2024

Single Family Residence Underground Service

TNMP™

Texas-New Mexico Power

10/30/2024

Single Family Residence Underground Service

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Do Commercial Specs Apply to Our Project?

Commercial specs (i.e., commercial-grade wiring, transformers, or breakers) are generally required when the projected load requirements exceed normal residential limits, such as large homes with pools, home-based businesses (e.g., a commercial kitchen or workshop), or commercial businesses (e.g., grocery stores or warehouses).

Residential buildings typically use standard residential electrical specifications, but certain conditions may require commercial-grade electrical specifications for new residential construction. These conditions can include:

1. **Large Load Demand**: If the building will have high electrical load demands, such as for large HVAC systems, multiple electric vehicle (EV) charging stations, or other high-power-consuming equipment, commercial-grade equipment may be required to handle the increased capacity.

2. **Mixed-Use Development**: If the building is part of a mixed-use development where there are both residential and commercial spaces (e.g., a residential unit above a retail store), commercial electrical standards might be applied to the entire structure or parts of it.

3. **Multifamily Residences**: Larger multifamily buildings, like apartment complexes, may require commercial electrical specifications due to the size and complexity of the electrical system needed to serve multiple units.

4. **Backup Generators or Solar Systems**: If the residence will have a backup generator, solar panel systems, or energy storage systems that integrate into the grid, commercial-grade specifications might be needed to ensure safety and compatibility with grid infrastructure.

5. **Zoning and Local Codes**: Local zoning laws or building codes may dictate the use of commercial-grade electrical components in certain residential developments, especially in high-density or urban areas.

6. **Building Size and Complexity**: For very large custom homes or luxury residences that are significantly larger or more complex than typical homes, commercial electrical standards might be applied to meet the increased needs for safety, power distribution, and capacity.

If any of the above conditions pertain to you, please see the Commercial and Apartment Complex Services document.

Underground Meter Loop Information

What is a “Meter Loop”?

A **meter loop** is the complete electrical assembly that connects the power company's service line to a building's electrical system. It typically includes the meter socket where the meter is placed, a weatherproof enclosure, conduit, and wiring necessary to safely route electricity from the utility’s underground power source to the service panel.

The meter loop is installed by the property owner’s electrical contractor and is inspected by TNMP before connecting to the grid. The meter loop ensures that the utility can measure electricity usage and protect the electrical system with proper grounding. In underground service setups, the conduit is typically buried, and the meter loop connects to a junction box or transformer near the property.

The **National Electrical Safety Code** (NESC) is a set of safety standards for the installation, operation, and maintenance of electrical power and communication systems in the United States. The NESC covers power lines, substations, electrical equipment, and communication lines, ensuring that electrical infrastructure is installed and maintained safely to protect workers and the public from hazards.

Underground Meter Loop Installation Requirements

Meter Location

Meter locations shall be approved by a TNMP representative. Meter bases should be located so that they are readily accessible, relatively free from possible mechanical injury, and available to the closest preferred serviced source as designated by a TNMP representative.

Mounting height of meter base must have a mounting height of not less than 4 and not more than 6 ft. from the center of the can to final grade.

Underground Service Checklist

1) ___ Ditch must be a minimum of 3 ft from the TOP of the conduit to the ground level at all times. If a 3 ft. clearance is not possible, contact a TNMP representative.

2) ___ All in-ground conduit must be a minimum of 3-inch GRAY schedule 40.

3) ___ Above-ground conduit on the customer end must be GRAY schedule 80 or GALVANIZED running from ground level to meter can.

4) ___ For primary, all turns must have a 48-inch min radius GRAY LONG SWEEPING 90's. For service, all turns must have a min 36-inch radius gray long sweeping 90's.

5) ___ There may be no more than 3 turns including up the pole and on the house. If the layout requires more than 3 turns, contact a TNMP engineering designer.

6) ___ The customer must provide a pull string running inside the conduit from the pole to the structure.

7) ___ The center of the meter socket must be located between 5 and 6 ft. above the final grade.

8) ___ The meter socket must be an approved underground-only meter socket and NOT a universal or modified overhead meter socket.

9) ___ When facing the meter socket, the conduit must enter the meter socket through the bottom LEFT side. See figure MS-2-5.0 underground socket.

10) ___ The conduit entering the bottom of the meter socket must be threaded and secured with 2 locknuts and plastic conduit bushing. See figure UG-9-6.

11) ___ Wires entering the customer's structure MUST NOT cross TNMP wires coming into or out of the meter socket.

12) ___ ALL Services should have a main breaker outside of the building next to the meter socket, in accordance with local authority.

13) ___ All meter loops must have an approved ground rod attached.

14) ___ Consult local TNMP representative for the location of the sweeping 90 located at the pole.

Texas-New Mexico Power

Requirements:

CALL 1-800-DIGTESS 48 hours before digging

- Location: Side of structure 5 ft. from front corner or as determined by TNMP representative
- Meter can (supplied by the customer or contractor) has a mounting height of not less than 4’ and not more than 6’ from center of can to final grade. The service wire is owned and installed to the meter by TNMP.
- Wild leg conductor must be wired to right side terminal on 3-phase installation. This type of system provides both three-phase and single-phase power.
- Conduit shall be rigid plastic, with Schedule 40 wall thickness for underground and Schedule 80 for above-ground conduit.
- Crossing of line and load wires is not permitted. **Line wires** carry incoming power from the utility or breaker panel to a device or circuit. These wires are connected directly to the power supply and bring electricity into the system. **Load wires** carry power out from a switch or breaker to the connected electrical devices or equipment. These wires deliver electricity to the "load," i.e., the equipment that uses the power (such as lights, appliances, or outlets).
- The meter location and service source must be prior approved by TNMP.
- All services are required to have an outside disconnect device. Disconnect device must be located immediately to the right of underground meter sockets to avoid line and load wires crossing inside meter socket.
- The **National Electrical Safety Code** (NESC) is a set of safety standards for the installation, operation, and maintenance of electrical power and communication systems in the United States. The NESC covers power lines, substations, electrical equipment, and communication lines, ensuring that electrical infrastructure is installed and maintained safely to protect workers and the public from hazards.
- All requirements meet NESC and are subject to NESC changes as they occur. Any changes from the above requirements are subject to approval by TNMP representative based on TNMP construction standards. Local Municipalities may have additional codes or requirements.
- If you are going to have more than 1 electrical main connected to the meter base or it is your intention to provide electricity to a shop or outbuilding from this meter in the future, then you may need to install a 320-amp meter base. The connection lugs on a standard 200-amp residential meter base are not rated for connection 2 cables. A 320-amp meter

base is rated for connecting 2 or more cables. TNMP will not allow you to connect 2 cables under one lug on a standard 200-amp meter base in the future.

Service Entrance Conductors

Service entrance conductors are the wires that connect electrical power from the utility company's distribution system to the home's electrical panel. The service entrance conductors are owned and installed by TNMP.

Grounding

1. All grounding shall comply with the National Electric Code.
1. The ground electrode conductors may originate in the meter base or the customer's service equipment panel (not required in both locations).
2. The grounding electrode conductor shall be sized according to the following table:

Size of Largest Service-Entrance Conductor or Equivalent Area for Parallel Conductors		Size of Grounding Electrode Conductor	
Copper	Aluminum or Copper-Clad Aluminum	Copper	Aluminum or Copper-Clad Aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 2/0	6	4
2/0 or 3/0	4/0 or 250 kcmil	4	2
Over 3/0 thru 350 kcmil	Over 250 kcmil thru 500 kcmil	2	1/0
Over 350 kcmil thru 600 kcmil	Over 500 kcmil thru 900 kcmil	1/0	3/0
Over 600 kcmil thru 1100 kcmil	Over 900 kcmil thru 1750 kcmil	2/0	4/0
Over 1100 kcmil	Over 1750 kcmil	3/0	250 kcmil

3. The grounding electrode shall be a rod or pipe no less than 8 ft. in length made of 3/4" or larger galvanized iron pipe, 1/2" or larger Copperweld rod, or 5/8" or larger iron or steel rod.

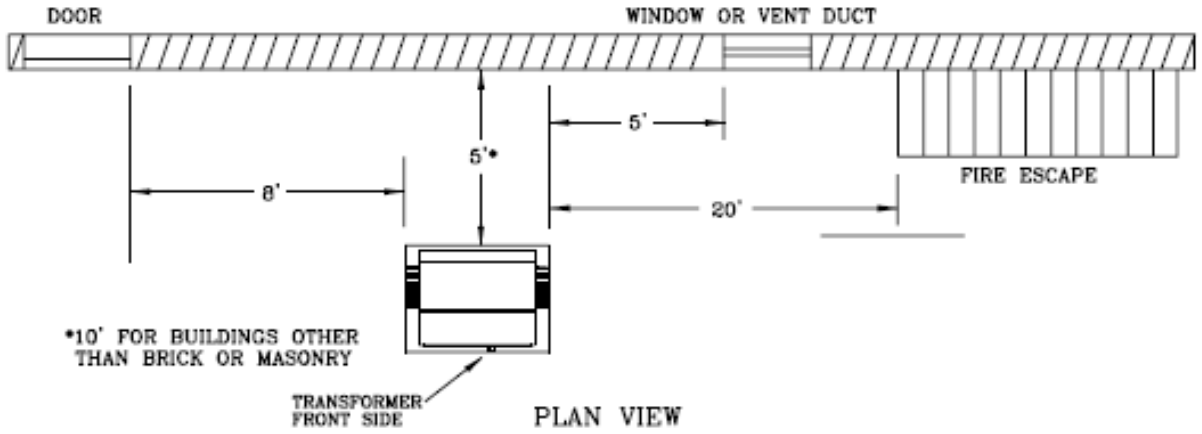
Service Conduit

1. Service conduit is furnished and installed by the customer at customer's expense. Ownership of the conduit is accepted by TNMP, and any repairs needed after the initial installation will be made by TNMP.
2. Conduit size, number of elbows, and radius of elbows will be determined by a TNMP representative.
3. TNMP must approve the conduit installation before backfilling the trench.
4. Warning tape should be installed by the customer in the ditch approximately 1 'below grade.

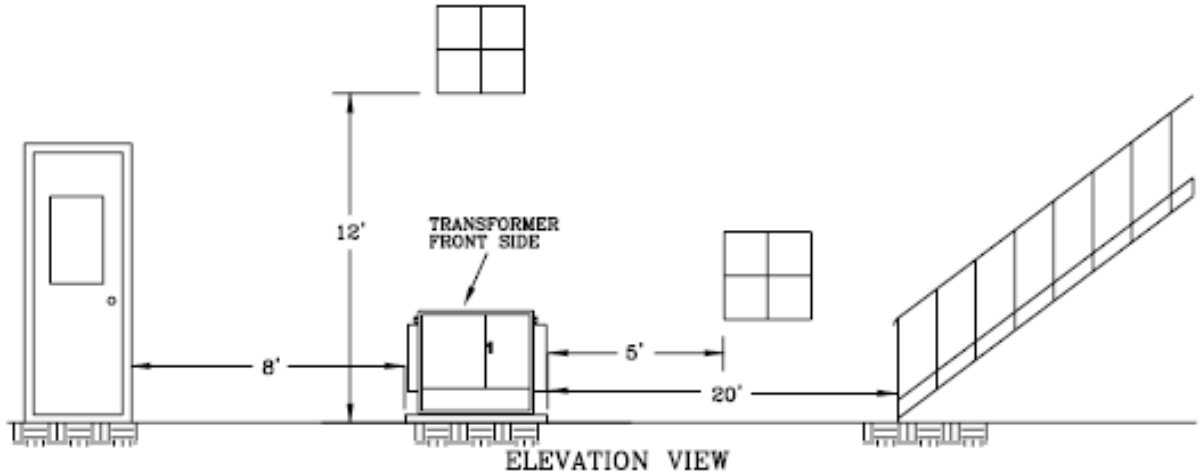
Energizing of Customer's Service

Only authorized employees of TNMP are to make and energize the connections between the company's service wire and the customer's service entrance conductors.

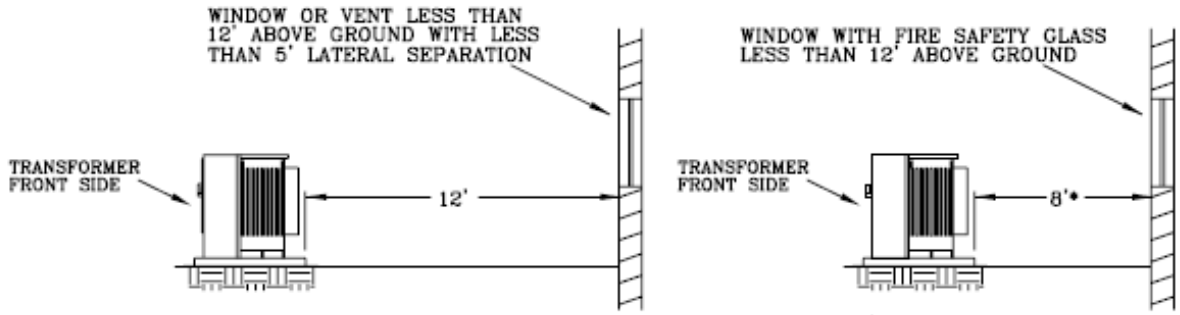
Drawing Sets



PLAN VIEW



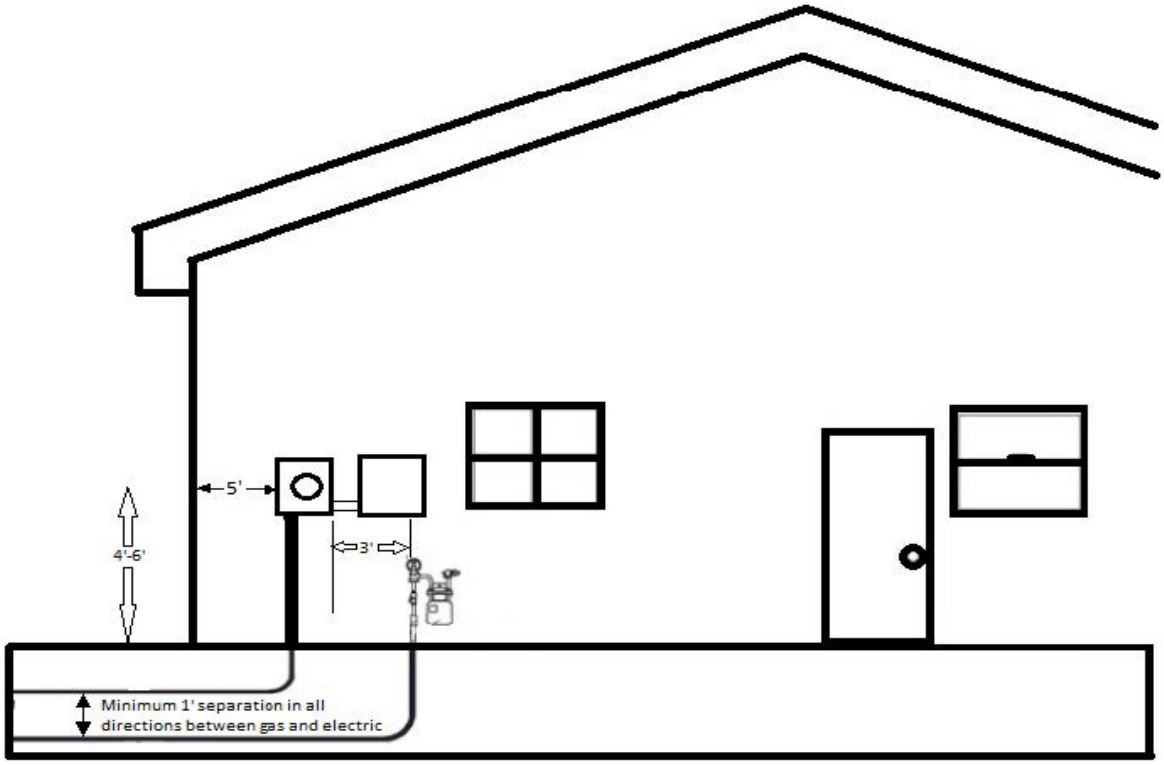
ELEVATION VIEW



END VIEW

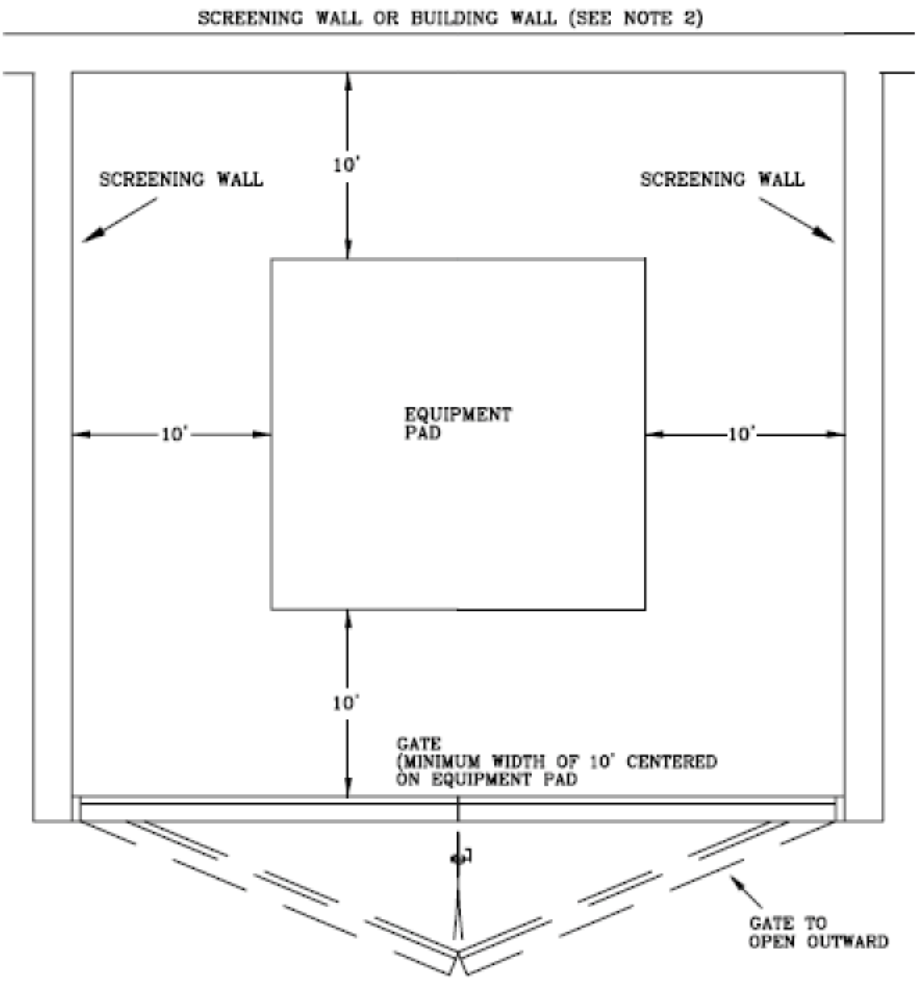
NOTES:
1. ALL DIMENSIONS ARE MINIMUM.
2. MAINTAIN A MINIMUM OF 10' CLEARANCE IN FRONT OF TRANSFORMER FOR ACCESS. ADEQUATE SPACE REQUIRED FOR TRUCKS AND LIFTING EQUIPMENT.
3. APPLIES TO BRICK OR MASONRY BUILDINGS ONLY, EXCEPT WHERE NOTED.
4. DRAINAGE FLOW AROUND TRANSFORMER SHOULD BE AWAY FROM BUILDING.
5. NO COOLING TOWERS, GAS METERS, ETC., WITHIN 5' OF PAD.
6. NO PIPES OR CONDUITS UNDER PAD EXCEPT THOSE REQUIRED FOR TRANSFORMER CONNECTIONS. EXCEPTIONS ALLOWED IF APPROVED BY TNP.
7. NO PART OF BUILDING MAY EXTEND OVER TRANSFORMER.

Single Family Residence Underground



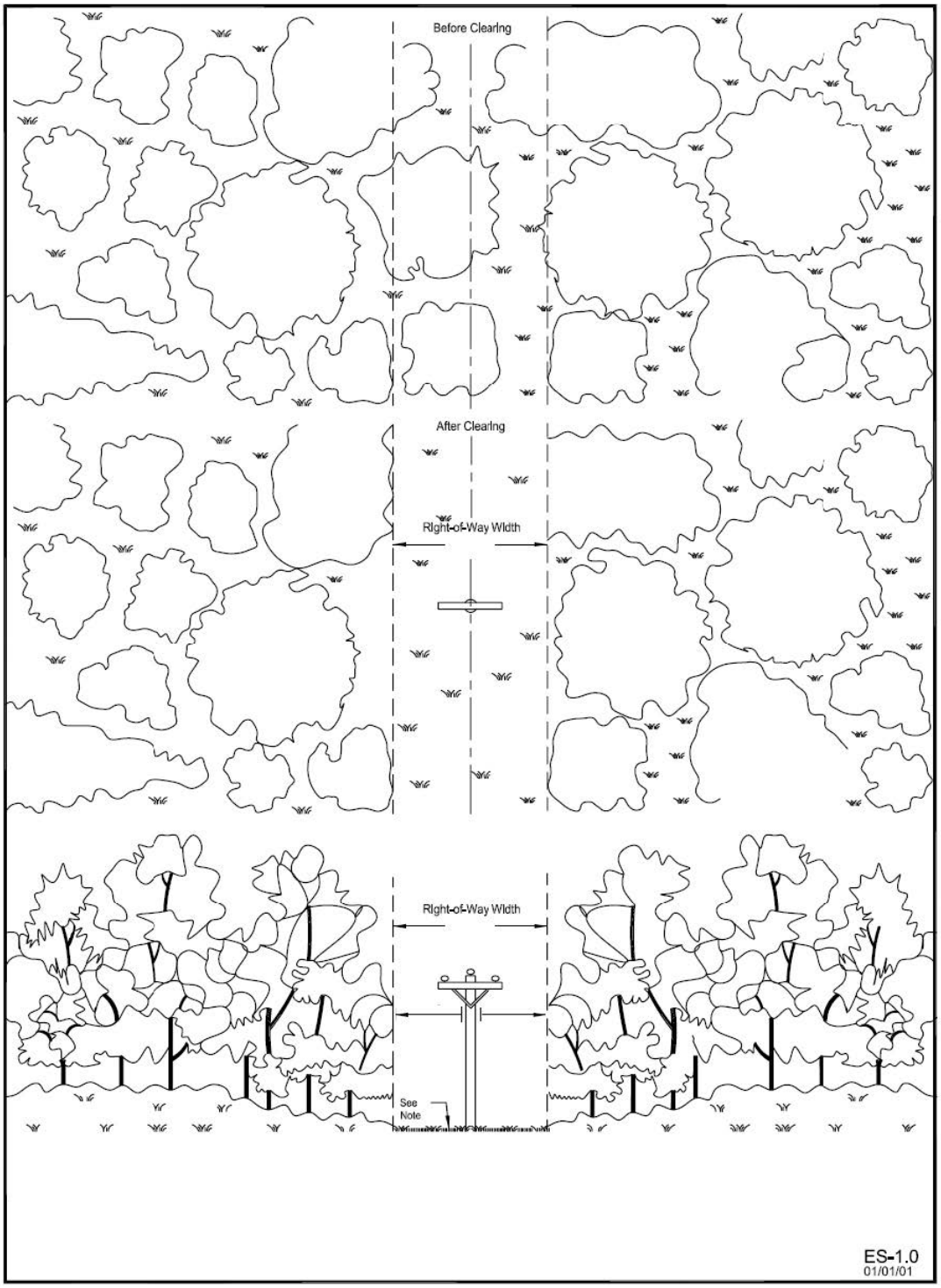
Notes:

1. Meter must have 3 ft horizontal clearance from gas regulator
2. Meter must be between 4' and 6' from final grade
3. Minimum of 1 ft separation in all direction between underground electric conduit and any other utility.
4. Meter must be located with 5 ft of front corner of building.



Notes:

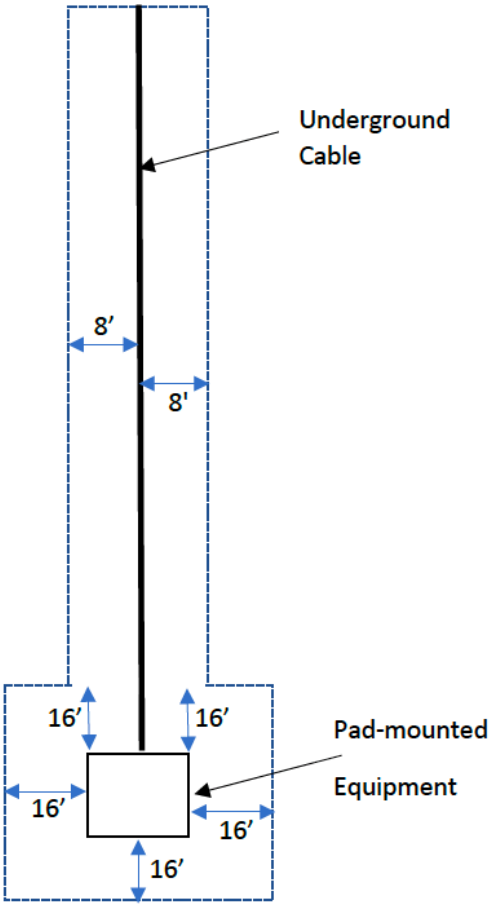
1. Distance may be reduced to 5' if equipment side is not used for hot stick switching.
2. Use UG-2-10 for oil filled equipment distances from building walls.
3. If gate is locked, TNMP lock shall be installed.
4. Minimum distance from gate to pad may be reduced to 5' but minimum 10' open area required in front of pad with gate open.
5. When installing a transformer, screening walls shall provide adequate ventilation.



Right of Way (ROW) Width as Determined by TNMP Personnel.

Single Family Residence Underground

Right of way must be a minimum of 8 feet on both sides of underground cable and 16 feet to enclose the pad-mounted equipment.



TEXAS-NEW MEXICO POWER COMPANY

SERVICE CONDUIT

For scheduling of conduit/service entrance inspections or account initiation, please call TNMP.

All conduit inspections between 8AM - 5PM Mon. - Fri.

CONDUIT

Specifications & Installation

1. Inspection required on all conduit prior to back fill.
2. Schedule 40 PVC, Gray color (approved for electrical use).
3. All elbow radius per legend.
4. Customer remains responsible for conduit installation until all electrical facilities are installed.
5. Ditch shall be level and straight. Sand may be used to level ditch.
6. Flat braided mule tape shall be installed in each conduit section.
7. Yellow TNMP Warning Tape to be install 12" to 18" inches above conduit.
8. See attached sheet(s) for information on conduit installation: UG-2-5, UG-3-1, UG-3-2, UG-3-3
9. All conduit bends at poles will be turned up away from traffic, whenever possible.
10. ***SLIP METER RISERS REQUIRED BELOW METER SOCKET. SEE ATTACHED.***
11. ***SCHEDULE 80 PVC REQUIRED FROM GROUND LEVEL INTO SLIP METER RISER.***

Conduit Clearances

1. Min. Depth = 48" from top of PRIMARY conduit to grade.
2. Min. Depth = 36" from top of SECONDARY or SERVICE conduit to grade.
3. Five foot (5') minimum horizontal distance from structures, buildings, etc.
4. Twelve inch (12") minimum clearance from other utilities.

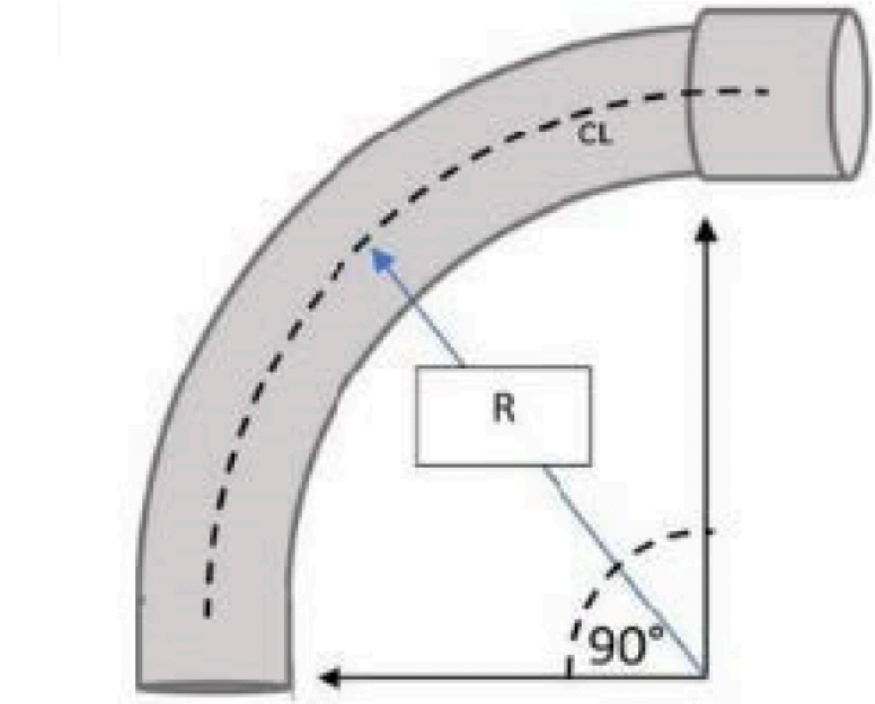
Legend for conduit

All measurements in inches

			Elbow Radius			Elbow	
Use	Description	Size	Horizontal	Vertical	Cover Depth	Material	# Conduits
Primary	NA	NA	NA	NA	NA	NA	NA
Secondary	NA	NA	NA	NA	NA	NA	NA
Service	pole to meter	3	36	36	36	SCH 40 PVC	1

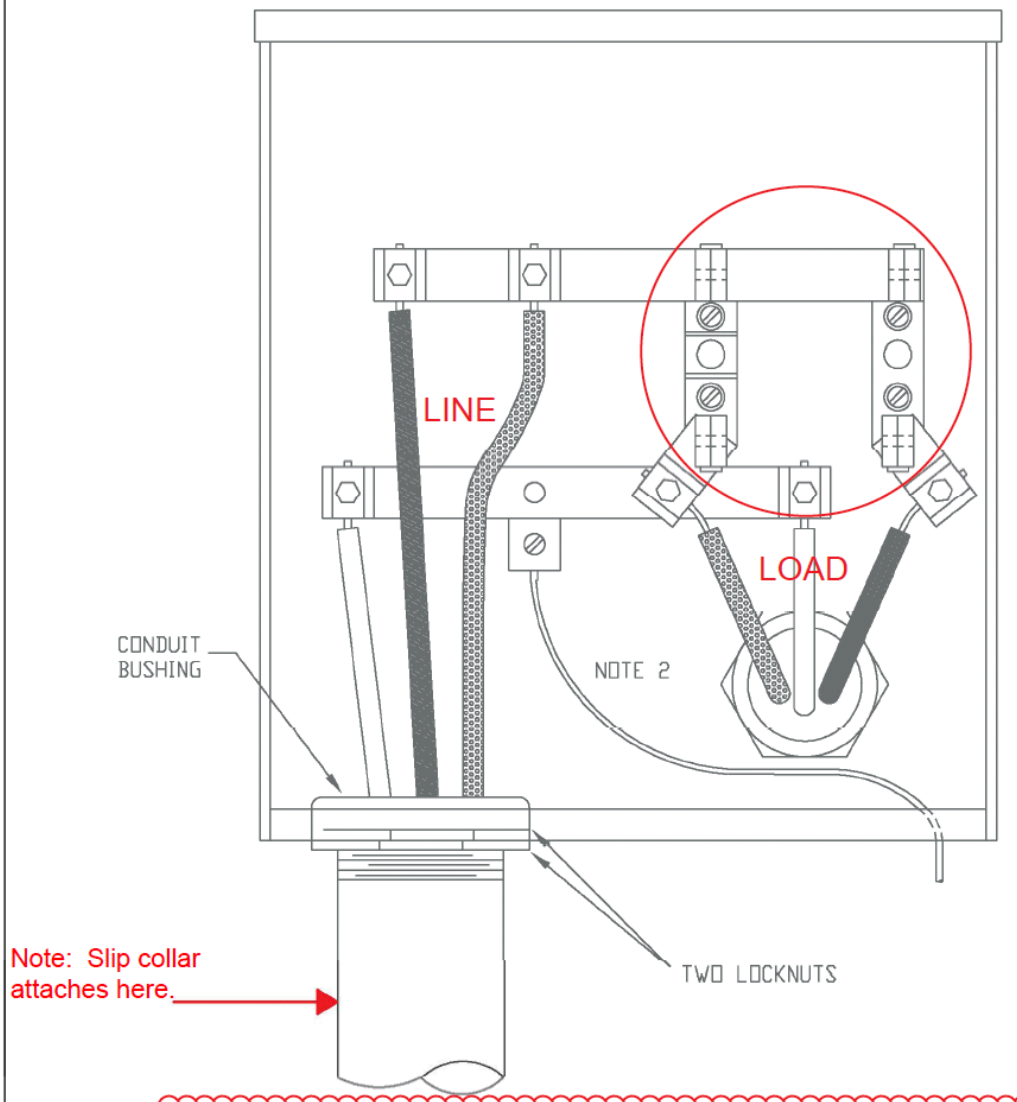
For scheduling of conduit/service entrance inspections or account initiation, please call TNMP Engineering Designer.

48 in. Radius for Primary	36 in. Radius for Service



Drawing from todaypvcbending.com

Note: All conduit elbows require long sweeping 90's. For primary use a minimum of 48 inch and for service a 36 inch minimum radius is required.

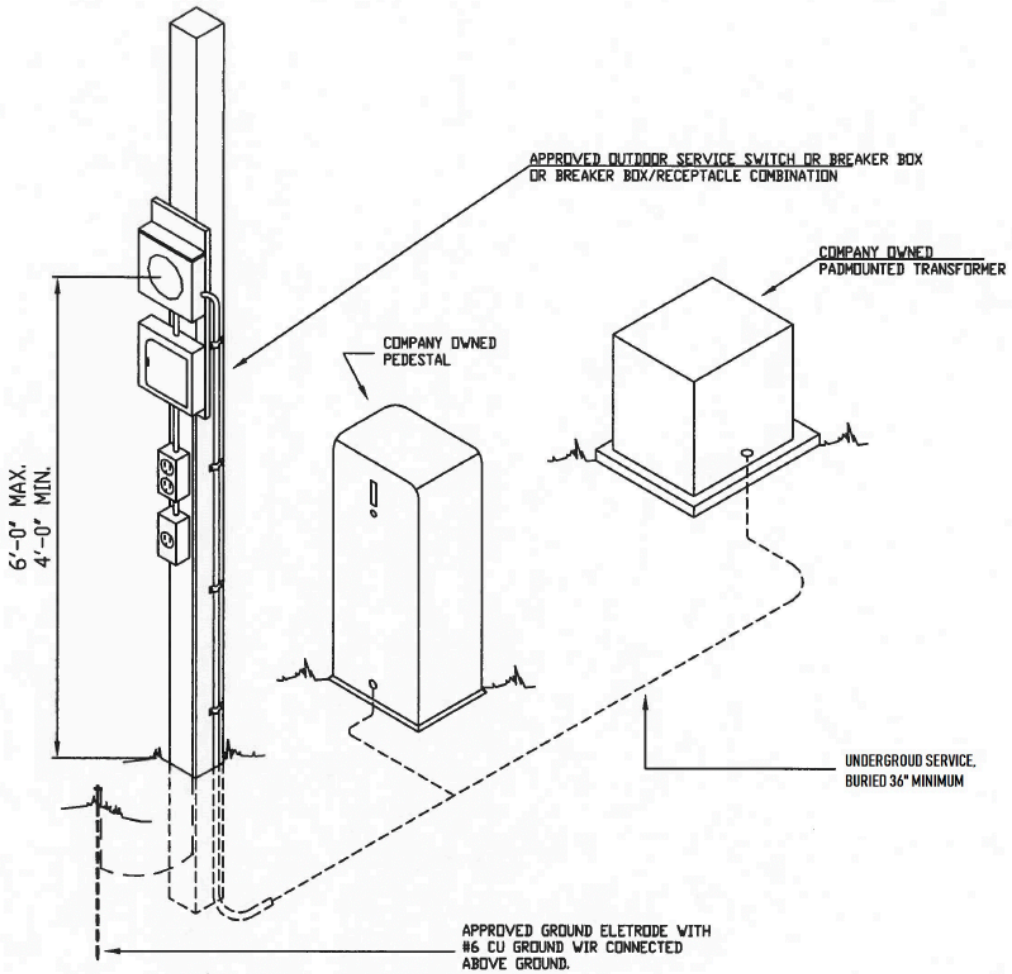


LINE AND LOAD CONDUCTORS SHALL NOT CROSS INSIDE METER SOCKET.

NOTES:

1. METALLIC CONDUIT RISER AND METER SOCKET SHALL BE EFFECTIVELY GROUNDED TO THE CUSTOMER'S GROUND AND THE SERVICE NEUTRAL CONDUCTOR IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE REQUIREMENTS.
2. OPTIONAL LOCATION FOR GROUNDING ELECTRODE CONDUCTOR. IT MAY BE INSTALLED IN CUSTOMER'S SERVICE PANEL. IF INSTALLED IN CUSTOMER'S SERVICE PANEL, IT MAY BE ROUTED THROUGH THE METER BASE TO THE GROUND ELECTRODE. SEE UG-9-1 FOR PROPER SIZE.

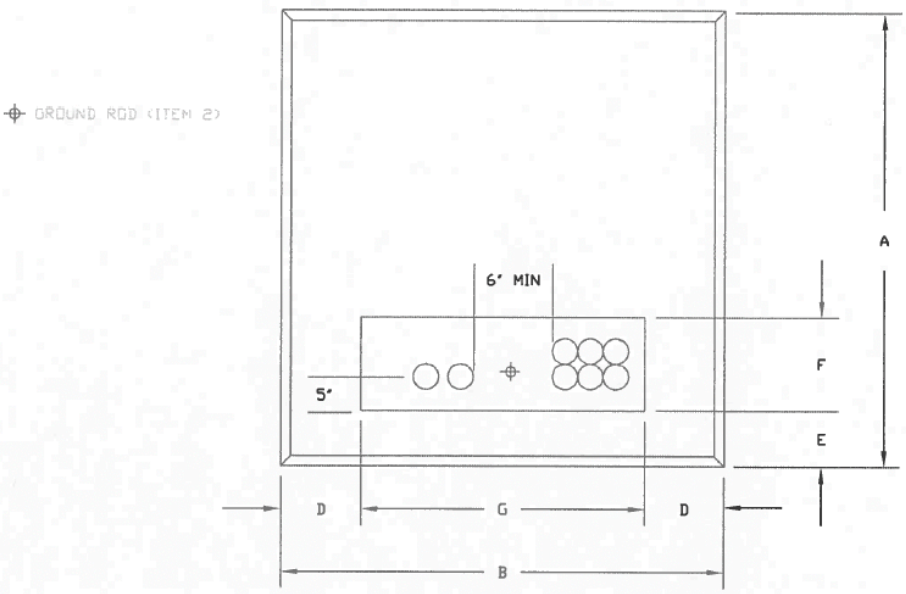
TEXAS NEW MEXICO POWER COMPANY DISTRIBUTION CONSTRUCTION STANDARD	APP._____
CONNECTION DIAGRAM FOR SINGLE-PHASE SOCKET UNDERGROUND SERVICE	DATE: 8/97 UG-9-6

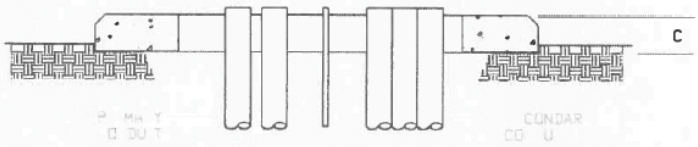


NOTES:

1. ALL TEMPORARY SERVICE POLE MATERIAL WILL BE SUPPLIED BY THE CUSTOMER OR HIS WIRING CONTRACTOR, WITH EXCEPTION OF METER SOCKET AND METER.
2. SERVICE SUPPORT TO BE 4" x 4" MINIMUM UNSPLICED WOOD POLE SET 36" MINIMUM DEPTH AND 6' MINIMUM FROM ALLEY OR DRIVE.
3. CUSTOMER OR HIS WIRING CONTRACTOR SHALL NOT ALLOW POLE TO BE MOVED OR TAMPERED WITH WHILE CONNECTED TO COMPANY FACILITIES.
4. CUSTOMER WILL TRENCH WITHIN 2' OF TRANSFORMER PAD OR SERVICE PEDESTAL AND INSTALL WIRE, LEAVING SUFFICIENT AMOUNT FOR CONNECTION TO COMPANY FACILITIES.
5. CUSTOMER WIRING, FROM TEMPORARY SERVICE POLE TO COMPANY FACILITIES, IN AREAS EXPOSED ABOVE GROUND MUST BE PROTECTED BY FLEXIBLE OR RIGID METAL CONDUIT.
6. COMPANY WILL MAKE FINAL TRENCHING AND CONNECTIONS.

TEXAS NEW MEXICO POWER COMPANY DISTRIBUTION CONSTRUCTION STANDARD	APP._____
TEMPORARY SERVICE POLE UNDERGROUND	DATE: 6/97
	UG–9–10





CROSS SECTION

KVA	PAD DIMENSIONS IN INCHES							DESCRIPTION
	A	B	C	D	E	F	G	
50-75	42	42	3	7	6	12	27	POLYMER PAD 42 X 42
100-167	56	44	4	9	6	14	27	POLYMER PAD 56 X 44

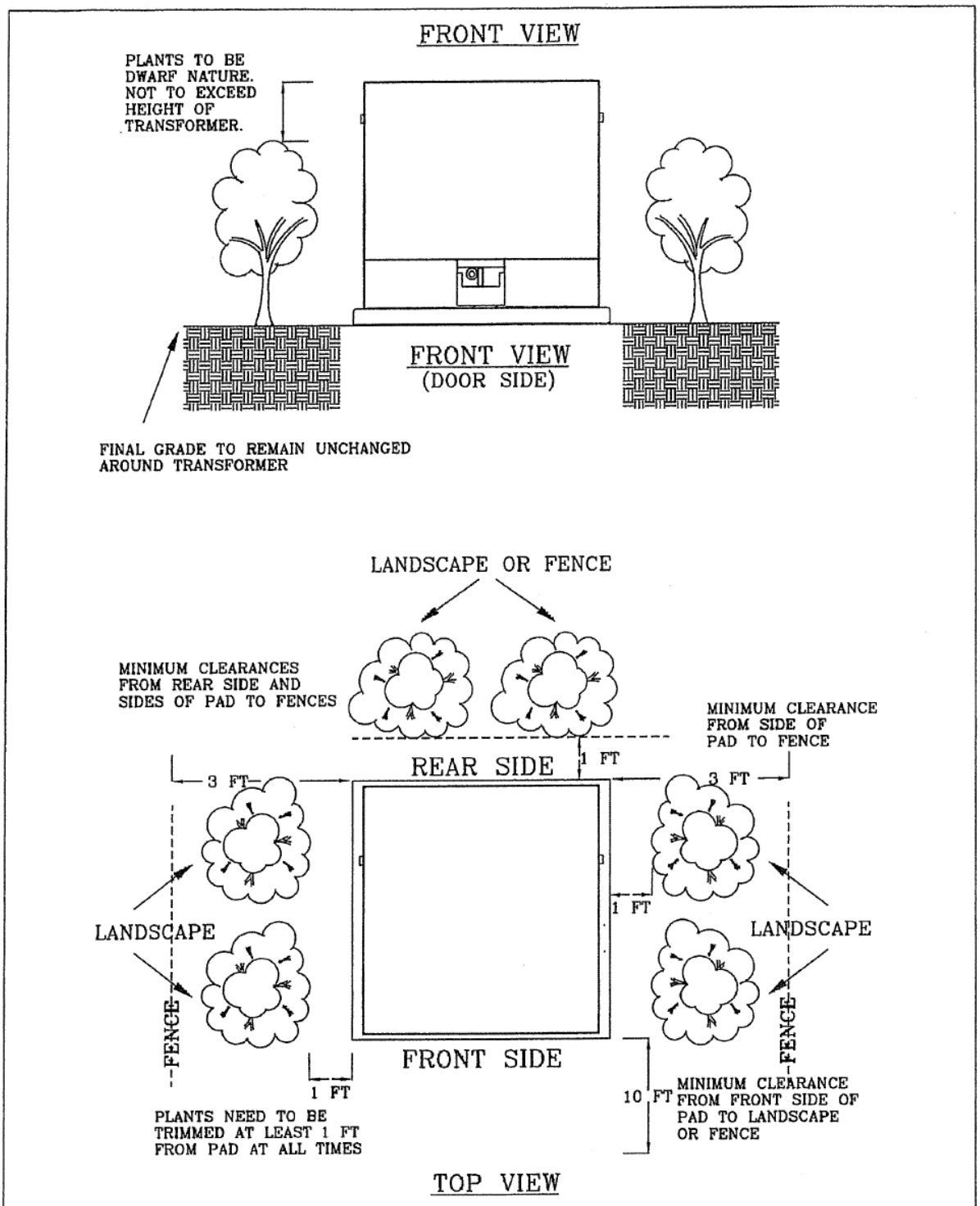
NOTES:
1. A POLYMER CONCRETE PAD SHALL BE USED UNLESS CONDITIONS WARRANT A CONCRETE PAD. IF A CONCRETE PAD IS NEEDED INCREASE PAD DIMENSION - C - TO 6 INCHES.
2. PIERS SHALL BE INSTALLED UNDER PAD WHEN DIRT HAS BEEN DISTURBED UNDER THE LOAD BEARING AREA OF THE PAD. REFERENCE STANDARD UG-5-30 FOR PIER INSTALLATION.

					MUN
ITEM	QTY	MATERIAL DESCRIPTION	REF	M&S	CUN
1	1	PAD, TRANSFORMER, POLYMER CONCRETE, 42" x 42"		31-1002	XPAD1
1	1	PAD, TRANSFORMER, POLYMER CONCRETE, 56" x 44"		31-1005	XPAD2
2	1	GROUND, UG EQUIPMENT	UG-7-10		

TEXAS NEW MEXICO POWER COMPANY
DISTRIBUTION CONSTRUCTION STANDARD

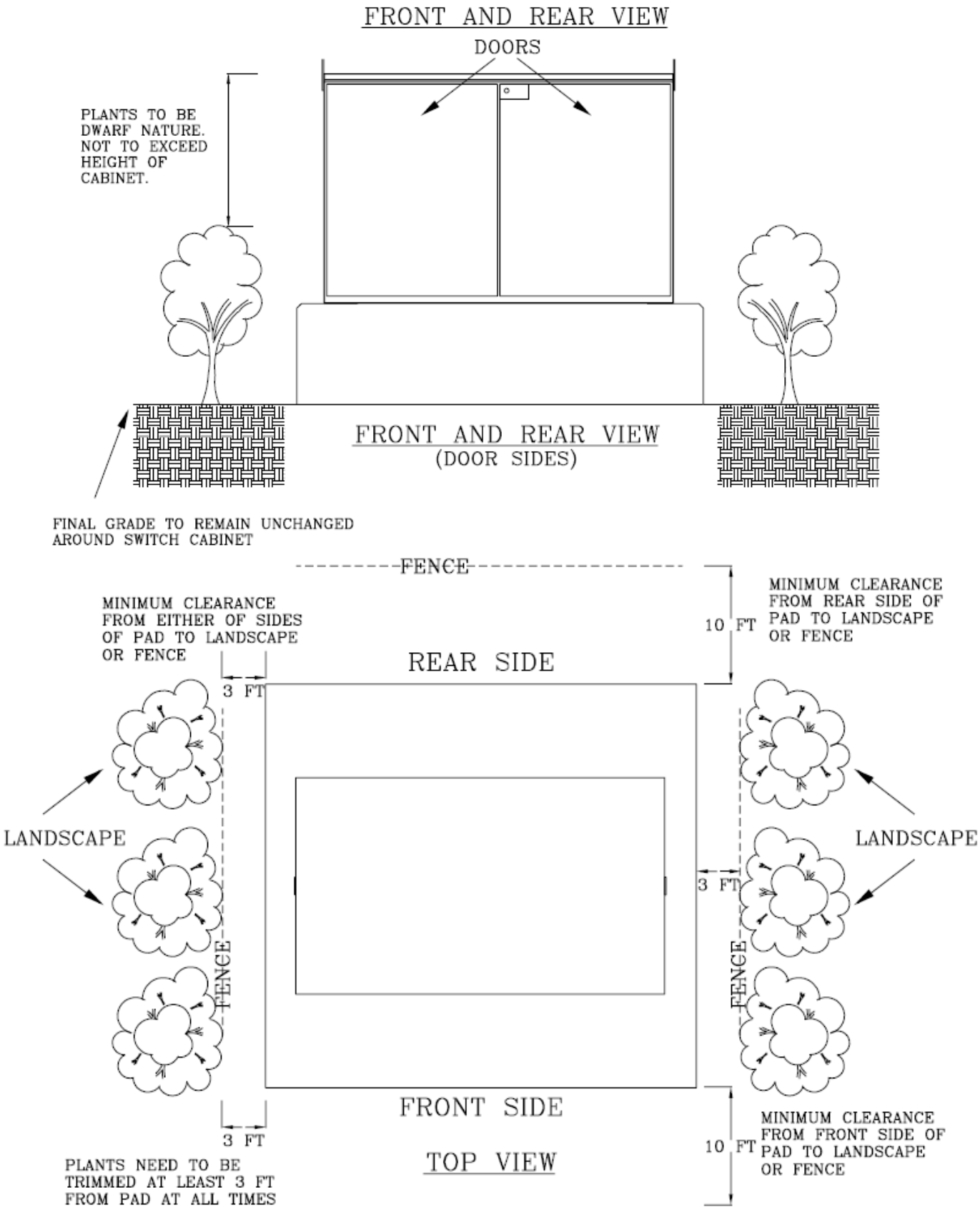
TRANSFORMER PAD - POLYMER
SINGLE PHASE
DEADFRONT

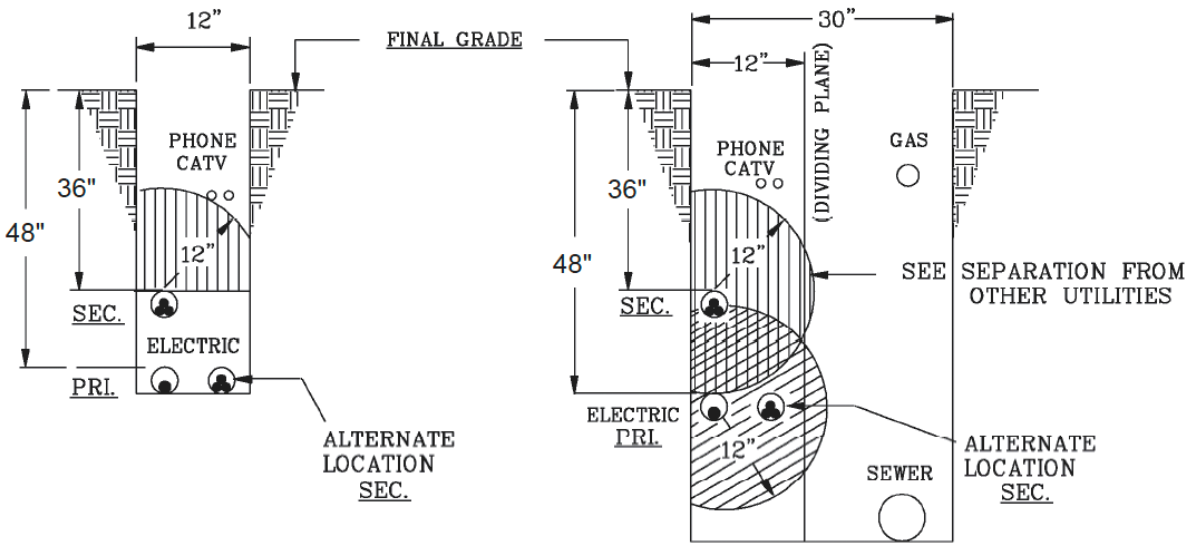
APP._____
DATE: 4/97
UG-5-25



TEXAS NEW MEXICO POWER COMPANY DISTRIBUTION CONSTRUCTION STANDARD	APP._____
	DATE: 8/96
CLEARANCES OF PADMOUNT TRANSFORMERS FROM LANDSCAPING AND FENCING	UG–2–11

Single Family Residence Underground





MINIMUM COVER REQUIREMENTS

Conduits shall be installed to meet the minimum depth requirements of the following table. The depth is measured from the top of the conduit to the final grade of the surface.

Circuit Voltage	Depth
0 to 600 Volts	36"
601 volts to 40 KV	48"

Exceptions:

1. If it is impractical to install at the above prescribed depths, the depth may be reduced 6" for each 2" of concrete cap placed in trench over the conduit installation. The depth will not be reduced more than 12".
2. When crossing under railroad tracks, the depth of the conduit will be 50" under the top of rails.
3. Due to design considerations or required separation from other utilities, the installed depth may be required to be deeper than noted in the above table or drawing.

SEPARATION FROM OTHER UTILITIES

1. Communication conduit systems shall be separated from the electrical conduit system by:
   a) 12 inches of well-tamped earth
   b) 3 inches of concrete
   c) 4 inches of masonry
   d) Exception: Lesser separations may used where the parties concur
2. Electrical conduit systems installed parallel to water, sewer or gas lines shall have a minimum horizonal separation of 12 inches.
3. Vertical crossing clearance from other utilities shall be 12 inches.
   a) Exception: When it is not possible to achieve 12 inches of separation, the conduit system shall have suitable support on each side to prevent the direct transfer of loads onto the other utilitity.

TEXAS NEW MEXICO POWER COMPANY
DISTRIBUTION CONSTRUCTION STANDARD

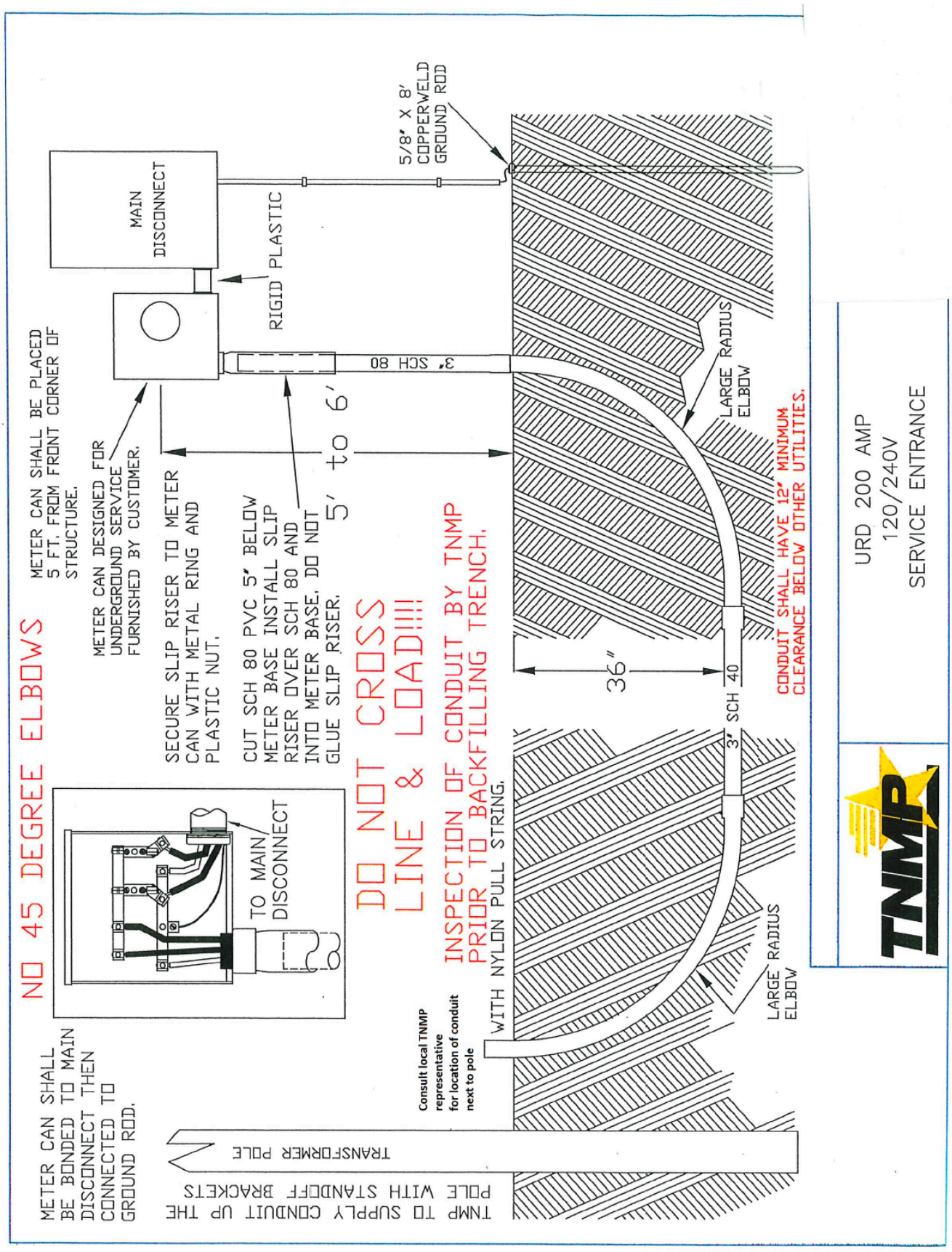
APP. _____

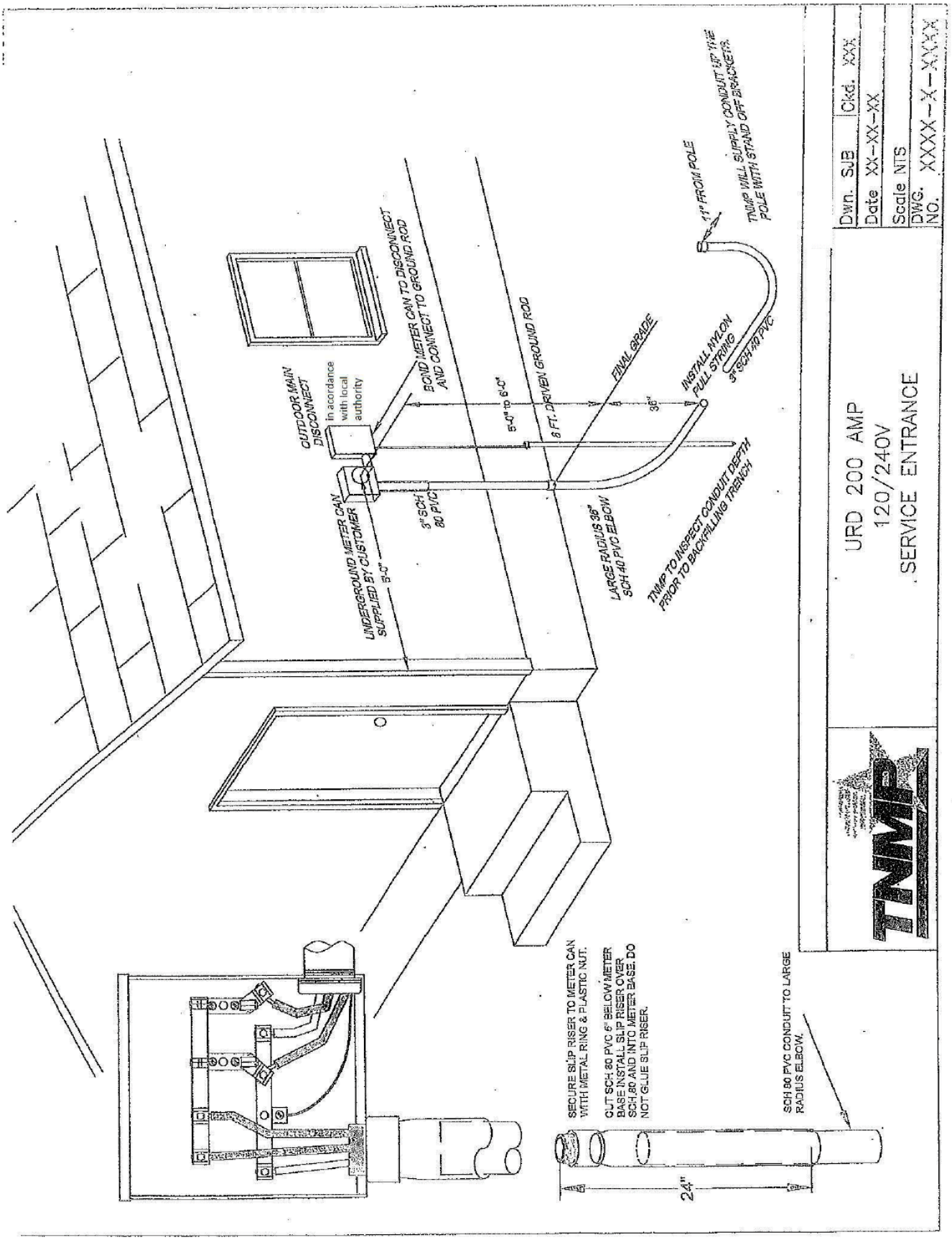
DATE: 8/96

CLEARANCES OF CONDUIT SYSTEM FROM GROUND AND FOREIGN UTILITIES IN A COMMON TRENCH

UG-2-5

Single Family Residence Underground




URD 200 AMP
120/240V
SERVICE ENTRANCE
Dwn. SJB
Chkd. XXX
Date XX-XX-XX
Scale NTS
DWG. NO. XXXX-X-XXXX
TNMP
OUTDOOR MAIN DISCONNECT
in acordance with local authority
BOND METER CAN TO DISCONNECT AND CONNECT TO GROUND ROD
8 FT. DRIVEN GROUND ROD
5'-0" TO 6'-0"
FINAL GRADE
36"
INSTALL NYLON PULL STRING
3" SCH 40 PVC
41" FROM POLE
TNMP WILL SUPPLY CONDUIT UP THE POLE WITH STAND OFF BRACKETS
UNDERGROUND METER CAN SUPPLIED BY CUSTOMER
5'-0"
3" SCH 80 PVC
LARGE RADIUS 36" SCH 40 PVC ELBOW
TNMP TO INSPECT CONDUIT DEPTH PRIOR TO BACKFILLING TRENCH
SECURE SLIP RISER TO METER CAN WITH METAL RING & PLASTIC NUT.
CUT SCH 80 PVC 6" BELOW METER BASE INSTALL SLIP RISER OVER SCH 80 AND INTO METER BASE. DO NOT GLUE SLIP RISER.
SCH 80 PVC CONDUIT TO LARGE RADIUS ELBOW.
24"

Slip Meter Risers

Carlon® Slip Meter Risers are designed for use in electrical service entrance applications. They provide solutions for applications requiring a non-rigid connection, with incoming service conduit diameters ranging from 2" to 4".

The Slip Meter Risers are fitted with a terminal adapter for easy installation at the service entrance location, and provide a low-cost method to comply with NEC 300.5(J), which requires protection for buried cables in areas subject to ground movement due to frost or trench settling.

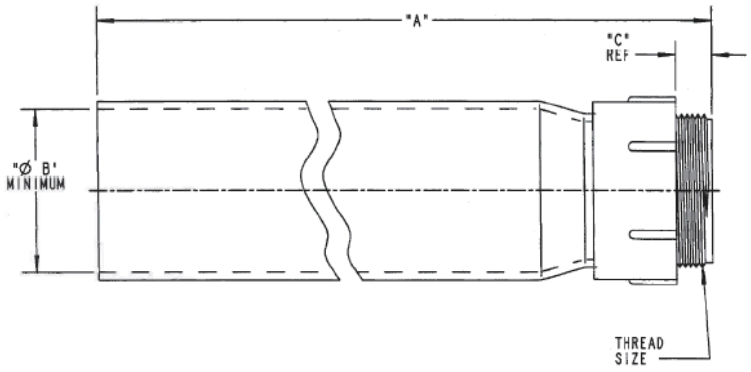
Features:

- Designed to provide faster and easier underground service entrance installations.
- Provides cable protection from ground movement.
- Accommodates incoming service conduit diameters ranging from 3" to 4".
- Fitted with Terminal Adapters for easy installing.
- Allows ground water in raceway system to drain.
- Complies with NEC 300.5(J)

Slip Meter Risers

Slip Meter Riser Specifications

Part Number	Size	"A" Length	"B" (minimum)	"C"	Thread Size	Std. Carton Qty.	Std. Carton Wt. (lbs.)
E954LXX	3"	24	3.012	0.798	3"NPSC	10	35
E954LXS (split)	3"	24	3.012	0.798	3"NPSC	10	36
E954Nxx	4"	24	5.06	0.773	4"NPSC	5	23



Article 300 Wiring Methods

(J) Ground Movement. Where direct buried conductors, raceways, or cables are subject to movement by settlement or frost, direct buried conductors, raceways, or cables shall be arranged to prevent damage to the enclosed conductors or to equipment connected to the raceways.

(FPN): This section recognizes "S" loops in underground direct burial to raceway transitions, expansion joints in raceway risers to fixed equipment, and, generally, the provision of flexible connections to equipment subject to settlement or frost heaves.