

## **GENERAL**

The purpose of this guide is to assist you, our customer-owners, in acquiring three phase commercial underground electrical service as economically and with as little inconvenience and delay as possible. Included here is a summary of the requirements that the PUD has incorporated into their Rules & Regulations for Three-Phase Underground Line Extensions.

- A representative from our Engineering Department will determine the availability, location and conditions of service, if an easement will be necessary, and the dollar amount of line extension fees for your new service. Contact our Engineering Department early in your planning process for this information.
- You normally provide and install all trenching, conduit, primary junction vaults, transformer vaults, backfilling, and secondary conductors, as well as service entrance wiring and equipment. You retain ownership and maintenance responsibility for customer-provided service conductors and equipment.
- Prior to commencing actual installation, one of our Engineers will meet with you and/or your representative at the construction site to finalize the scope of the work. If there are additional customer furnished items, our Engineer will review them with you in greater detail as the job progresses.
- We supply and install the meter when the new service is connected. We also provide and install current transformers (CT's) when required. Check with our Engineering Department for detailed meter socket, test switch and installation requirements. The customer must pay all metering costs before the service is connected.
- You will need to obtain all permits required from city, county and state agencies before excavating on any public lands or rights-of-way, and comply with the requirements of these agencies.

## **INSTALLATION AND MATERIAL SPECIFICATIONS**

- General: Primary conduit runs that exceed 175 feet in length may require special sweeps unless otherwise agreed upon by the PUD. Not more than a total of 180° of turns or sweeps will be allowed in a duct run without a pull box or handhole. For example, between a PUD transformer and primary junction vault, not more than two 90° sweeps or four 45° sweeps, or any combination thereof, would be allowed in the conduit.
- Grading: Final grade must be established before trenching and installing duct or vaults. Any changes in the grade that would put the conduits or vaults at a depth less than required, or leave any installation in an undesirable condition, will require you to correct it at your expense.

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- Excavation: Excavating should be done only as necessary for installing the duct and vault system, exercising care for adjacent sidewalks, curbs, streets, and underground utilities. Trenches for underground ducts need to be true to line and grade, as shown on the drawings and indicated in the specifications. Keep banks of trenches vertical. Maintain trenches free from standing water when ducts or vaults are being installed, and cleaned of excess and loose rock and earth before installation of duct encasement.



## **3-PH COMMERCIAL SERVICE UG LINE EXTENSION GUIDE**

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- Conduit: The underground duct (conduit) must be gray Polyvinyl Chloride (PVC) Schedule 40, conform to NEMA TC2 Specifications and be permanently marked at regular intervals with the manufacturer's name or symbol, size, "SCH 40" and "PVC". The conduit size will be determined by the PUD (normally 3", 4", or 6").
- Couplings and Fittings: Must be PVC Schedule 40, factory-made, and conform to the same specifications as the conduit. Special sweeps may be required, at the discretion of our Engineer. Sweeps must have a minimum 36" centerline radius. 24" radius can be used with prior approval of our Engineer.
- Installation of the Conduit System: Ducts should run in a straight line. Standard bends, sweeps or offsets, as specified above, may be used as required. Install couplings, connectors, and fittings to provide a rigid mechanical assembly with conduit cut square, reamed, and without burrs. Cement conduit joints as recommended by the manufacturer.
- Duct Bedding and Encasement: A minimum of four (4) inches of bedding and four (4) inches of cover is used to encase the ducts. The minimum depth from finished grade to bottom of the trench for primary cable is forty-eight (48) inches and thirty-six (36) inches to bottom of trench for services and secondary. (See Page 242.4).

**Sand or clean soil should be used for the encasement of the duct. Crushed stone or other similar aggregate with sharp points is NOT acceptable.**

- Inspections: After installing the duct, vault, and 4" sand bedding beneath the duct, call the Engineering Department for an inspection before proceeding. After installing the 4" sand cover over the conduit, call the Engineering Department again for a final inspection before proceeding with the backfill.

**FAILURE TO OBTAIN AN APPROVAL BEFORE BACKFILLING WILL REQUIRE YOU TO EXPOSE ALL OR PART OF THE DUCT RUN FOR OUR INSPECTION AND ACCEPTANCE BEFORE WE PROCEED WITH INSTALLATION OF CABLE.**

- Backfill: Excavation material may be used for backfill provided it is free from frozen particles, rock, vegetation, or trash. Backfill should be placed uniformly in layers and each layer thoroughly compacted. **Conduit must be sealed with a factory manufactured conduit plug.**
- Vaults and Covers: The concrete primary junction vault(s) with cover(s), and transformer vault(s) and cover(s) will be specified by our Engineering Department after preliminary engineering is complete and the transformer size is determined. Equivalent products must have prior approval of our Engineering Department. The top of a vault (not including the cover) is installed at the final grade level so that when the 6" cover is in place, the top of the cover will be 6" above the final grade of the surrounding surface. Knockouts should be made from the inside of the vault. Completely remove center knockout in bottom of vault prior to installation to allow vault to drain. For vaults in paved areas, discuss grade requirements with the Engineer before excavating.
- Secondary Conductors: Your secondary conductors need to be installed to the transformer vault location prior to installation of the transformer. Secondary conductors need to be limited to a maximum of eight per phase. More than eight conductors per phase may require the customer to use a special terminating cabinet. Contact a PUD Engineer if more than eight secondary conductors per phase will be needed. **Secondary conductors must be sufficient length to extend a minimum of eight feet above the transformer pad.**
- Access to Equipment: Where 24 hour access to PUD equipment is restricted by fences or other means, you will need to provide a key box or double locking gate which will allow PUD personnel access by use of a PUD key.