedestal.
- Terminates the conductors at the main disconnect panel.

The power pedestal is always grounded the same (i.e., Lead 4, etc.):

- Regardless of where the power meter is located.
- Whether or not the power meter is grounded.

5.5.1 Installing the Power Meter Housing

To install the power meter housing, perform the following procedures.

| Step | Installing the Power Meter Housing |
|-------------|--|
| 1 | Position the power meter housing on top of the power pedestal (see Exhibit 4). |
| 2 | Locate the center line of the KO for the 2½-inch (6.4-cm) hub assembly. |
| 3 | Punch a hole in the top of the power pedestal. |
| 4 | Install the hub assembly. |
| 5 | Mount the power meter housing. |

NOTE: Optional 6-inch (15-cm) extension brackets are available to raise the power pedestal to the desired power meter height.

5.6 Maintenance

WARNING: Because of high-voltage input connections to the power pedestal, precautions are necessary while performing maintenance. Maintenance must be performed by licensed electricians in accordance with the manufacturer's guidelines.

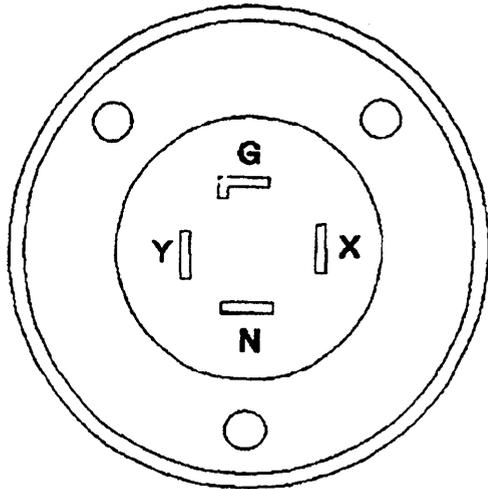
The documentation provided by the vendor with each power pedestal contains specific maintenance information.

Only certain power pedestal components (indicator lights, arresters, etc.) require maintenance/repair. Typically, the indicator lights might require replacement.

When replacing surge arresters:

1. Make sure that the batteries at the site are working correctly.
2. Turn the AC power off.

Exhibits



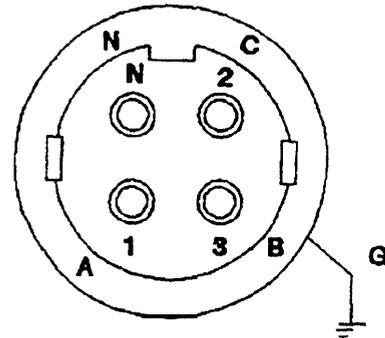
Hubbell 2715 NEMA L14-30

Clockwise as follows:

- G** = Ground Green Wire
- X** = 125-Volt Black Wire
- N** = Neutral White Wire
- Y** = 125-Volt Red Wire

Receptacle:

125/240 Volt, 30 Amp,
Single Phase



Crouse-Hinds AR2041-S22 Type 1

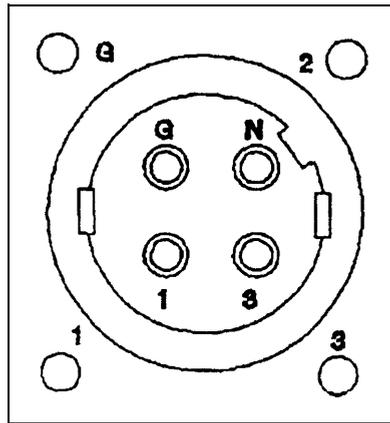
Clockwise as follows:

- N** = N = Neutral White Wire
- 2** = C = 125-Volt Black Wire
- 3** = B = Wild Leg No Wire
- 1** = A = 125-Volt Red Wire
- G** = G = Ground Green Wire

Receptacle:

125 Volt, 230 Amp,
Single Phase, 4 Wire, 4 Pole

NOTE: 3 or B is wild leg and used on
3-phase systems.



Crouse-Hinds AR1 042-S22 Type 2

Clockwise as follows:

- 2** = N = Neutral White Wire
- 3** = 3 = 125-Volt Black Wire
- 1** = 1 = 125-Volt Red Wire
- G** = G = Ground Green Wire

Receptacle:

125/250 Volt, 100 Amp,
Single Phase, 3 Wire, 4 Pole

Exhibit 1 - AC Transfer Switch Emergency Receptacle Layouts

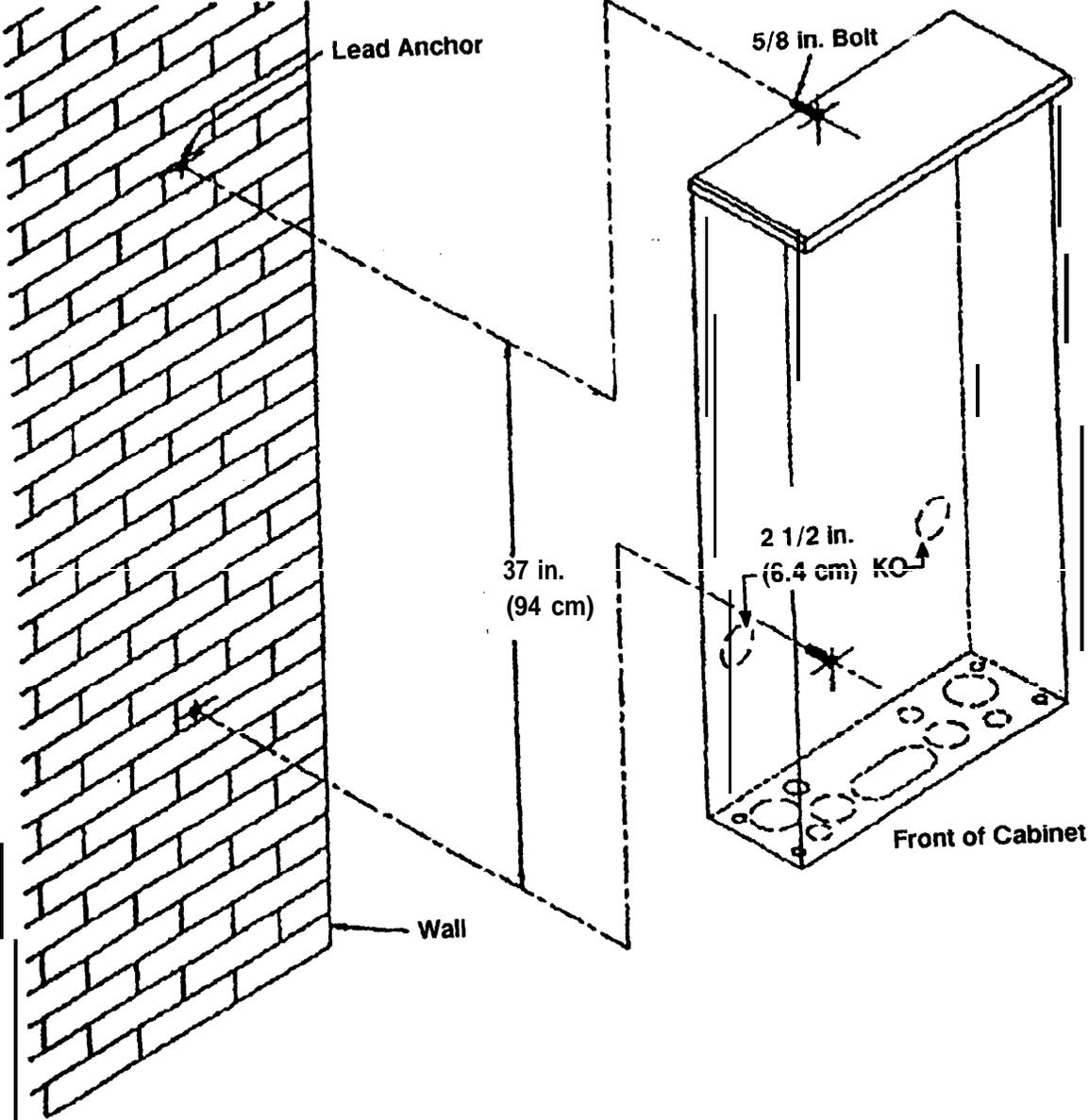


Exhibit 2 - Wall-Mounting Application for Standard Power Pedestal

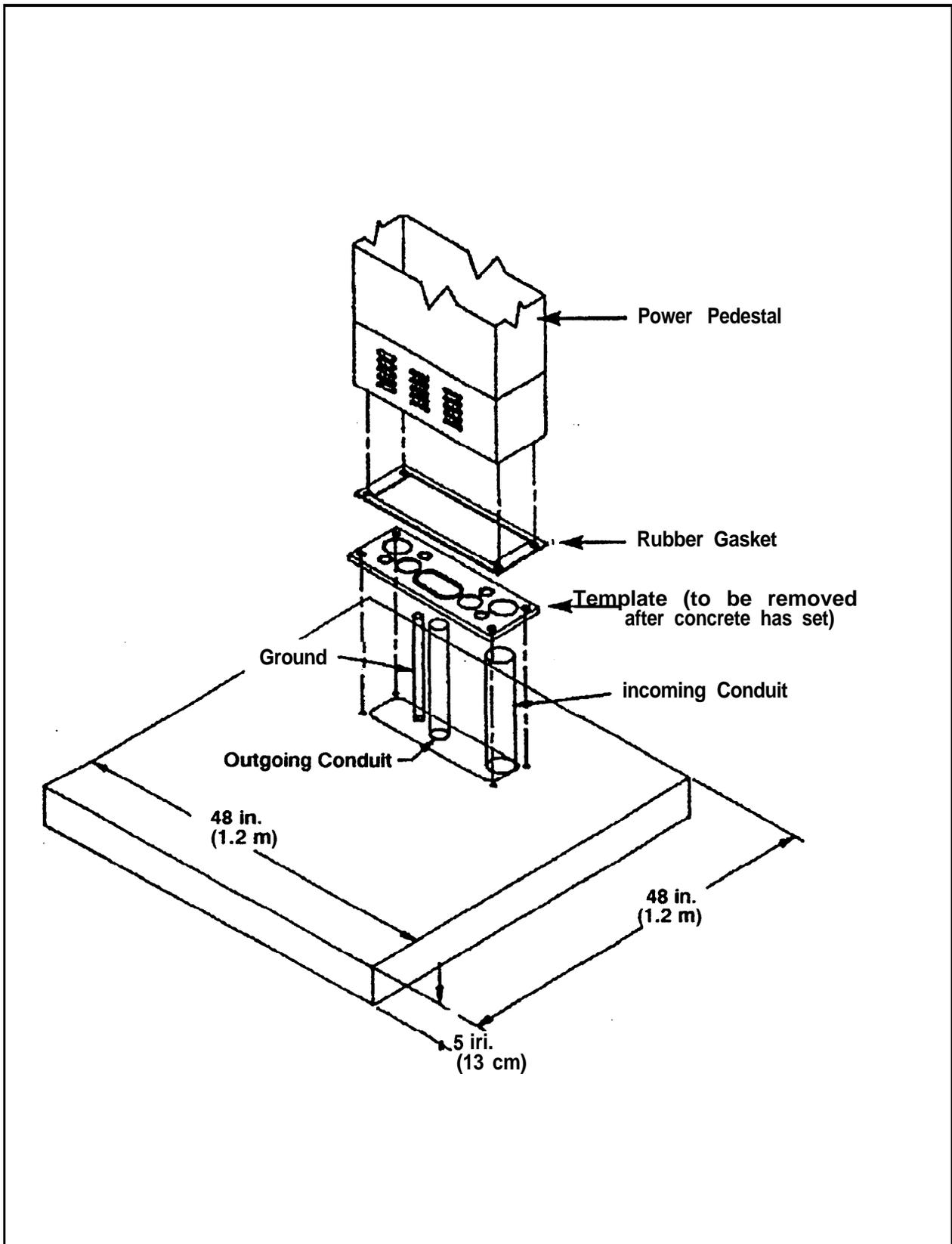


Exhibit 3 - Pad-Mounting Application for Power Pedestal

1. After meter is set, drill hole for 1/4-in. bolt from front side.
2. Insert bolt from back side.
3. Attach locknut to bolt.

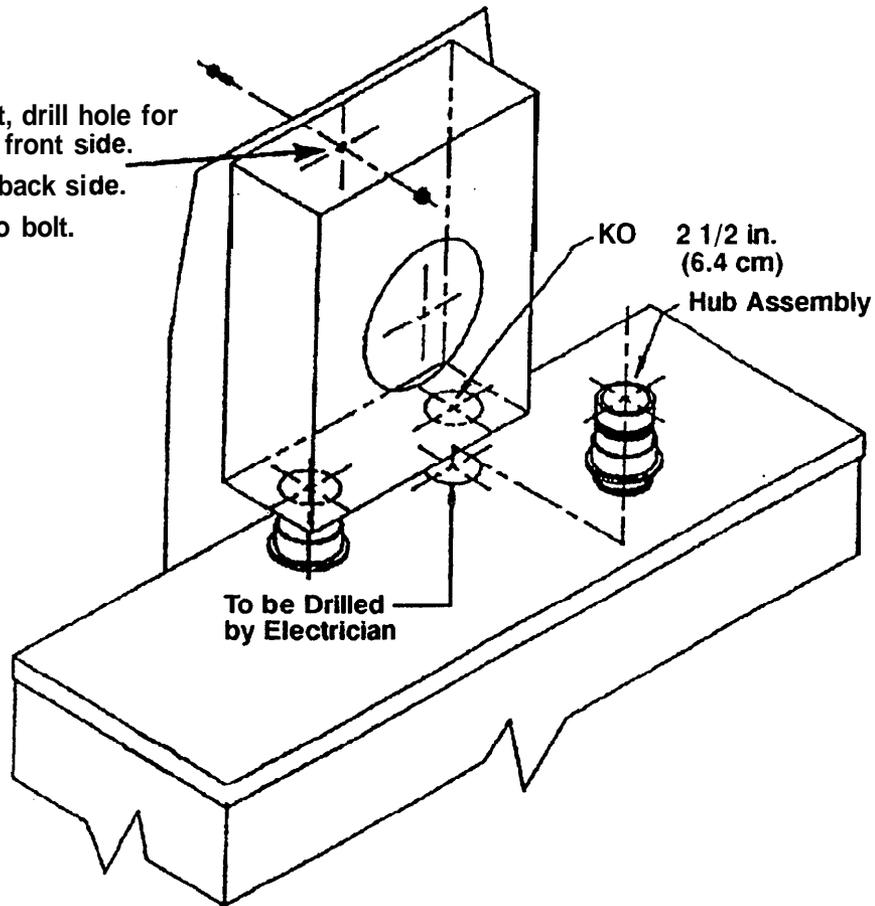
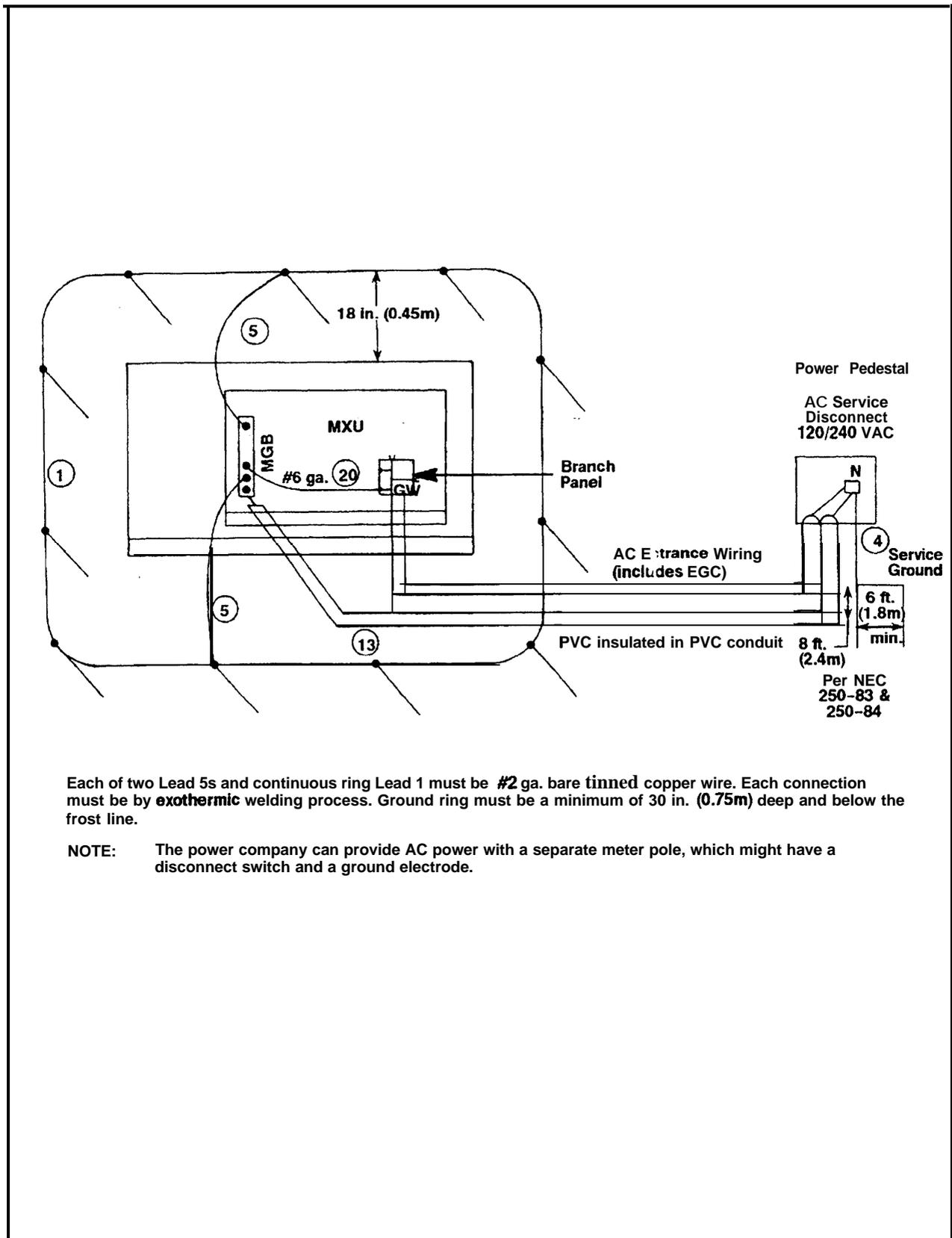


Exhibit 4 - Meter Housing with 2 1/2-Inch Hub Assembly



Each of two Lead 5s and continuous ring Lead 1 must be #2 ga. bare tinned copper wire. Each connection must be by exothermic welding process. Ground ring must be a minimum of 30 in. (0.75m) deep and below the frost line.

NOTE: The power company can provide AC power with a separate meter pole, which might have a disconnect switch and a ground electrode.

Exhibit 5 - Pad-Mounted Standard AC and Grounding