

## 5 - Residential Service Requirements

### General Requirements

- Contact FPUD Engineering at 509-547-0556.
- Determine type of service required. (overhead or underground)
- Fill out application and submit site plan.
- Obtain an electrical work permit from the Department of Labor and Industries.
- Call 811 for underground locates.
- Obtain easements for primary line and transformer.
- Provide all trenching, conduit, and backfill.
- Pay the cost of secondary conductor, beyond 100 feet in length, per dwelling unit.
- Provide all service entrance wiring and equipment.
- Call FPUD Engineering at 509-547-0556 for trench inspection.
- Pay required service fees.
- Call the Department of Labor and Industries for inspection and approval of your new service.
- FPUD normally supplies and installs the underground secondary cable, meter, and current transformers, when necessary.

### Installation & Material Specifications

- **General:** Conduit runs over 175 feet may require special conduit sweeps unless prior approval is obtained from Engineering. A maximum total of 270 degrees of sweeps (elbows) are allowed. 90 degrees at the service location, 90 degrees in the trench, and 90 degrees at the meter base. If more than 270 degrees of sweeps are required, a pull box must be installed or trench must be rerouted, at FPUD discretion.
- **Grading:** Final grade should be established prior to trenching and installation of ducts or vaults. If final grade cannot be established prior to duct and vault excavation, grade stakes shall be installed for reference. Any changes in the grade that would put the conduits, vaults or pull boxes at a depth less than required, or

leave any installation in an undesirable condition, would require the customer to correct it at their expense. The height to the center of the meter base must be met for both the construction grade, when the meter and service conductor are installed and at final grade. For example, during construction the elevation in front of the meter base provides 5' of clearance to the center of the meter base. Adding 6" of additional cover would result in a final grade with 4'6" to the center of the meter base.

- **Excavation:** Excavating should be done only as necessary for installing the duct and vault system. Trenches for underground ducts need to be true to line and grade, as shown on the drawings and specifications. Trenches shall be wide enough to allow separation requirements for other utilities, if needed. Maintain trenches free from standing water when installing ducts or vaults. Trenches shall be cleaned of excess rock, earth, and debris prior to installation of ducts and vaults.
- **Conduit:** Underground duct (conduit) must be **gray** Polyvinyl Chloride (PVC) Schedule 40, conform to NEMA TC2 Specifications and be permanently marked at regular intervals with the manufacturer's name or symbol, size, "SCH 40" and "PVC". Conduit size will be determined by FPUD Engineering (normally 3-inch, 4-inch, and 6-inch).
- **Couplers and Fittings:** Must be PVC Schedule 40, factory-made and conform to the same specifications as the conduit. All sweeps (elbows) and fittings must have a minimum 36-inch center radius, except secondary sweeps under residential padmounted transformers, which shall be 3", 90-degrees with a 24" radius. Heat bent angles shall not be allowed. Fiberglass sweeps may be required at the discretion of FPUD Engineering.
- **Installation of Conduit System:** Ducts shall run in a straight line. Standard sweeps as specified above, may be used as required. Install couplings, connectors, and fittings to provide a rigid mechanical assembly with conduit cut square, reamed and without burrs. Cement conduit joints as recommended by the manufacturer. **Heat bent angles will be rejected.**
- **Duct Bedding and Encasement:** A minimum of four (4) inches of bedding and four (4) inches of cover shall be used to encase the duct when native material is deemed unacceptable by the Engineer. The minimum depth from finished grade to bottom of trench from primary cable is forty-eight (48) inches and thirty-six (36) inches for secondary services. Sand, clean soil, or pea gravel shall be used for the encasement of the duct. **Crushed stone or other similar aggregate with sharp points is NOT acceptable.**

**Inspections:** After installation of the duct, pull boxes, and the 4-inch bedding beneath the duct, call Engineering at 509-546-0556 for an inspection before proceeding.

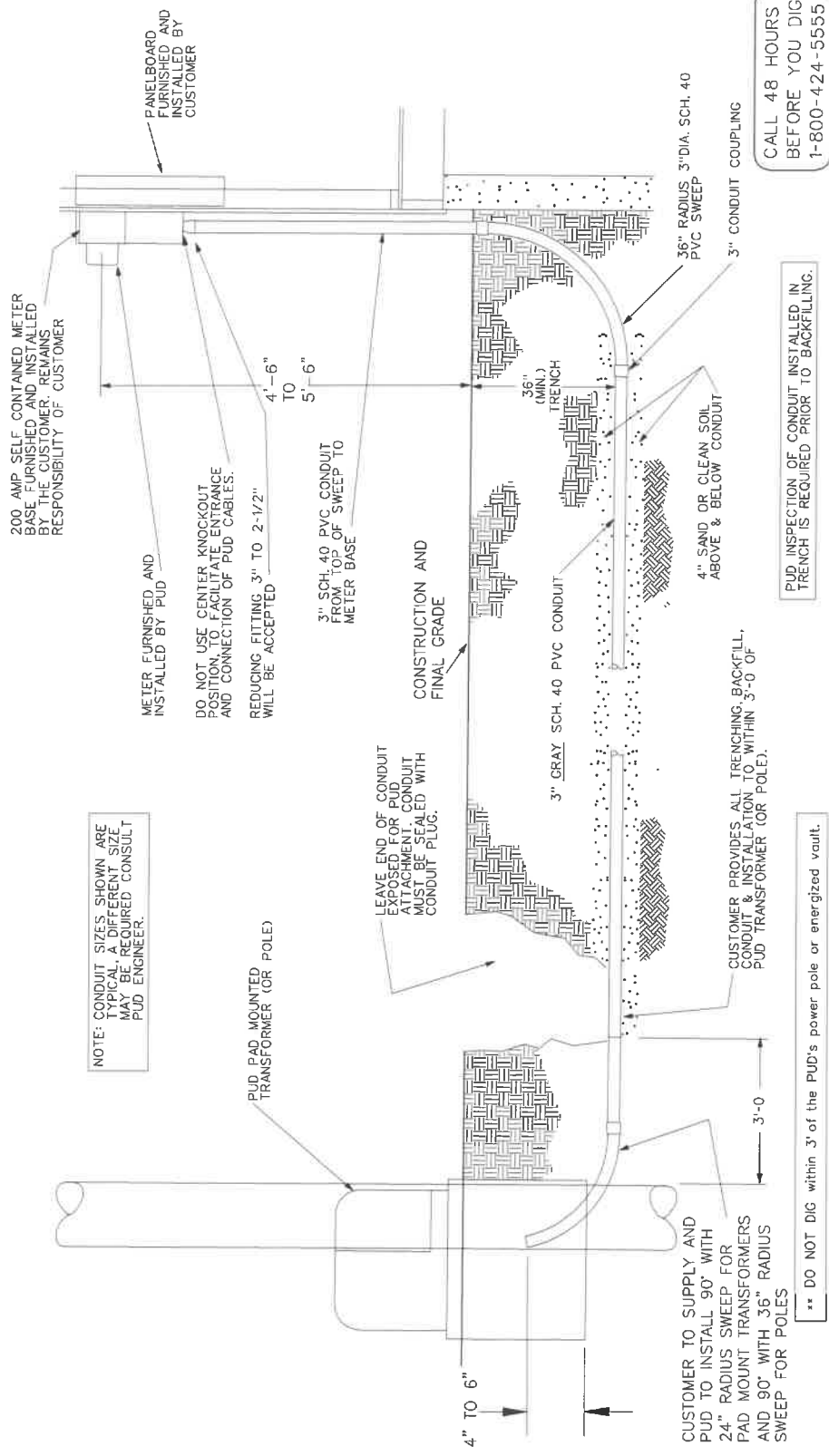
***If you fail to obtain FPUD approval before backfilling the trench, we will require that you expose all or part of the duct run for inspection before we will install cable.***

- **Backfill:** Excavation material may be used for backfill provided it is free from frozen particles, rock, vegetation, or trash. Backfill should be placed uniformly in layers and each layer thoroughly compacted. Leave ends of conduit exposed for FPUD crews to gain access. **Conduit must be sealed with a factory manufactured conduit plug.**
- **Vaults & Covers:** The concrete primary junction vaults with covers, transformer vaults and covers and secondary junction boxes will be specified by Engineering after preliminary design is complete. **Equivalent products must have prior written approval of Engineering.**

The top of a vault (not including the cover) is installed at the final grade level so that when the 6" cover is in place; the top of the cover will be 6" above the final grade of the surrounding surface. Knockouts should be made from the inside of the vault. For vaults installed in pavement, reference drawing 243.1.

**Completely remove center knockout in bottom of vault prior to installation to allow vault to drain.** For vaults in paved areas, discuss grade requirements with the Engineer before excavating. All vaults and junction boxes shall be placed on a minimum of 6" of compacted crushed rock.

- **Secondary Conductors:** Commercial secondary conductors should be installed into the transformer vault prior to installing the transformer. Secondary conductors must be limited to a maximum of eight per phase. More than eight conductors per phase may require the customer to provide a special terminating cabinet. Contact an FPUD Engineer if more than eight secondary conductors per phase will be needed. **Secondary conductors must extend a minimum of eight feet above the transformer pad.**
- **Access to Equipment:** Where 24-hour access to FPUD equipment is restricted by fences or other means, you will need to provide a key box or double locking gate which will allow FPUD personnel access by use of a FPUD key.

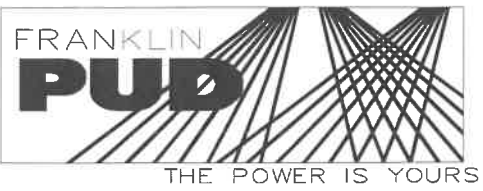


CALL 48 HOURS BEFORE YOU DIG  
1-800-424-5555

PUD INSPECTION OF CONDUIT INSTALLED IN TRENCH IS REQUIRED PRIOR TO BACKFILLING.

\*\* DO NOT DIG within 3' of the PUD's power pole or energized vault.

221.1.DWG

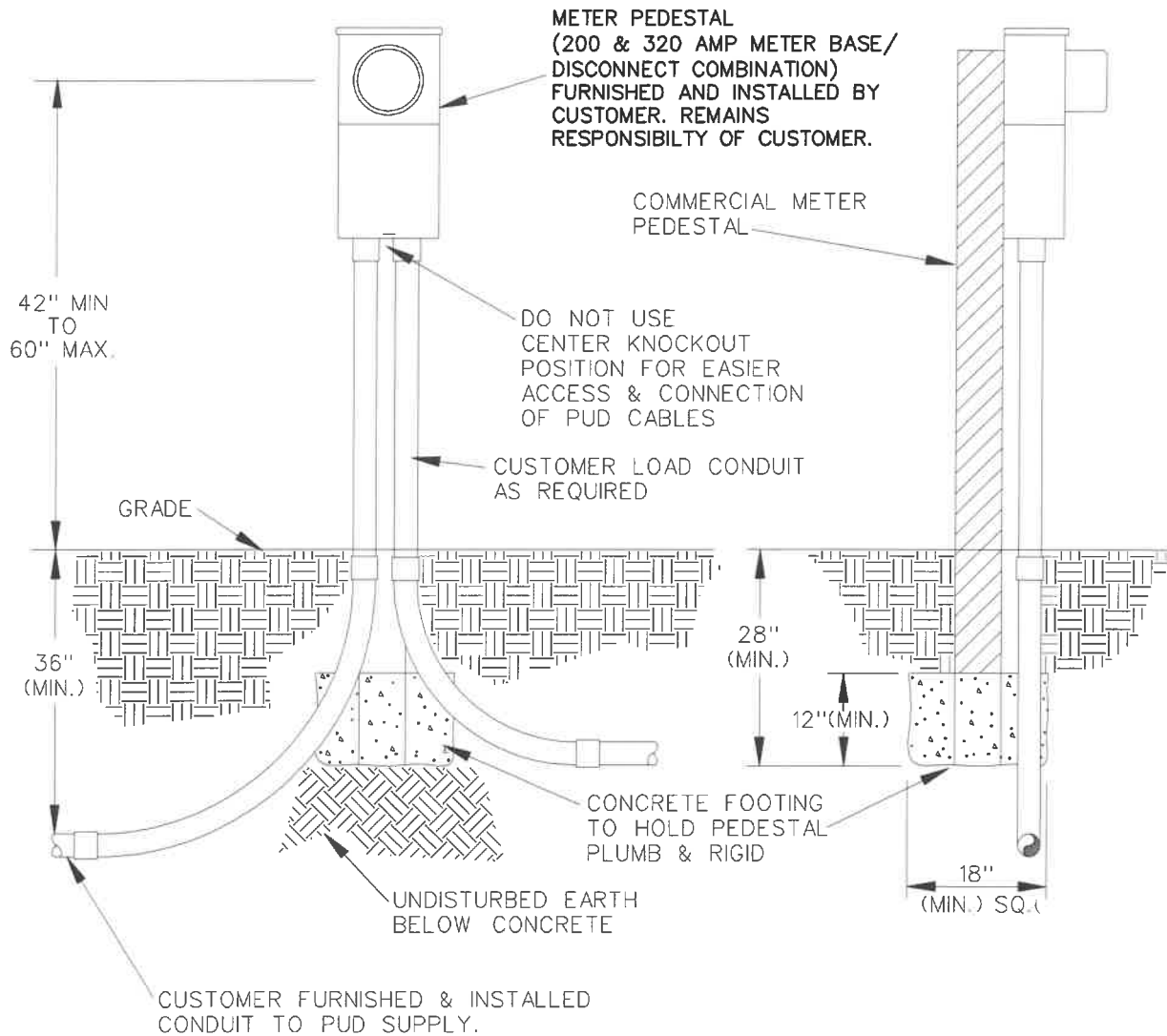


**TYPICAL 200A UNDERGROUND RESIDENTIAL SERVICE**

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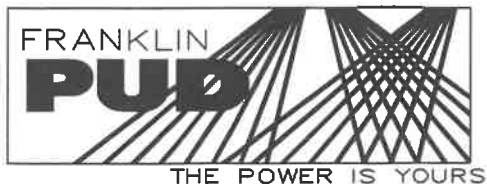
FRONT VIEW

SIDE VIEW



1. OUR CUSTOMERS PROVIDE EXCAVATION, CONCRETE, CONDUIT AND METER PEDESTAL.
2. CUSTOMER SERVICE EQUIPMENT TO BE INSPECTED AND "APPROVED FOR SERVICE" BY STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY PUD.
3. REFER TO "RESIDENTIAL SERVICE UNDERGROUND LINE EXTENSION GUIDE" FOR TRENCHING AND CONDUIT DETAILS.
4. PUD SERVICE CONDUCTORS TERMINATE AT "LINE SIDE" METER TERMINAL LUGS.

223.1.DWG

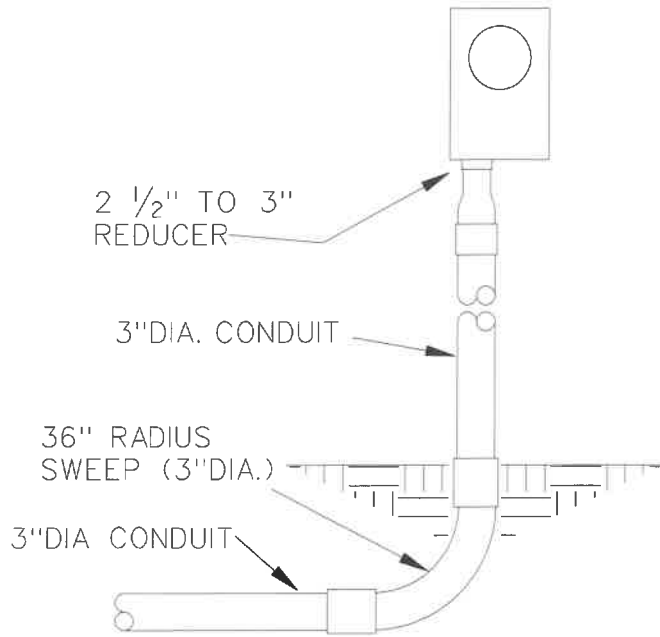


**UNDERGROUND SERVICE ENTRANCE  
FOR MOBILE HOME PEDESTAL**

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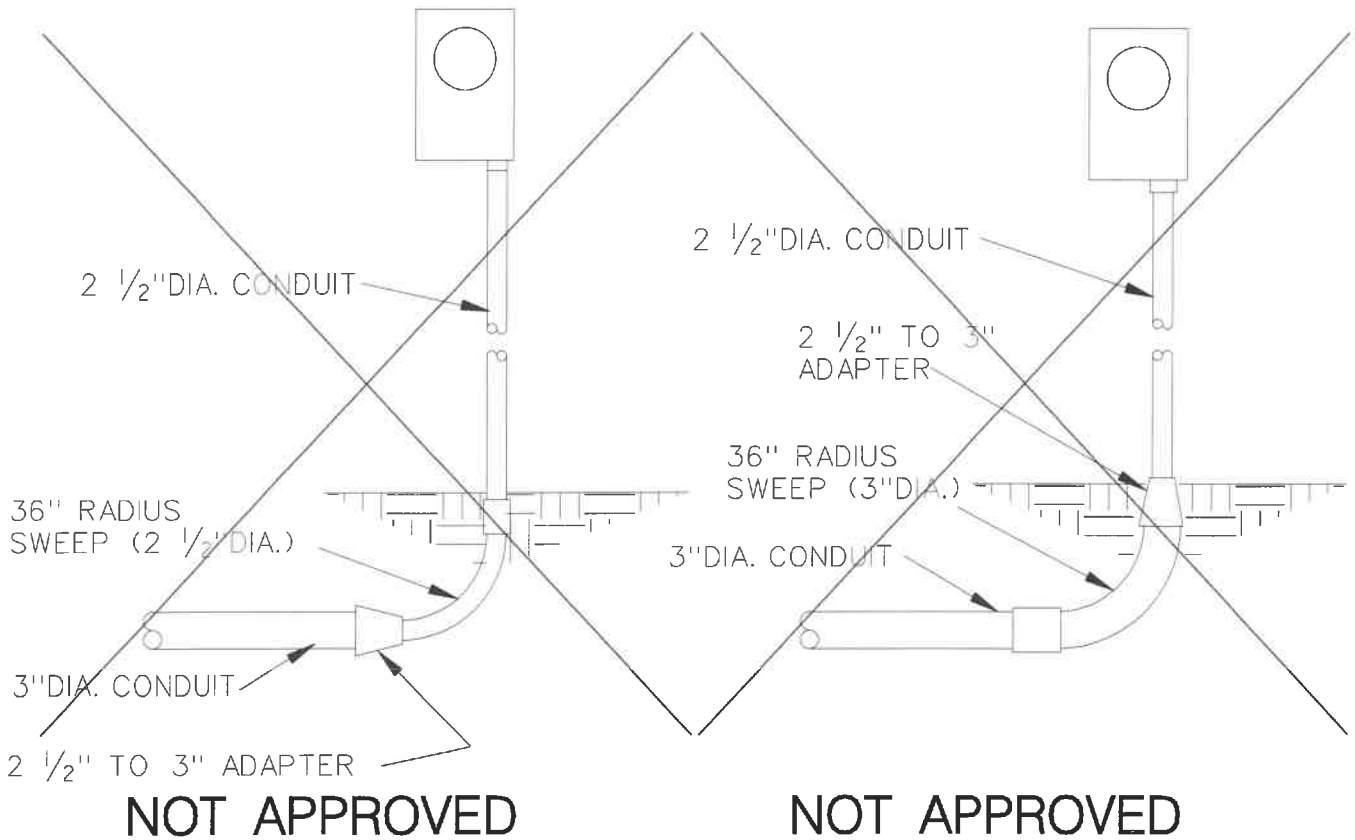
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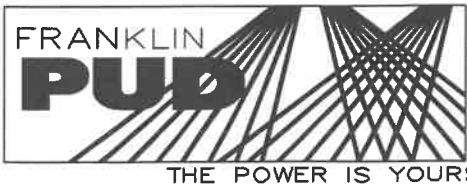


**APPROVED**

200 AMP METER BASE SHOWN. FOR 320 AMP METER BASES AND CT COMPARTMENTS, RUN 3 INCH CONDUIT ALL THE WAY INTO METER BASE



224.1.DWG



**USE OF ADAPTERS  
IN CONTINUOUS PVC CONDUIT RUNS**

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APP. D. SAMS

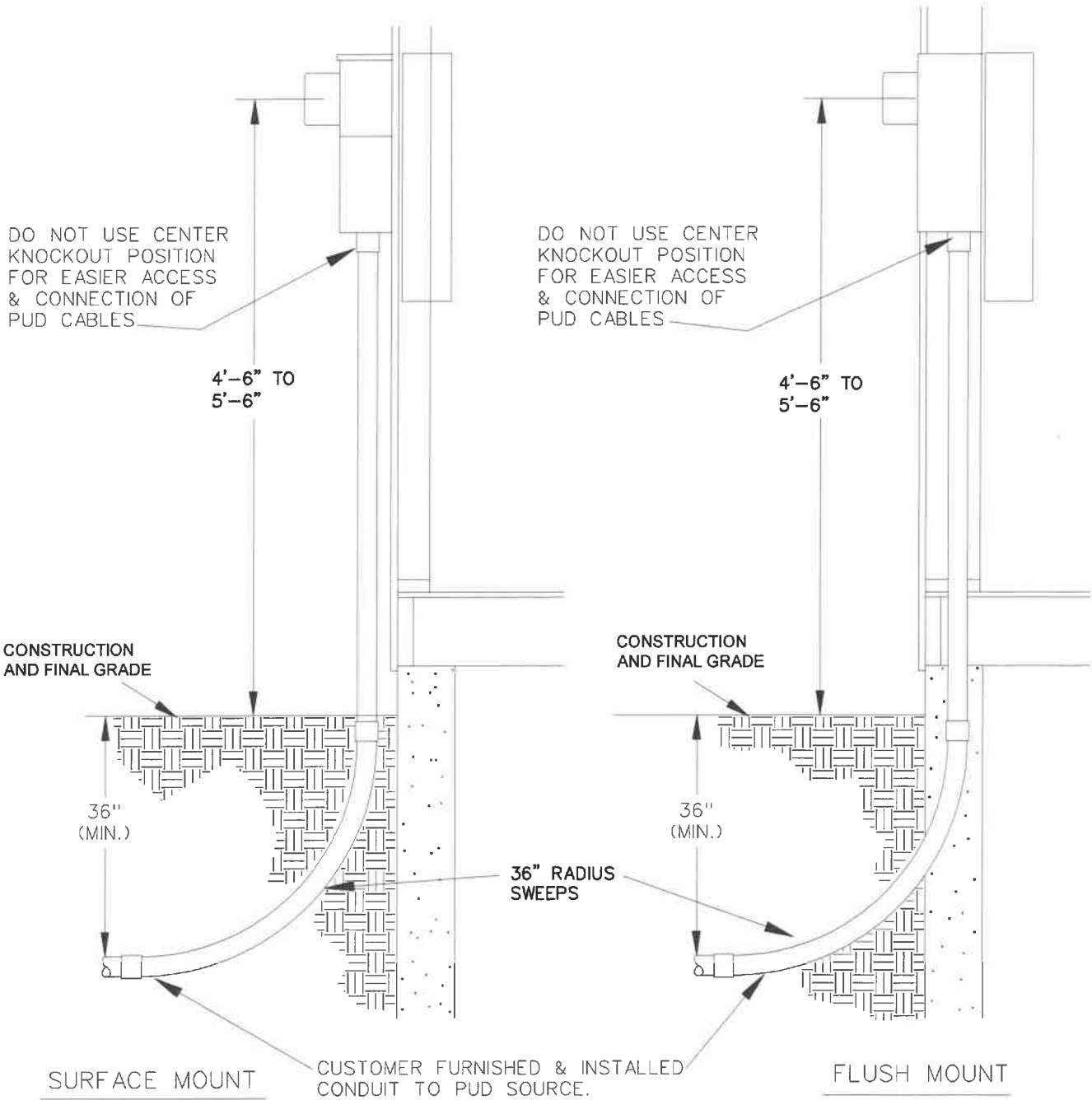
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UPDATED: 11/21/2019

DWG. NO.

224.1

NOTES:

1. CUSTOMER FURNISHES ALL EXCAVATION AND MATERIALS, EXCEPT METER AND SERVICE CONDUCTOR.
2. CUSTOMER SERVICE EQUIPMENT NEEDS TO BE INSPECTED AND "APPROVED FOR SERVICE" BY THE STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY THE PUD. SERVICE EQUIPMENT MAINTENANCE REMAINS CUSTOMER'S RESPONSIBILITY.
3. REFER TO "RESIDENTIAL SERVICE UNDERGROUND LINE EXTENSION GUIDE" FOR TRENCHING AND CONDUIT INSTALLATION DETAILS.
4. PUD SERVICE CONDUCTORS TERMINATE AT THE "LINE SIDE" METER BASE TERMINAL LUGS
5. TRENCH MUST BE COMPLETELY BACKFILLED FROM METERBASE BEFORE SERVICE IS PULLED & METER SET
6. CONDUIT SHALL NOT RUN UNDER THE HOUSE AND SHALL EXIT CONCRETE AS SOON AS PRACTICAL



225.1.DWG

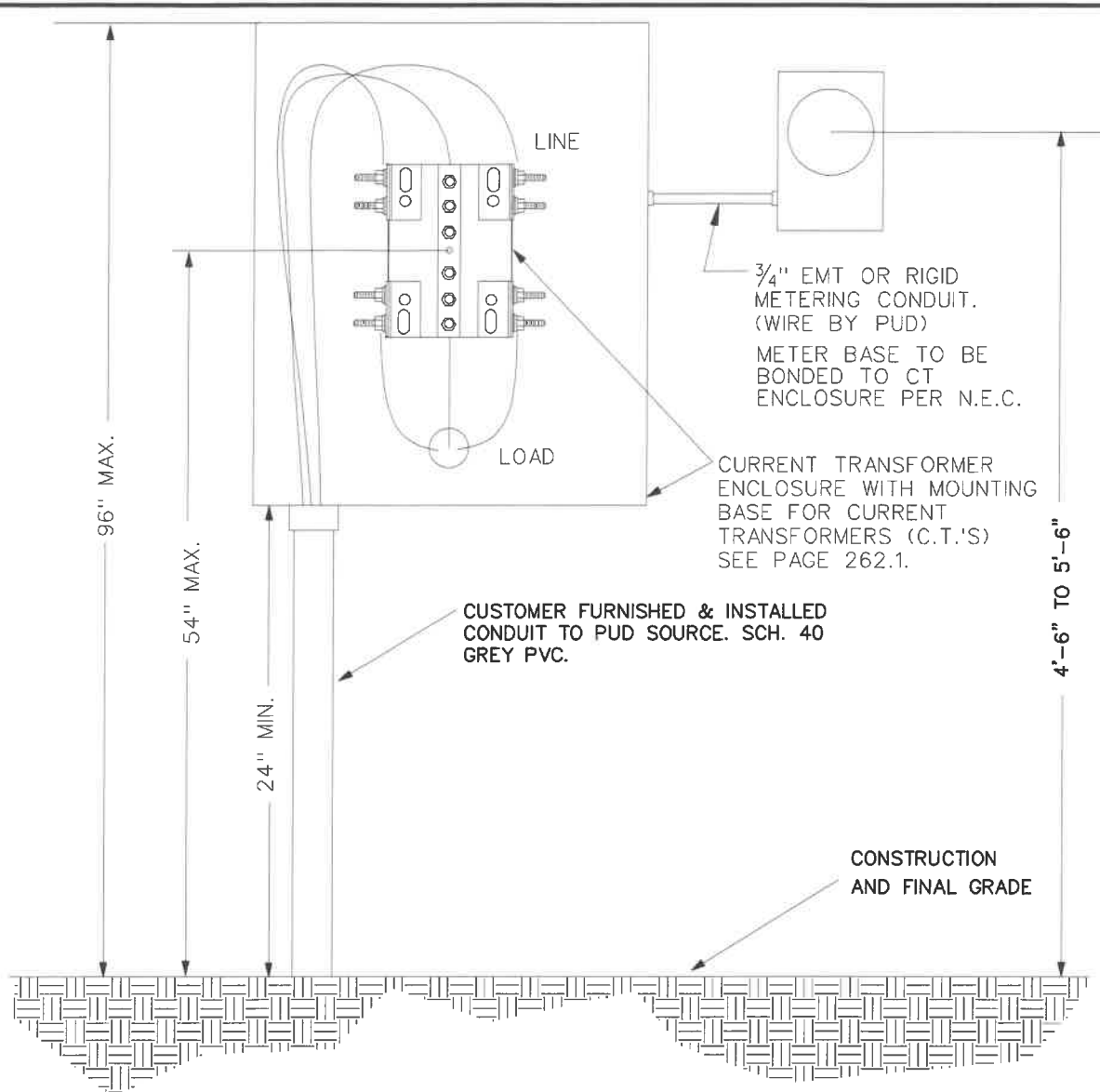


**UNDERGROUND RESIDENTIAL SERVICE  
ENTRANCE 200 AMP OR SMALLER**

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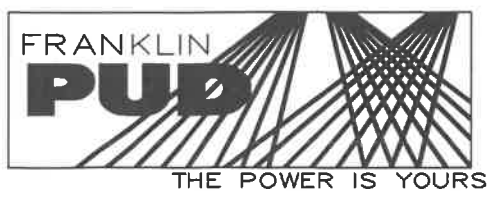
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UPDATED: 11/21/2019

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225.1



1. CUSTOMER FURNISHES ALL EXCAVATION AND MATERIALS. EXCEPT METER AND SERVICE CONDUCTOR.
2. CUSTOMER SERVICE EQUIPMENT NEEDS TO BE INSPECTED AND "APPROVED FOR SERVICE" BY THE STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY THE PUD. SERVICE EQUIPMENT MAINTENANCE REMAINS CUSTOMER'S RESPONSIBILITY.
3. REFER TO "RESIDENTIAL SERVICE UNDERGROUND LINE EXTENSION GUIDE" FOR TRENCHING AND CONDUIT INSTALLATION DETAILS.
4. THE C.T. COMPARTMENT IS TO BE WEATHER TIGHT WITH METER SEAL CLOSURES. DO NOT USE THE CENTER KNOCKOUT POSITION.(SEE PAGE 262.1 FOR DETAILED C.T. ENCLOSURE REQUIREMENTS).
5. THE PUD'S SERVICE CONDUCTORS TERMINATE AT THE LINE SIDE OF CURRENT TRANSFORMER COMPARTMENT.
6. THE CUSTOMER SERVICE ENTRANCE CONDUCTORS NEED TO BE LEFT WITH A MINIMUM 6'-0" TAIL IN THE C.T. COMPARTMENT FOR CONNECTION BY PUD.
7. TRENCH MUST BE COMPLETELY BACKFILLED FROM C.T. CAN BEFORE SERVICE IS PULLED & METER SET.

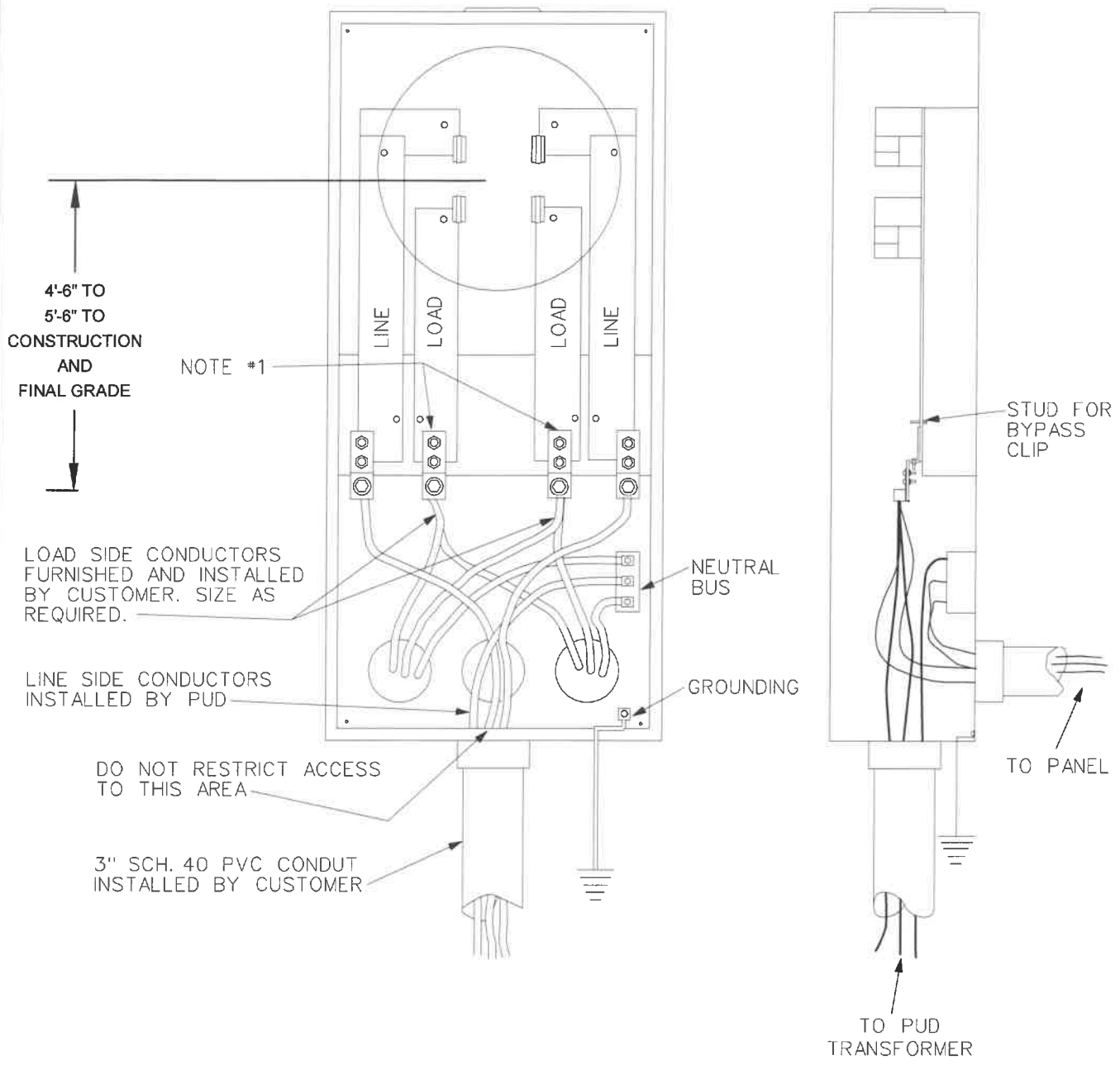
226.1.DWG



**UNDERGROUND RESIDENTIAL SERVICE  
ENTRANCE LARGER THAN 400 AMP**

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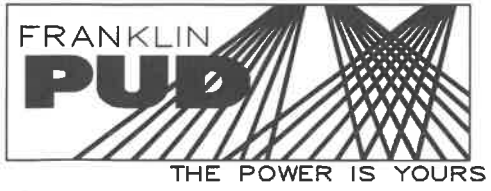




**NOTES:**

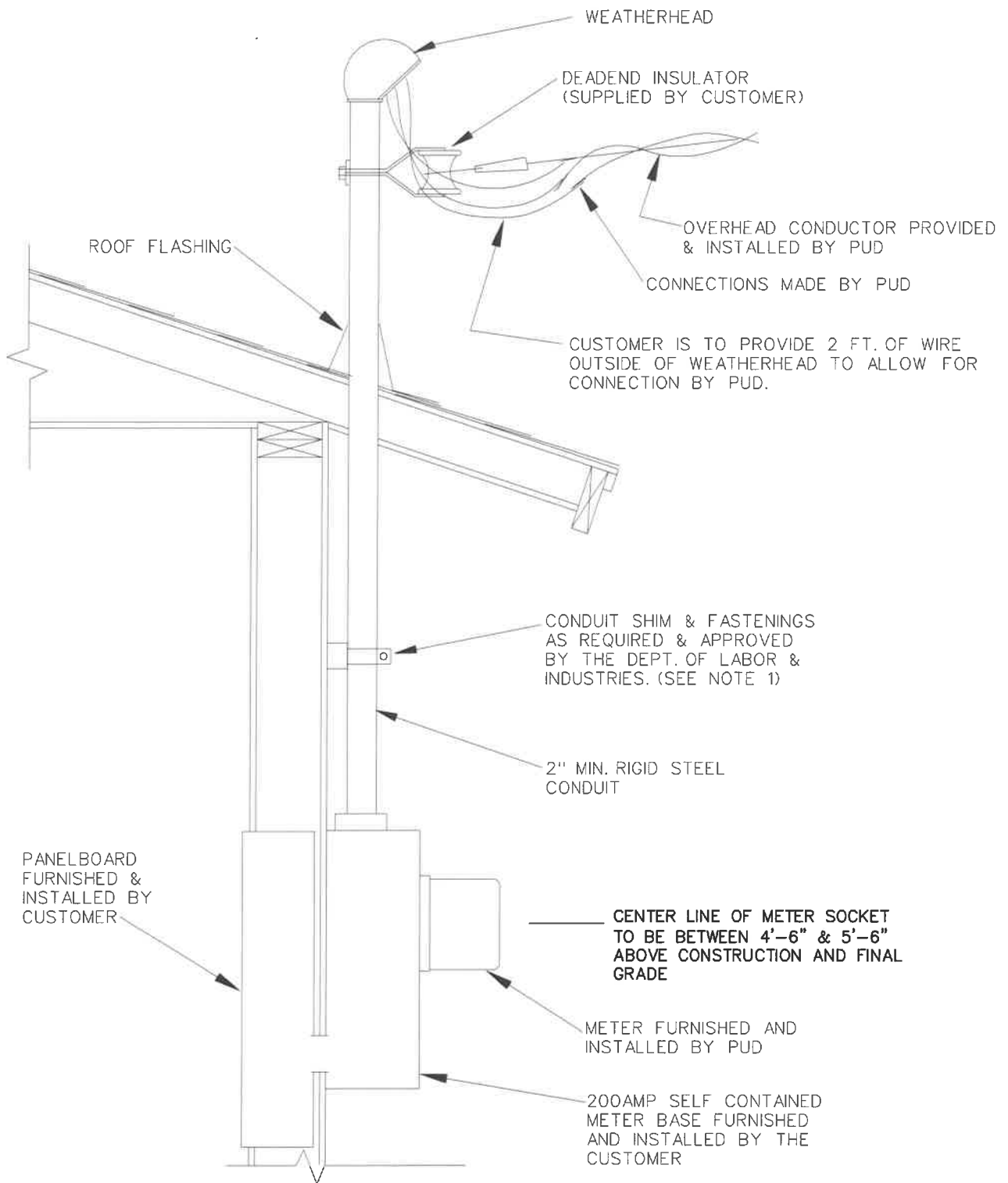
1. THE CUSTOMER PROVIDES AND INSTALLS THE LOAD SIDE CONNECTORS.
2. SEE GENERAL METERING REQUIREMENTS FOR APPROVED METER BASES.
3. INSTALL GROUND RODS AT EACH METER LOCATION PER N.E.C.
4. NO ACCESS TYPE FITTINGS ARE ALLOWED IN THE LINE SIDE CONDUIT
5. SERVICE CONDUIT MUST BE IN A POSITION NOT TO CONFLICT WITH CONDUITS AND WIRES FROM METER BASE TO PANELBOARD.
6. TRENCH MUST BE COMPLETELY BACKFILLED FROM METER BASE BEFORE SERVICE IS PULLED & METER IS SET

227.1.DWG



**UNDERGROUND SOURCE - RESIDENTIAL  
320 AMP METER BASE 120/240 V. SINGLE PHASE**

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1. SEE CURRENT WASHINGTON STATE DEPARTMENT OF LABOR & INDUSTRIES SERVICE MAST DRAWINGS E-101, E-102 & E-103 FOR MORE DETAILED REQUIREMENTS.
2. CONSULT ALL OTHER AGENCIES THAT MAY ADMINISTER ANY CODES RELATING TO ELECTRICAL WIRING & INSTALLATION.

230.1.DWG

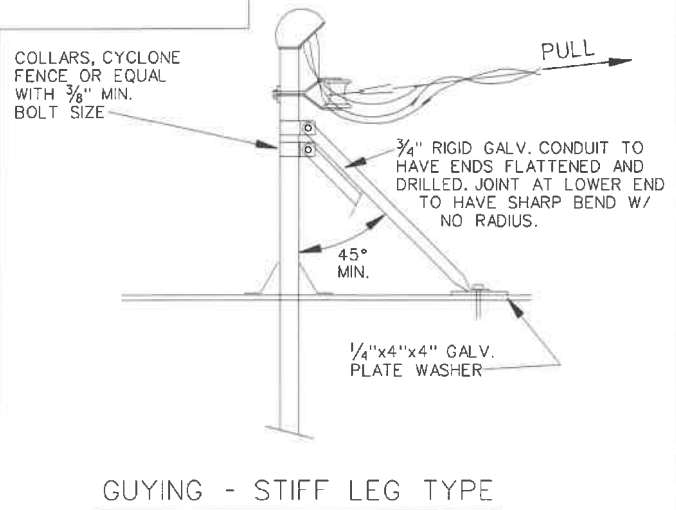
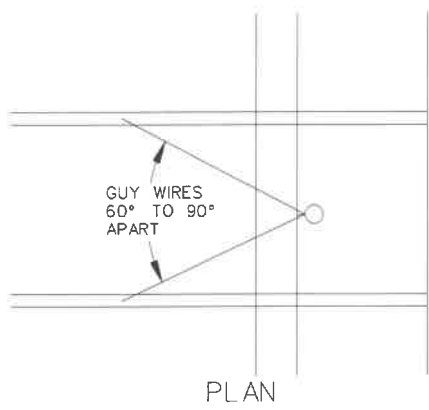
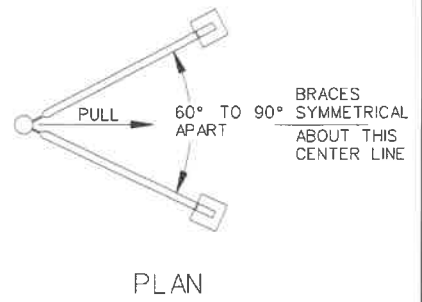
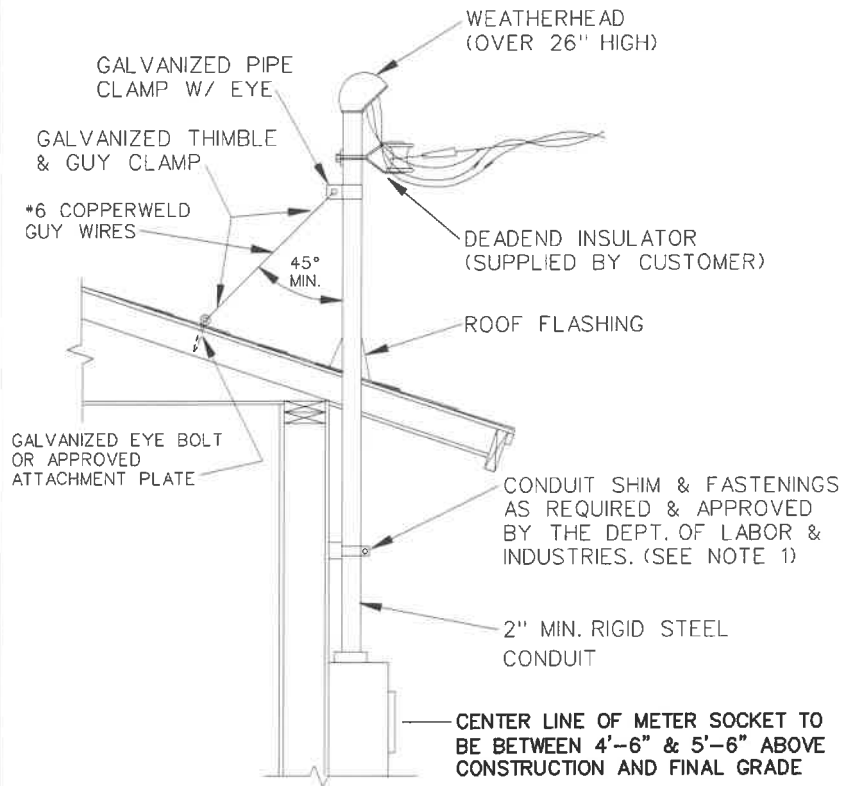


**OVERHEAD SERVICE MAST  
NOT OVER 26" HIGH**

DWN.  
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APP. D. SAMS

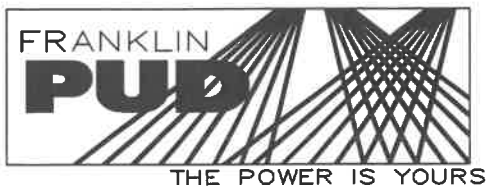
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UPDATED: 11/22/2019

DWG. NO.  
**230.1**



1. SEE CURRENT WASHINGTON STATE DEPARTMENT OF LABOR & INDUSTRIES SERVICE MAST DRAWINGS E-101, E-102 AND E-103 FOR MORE DETAILED REQUIREMENTS.
2. CONSULT ALL OTHER AGENCIES THAT MAY ADMINISTER ANY CODES RELATING TO ELECTRICAL WIRING AND INSTALLATION.

231.1.DWG

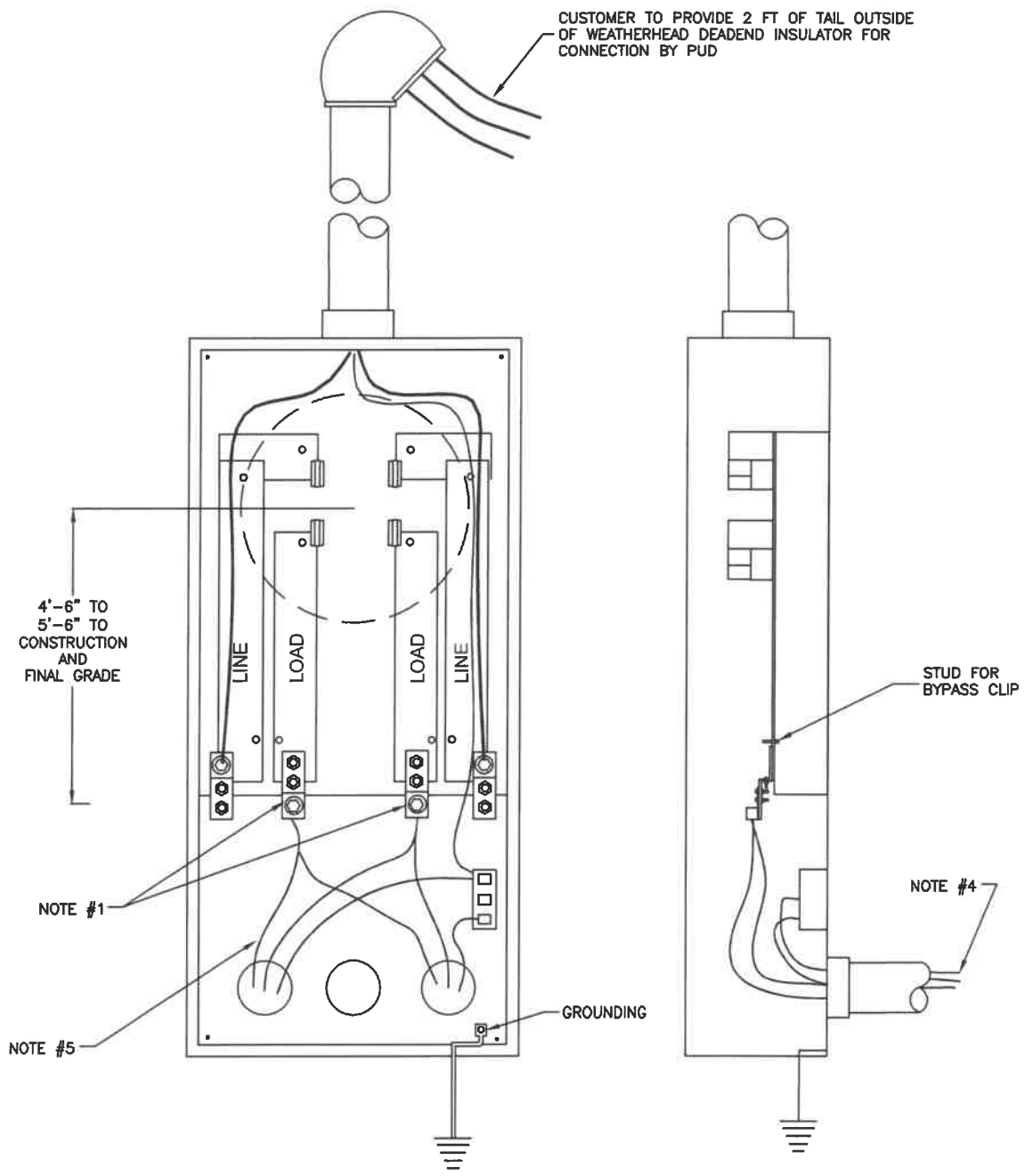


### OVERHEAD SERVICE MAST OVER 26" HIGH

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UPDATED: 11/22/2019

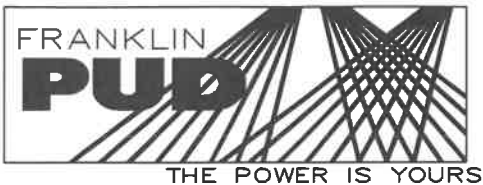
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**NOTES:**

1. THE CUSTOMER PROVIDES AND INSTALLS THE LOAD SIDE CONNECTORS.
2. SEE GENERAL METERING REQUIREMENT FOR APPROVED METER BASES.
3. INSTALL GROUND RODS AT EACH METER LOCATION PER N.E.C.
4. LOAD SIDE CONDUCTORS FURNISHED AND INSTALLED BY CUSTOMER. SIZE AS REQUIRED.

232.1.DWG



**OVERHEAD SOURCE - RESIDENTIAL  
320 AMP METER BASE 120/240 V. SINGLE PHASE**

DWN.  
WR  
APP. D. SAMS

DATE: 4/9/03  
UPDATED: 11/22/2019

DWG. NO.  
232.1