SECTION 400
UNDERGROUND SERVICE

400.01 General
Underground service is provided to Customer who meets Company requirements set out herein and pays to Company any amount due. Cash payments or other arrangements satisfactory to Company are made by Customer prior to Company’s beginning construction. All underground facilities included in the cost estimates are provided, installed, owned and maintained by Company.

Where Company provides delivery service underground, Company retains the right to limit delivery service to such underground, network, and/or dual feed distribution systems.

400.02 Underground Service Lateral for Underground Residential Customers and Non-Residential Service Customers served from Overhead Transformation
The Company owns and maintains the service lateral conductor and raceway to the Point of Delivery, see Service Point 100.01.29, page 5. The Company installs the service lateral conductor. The Customer has the option of installing the raceway connecting the Company’s distribution system to Customer’s point of delivery, reference Tables 5A & 5B, pages 41 & 42. Where Customer installs or plans to install obstructions (e.g., asphalt or concrete walk, driveway, retaining wall, paved parking lot, etc.) in the path of Company’s service lateral, Company will require Customer to provide and install raceway for Company’s service lateral to Company specifications. Should Customer not install necessary raceway for service lateral prior to the installation of obstructions or should Customer’s service route change after the installation of obstructions where no raceway exists for new service lateral location, Customer must make the necessary raceway installations prior to service lateral installations. Contact Company for details.

Customer is to establish final grade before service lateral can be installed. Any change in final grade which results in the lowering or raising of service lateral raceway or associated equipment is at the expense of the Customer. When installed by Company, service lateral will be run in a straight line. A clear path wide enough to permit passage of excavation equipment is required. It is the Customer’s responsibility to clear all obstructions before service lateral installation starts. Customer is also responsible for marking or exposing any plumbing. The Company will not be responsible for damaging private plumbing.

Company owned service lateral raceways are to be located on the exterior of the building.

400.03 Underground Services to Non-Residential Service Customers Fed from Padmounted Transformers, Handholes, or Service Pedestals for all three-phase and single-phase greater than or equal to 20 kW
Secondary Service Customers fed from padmounted transformers, handholes, or service pedestals are to furnish, install, own and maintain the service lateral conductors including raceway(s) to the device terminals. Customer will furnish and Company will install physical connections at POD. Conductor size limits are based on equipment terminal configurations. For single-phase padmounted transformers the maximum size secondary service conductors is 500 kcmil. For Service Enclosures maximum conductor sizes refer to Typical Service Enclosures, Figure 5-E, page 50. Where fed from three-phase padmounted transformers 3-wire or 4-wire delta service is not available. For three-phase transformers and Secondary Enclosures the Customer conductor size shall be limited to 1000 kcmil. See Tables 5-A & 5-B, pages 41 & 42 for Company-Customer responsibility.
UNDERGROUND SERVICE (cont’d)

400.04 Underground Services to Multimetered Apartments
For apartments served single-phase, 120/240V, Company provides and installs conduit and conductors from padmounted or pole-mounted transformer to POD. Customer may provide and install conduit with approval from Company and per Company specifications. Apartments served single-phase, 120/208V, Customer provides and installs conductors and conduit from Company padmounted transformer to metering equipment located on structures. If Company transformers are pole-mounted, the Company will provide and install conduit and conductors to the POD. If the number of conductors exceeds the padmounted transformer secondary terminal limitations, the Company may require a padmounted secondary enclosure. See 100.01.30, page 5 and 500.09, page 40.

400.05 Underground Service, Self-contained Meter Wiring
See Figure 4-A, page 30.

400.06 Underground Service Meter for One Residential or One Non-Residential (One Secondary) Service
See Figure 4-B, page 31.

400.07 Underground Service, Two or More Non-Residential Service Meters with Service Enclosure
See Figure 4-C page 32.

400.08 Underground Service, Two or More Non-Residential Service Meters with Meterpack
See Figure 4-D, page 33.

400.09 Underground Service, Meter Rack (see figure for reference to Meter Pedestal)
See Figure 4-E, page 34.

400.10 Underground Service to Mobile or Manufactured Homes
Underground service to a mobile home shall be made in a manner as depicted in Figure 4-E, page 34. The meter socket shall not be mounted directly to the mobile home. Manufactured homes, if equipped with factory-installed service equipment, may be connected as depicted in Figure 4-B, page 31 if all three of the following requirements are met.

1. The manufactured home is secured to a permanent foundation by an approved anchoring system. Compliance with this requirement may be evidenced with one of the following:
   a. the manufactured home structure is included in the real property deed,
   b. the foundation and anchoring system is designed by a Texas licensed engineer or Texas licensed architect, or
   c. an affidavit from a home inspector is provided verifying that the foundation and anchoring system meets the Texas Administrative Code Foundation and anchoring requirements for Manufactured Housing (TAC Title 10, Part 1, Chapter 80).

2. The service equipment complies with Article 230 of the National Electrical Code (NEC).

3. Bonding and grounding comply with Article 250 of the NEC. Contact Company prior to installation of mobile or manufactured homes to determine service method.

400.11 Other Underground Services
For any situation that is not addressed, please contact Company for specific instructions.

Notes:
1. For temporary underground service, see Section 600, page 57 and Figure 6-B, page 59.
2. For underground utility cable locating service - Call 811 - before you dig.
NOTES:
1. Company owned service lateral conductors are installed by Company and line-side (top) connections made up by Company. Customer’s service conductors are installed and connected in socket by Customer. **Customer’s load conductors for self-contained meter sockets may not exit top half of meter socket enclosure.**
2. Meter socket shall be provided, installed, and maintained by the customer. See Table 5-C, pages 43-46 for list of approved meter sockets.
3. An insulated conduit bushing is required for raceways terminating in the meter socket. The service raceway may not contain any LB or other open connections. See Figure 4-B, page 31 for oversized PVC conduit/raceway fitting details.
4. Customer’s grounding electrode conductor, #6 Cu minimum shall originate in the service entrance equipment and extend to an approved ground electrode. The grounding electrode conductor is permitted to be routed through the meter socket enclosure, but shall not terminate within. Company reserves the right to refuse installation of service contingent upon inspection of Customer’s grounding connections.
5. Reference 400.02, page 28 for Company or Customer responsibility for service lateral raceway installation. Schedule 80 PVC or Schedule 40 PVC (if permitted by local code) is required for underground service lateral raceway. **Rigid steel, IMC, or EMC is not allowed.**
6. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service entrance raceway is prohibited, unless approved by the local inspecting authority.
7. Company service lateral conductors must enter from the BOTTOM of the meter socket, not from the side and not from the top.
8. Customer to provide and install an oversized PVC conduit/raceway fitting that slips over the service lateral conduit. This fitting prevents exposure of conductors due to conduit/raceway movement due to soil expansion and contraction. Conduit inserted a minimum of 12 in. into the fitting. See Figure 4-B, page 31 for illustration. Approved oversized PVC conduit/raceway fitting manufacturers and part numbers:

<table>
<thead>
<tr>
<th>Conduit size</th>
<th>MFR</th>
<th>MFR #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2”</td>
<td>Carlon</td>
<td>E954JXX</td>
</tr>
<tr>
<td>2”</td>
<td>Cantex</td>
<td>5144028</td>
</tr>
<tr>
<td>2”</td>
<td>Heritage</td>
<td>610407</td>
</tr>
<tr>
<td>3”</td>
<td>Carlon</td>
<td>E954LXX</td>
</tr>
<tr>
<td>3”</td>
<td>Cantex</td>
<td>5144043</td>
</tr>
<tr>
<td>3”</td>
<td>Heritage</td>
<td>610409</td>
</tr>
</tbody>
</table>
NOTES:

1. See Tables 5-A & 5-B, pages 41 & 42 for Company-Customer responsibility of source and load conductors and connection of these conductors.

2. Meter socket shall be provided, installed, and maintained by Customer. See Table 5-C, pages 43-46 for list of approved meter sockets. Transockets, when required, shall be provided by Company and installed and maintained by Customer. All meter sockets (excluding transockets) require the line-side conductors to be connected to the top meter socket terminals. **Customer load conductors may not exit top half of meter socket.**

3. An insulated conduit bushing is required for raceways terminating in the meter socket. The service raceway may not contain any LB or other open connections.

4. Customer’s grounding electrode conductor, #6 Cu minimum shall originate in the service entrance equipment and extend to an approved ground electrode. The grounding electrode conductor is permitted to be routed through the meter socket enclosure, but shall not terminate within. Company reserves the right to refuse installation of service contingent upon inspection of Customer’s grounding connections.

5. Reference 400.02, page 28 and 400.03, page 28 for Company or Customer responsibility for service lateral raceway installation. Schedule 80 PVC is required for Company owned underground service lateral raceways. **Rigid steel, IMC, or EMT is not allowed.** Contact Company prior to installation to determine service lateral raceway size, 2 in. is minimum.

6. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service entrance raceway is prohibited, unless approved by the local inspecting authority.

7. Customer to provide and install an oversized PVC conduit/raceway fitting that slips over the service lateral conduit. This fitting prevents exposure of conductors due to conduit/raceway movement due to soil expansion and contraction. Conduit inserted a minimum of 12 in. into the fitting. Approved PVC conduit/raceway fitting manufacturers and part numbers:

<table>
<thead>
<tr>
<th>Conduit size</th>
<th>MFR</th>
<th>MFR #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2”</td>
<td>Carlon</td>
<td>E9541XX</td>
</tr>
<tr>
<td>2”</td>
<td>Cantex</td>
<td>5144028</td>
</tr>
<tr>
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<td>3”</td>
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<tr>
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<td>4”</td>
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<tr>
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<td>Heritage</td>
<td>610410</td>
</tr>
</tbody>
</table>

8. Service lateral conductor must enter from the BOTTOM of the meter socket, not from the side and not from the top.

9. Company owned service lateral conductors are installed by Company and line-side (top) connections made up by Company. Customer’s service conductors are installed and connected in socket by Customer.
NOTES:

1. A service enclosure (see 500.08, page 40) for Secondary Service installations through 2500 amperes and two or more meter sockets are required. Service enclosure shall be installed by Customer on outside wall of building. Contact Company for determination of service enclosure requirements. For Duplex and multifamily installations, see Figure 5-F, page 51.

2. Load conductors to meter sockets to be connected equally on both ends of bus bars to obtain full current rating of bus bars. Line conductors shall be connected to center of bus bars.

3. Conductors, gutters and raceways provided, installed and maintained by Customer. Company locks or seals may be required.

4. Meter sockets shall be provided, installed and maintained by Customer. Transockets, when required, shall be provided by Company and installed by Customer. Company locks or seals will be installed at each meter socket. See Table 5-C, pages 43-46 for list of approved meter sockets.

5. For use on service voltages through 480V.

6. Service entrance conductors to be continuous from meter sockets to service enclosure.

7. Refer to Tables 5-A & 5-B, pages 41 & 42 for connector/conductor responsibility in service enclosures. Approved connectors, plated 3/8 in. minimum diameter bolts, Belleville washers, and oxide inhibitor are required for connections to plated aluminum bus.

8. Three-phase service to a non-residential structure must be equipped with a disconnecting means installed on the load-side of the three-phase metering equipment where the metering equipment is installed on a customer structure, unless prohibited by local governing authority. Service disconnect switches and breakers are both acceptable for use as the disconnecting means. The disconnecting means must have provision for a Company lock. The disconnecting means must be readily accessible by Company and within close proximity of the meter. A 4” minimum clearance from the service disconnect switch operating lever is required. Customer must receive Company approval of electrical design and/or nonstandard equipment or locations prior to installation of equipment.

9. For service lateral installation refer to 400.02, page 28. The service raceway may not contain any LB or other open connections.

10. For underground services, the bottom section of the enclosure shall be reserved for the line-side conductors. Load side conductors are not permitted to exit bottom.

11. Insulated conduit bushings are required for raceways terminating in the meter socket.

12. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service entrance raceway is prohibited unless approved by the local inspecting authority.

13. Schedule 80 PVC is required for Company owned underground service lateral raceways. Rigid steel, IMC, or EMT is not allowed.

14. Each socket must be clearly and permanently marked as indicated in 500.11, page 40.
NOTES:
1. A meterpack, installed by Customer on outside wall of building for Secondary Service installations for two or more meter sockets, may be installed in lieu of a service enclosure. **Contact Company for approval of meterpacks prior to letting bids and installing equipment.** For multifamily installations, see Figure 5-F, page 51.
2. Meterpacks provided, installed, and maintained by Customer.
3. Refer to Tables 5-A & 5-B, pages 41 & 42 for connector/conductor responsibility in meterpack.
4. When utilizing meterpacks to serve Secondary Service Customers, lever-operated bypass mechanisms are required for each individual meter socket.
5. For service lateral installation refer to 400.02, page 28. The service raceway may not contain any LB or other open connections.
6. The use of flexible metallic conduit, liquid tight flexible metallic conduit, and liquid tight flexible non-metallic conduit for service entrance raceway is prohibited unless approved by the local inspecting authority. The service raceway may not contain any LB or other open connections.
7. Schedule 80 PVC is required for Company owned underground service lateral raceways. **Rigid steel, IMC, or EMT is not allowed.**
8. Meterpacks with meter stacks up to 5 meters tall will be permitted under certain conditions. Maximum mounting height is 72 in. to the center of the top meter socket. For meter stacks that have 5 vertical positions, a permanent hard surface extending a minimum of 24 in. in front of the meterpack and the width of the meterpack is required. Contact Company for details.
9. **It is the Customer’s responsibility to determine local code requirements concerning meterpacks with main switches or main circuit breakers prior to installing equipment.**
10. Each socket must be clearly and permanently marked as indicated in 500.11, page 40. Apartment or Location placards may be mounted on meterpack adjacent to the tenant breaker, as an alternate mounting position. Screws and rivets are not allowed to attach placards.
UNDERGROUND SERVICE, METER RACK

FIGURE 4-E

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Angle iron, 3&quot; x 3&quot; x _ x 8'-0&quot;, galv. (or unistrut)</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Angle iron, 2 3/4&quot; x 2 3/4&quot; x 36&quot;, galv. (or unistrut)</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>Conduit, Sch. 80 PVC, as required</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Conduit, nipple, as required (lowered for meter socket - upper for transocket)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Concrete, as required</td>
</tr>
</tbody>
</table>

NOTES:
1. Company owned service lateral conductors are installed by Company and line-side (top) connections made up by Company. Customer service conductors are installed and connected in socket by Customer.
2. Meter socket, rack and conduit/risers provided, installed and maintained by Customer. A 4" minimum clearance from the disconnect switch operating-lever is required. See Table 5-C, pages 43-46 for list of approved meter sockets.
3. Service lateral or source conductors provided and installed as per 400.02, page 28. The service raceway to transformer (source) may not contain any LB or other open connections.
4. A 4 Ft. clearance is required from meter side of meter rack assembly to any obstruction or structure.
5. Customer service equipment may be installed on meter rack assembly in accordance with all applicable codes.
6. Customer provides, installs and maintains the grounding electrode conductor, #6 Cu minimum and connection to an approved ground electrode. Company reserves the right to refuse installation of service contingent upon observing an unsafe Customer connection.
7. Alternate Design- Customer shall obtain Company approval of any alternate design prior to installation. A Meter Pedestal is an acceptable alternate design, and it must follow Company Standard Drawing 212-305. See Company for details.