



# **Harney Electric Cooperative, Inc.**

## **Service and Meter Requirements**

**Effective April 2014**

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Hines, OR 97738**

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**[www.harneyelectric.org](http://www.harneyelectric.org)**

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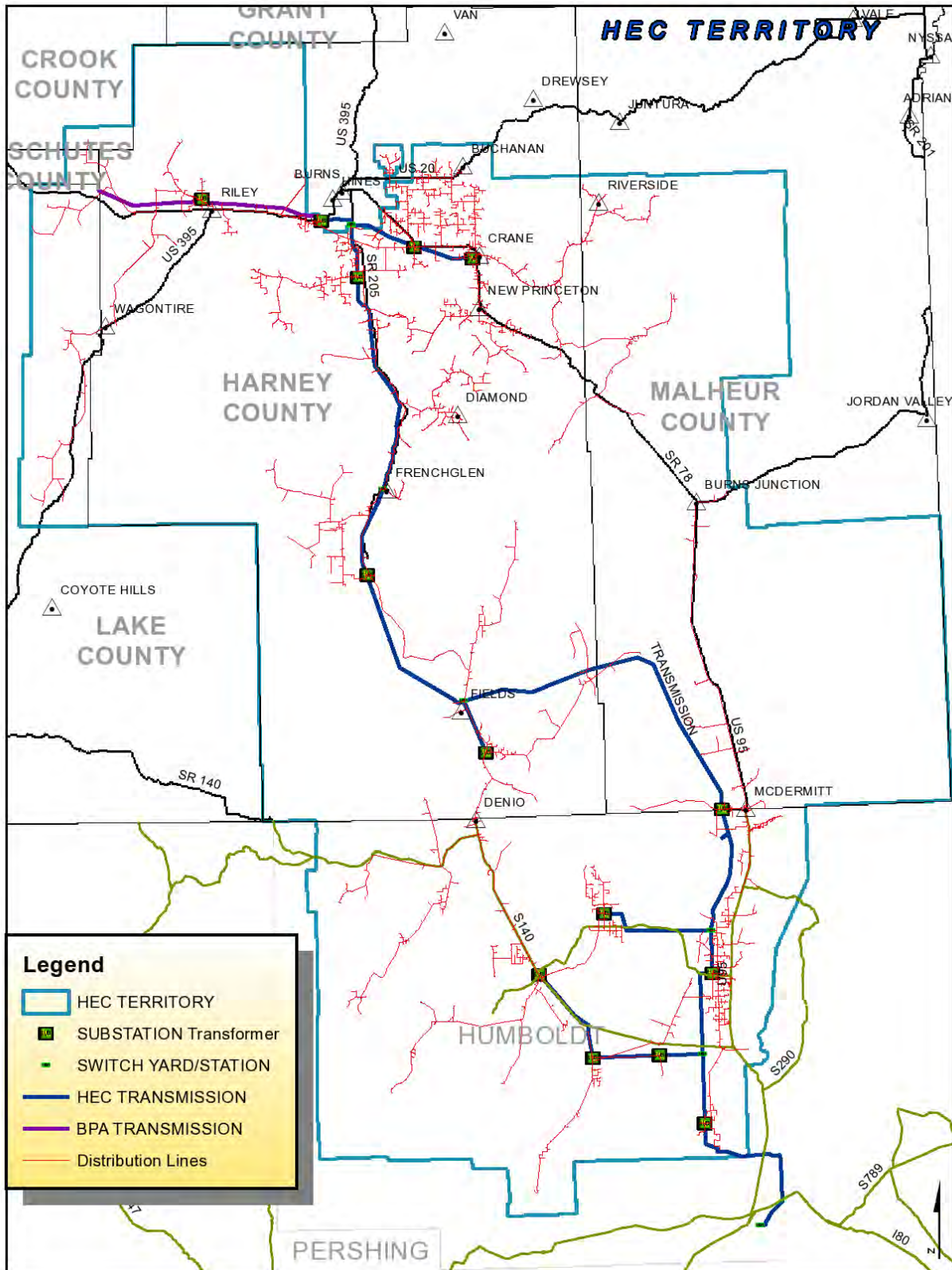
## Service and Meter Requirements

### HEC Business Offices

<b>Office</b>	<b>Location</b>	<b>Phone</b>
Hines Office	277 Lottery Ln. Hines, OR 97738	(541) 573-2061
Orovada Office	24710 US Hwy 95 Orovada, NV 89425	(775) 272-3336

### Electrical Inspections

Harney County:	(541) 573-8174
Humboldt County:	(775) 623-6322



## 1) General

Harney Electric Cooperative (HEC) will make every reasonable effort to provide safe, reliable and adequate electric service to best meet your requirements. **To best accomplish this, HEC should be contacted well in advance of your desired service connection date.** Available service voltage, phase, etc. varies at different locations.

The specifications and requirements contained in this handbook are for the purpose of safeguarding members and the employees, and providing adequate service to all members. Strict adherence to this handbook will insure prompt service and connections; and allows HEC to standardize its equipment, thus affording members with the best possible service at the lowest possible cost.

All services provided by HEC are subject to HEC's bylaws, policies, rate tariffs, and member agreements. This handbook does not supersede any of those documents. This handbook replaces all other standards previously issued and is enforced in all areas served by HEC.

### *Scope*

This handbook covers the HEC requirements and responsibilities and the member responsibilities for member service installations.

Nothing in this handbook shall be so interpreted as to conflict with the laws and state regulations or other regulatory bodies having jurisdiction.

**All references to the *member* will include the member, member's agent or contractor**

Non-conforming services will not be energized, or if energized, will be subject to disconnection.

Existing non-conforming services will be dealt with on a case-by-case basis.

### HEC Responsibilities

1. The HEC employee will provide the member with information and interpretations of the Service and Metering Requirements related to the member's specific installation.
2. HEC will require installations to conform to applicable laws and regulations, including the National Electric Code.
3. HEC will require all installations to be inspected and approved by the Oregon State/Nevada, Humboldt County Electrical Inspector prior to energization.

### Member Responsibilities

1. The member will contact the appropriate HEC employee before beginning any construction of, modification of, or addition to an electric service.
2. The member will not open any HEC seals or locks, or in any way interfere with or tamper with an HEC installation.
3. The member will not make any connection to HEC's system
4. Prior to HEC energizing the service, the member will call the office stating they are ready for connection and the Electrical Inspector has notified HEC that the installation has been approved. The scheduling of the inspection is between the member and the Inspector.

## *Right-of-Way and Permits*

### HEC Responsibilities

1. HEC will construct, own, operate and maintain lines along public streets, roads, highways and public lands.
2. HEC will obtain the required permits/licenses from public agencies or entities (DOT, USBR, Irrigation Districts, BLM, Counties, Cities, etc.) and coordinate any professional land survey(s), if required, for these permits.
3. HEC will get the necessary permits from government agencies at the member's expense for all associated costs in obtaining the necessary right-of-ways.

### Member Responsibilities

The member will provide and maintain safe and unobstructed access, as determined by HEC, to all HEC construction, operation and future maintenance.



## 2) Services

### *General*

HEC's staking and mapping department will develop a design to meet the member's needs and that of HEC. We have the best results when the requesting party or representative meets at the job site to review the request. The Staking Department will develop an estimate for the design following the guidelines below. The Staking Department will **not** be able to give an accurate cost while meeting on site. Please refer to HEC's current line extension policy.

- ❖ HEC will determine the cost of the line extension. The line extension will be compatible with present electrical distribution facilities.
- ❖ The line extension design will be designed and constructed in accordance to HEC's standards.
- ❖ Please refer to HEC's current line extension policy for final property specifications.
- ❖ Additional costs will be incurred for unusual labor and/or materials which are requested by the member but which are not necessary to construct the line extension based on HEC's line extension policy #15.

### Available Service

1. HEC offers service at:
  - Single-phase 120/240 volts
  - Single-phase 240/480 volts
  - Three-phase 120/208 volts
  - Three-phase 120/240 volts
  - Three-phase 277/480 volts
2. All three-phase services will be 4-wire connections

### HEC Responsibilities

1. The HEC Staking Department will work with the member to determine the "point of service" where HEC facilities will connect to member's facilities.
2. HEC will furnish, install and maintain transformers, secondary conductors, meters, and meter poles to provide electrical energy to the "point of service" according to the maintenance agreement.
3. Prior to installation, HEC must approve the meter location and type.
4. HEC will make any and all connections of the member's facilities to HEC's system.
5. HEC reserves the right to refuse service or to disconnect/terminate service whenever the member's wiring, equipment, or use of service does not conform to the National Electric Code, or to the rules, terms, and conditions stated herein.

### Member Responsibilities

1. The member will complete a service application complete with the expected electrical load. **If the electrical load changes**, the member will provide HEC with the new information in writing as soon as possible. **Additional inquiries may be at the member's cost.**
2. The member will furnish, install and maintain all facilities beyond the "point of service".

3. The member will use reasonable care in designing electric wiring and circuits so that the loads on the individual phases, legs, and circuits of the Cooperative's service conductors are properly balanced at all times.
4. The member will be solely responsible for the electrical and mechanical protection of wiring and accessories owned and operated by the member including protection against damage caused by reversal of rotation (phase reversal) on all rotating equipment.
5. The member will install safety and protective equipment in accordance with applicable codes and regulations.
6. The member will be responsible for repair of any damaged or deteriorated member furnished facilities (service mast and conductors, point of attachment, meter socket, etc.). **Repaired or modified facilities must be brought up to current HEC standards and may be required to be inspected and approved by the L & I Electrical Inspector before being re-energized.**
7. In the event a member desires to substantially add or to increase the size of his electrical equipment, it will be the member's responsibility to notify HEC in writing sufficiently in advance so that HEC's facilities may be modified to accommodate the increased load. HEC has forms available for this purpose. If the member fails to notify HEC, the member will be held responsible for any damage to the meter or any other HEC equipment caused by such increased load.
8. Member-owned metering equipment, switching devices, conduits and conductors will be installed per HEC requirements shown here-in.
9. Member-owned signs, basketball hoops, satellite dishes, antennas, etc., will not be installed on HEC's poles.

### *Temporary Services*

The Cooperative will provide temporary service, for construction sites and similar purposes. Meter socket must be L&I approved and all costs must be paid up front.

## 3) Overhead Service

### *General*

1. Overhead services must meet all vertical and horizontal clearance requirements of the NESC, NEC and any other applicable standards (DOT, County, City, etc.).
2. All references to the member will include the member's agent or contractor.

### HEC Responsibilities

1. HEC's Staking Department will determine the location of the overhead service conductors.
2. HEC's Staking Department will determine the requirements for, and the location of, any necessary poles, guy wires and anchors.
3. HEC will furnish, install and maintain the service conductors to the "point of service".
4. HEC will make any and all connections of member facilities to the Cooperative's electrical system.
5. The Cooperative will furnish and maintain meter poles.

### Member Responsibilities

1. The member will furnish, install and maintain the necessary service equipment (mast and conductors, weatherhead, meter socket, guy wires and bracing, etc.).
2. Service masts will support only power conductors. Communication wire is not permitted.
3. Metering requirements are listed in Section 5) Meters.

## 4) Underground Service

### *General*

1. HEC provides no secondary underground.
2. All primary underground will be paid upfront for the total cost of the job along with signing the primary maintenance agreement.
3. All references to the member will include the member's agent or contractor.

### HEC Responsibilities

1. The Staking Department will determine the location of primary underground facilities.
2. The Staking Department will determine the need for easements and access.

### Member Responsibilities

1. The member **may** furnish all required primary trenches and conduit to Cooperative specifications. See drawings MTR-UG-PT and MTR-UG-CJT.
2. The member will furnish, install and maintain all required service equipment (meter socket, disconnect, pedestal, etc.). See drawing MTR-UG-PT.
3. Metering requirements are listed in section 5) Meters.

### *Trenching*

#### General

1. HEC or the member will contact the One-Call Locating service (811) at least 48 hours prior to any excavation.
2. All excavation within 24 inches of any locate marking will be done by hand.
3. HEC requires photographs of the unfilled trenches before backfill.
4. Joint use of trenches for other utilities such as telephone, cable TV, other electrical conductors and water lines is generally permitted. The Staking Department will be consulted prior to such joint use to insure conformance to Cooperative requirements.

#### Depth

1. Trenches on the Cooperative side of the "point of service" will be deep enough to provide a minimum of 48" of cover for the conduit. See drawings MTR-UG-PT and MTR-UG-CJT.
2. In rocky soil conditions, where bedding is required, the trench will be an additional 6" deeper to allow placement of proper bedding under the conduit.

#### Bedding

1. Backfill material will be a maximum 1" minus (when available) for a minimum of 12" above and below the conduit. The backfill material will contain no sharp or foreign objects. Bedding sand would be the preferred material.
2. If the native backfill does not meet these requirements, member will be responsible for furnishing and installing appropriate backfill for a minimum of 12" above and below the conduit.

3. Locating tape shall be supplied by HEC and installed by the member at a minimum of 24" above conduit.

## Conduit

1. "Conduit" means listed, labeled, UL-approved electrical conduit, typically Schedule 40 or Schedule 80 PVC. Conduit is grey in color. Water pipe, sewer pipe and other round stock is not acceptable for electrical use.
2. "Sweep" means a large-radius conduit bend (as noted on drawing), typically either 90 degrees or 45 degrees. (36" in length min)
3. In general, primary (high-voltage) conductors will be installed in 3" conduit (at a minimum) with one cable per conduit. HEC may approve the use of CIC (Cable in Conduit) or other installations in specific cases.
4. HEC will determine the size and number of conduits to be placed.
5. A conduit run shall contain no more than 270 degrees of total bend, including at transformers and metering equipment.

## Transformers, Equipment, Vaults

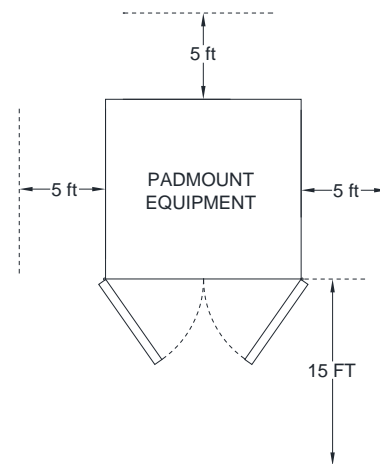
### General

1. The Cooperative's Staking Department will determine the need for, and the location of, all transformers, vaults, and other primary-voltage equipment necessary for primary underground service.
2. The Cooperative will furnish, install and maintain all necessary transformers, vaults and other equipment according to the maintenance agreement. See drawings MTR-UG-PT.
3. Where necessary to protect above-ground equipment, the member will furnish, install and maintain bollards. See drawing MTR-UG-PB.

### Transformers

1. The member must maintain a clear working space around the transformer free from vegetation, landscaping, structures of any sort, or anything that would restrict Cooperative access for maintenance or repair. This is shown in the sketch to the right.
2. The member will insure that nothing is placed within the clear working space that would impede the free flow of cooling air over the transformer.

**CLEARANCE ENVELOPE:**  
KEEP SHRUBS, TREES AND STRUCTURES 15' AWAY FROM THE SIDE WITH DOORS AND 5' AWAY FROM OTHER SIDES. OBSTRUCTIONS WILL BE REMOVED WHEN NECESSARY.



## 5) Metering

### *General*

1. Nothing in this handbook shall be so interpreted as to conflict with state other regulatory bodies having jurisdiction.
2. All references to the member will include the member's agent or contractor.

### HEC Responsibilities

1. HEC's Staking Department will provide the member with information and interpretations of these requirements related to the member's specific installation.
2. HEC will require installations to conform to applicable laws and regulations.
3. HEC will require all installations to be inspected and approved by the State Electrical Inspector prior to energization.

### Member Responsibilities

1. The member will provide the HEC Staking Department with load information on Cooperative forms OR calculations per NEC to allow proper sizing of service equipment.
2. The member will provide and install, in accordance with the following requirements, the necessary equipment for HEC's metering **with the exception of 13 terminal meters**. Please see drawings MTR-OH-CT, MTR-OH-SC and MTR-OH-MP.
3. The member will provide all necessary maintenance and repairs to the metering installation with the exception of 13 terminal meter installations.
4. The member will not break any HEC seals or locks, or in any way interfere with or tamper with a HEC metering installation.
5. Prior to installation, HEC must approve the meter location and type.
6. The member will not make any connection to HEC's system.
7. If a member wishes to perform work on the meter base, HEC must be contacted in order to deenergize the service and remove the meter seal prior to any work being done.

### *Location and Access*

#### Location

1. Metering must be installed in an acceptable location and approved by the HEC Staking Department.
2. Meter sockets will be installed at a height between 5' to 6' from the center of the meter to finished grade in front of the meter. See the Drawing(s) applicable to your installation.

#### Access

1. The member will provide, as a condition of service, access to HEC facilities located on member's premises.
2. The member will provide access, as required by HEC and free from recognized hazard. Examples of hazards might include (but are not limited to) animals, traffic, machinery or industrial environments, height, chemicals, vegetation, unstable work surfaces, falling trees or rocks, etc.

3. The member will provide, as required by the National Electrical Code, clear working space in front of the metering equipment, 36" deep, 30" (or the width of the equipment if greater) wide, and 6'8" high. This space will be maintained clear of all other equipment, vegetation, etc.
4. The working surface in front of metering equipment will be reasonably level and graded to drain away from the equipment.
5. Members with security requirements will provide for the installation of a HEC lock to allow HEC access.

## Access Maintenance

1. The member will maintain the required access to and clear working space around HEC facilities on member's property.
2. When HEC facilities on member's property are not readily accessible, in the opinion of HEC, the member will be responsible for necessary corrections.
3. When, in the opinion of HEC, alterations on the member's property (remodeling, landscaping, etc.) interfere with ready access to HEC facilities, member will be responsible for the cost of remedy.
4. When, in the opinion of HEC, pets, livestock, or other animals interfere with ready access to HEC facilities, member will be responsible for installation of necessary barriers to remedy the problem. If relocation of HEC facilities becomes necessary, member will be responsible for all costs.
5. HEC shall have the right to install and maintain locks on gates as necessary or appropriate for the right of ingress and egress to the right-of-way easement.

## Installation

### General

1. All installations must conform to the requirements of the National Electric Code, state electrical code, and these Service & Meter Requirements.
2. Equipment to be installed will be listed, labeled, manufactured in accordance with all applicable standards, and suitable for the purpose in which it is utilized.
3. Metering enclosures, switchgear, disconnects and other equipment which allows access to un-metered conductors must be capable of being sealed using HEC's normal seals and locks.
4. Equipment will be installed level, plumb and securely fastened to a rigid surface not subject to excessive vibration. Meter sockets must be installed to withstand the forces imposed by installation and removal of meters.
5. Where used to support metering equipment, wood posts, dimensional lumber and plywood will be pressure-treated lumber. Posts will be a minimum 6" x 6" x 8'. Dimensional lumber will be a minimum of 2"x 6", and plywood will be a minimum of 3/4". Metal channel may also be used.
6. Meters will not be covered. The Cooperative may install covers where necessary to prevent vandalism.
7. Meter sockets will not be used as a raceway.
8. **The member shall leave a minimum of 36" of service conductor at the weatherhead for connection to HEC's wires.**
9. The weatherhead shall be located no more than 6" from the top of the meter pole.
10. **No self-shunting or bypass metering will be allowed.**

## *Single-Phase 400-Ampere and Below, Self-Contained Metering*

### General

1. The meter socket will be 4-jaw and have a main disconnect breaker.
2. The meter socket may be ring-type or ringless.
3. The service conductors will be color coded per the applicable drawing.

## *Three-Phase Below 125-Ampere, Self-Contained Metering*

### General

1. The meter socket may be ring-type or ringless.
2. Bypasses are not permitted.
3. Where a service has a high leg (delta connection), the high leg will be connected to the right-hand lugs and marked with identification tape in the meter socket.
4. For services with motor load, the following chart will be used.

<b>VOLTAGE</b>	<b>HORSEPOWER</b>	<b>TYPE OF SOCKET</b>
<b>240</b>	<b>39 or less</b>	<b>200 amp self-contained</b>
<b>240</b>	<b>40 and above</b>	<b>CT</b>
<b>480</b>	<b>Less than 100*</b>	<b>200 amp self-contained</b>
<b>480</b>	<b>100 or greater</b>	<b>CT</b>

\* 75 HP of pump motor load plus any pivot power, booster pumps etc. so long as the total HP of the load is less than 100 HP

## *Single and Three Phase, Current Transformer (CT) Metering*

### General

1. Services from 401-800 amperes single-phase and 125-800 amperes three-phase will be metered using current transformers (CTs).
2. For Motor loads, please see the above chart.
3. CTs will be mounted, by HEC, on the pole unless otherwise specified.
4. HEC will furnish and install the CTs, CT wiring, test switch and meter. The member will be responsible for the cost of the meter base assembly.
5. Equipment location and mounting heights will be per sections 5) Metering, Locations and 5) Metering, Installation sections. This information is also shown on the applicable drawings.
6. See drawings MTR-OH-CT and MTR-OH-SC for details.



## *CT Metering—Services Over 800 Amperes*

1. Services rated over 800 amperes will be metered with current transformers mounted in switchgear, unless an alternative is approved by Engineering.
2. HEC will make available for installation, an approved 13-jaw meter socket and a 10 pole test switch at the member's expense.
3. HEC will approve the meter location.

## *Multiple Occupancy*

### General

1. Metering equipment for multiple-occupancy installations shall be specified and approved by the HEC Staking Department.
2. The member will submit manufacturer's drawings or cut sheets to the Cooperative for approval **before** installing the metering equipment.
3. All compartments and disconnects allowing access to unmetered conductors must be capable of being sealed using the Cooperative's standard seal.
4. Meter sockets must be ring-type, to accept locking rings.
5. **Bypasses** are **not** permitted.

### Single-Phase (120/240 volts)

The socket will be 4-jaw and have a main disconnect.

### Network (120/208 volts)

1. Please contact the Engineering Department regarding more information on Network Metering

### Identification

1. The member will permanently identify each meter socket. Meters will not be installed nor services energized until identification is complete.
2. Sockets will be identified by address and/or unit number permanently affixed to the entrance door of the unit. Occupant or business name is not sufficient.
3. Satisfactory permanent means of identification include engraved plastic or metal tags attached with screws, bolts or rivets. Permanent ink markers, label makers, etc. are not permitted as permanent identification. Adhesives may be used, but screws, bolts or rivets are still required.
4. Engraved lettering will be at least ½" tall.
5. If unit identification changes, the member will notify the Cooperative in writing immediately.
6. The Cooperative will record consumption and issue billings according to the member's identification of the units. Proper identification of a unit is the member's responsibility.

## 6) Power Quality

This section will cover HEC requirements that assure suitable power quality, and prevent interference with Cooperative service to other members.

### HEC Responsibilities

1. Insofar as is practical, as determined by HEC, HEC will endeavor to maintain standard voltages and frequency on its distribution systems, subject to variations within reasonable limits.
2. Upon request, HEC will furnish percent impedances of the transformers being installed for the member's service.

### Member Responsibilities

1. The member's equipment will be designed to perform satisfactorily within the standard voltage ranges and frequency provided on HEC's system.
2. The member's system will be rated to withstand the fault current available at the serving transformer.
3. The member will, upon request, provide HEC with information regarding any equipment that might cause interference with service to other members.
4. The member will be responsible for mitigating, at member's expense, any interference to HEC's service to other members caused by member's equipment. Examples of such interference would include, but not be limited to, flicker, harmonic distortion, radio frequency interference, etc.
5. The member will be responsible for providing any power conditioning or protective devices required for their particular equipment (uninterruptible power supplies, filters, power factor correction, harmonic suppression, etc.).
6. Where the member installs equipment/appliances with sensitive electronic components such as computers and other devices containing programmable controllers, it is understood that it is impossible for HEC to provide "computer grade" voltage and power at all times. It will be the responsibility of the member to install, own, operate, and maintain appropriate protection equipment in order to protect such devices from damage including power line noise, voltage fluctuations, power outages, spikes, transient surges or other power deviations.

### *Motors*

Maximum single phase motor load is 10 horsepower or 40 horsepower with a phase converter. Maximum open-delta (V-phase) motor load is 40 horsepower. Phase converters and open-delta configurations may be permitted (where 3-phase distribution facilities are not available or not feasible for member to afford) by special arrangement with the Cooperative.

### Starting Load

1. HEC requires IEEE rated reduced-voltage starting (soft start or VFD) on all motors 100 HP and above **or where deemed necessary** in order to reduce voltage fluctuations on HEC's system caused by motor starting.

2. A motor start test performed by Cooperative personnel may also be required. At the time of testing, the Cooperative will verify the size and nameplate rating of the motor. If there are any discrepancies, a delay in energizing the service could occur.
3. Soft start motors shall be equipped with a run capacitor option to obtain 95% power factor.

## Power Factor Correction

HEC requires that the member install power factor correction equipment for all three-phase motors rated 20 horse power or above to correct the power factor of the motor to 95%.

## Harmonics

1. Variable Frequency Drive (VFD) motors are a major source of harmonic distortion. This harmonic distortion causes heating of equipment and system disturbances on HEC's distribution system.
2. The member will design the service so that the Total Demand Distortion (TDD) is at or below 10% at the Point of Common Coupling (PCC). This may require harmonic filters or various types of motors designed to reduce harmonics. **The service will not be energized until the VFD Approval Form is approved by the Cooperative.**
3. If HEC determines that the harmonic distortion is outside the HEC standard, the service will not be energized until satisfactory mitigation has been completed by the member. **Energized services will be subject to disconnection if distortion falls outside the HEC standards.**

TDD = Total Demand Distortion is Harmonic Current in percent of maximum demand load current (15 or 30 minute demand).

## Motor Protection

It will be the member's responsibility to provide all necessary protective devices for all motors to protect the motor from overload, under-voltage, over-voltage, phase loss or reversal, etc.

## 7) Emergency and Standby Generators

### Member Responsibilities

1. Permanently-installed emergency or standby generators will be connected to the Cooperative's system and the member's wiring system by a permanently-installed transfer switch installed in accordance with the requirements of the NEC and state code.
2. All transfer switch installations must meet all applicable codes and be approved by the L & I Electrical Inspector.
3. The transfer switch will disconnect all Cooperative conductors, including the neutral wire, from the member's system prior to connecting the generator to the conductors supplying the load.
4. Portable generators will not be connected to a member's permanent wiring system at any time, unless the interconnection is also made with a permanently installed U.L. listed transfer switch
5. Notify HEC of any emergency or standby generators.

## 8) Net Metering (Under 25 kW)

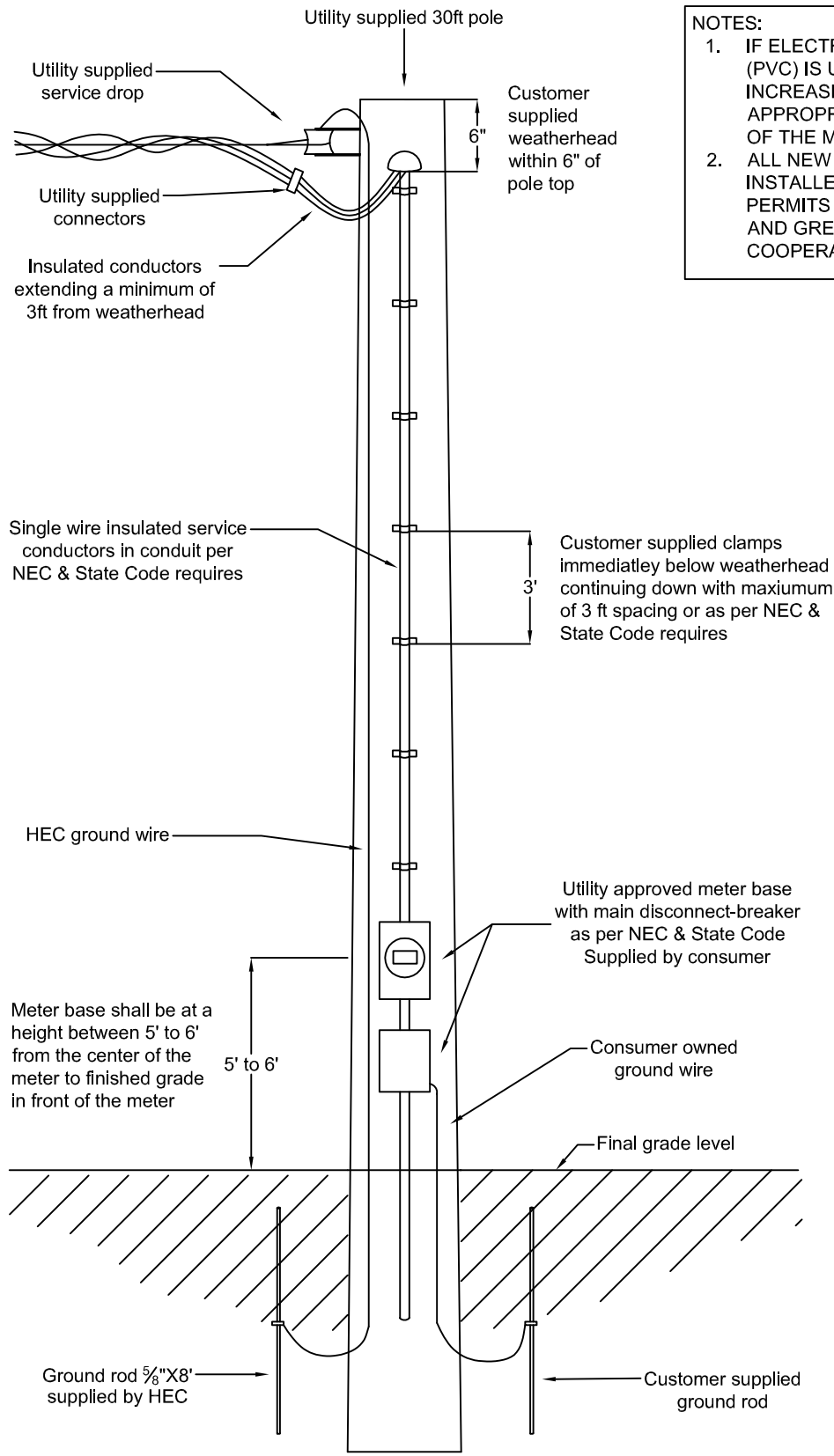
Net Metering is the measurement of the difference between the electricity supplied by HEC and the electricity generated by a member-generator that is fed back to the Cooperative over the applicable billing period.

A Net Metering System is a fuel cell, a facility that produces electricity and useful thermal energy from a common fuel source, or a facility for the production of electrical energy that:

- a. Uses either water, wind, solar energy, or biogas from animal waste as a fuel;
- b. Has an electrical generating capacity of not more than one hundred kilowatts;
- c. Is located on the member-generator's premises and for which the Cooperative has, at the time of application as member-generator, an active account in the member-generator's name;
- d. Operates in parallel with the Cooperative's distribution facilities; and
- e. Is intended to offset part or all of the member-generator's requirements for electricity.

The Cooperative will require a written application from member-generators for all Net Metering Systems, clearly detailing member-generators' proposals **before any action** will be taken by the Cooperative. Such application will include the size, location, fuel source and equipment configuration of such proposed installation. Applications will be processed in the order received by the Cooperative, and on a first-come first-served basis. An application fee does apply. The consumer will be charged a monthly cost to read the meter. HEC requires access to a visible open break between the consumer's line and HEC's system that can be locked-out and tagged to ensure no back-feed onto HEC's system. The member will be held liable for any and all costs associated with the net metering service.

Call the Cooperative for more information in regards to your project.



- NOTES:**
1. IF ELECTRICAL NON-METALLIC TUBING (PVC) IS USED, STRAPPING SHALL BE INCREASED TO 2FT SPACING WITH APPROPRIATE BENDING INTO THE TOP OF THE METER BASE
  2. ALL NEW SERVICES ARE TO BE INSTALLED WITH APPROPRIATE PERMITS AND SHALL BE INSPECTED AND GREEN TAGGED BEFORE THE COOPERATIVE WILL CONNECT

SEE SERVICE AND METER REQUIREMENTS FOR APPROVED METER BASES AND APPROVED LOCATIONS

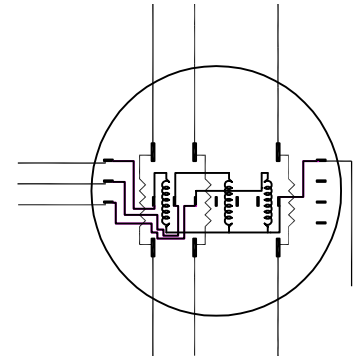
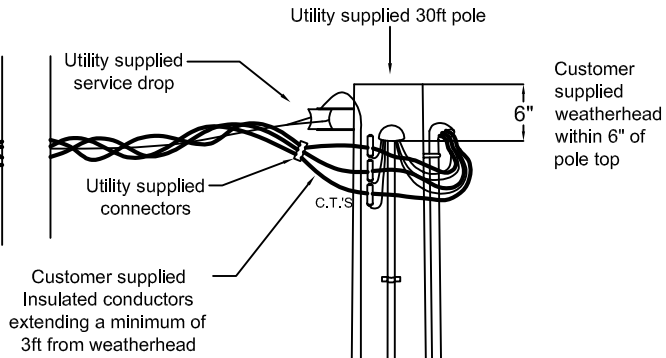
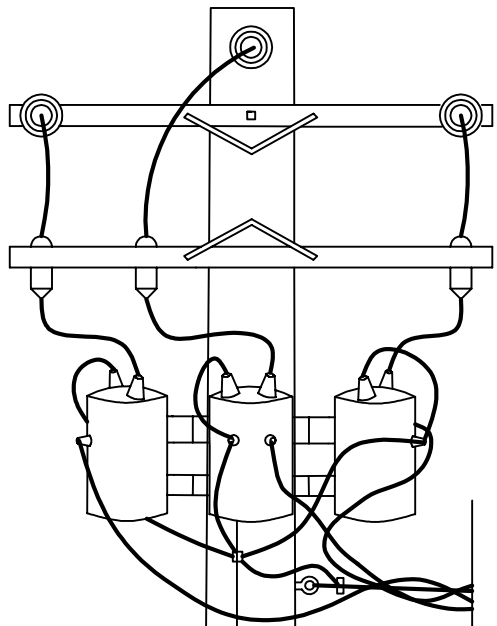
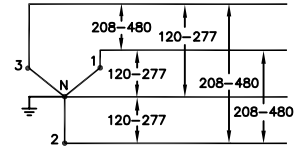
**METERING - POLE**

MTR-OH-MP

APRIL 2014

DOM./STOCK WELL  
SINGLE PHASE 120/240V OR 240/480V





HEC Ground Wire

13-terminal meter base to HEC standards

Meter base shall be at a height between 5' to 6' from the center of the meter to the finished grade in front of the meter

5' - 6'

Customer supplied disconnect

Final grade level

Ground Rod  $\frac{5}{8}$ "x8' Supplied by HEC

Ground rod  $\frac{5}{8}$ "x8' supplied by HEC

Customer Supplied ground rod

SEE SERVICE AND METER REQUIREMENTS FOR APPROVED METER BASES.

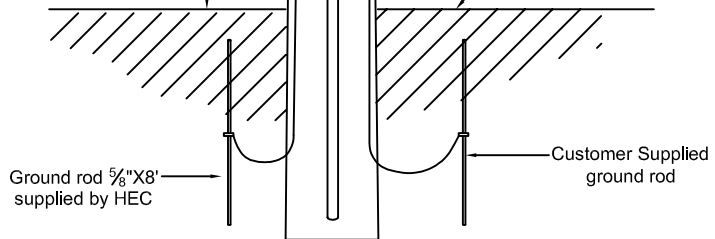
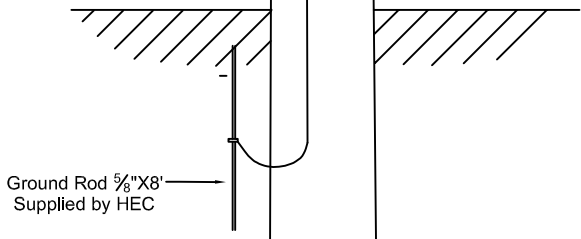
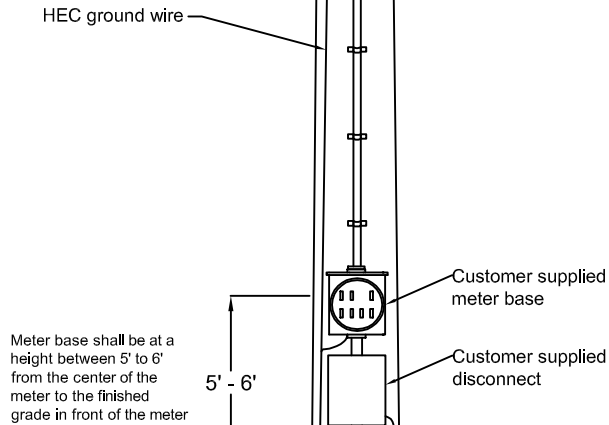
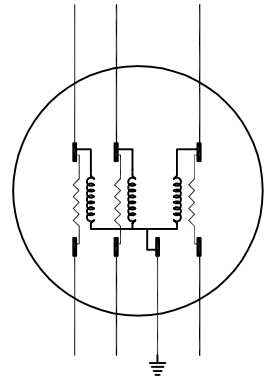
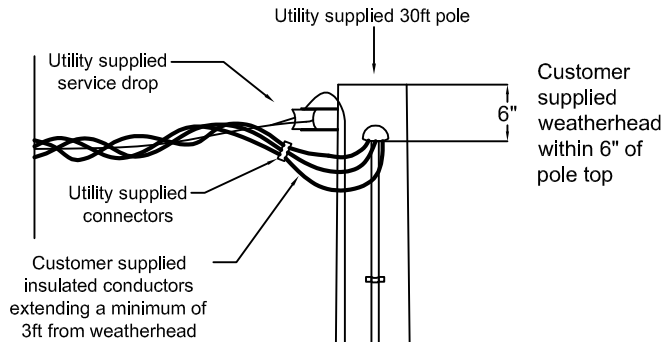
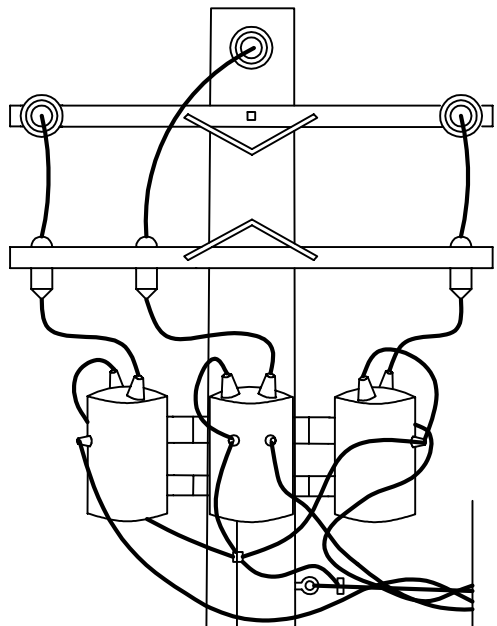
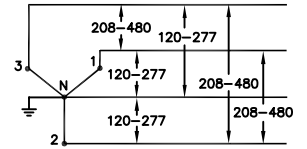
### 3 PHASE C.T. METERING - POLE

MTR-OH-CT

APR 2014

(100 HP or Greater)  
120/240, 120/208,  
277/480





SEE SERVICE AND METER REQUIREMENTS FOR APPROVED METER BASES.

### 3 PHASE SELF-CONTAINED METERING - POLE

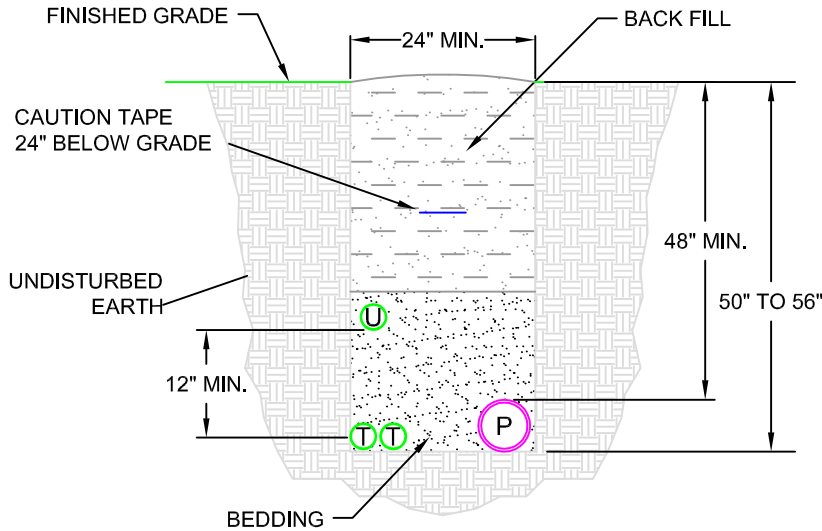
MTR-OH-SC

APR 2014

(Less than 100 HP)  
120/240, 120/208,  
277/480



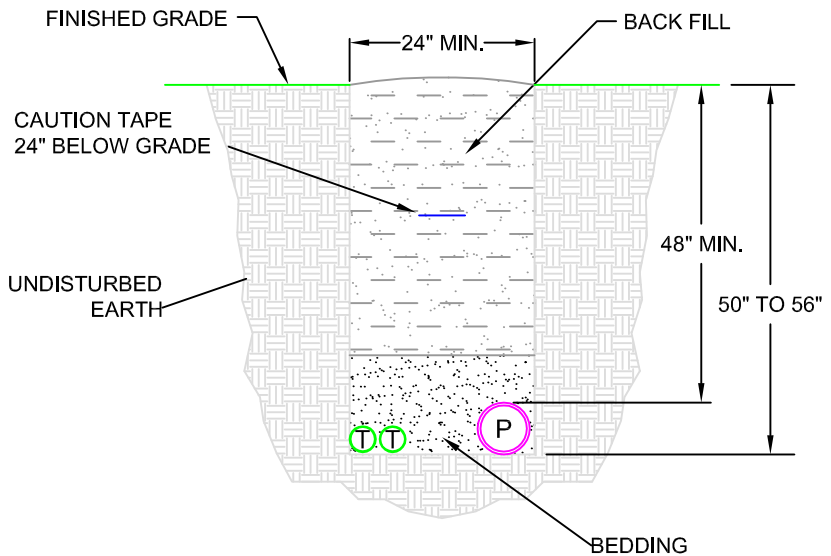
**TRENCH WITH PRIMARY AND WATER OR GAS UTILITY**









**NOTES:**

1. CLEAN FILL TO BE USED FOR A MINIMUM OF 12" ABOVE PRIMARY CONDUIT(S).
2. MINIMUM OF 12" OF CLEARANCE BETWEEN COMMUNICATION, GAS OR WATER AND UTILITY CONDUITS.
3. CONTACT ENGINEERING FOR CLEARANCES BETWEEN UTILITIES AT CROSSINGS.

**TRENCH WITH PRIMARY AND COMMUNICATIONS**



-  SAND OR CLEAN SOIL
-  UNDISTURBED EARTH
-  PRIMARY POWER
-  SECONDARY POWER
-  TELECOMMUNICATIONS
-  UTILITY(GAS,WATER,ETC)

**CONTACT THE ONE-CALL LOCATING SERVICES (811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.**

MINIMUM CLEARANCES SHOWN. BASED ON NESC 2007 OR STATE REQUIREMENTS.

NOT ALL POSSIBLE CLEARANCE SITUATIONS SHOWN.

NOT INCLUDED IN SERVICE & METER REQUIREMENT HANDBOOK.

**CLEARANCES - JOINT TRENCH**

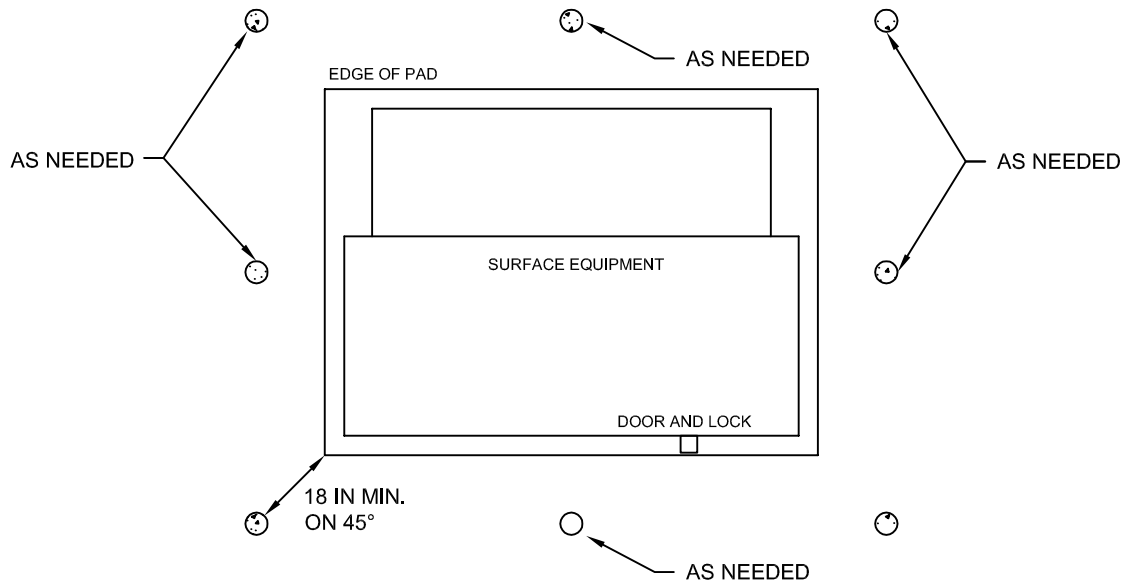
MTR-UG-CJT

MARCH 2014

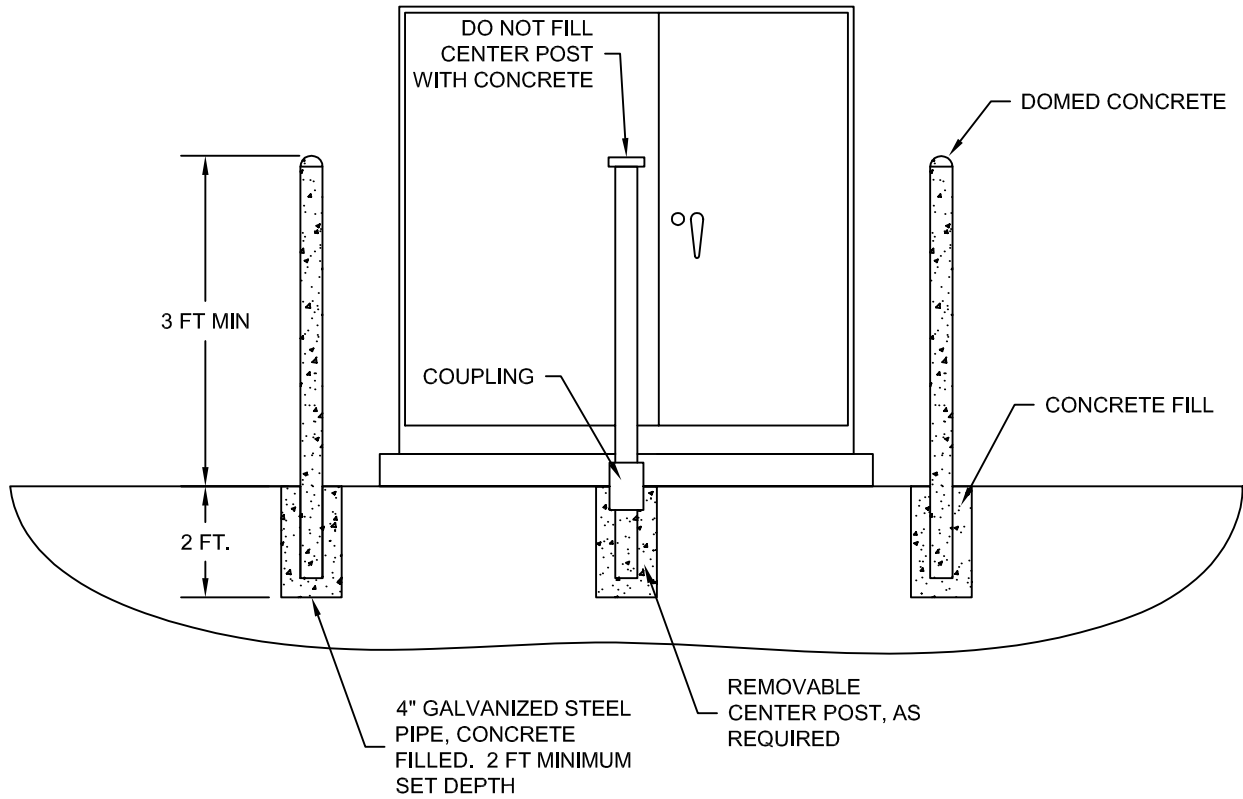
GENERAL  
INFORMATION







- NOTES:
1. NO MORE THAN 5 FT BETWEEN POSTS.



THE MEMBER WILL INSTALL BOLLARDS WHERE NECESSARY TO PROTECT ABOVE-GROUND EQUIPMENT

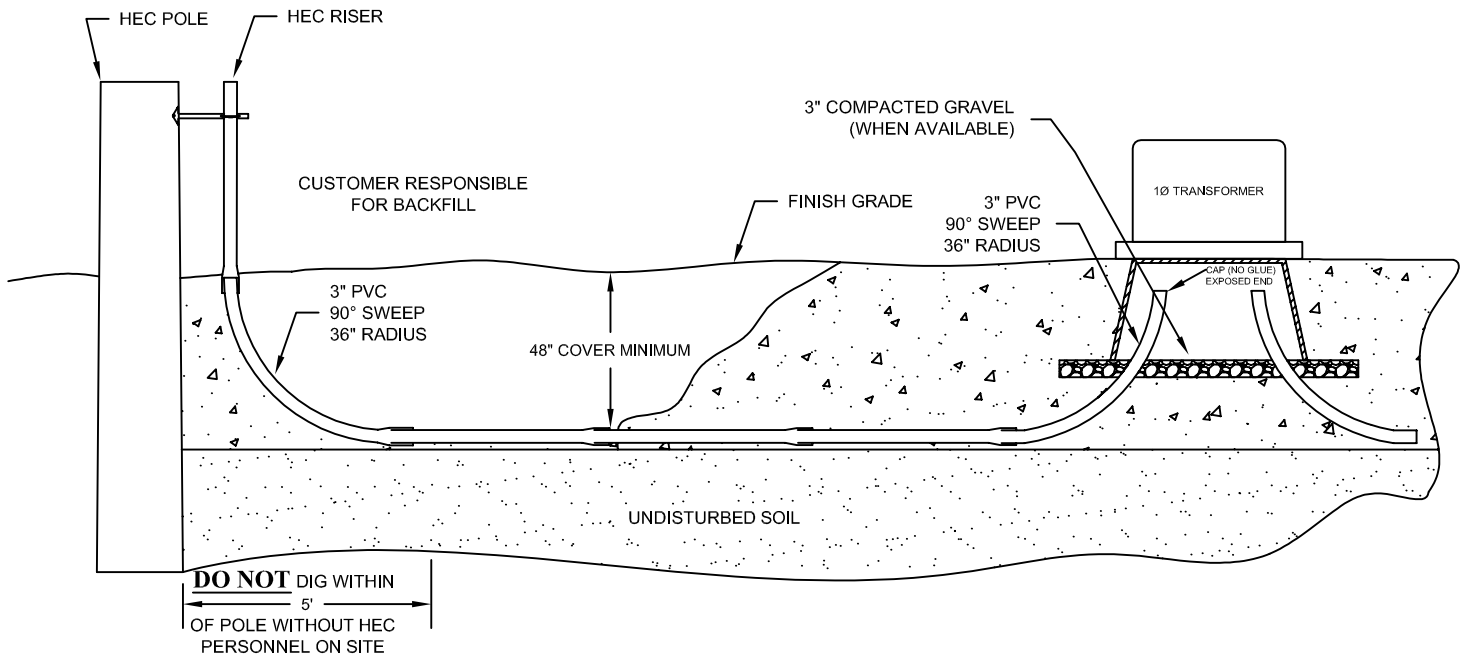
## PRIMARY EQUIPMENT - TRAFFIC BOLLARDS

MTR-UG-PB

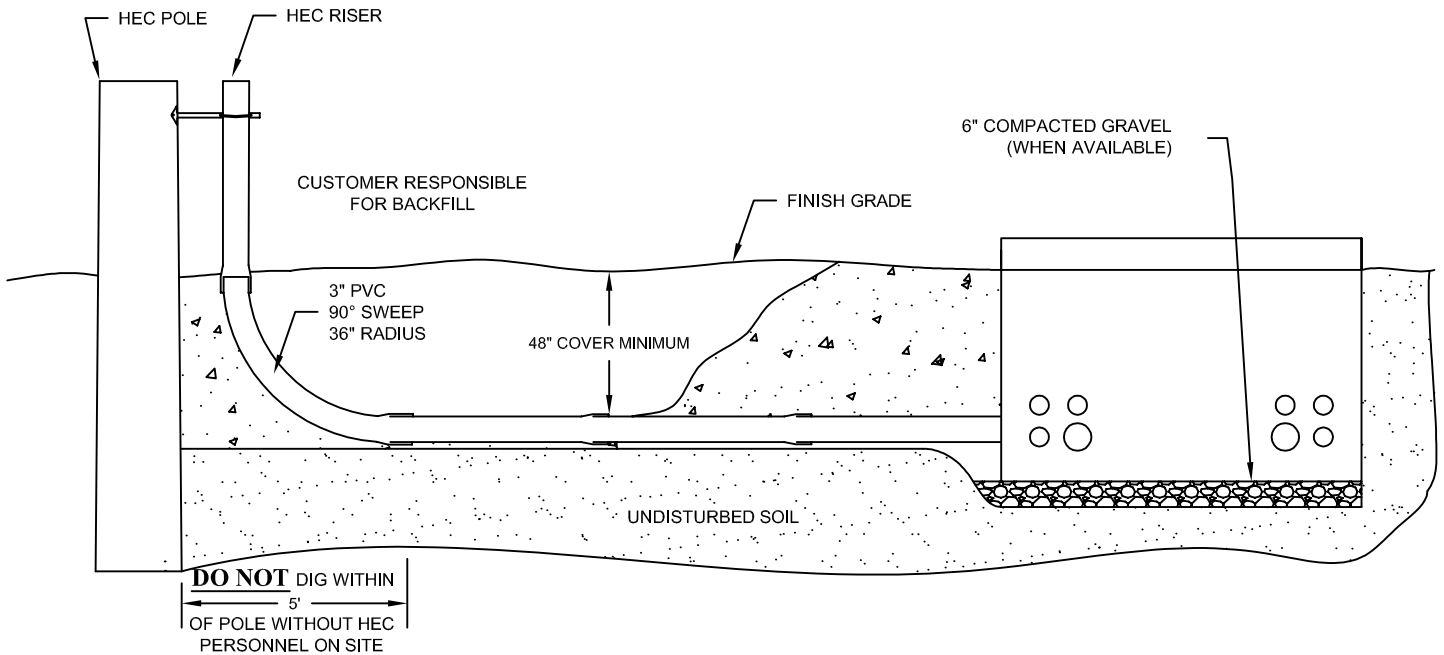
MARCH 2014

GENERAL INFORMATION





**CONTACT THE ONE-CALL LOCATING SERVICES (811)  
AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.**



ALL TRENCHES AND CONDUIT  
SUPPLIED BY MEMBERS ARE  
TO BE INSPECTED BY HEC  
PERSONNEL PRIOR TO  
BACKFILL.

## PRIMARY - TRENCH

MTR-UG-PT

MARCH 2014

GENERAL INFORMATION

