



Touchstone Energy® Cooperatives
The power of human connections®

Construction Handbook

*Guidelines and Information for
Members, Builders & Developers*

- SERVICE TERRITORY MAP
- GETTING STARTED
- PRE-CONSTRUCTION PLANNING
- PLANNING AN EXCAVATION
- TRENCHING
- METERING INSTALLATIONS
- COLORADO STATE ELECTRICAL INSPECTIONS

***FOR NEW SERVICES, UPGRADES, CONSTRUCTION PROJECTS, & LINE
EXTENSIONS CONTACT OUR PLANNING DEPARTMENT***

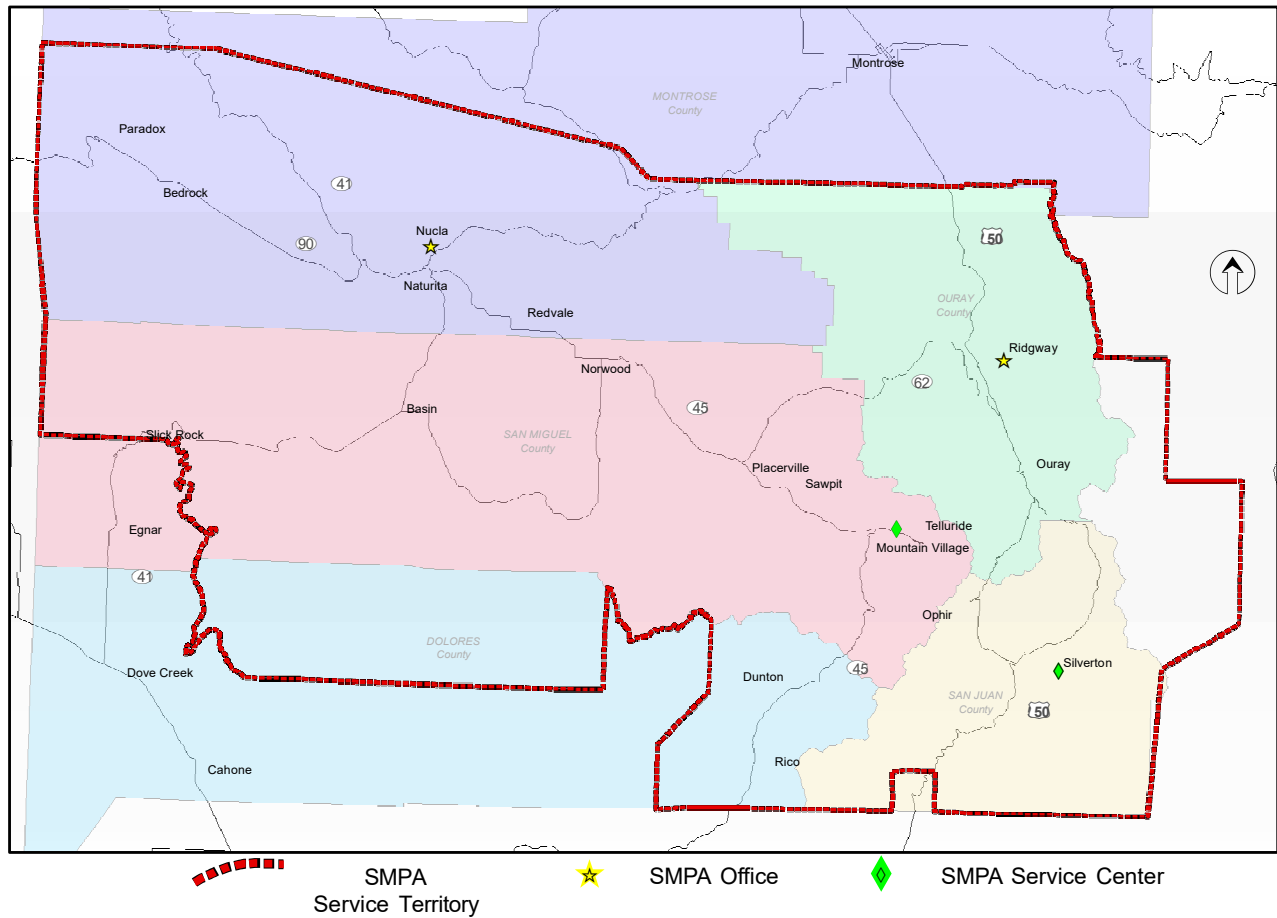
**Nucla Office
PO Box 817
Nucla, CO 81424
970-864-7311
970-864-7257 FAX**

**Ridgway Office
PO Box 1150
Ridgway, CO 81432
970-626-5549
970-626-5688 FAX**

This institution is an equal opportunity provider and employer.

ISSUE 2025

SAN MIGUEL POWER SERVICE AREA MAP



SMPA Offices are located in Nucla and Ridgway. SMPA also has a Service Center in Telluride and Silverton.

SMPA “Your Rural Electric Co-op”

San Miguel Power Association Inc., is a Rural Utilities Services not-for-profit cooperative owned by the members it serves. Consumers become members when they apply for and receive electric service. At present, there are 7 districts within SMPA’s service territory with one director elected from each district and serving on SMPA’s Board of Directors. The Board of Directors set the policies and direction of the Association.

SMPA supplies electric power to more than 15,000 consumers in all or parts of San Miguel, Ouray, Montrose, Dolores, San Juan, Hinsdale, and Mesa Counties. SMPA’s service area covers some of the most rugged terrain in America. SMPA members own more than 1500 miles of electric power lines with 9.64 consumers per mile of line.

GETTING STARTED

NEW CONSTRUCTION / UPGRADE ENGINEERING REQUEST FORM

A New Construction/Upgrade Engineering form **must** accompany every request for electrical service or project involving any of SMPA facilities. This form may be obtained from the Service Planning Coordinator, local SMPA office, or from www.smpa.com (Account Services, Start New Service). All information requested on the form must be provided to allow SMPA to prepare for your project. A completed form and Application for Service **MUST** be returned before any new service is installed.

COSTS AND PREPAYMENT

After SMPA has received a New Construction/Upgrade Engineering Form, an estimate will be provided to the applicant. The estimate is an approximation and may change based on actual project conditions and costs.

A non-refundable advance deposit (Engineering Service Fee) shall be received before an estimate is prepared and will be applied to the engineering cost of the new service.

The estimate will include labor, engineering, material and equipment costs, applicable fees (facility reinforcement), & other costs (re-vegetation, permitting, etc.).

The provisions in *SMPA's Service Connection and Line Extension Policy* require a deposit in the full amount of the estimated cost of the project be paid to SMPA **before** construction will be scheduled.

PLANS

Plans such as plats, site surveys and electrical drawings including loading data are needed on service requests. ***SMPA may require that plats, surveys, and site plans be submitted in electronic format before an estimate and utility plan is prepared.*** Design and associated cost can not be determined until proper planning information is received. If design changes occur after the estimate is completed or after facilities have been installed, service connection may be delayed and/or additional costs incurred.

Keep SMPA informed of any change in plans!

EASEMENTS AND PERMITS

- Easements and special use permits must be secured and conveyed to SMPA before construction begins.
- Development projects must include platted SMPA utility easements on site plans.
- Property pins must be in place before SMPA can begin the design process.
- Excavation permits are required in all incorporated towns and cities within SMPA's service territory.
- County permits are required for underground and overhead power line construction within county rights of way in Montrose, Ouray, and San Miguel counties.
- Power line construction within CDOT rights-of-way and on federal lands requires permits. SMPA will apply for CDOT and federal permits, while project developers must secure all other local permits before proceeding with construction.









UNDERGROUND POWER LINE INSTALLATION


Members and developers are responsible for all required trenching and excavating, bedding and/or shading, conduit, backfilling and site preparation costs for electrical facilities.

Planning a Power Line Installation?

Check with your local SMPA Service Planner first!

COLOR CODE
FOR MARKING
UNDERGROUND UTILITY LINES

	PROPOSED EXCAVATION
	TEMPORARY SURVEY MARKINGS
	ELECTRIC
	GAS, OIL, STEAM
	COMMUNICATION, CATV
	POTABLE WATER
	IRRIGATION, RECLAIMED WATER, SLURRY LINES
	SEWER



UNCC
UTILITY NOTIFICATION
CENTER OF COLORADO

3 Days Before You Dig:
Call: 1-800-922-1987
Click: www.UNCC.org

Before digging call 8.1.1 or 1-800-922-1987 for cable locates!

Homeowners often make risky assumptions about whether or not they should get their utility lines marked, but every digging job requires a call – even small projects like planting trees and shrubs.

The depth of utility lines varies and there may be multiple utility lines in a common area. Digging without calling can disrupt service to an entire neighborhood, harm you and those around you and potentially result in fines and repair costs.

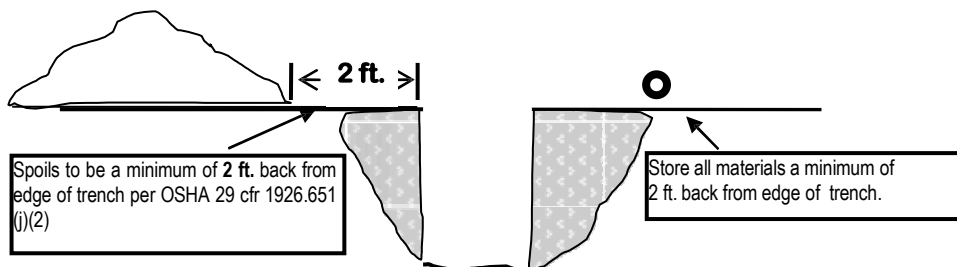
Calling 8-1-1 before every digging job gets your underground utility lines marked for free and helps prevent undesired consequences.

Please note the following:

SMPA employees will **not** enter trenches without proper spoil layback or shoring and any excavations where water accumulation hazards exist, or where employee protection requirements have not been met as required in the Code of Federal Regulations 29, Part 1926, Subpart P - Excavations.

OSHA 29 CFR 1926.651 (j)(1) and (2) require employees be protected from excavated or other materials, and equipment that could pose a hazard by falling or rolling into excavations. Protection must be provided by placing and keeping such materials and equipment at least 2 feet from the edge of excavations [see drawing below], or by the use of retaining devices, or both, if necessary.

OSHA 29 CFR 1926.651 (h)(1), (2) and (3) require employees be protected from the hazards associated with water accumulation in excavations. OSHA 29 CFR 1926.652 contains requirements for protective systems.



UNDERGROUND ELECTRICAL FACILITIES

Electrical facilities such as transformers and pedestals shall be located per SMPA design. Final grades need to be established prior to cable installation. Lot corners must be marked prior to trenching. Facilities should be slightly above road grade to provide drainage away from equipment. If different utilities use the same site, proper clearance between the different equipment installed must be maintained.

ELECTRICAL FACILITY SITE PREPARATION

Site preparation is required for installation of electrical equipment. The contractor/member/developer is required to provide a trench from the SMPA power source to the equipment site. The site must be leveled and prepared for the equipment to be installed. Transformer and “j-box” vaults are to be installed on undisturbed soil, not on trenching backfill. Around all sites, backfill material will be free of rocks and other unsuitable material. If settling does occur, excavator (contractor) will be responsible for repair.

TRENCHING REQUIREMENTS

SMPA allows joint use trenches for the installation of buried cables provided that there is adequate clearance from other buried utilities and facilities. See the table on page 6 for minimum clearance requirements.

SMPA will not install cable until after “deep” utilities are installed. If the trench is located along the edge of roadways, the road must be within 6” of final grade. Lot corners and easement lines must be surveyed and staked prior to trenching. SMPA requires above-ground facilities be installed as required for grounding purposes.

Access for SMPA’s line trucks must be provided alongside trenches for high-voltage cable.

TRENCH DEPTHS

Proper trenching depths must be maintained.

Trench depth for high-voltage cable is 40 inches deep (from finished grade to top of conduit).

** Maximum depth of 48 inches*

Trench depth for secondary cable is 30 inches deep (from finished grade to top of conduit).

** Maximum depth of 48 inches*

Clearances from other utility lines and buried facilities must be maintained. (See table on page 6) Trench depth must be maintained when crossing drainages and culverts. The trench should follow the contours of the grade while maintaining proper depth. Cutting or filling of the areas to be trenched should take place prior to trenching.

In some instances SMPA may allow a variance from the required trench depth. You must see your local SMPA Service Planner for approval of a depth variance.

MINIMUM HORIZONTAL CLEARANCE FROM OTHER UTILITIES

(measured from edge to edge of cables, conduits, gas, sewer and water lines)

SMPA requires that electric lines **not** be located directly over water or sewer lines but be offset horizontally. SMPA requires that gas, telephone and CATV lines **not** be located directly over electric lines but be offset horizontally. In situation where utilities must cross, a perpendicular crossing with at least 12" vertical clearance is required.

Distance from:	Min. Clearance	Distance from:	Min. Clearance
Gas Line	36"	Telephone	12"
High Pressure Gas Line	60"	CATV	12"
Water Line	36"	Sewer Line	36"

TRENCH BEDDING and COMPACTION

Trenches should be free of rocks prior to laying under-bedding. All trenches need to be smooth bottomed. Access for SMPA's line trucks must be provided alongside trenches for high-voltage cable.

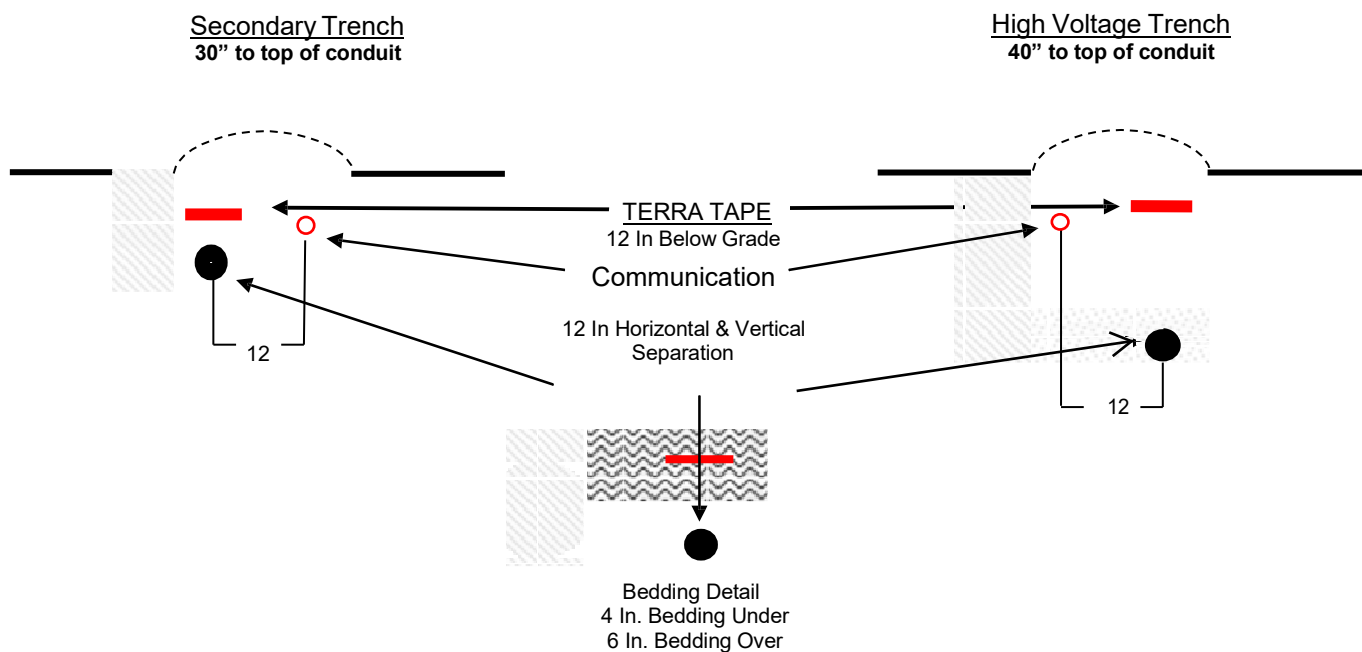
Where bedding is required, 4" will be placed under the conduit or SMPA facilities. After installation, 6" of bedding material will be placed over the conduit/SMPA facilities. Suitable bedding material is defined as soft soil or sand free of rocks or other abrasive objects greater than 1/2" in diameter. Mine tailings are not allowed. The bedding of the conduit or SMPA facilities must be inspected by SMPA prior to backfilling of the trench.

SMPA will supply red terra tape to be installed 1 foot below the surface over the buried conduit or SMPA facilities

Terra tape is to be used ONLY for power line installations.

Trenches will be compacted after backfilling. Compaction is not allowed until 24" of backfill has been placed over conduit. Care must be taken to not allow equipment to damage cable by driving over it or by falling onto it in the trench.

TYPICAL TRENCH DETAIL



CONDUIT INSTALLATION and REQUIREMENTS

Conduit type and size will be specified by SMPA. All conduit runs must be inspected and approved by SMPA before they can be buried. All conduit installations must be clean and dry with pull string installed (min 250lb breaking strength). **Pipe proofing may be required.** The use of sweeping Galvanized Rigid Conduit elbows may be required at vaults or other locations when specified by SMPA. ***The excavation contractor or member will be responsible for the viability of the duct bank until SMPA acquires ownership of the facilities, regardless of inspection approvals.***

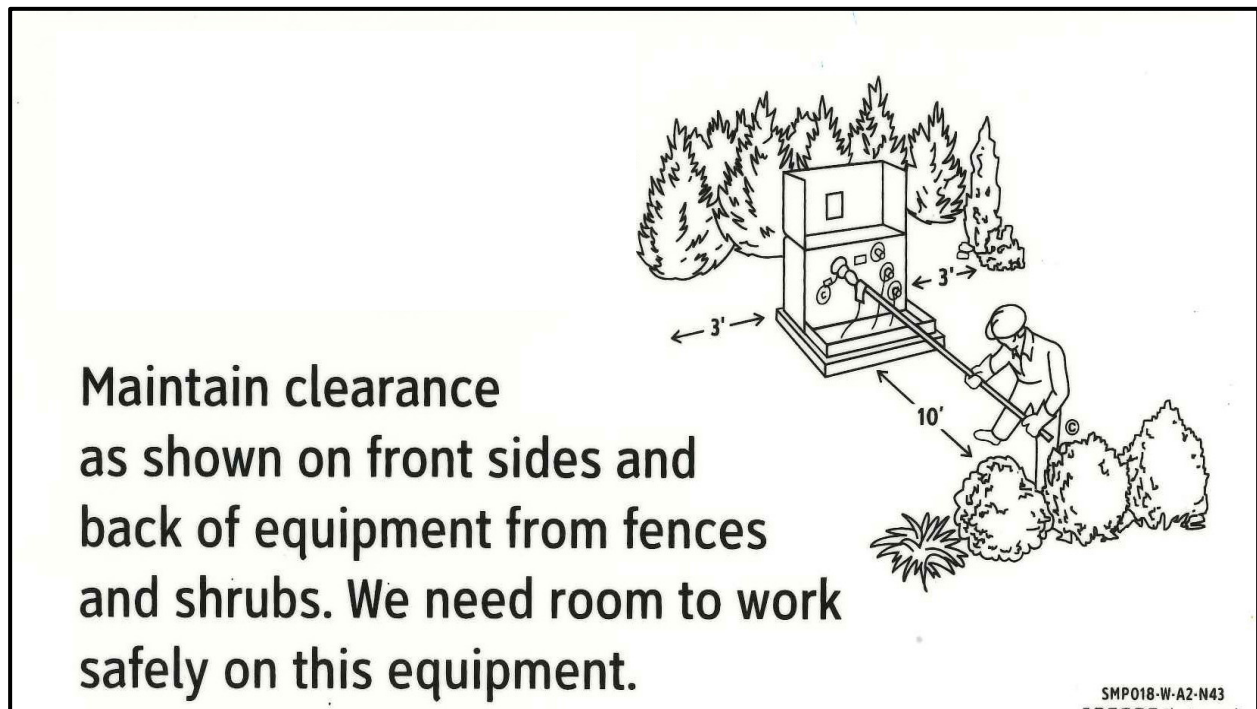
***CONDUIT/ DITCH INSPECTIONS CAN BE SCHEDULED BY CALLING YOUR SERVICE COORDINATOR (This will be listed on your construction estimate provided by the SERVICE PLANNER) INSPECTIONS WILL TAKE PLACE WITHIN 48 HOURS OF NOTIFICATION (DURING REGULAR BUSINESS HOURS)**

Conduit will be required on all underground installations. Conduit type will be electrical grade PVC schedule 40 as specified by SMPA. Service entrance “risers” will be Sch 80 PVC in accordance with the NEC (*National Electrical Code*). **Conduit size will be 2.5", 4", or 6" as specified by SMPA.** Conduit will be provided by the builder or developer. **SMPA will provide conduit for purchase by appointment only.**

Expansion joints used at service entrances can **not** be rocked or mortared in; they must be visible and able to move.

Conduit will **not** be routed under buildings.

Please maintain clearances from SMPA facilities



PERMANENT METERING INSTALLATIONS

All new and upgraded electrical services shall be approved by the State Electrical Inspector or other local authority having jurisdiction. Your assigned inspection number must be provided to SMPA prior to energizing the meter.

Electrical Inspection Contacts:

Electrical Inspection: 303-869-3459 (Montrose/Ouray/San Miguel County)

The Mountain Village / Telluride: 970-728-3923 (Building Department)

Silverton / San Juan County: 303-869-3461

Online: www.dpo.colorado.gov

All metering installations, including the location, need prior approval by SMPA. Meters shall be located, when practical, on the exterior wall **closest to the nearest source of power** of the premises being served. Meter locations shall be located on the gable ends of residences, when practical, or should be protected from snow and ice shedding from roofs. Meter pedestals are allowed for front lot locations & meter locations not located on the exterior wall of the premises.

*Meter location shall be such that the meters are easily accessible for reading, testing, and servicing, and shall not be located in locked areas except with express permission of the Association.
(SMPA General Rules & Regulations)*

(See page 14 for typical meter installation details)

480 Volt Services: All 480V services under 400 amps require a non-fused, cold sequence disconnect switch with provisions for an SMPA padlock. This shall be installed on the source side of each 277/480V self contained meter as described above. 120/208V and 120/240V self-contained metering (400amp and smaller) shall require a disconnect adjacent to the meter on the exterior of the building.

Meter base cable lugs must be rated for installed cable size.

Meters shall be located in accordance with accepted safe practice. Meter locations shall have the appropriate NEC working space clearance minimums for width and depth and must remain free of obstructions SMPA requires 7' of headroom. Meter rooms shall have SMPA authorization.

All 320 amp services must include a lever bypass in the meter socket.

Multi-meter stacks will have an embossed tag at each meter socket (attached to a non-removable portion of the meter base) with the unit designation on the tag. SMPA shall pre-approve embossed tag labeling.

SMPA will deny connection of a multi-metered service until unit designation tags are affixed.

All meters fed by three-phase 208 volt transformers must have fifth-jaw meter sockets with the fifth-jaw being in the 9 o'clock position.

All current transformer (CT) metering applications require prior approval by SMPA.

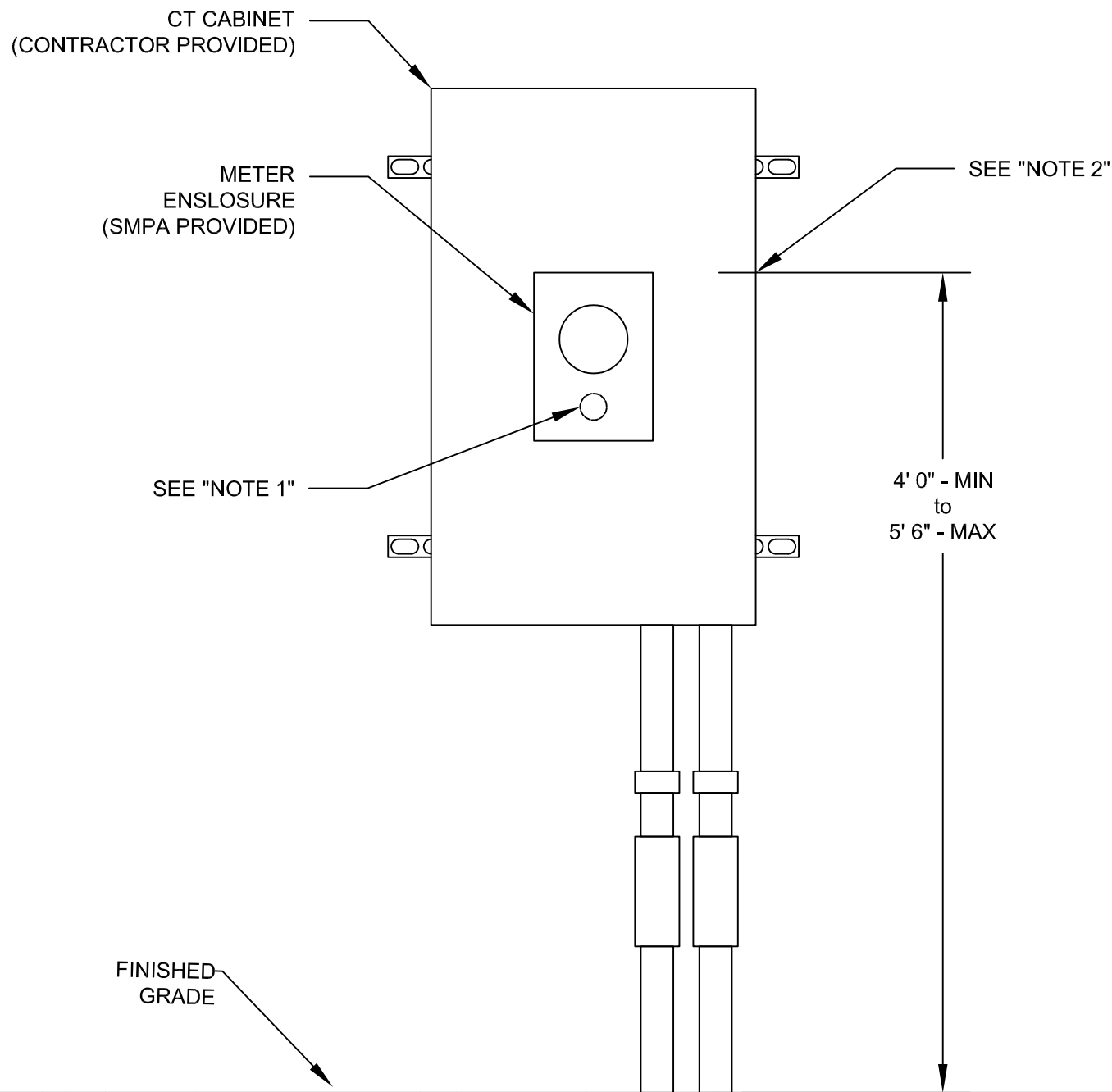
The CT enclosure (CT "can") for 400, 600, 800 and 1000 amp, single or three-phase services will be purchased from Consolidated Electrical Distributors (CED) (910 N GRAND AVE, MONTROSE CO, 81401) or approved by SMPA. The meter bases for CT metering must be purchased from SMPA.

Exceptions may be granted, subject to review and approval of SMPA, for certain switchgear equipped with provisions for CT metering.

The location of multi-metered switchgear and meter rooms located within large commercial building must be approved by SMPA. SMPA requires multi-metered switchgear and meter rooms be located on the inside of the exterior wall adjacent to the transformer location.

NOTES:

- 1. CONTRACTOR TO DRILL 1" HOLE IN DOOR OF CT CABINET TO ALLOW FOR CT WIRING. THIS SHALL LINE UP WITH APPROPRIATE KNOCKOUT ON METER ENCLOSURE. CONDUIT PASS-THROUGH TO BE INSTALLED WITH APPROPRIATE PULL BUSHINGS TO PREVENT DAMAGE TO WIRING.
- 2. TOP OF METER ENCLOSURE SHALL BE 4' 0" (MIN) TO 5' 6" (MAX) FROM FINISHED GRADE



0	4/28/2025	UPDATES FOR CONSTRUCTION HANDBOOK	MAT
REV:	DATE:	DESCRIPTION:	DRAWN:

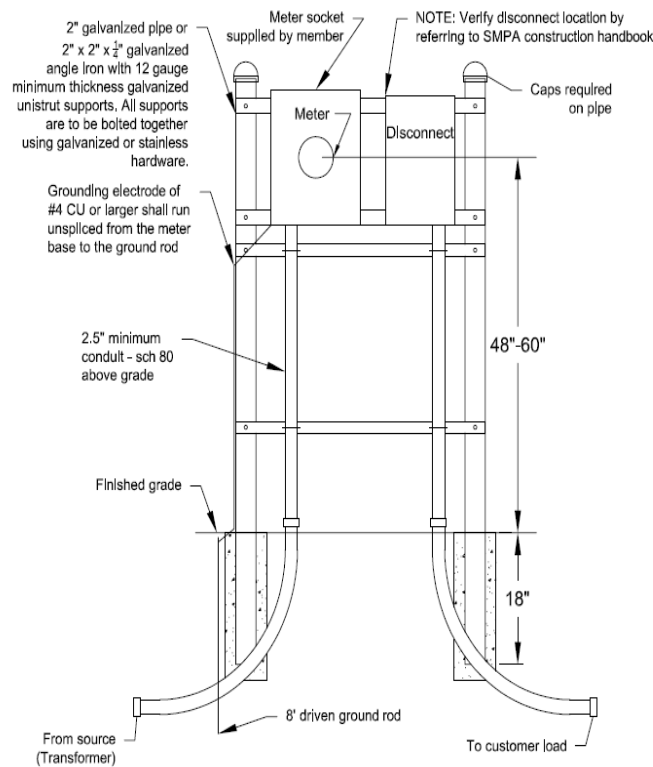
TYPICAL CT CABINET
METER INSTALLATION



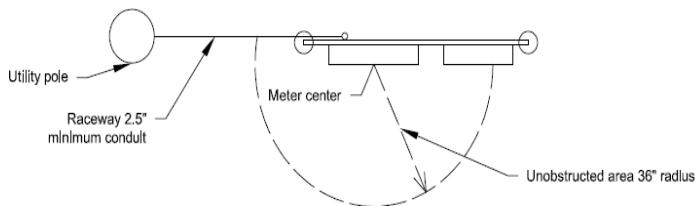
CT-100	0
--------	---

Notes:


- Be sure to call One Call before digging or opening ditches: 811 or 1-800-922-1987
 - Underground Inspection: (970) 864-7311 x1270
1. SMPA will furnish and install the following materials at the service pole:
 - A. Conduit up the service pole, to include all related hardware.
 - B. Where junction box (not shown) is present at the service pole, see an SMPA engineering representative for specifications.
 2. Member will open ditch from service pole or junction box to meter location with the following specifications:
 - A. See an SMPA engineering representative prior to opening ditch.
 - B. Hand-dig ditch when within 5 ft. of transformer.
 - C. Depth sufficient to bed conduit with service conductors 30 in. below final grade.
 - D. Where impractical to obtain 30 in. depth, see an SMPA engineering representative.
 - E. Member will backfill ditch after inspection by SMPA. Call (970) 864-7311 x1270.
 3. Continuous raceway from transformer to meter base will be furnished and installed by member to the following specifications:
 - A. Conduit size is to be 2.5 in. or 4 in. as specified below with appropriate fittings and/or bushings as required. For all conduit connections use long, integral belled end conduit.
 - B. Raceway between elbows is to be schedule 40 electrical PVC or schedule 80 electrical PVC conduit.
 - C. Elbows are to be schedule 80 electrical PVC with a sweeping radius of 24 inches.
 - D. Conduit extending from meter base to one foot below grade is to be schedule 80 electrical PVC.
 - E. A polyvinyl, non-rot or mildew proof, pull string with a minimum breaking strength of 250 pounds is to be installed inside the raceway.
 - F. Under certain loading and/or density conditions, an alternate sized conduit may be used with the approval of an SMPA engineering representative.
 4. The bottom of a weatherproof, UL listed, multi-circuit disconnect shall be located no less than 2 ft. above grade.
 5. For information about conductors, conduit and grounding, refer to the National Electric Code.
 6. See the SMPA Construction Handbook for additional metering information.



ELEVATION VIEW
(Not to Scale)



PLAN VIEW
(Not to Scale)

0	1/8/2019	UPDATE REVISION	MAT
REV:	DATE:	DESCRIPTION:	DRAWN:
FREE STANDING METER CENTER			 SAN MIGUEL POWER ASSOCIATION
FSMC-2			0

HARMONIC MITIGATION EQUIPMENT

Each member requesting electric service from SMPA is responsible for limiting the harmonic current distortion levels at their delivery point to the levels prescribed in *IEEE Standard 519-2014*. The member will limit harmonic current injection to the levels shown in the tables below, taken from *IEEE Standard 519-2014*.

SMPA will work with members to provide information on limiting harmonic distortion. SMPA reserves the right to measure harmonic distortion at the delivery point and to require remediation of harmonic distortion to acceptable levels as described above.

Table 1 – Voltage Distortion Limits		
Bus Voltage V at PCC	Individual Harmonic (%)	Total Harmonic Distortion THD (%)
$V \leq 1.0$ kV	5.0	8.0
$1 \text{ kV} < V \leq 69$ kV	3.0	5.0
$69 \text{ kV} < V \leq 161$ kV	1.5	2.5
$161 \text{ kV} < V$	1.0	1.5 ^a

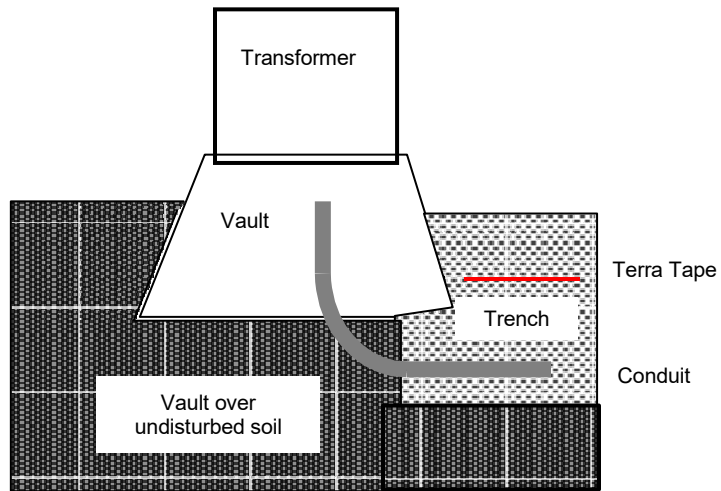
Table 2 – Maximum Harmonic Current Distortion in Percent of I_L						
Individual Harmonic Order (odd harmonics)						
I_{sc}/I_L	$3 \leq h < 11$	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h < 50$	TDD
$< 20^c$	4.0	2.0	1.5	0.6	0.3	5.0
$20 < 50$	7.0	3.5	2.5	1.0	0.5	8.0
$50 < 100$	10.0	4.5	4.0	1.5	0.7	12.0
$100 < 1000$	12.0	5.5	5.0	2.0	1.0	15.0
> 1000	15.0	7.0	6.0	2.5	1.4	20.0

SOFT STARTING EQUIPMENT

“Soft Starting” equipment is required for all single-phase motors 10 horsepower (10 hp.) or greater in size, “Soft Starting” equipment is required for all three-phase motors 30 horsepower (30 hp.) or greater in size. This is required to prevent new motor loads from introducing “start-up flicker” into SMPA’s system. Variable frequency drives will be evaluated for the amount of harmonics they introduce into SMPA’s system. If the amount of harmonic levels introduced exceed the recommended limit, SMPA will require the member to correct the problem.

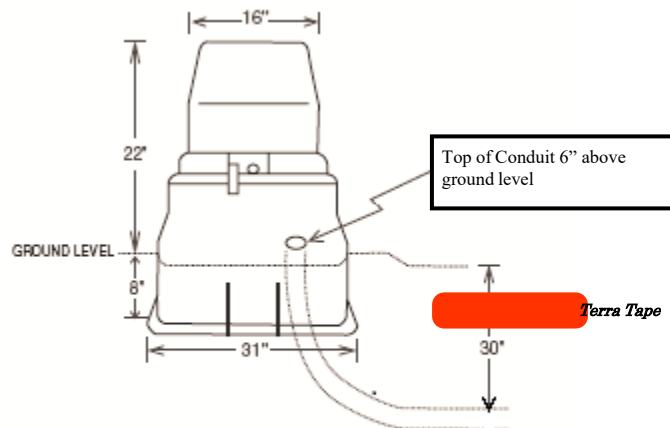
-----CONTINUED ON NEXT PAGE-----

TYPICAL PAD-MOUNT TRANSFORMER INSTALLATION

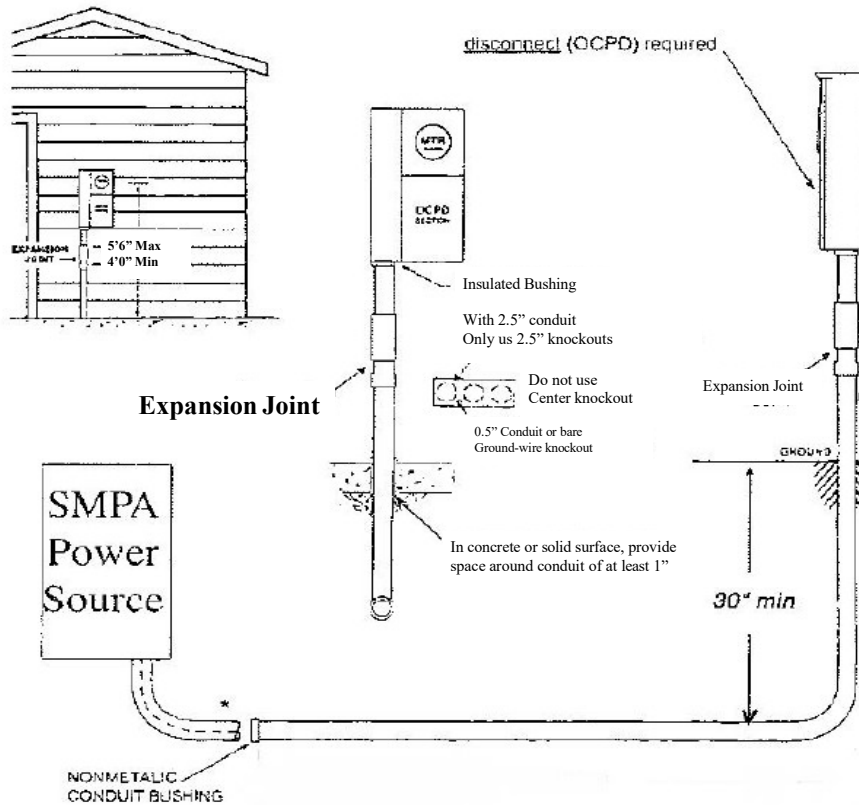


Please call **970-864-7311 x 1270** to schedule ditch inspection and/or supervised access into SMPA facilities for conduit installation.

Typical Secondary Pedestal Installation



Typical Residential Underground Service



Member furnished meter and service equipment with outside disconnect adjacent to meter.

Riser: PVC Sch 80 (Member furnished) **Sized per SMPA**

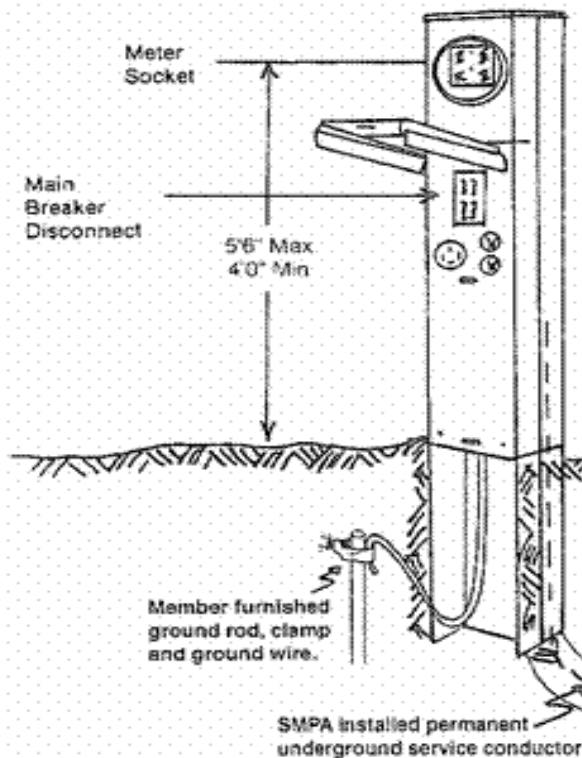
Member to provide trench and conduit for URD service conductor.

Expansion joint required at riser.

Service Conduit sized per SMPA.

New service installations will be in accordance to the current NEC and will require Colorado State Electrical inspection and release number before connection by SMPA.

NO enclosures around meter bases



Typical Permanent Underground Meter Pedestal

Member furnished meter base/pedestal, disconnect and protective devices and receptacles.

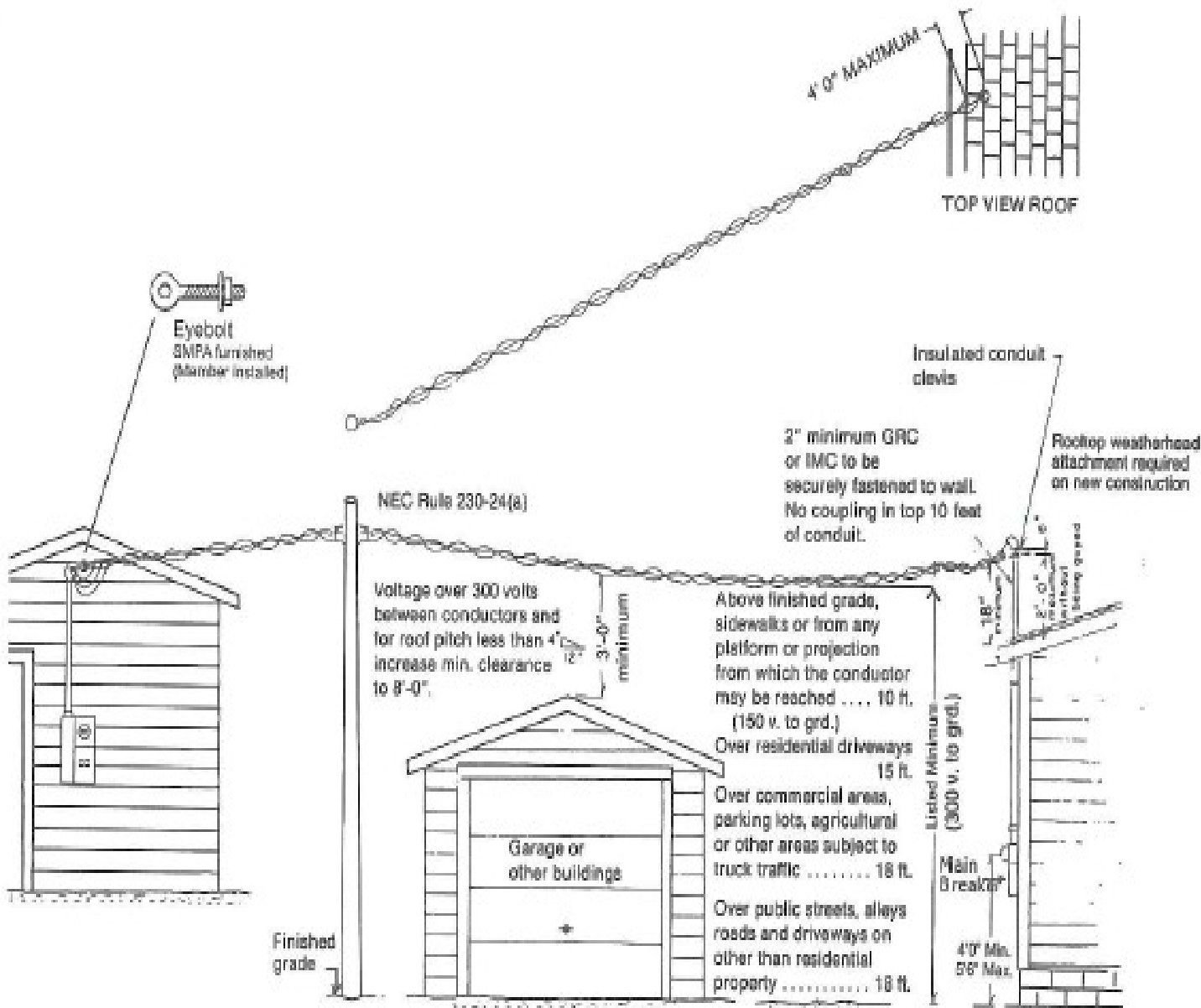
Permanent meter pedestals will be a fully enclosed, all-metal type enclosure. **Wooden posts with mounted meter bases are not acceptable.**

Member to provide trench and conduit for permanent underground service cable.

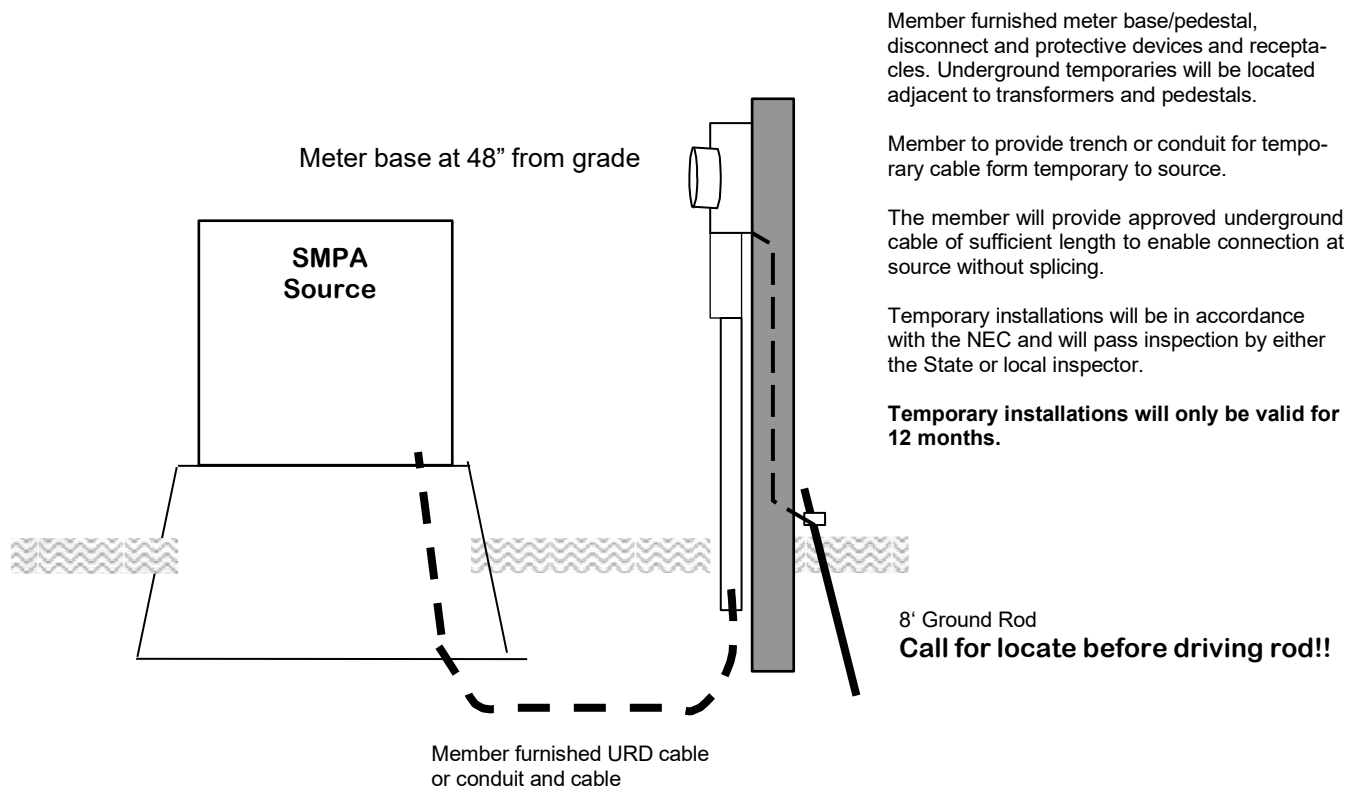
Cable to be installed by SMPA.

New service installations will be in accordance to the current NEC and will require Colorado State Electrical inspection and release number before connection by SM

Typical Overhead Service



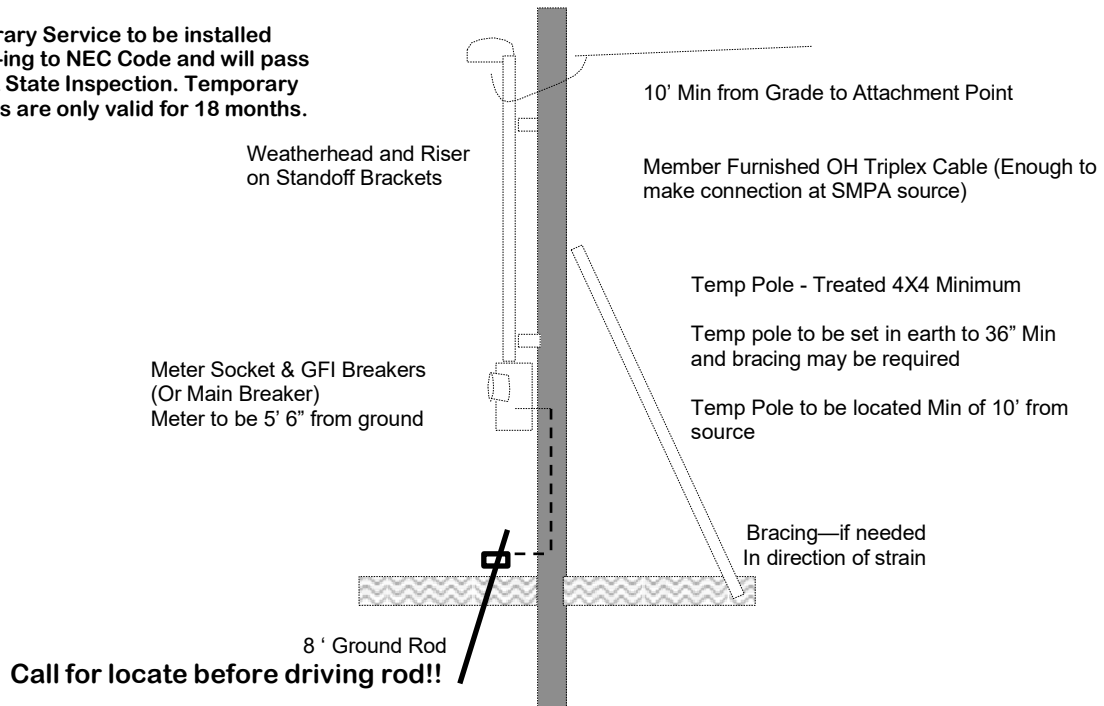
TYPICAL UNDERGROUND TEMPORARY SERVICE



Temporary meter pedestals shall be mounted on **treated 4"x4" wooden post**. The member/electrician will furnish the underground cable, enough cable being provided to reach the transformer/pedestal connection lugs. SMPA will not supply or splice additional cable for the temporary service. The temporary service will be located adjacent to the SMPA power source. Call or see your service planner for locating the temporary service.

TYPICAL OVERHEAD TEMPORARY SERVICE

Temporary Service to be installed according to NEC Code and will pass current State Inspection. Temporary services are only valid for 18 months.



Call or see your Service Planner about
 Locating the Temporary Service and Clearances