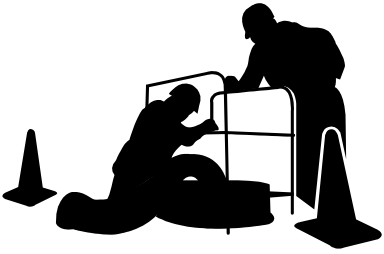
CHAPTER 3

UNDERGROUND SERVICES



The cost for underground service depends on the extent of special engineering required. The least complicated and cheapest situation is if a padmount transformer, or access point is already on the property. If this is the case, engineering may not be required. The customer is responsible for providing, installing, and maintaining all equipment from the point of delivery except for the meter.

NAED is responsible for providing and installing the meter and making the final connections at the point of delivery. If CTs are being used, NAED also provides the CTs and makes the connections to them and to the meter.

LOCATING UNDERGROUND UTILITIES

The customer must call Dig Safe® at least three full working days (72 hours) before trenching or excavating for underground service. Massachusetts law (MGL Chpt 82, sections 40-40E) requires that anyone who excavates where underground utilities may exist must notify the utility companies of such activity. One call to the locating service notifies all utilities that locates are required. North Attleborough Sewer Departments and DPW are not members of Dig Safe® and the customer must contact each department individually. Excavation must not begin until the locations of underground wires, cables, and pipes have been marked, or the utilities have informed the customer that they have no facilities in the area.
Any digging within 24 inches of location marks must be done by hand.

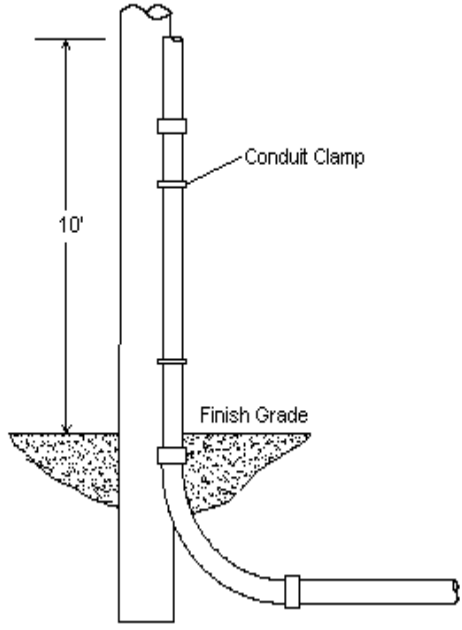
Dig Safe® telephone number 1-888-344-7233

The color code for marking underground utilities is:

Color	**Underground Service**
Red	Electric
Yellow	Gas, Oil, Steam
Orange	Telephone, Cable TV
Blue	Water
Purple	Reclaimed water
Green	Sewer
Pink	Temporary survey marks
White	Proposed excavation

SECONDARY UNDERGROUND SERVICE FROM NAED OVERHEAD LINES

The customer shall furnish and install all conduit and conductors. The size of the conduit is determined by the current rating of the service except that the conduit shall not be smaller than 2½" trade size.
All conduit shall be encased in concrete under public traveled ways and driveways. At the riser pole, the conduit shall extend 10 feet above grade. If metal conduit is used, a grounding connector will be required to be installed by the customer. The sum of all conduits on the pole; including telephone, fire alarm, cable TV, etc…; may not exceed 20 inches. The location of the riser shall be on the quarter of the pole away from traffic flow. The customer shall furnish and install conductors of sufficient length to reach the secondary conductors on the pole plus 18 inches for connections. The customer shall identify the phase and neutral conductors with permanent markings. Figure 3-1 shows a typical riser pole.



- Minimum size conduit is 2½”
- Extend conduit 10’ up pole
- Locate riser on quarter of pole away from traffic
- Leave enough service conductor to reach NAED secondary cable plus 18”
- If galvanized conduit is used, customer must install a grounding clamp. NAED will supply and install a ground rod and ground wire. If galvanized conduit is used only at the riser for mechanical protection, a grounding conductor must be installed in the conduit.

Figure 3-1

SECONDARY UNDERGROUND SERVICE IN AN UNDERGROUND RESIDENTIAL SUBDIVISION (URD)

A minimum conductor length of 3 feet at handholes and 7 feet at padmount transformers shall be left to provide final connections to NAED facilities. The final connections are the exclusive responsibility of NAED.

UNDERGROUND RESIDENTIAL SUBDIVISION (URD)

The standard URD installation is a conduit system. The customer will furnish and install all conduit and grounding. NAED will furnish all transformer pads, handholes and manholes for the customer to install. NAED will assume ownership of the aforementioned after all cable is installed. Construction specifications are available at the NAED Operations Center.

PRIMARY UNDERGROUND SERVICE FROM NAED OVERHEAD LINES

Customers requesting this type of service should contact NAED Engineering as soon as possible before construction. This time is required to determine transformer availability and construction requirements. The customer will furnish and install all conduits, manholes, transformer pads and grounding as specified by NAED. NAED will assume ownership of the aforementioned upon energizing the service. Construction specifications are available at the NAED Operations Center.

The drawing below and on the following page,are to be used only as a guide; contact the local authority having jurisdiction for exact requirements.

TYPICAL SINGLE-USE TRENCH

A typical trench for underground services is shown in figure 3-2.

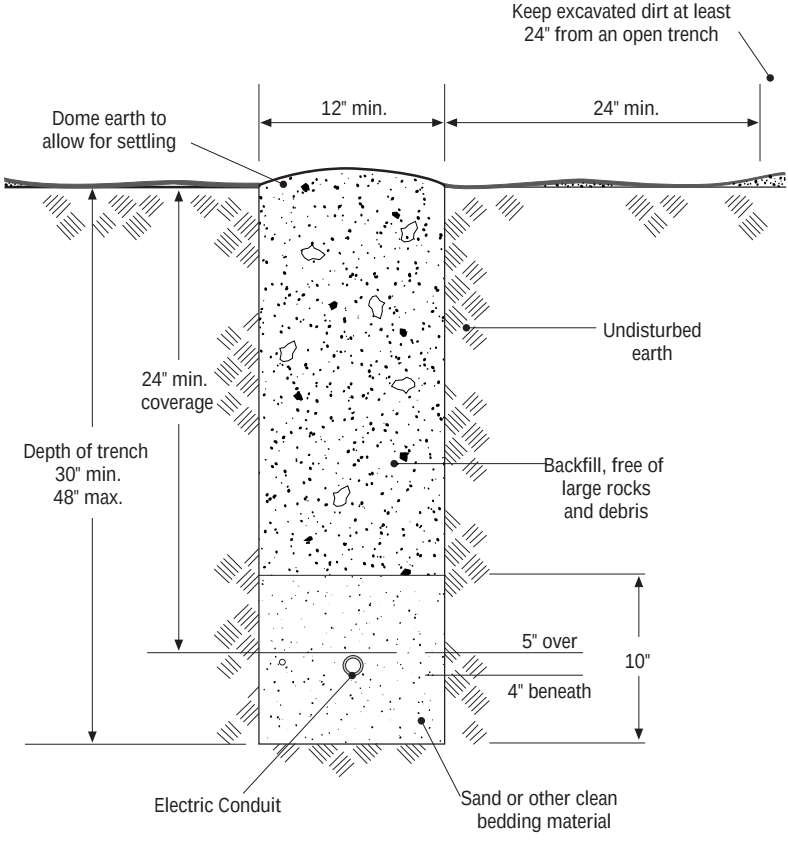


Figure 3-2

TYPICAL JOINT-USE TRENCH

The customer may place telephone, cable TV, or other electronic signal conductors in a trench with service conduit, providing the installation meets the requirements of all other parties.

Gas pipes may not be installed in a common trench.

Water and sewer lines may not be installed in a common trench.

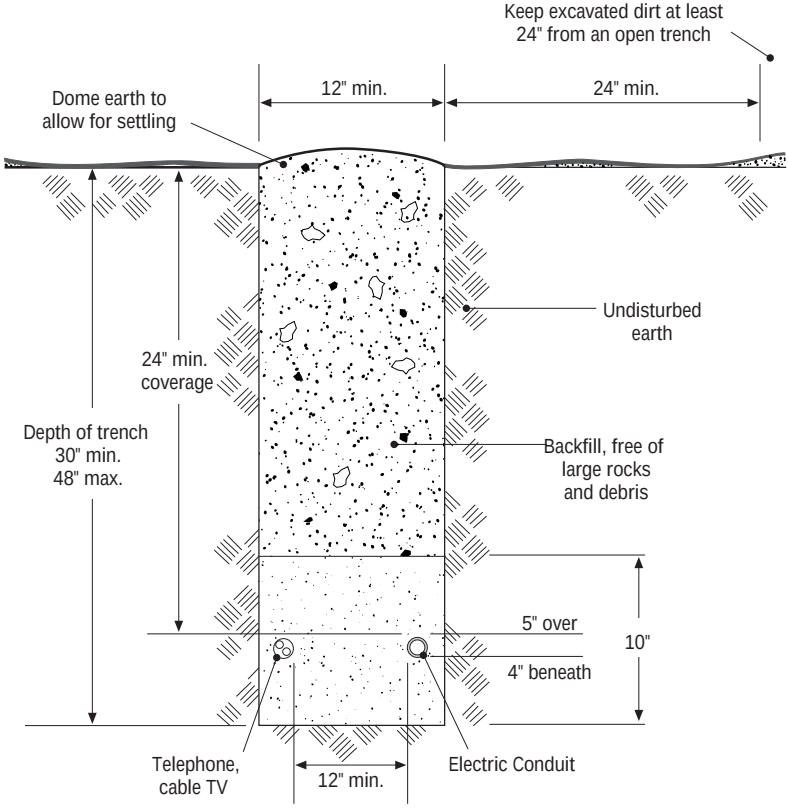


Figure 3-3

Direct-Burial Conductors

Direct buried service conductors are not allowed in the NAED system.

UNDERGROUND SERVICE, SURFACE-MOUNT METER

Fig. 3-4 shows a finished underground installation with the meter on the surface of a house. The customer is responsible for everything shown here, except the meter.

The service is underground from NAED'S pole, handhole, or padmount transformer (not shown here). After the customer installs the service equipment, NAED installs the meter in the meter socket. NAED also completes the connections of the wires at the transformer, pole or handhole.

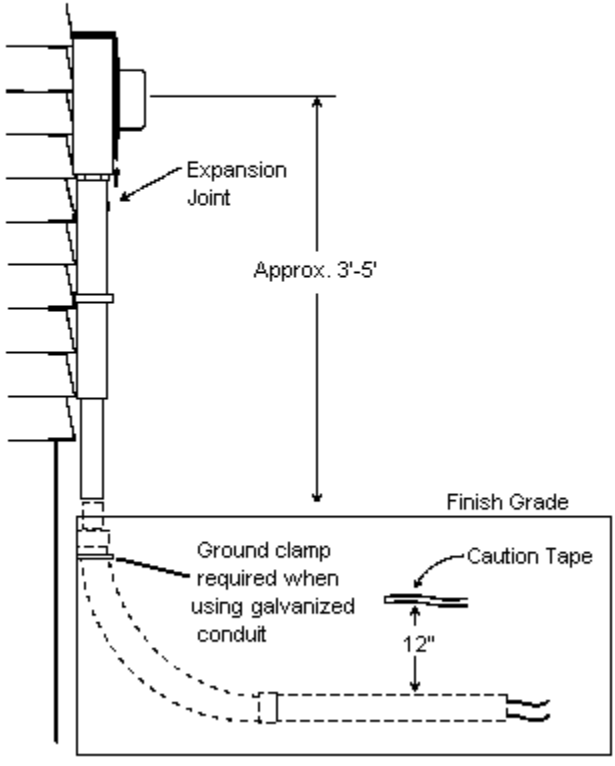

Expansion
Joint
Approx. 3'-5'
Finish Grade
Ground clamp
required when
using galvanized
conduit
Caution Tape
12"

Figure 3-4

UNDERGROUND SERVICE, PEDESTAL METER

A meter pedestal is a free-standing structure that supports service equipment for underground service. A meter pedestal can be manufactured as shown in figure 3-5a or built on site as shown in figure 3-5b. Install the meter pedestal between the home and normal public access. The pedestal usually contains the disconnect switch required by the NEC.

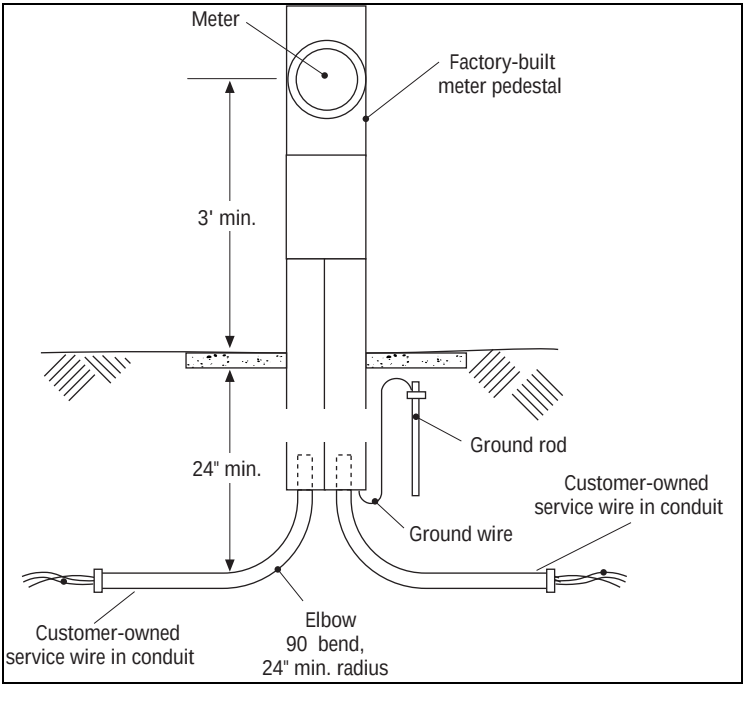


Figure 3-5a

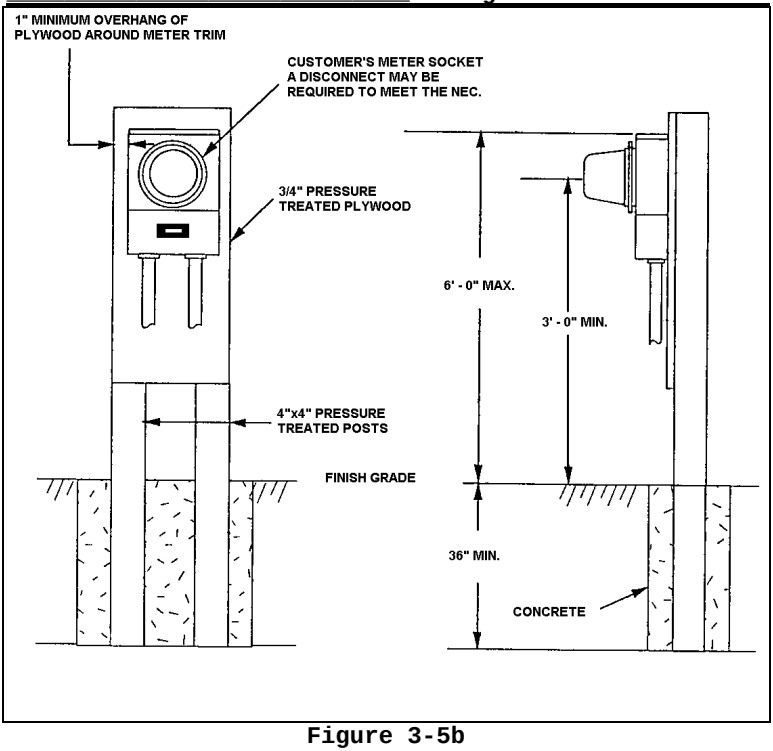


Figure 3-5b

A clear work area of 3 feet is required in front of the meter pedestal. The pedestal must maintain a minimum clearance of 10 feet from utility poles, transformers and other NAED owned equipment. The service disconnect (if required) shall be located on the line side of the meter.

UNDERGROUND SERVICE, TEMPORARY

Figure 3-6 shows a finished installation for temporary service, using a meter post. The service is underground from a handhole or padmount transformer. The customer provides everything shown, except the meter.

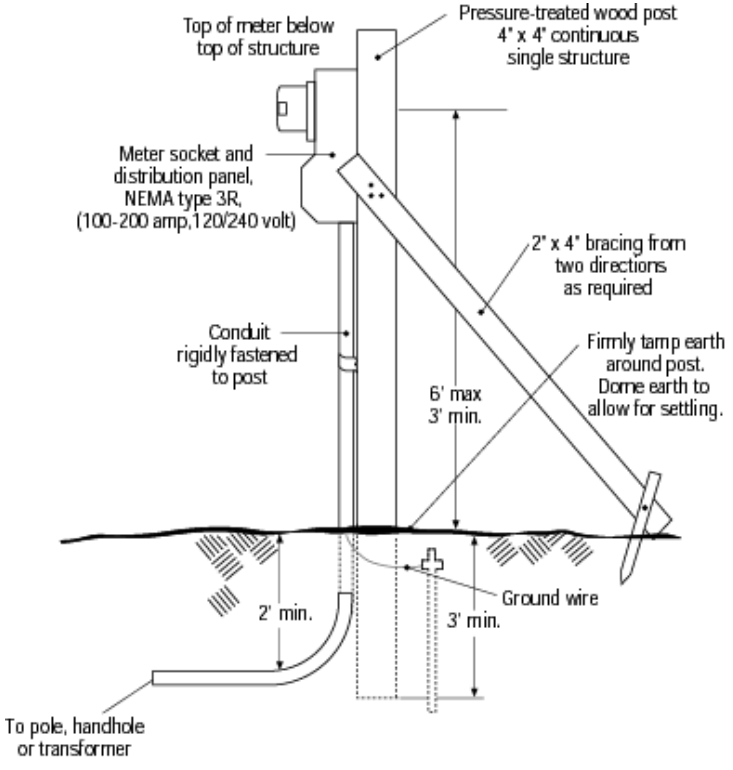


Figure 3-6

TRANSFORMER INSTALLATIONS

NAED is responsible for installing a padmount transformer at the customer's site. Conductors to the primary side of the transformer enter at the left side; conductors to the secondary side enter at the right. The trench runs from the right side of the transformer to the customer's building.
The customer is responsible for installing the service conductors in the trench, from the transformer to the building.

Safety Clearances around Transformers

Clearances from padmount transformers to structures are measured from the edge of the concrete pad to the structure or any overhang.
The clearance from a building is 6 feet if the building has non-combustible walls (brick, concrete, steel, or stone), 10 feet if the building has combustible walls (including stucco).
Other clearances are shown on the next page. These clearances also apply to any oil-filled electrical equipment.

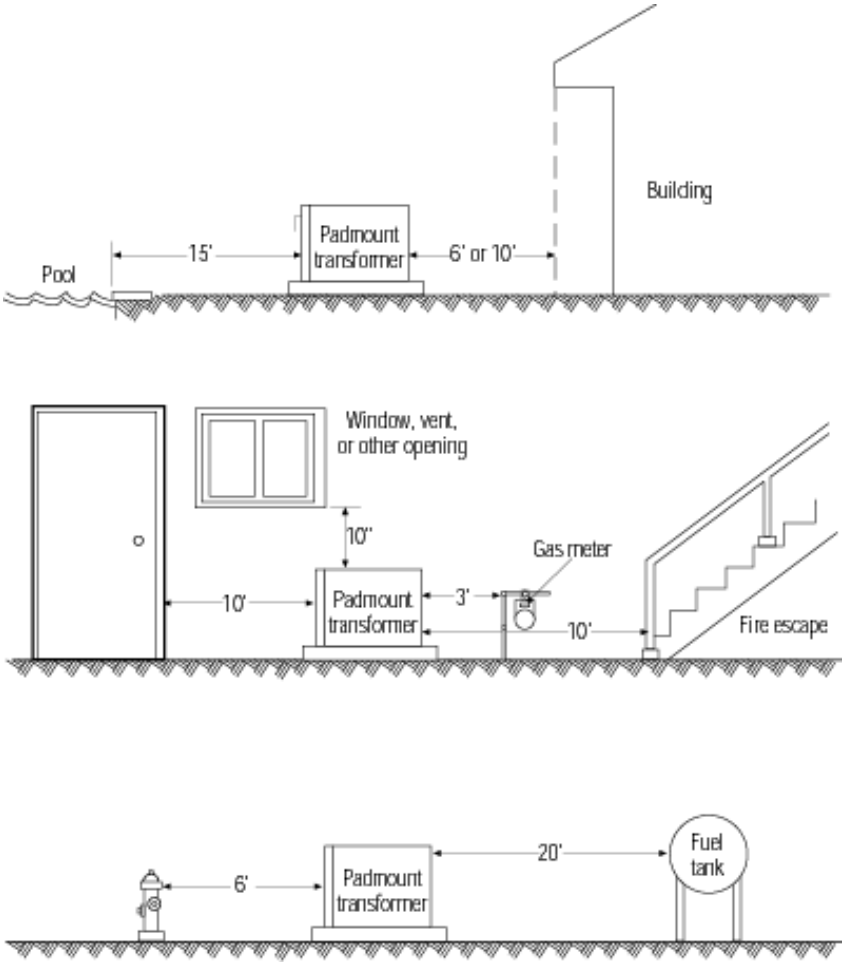

Building
Padmount transformer
15'
6' or 10'
Pool
Window, vent, or other opening
10"
Gas meter
10'
Padmount transformer
3'
10'
Fire escape
6'
Padmount transformer
20'
Fuel tank

Figure 3-7

Work Clearances around Transformers

A minimum clearance of 10 feet of clear, level working space is required in front of a padmount transformer, to allow use of hot sticks.
Other clearances are shown below, and all apply to any oil-filled electrical equipment.
Landscaping and other obstructions must not encroach on these clearances.

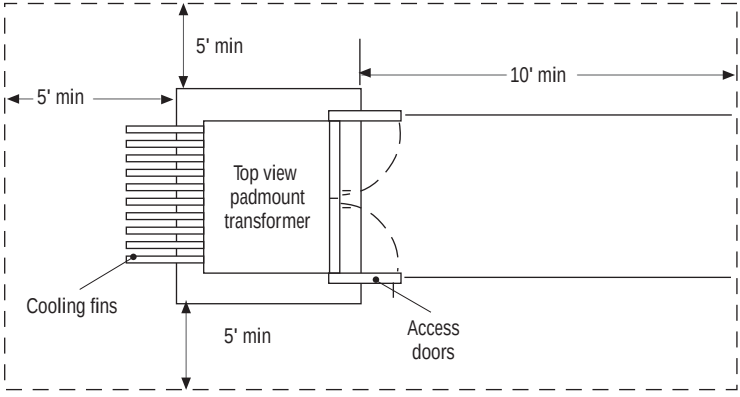


Figure 3-8

Guard Posts/Bollards

It is the customer's responsibility to install and maintain guard posts where NAED equipment is exposed to vehicular traffic.
If the post is placed in stable soil, surround it with 6 inches of concrete. If the soil is unstable or sand, surround the post with 12 inches of concrete.
If several guard posts are used, locate them no more than 5 feet apart. For extra visibility, paint the posts traffic yellow.
In some situations a 6-inch diameter post is required, not the 4 inch post illustrated here.

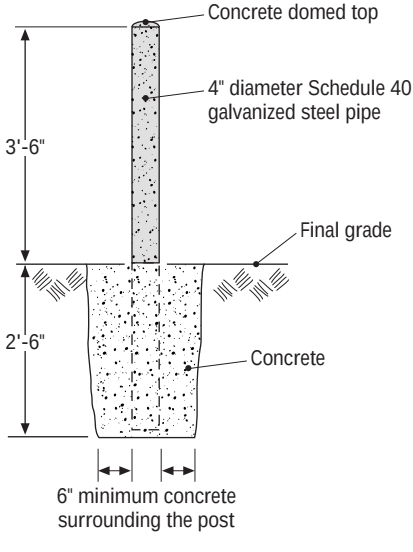


Figure 3-9