

Duct Bank General Notes

1. All work shall be performed in accordance with the standard Specifications for Contractor Installed Manholes and Concrete Encased Conduit Systems as established by Oncor Electric Delivery, latest editions, and any and all applicable Specifications and requirements of the Town of Addison.

Oncor Specifications include the following: DDS-4 "Specifications for Electrical Underground Distribution Systems from Padmounted Transformation, Secondary Service Accounts", DCS-5 "Specifications for Contractor Installed Manholes and Concrete Encased Conduit Systems", and Oncor Underground Distribution Construction Standard drawings 205-465, 205-475, 205-485 and 205-490. The Oncor Standard Drawings shall take precedence over the omission of or conflict with information in the DDS-4 or DCS-5 sheets.

2. All applicable codes and ordinances shall be followed in the construction of the manhole and conduit line system. Included but not limited to are the following:

- Local Town of Addison building codes
The National Electric Code (NEC)
OSHA requirements. Any conflict or omission shall not relieve the contractor or responsibility of complying with OSHA requirements.
Local Town of Addison location and coordination Policy (if applicable).
The American Concrete Institute (ACI).
The American Society for Testing and Materials (ASTM).
Local, City, State and Federal Environmental Regulations
Texas Engineering Practice Act and Rules Concerning The Practice of Engineering and Professional Engineering Licensure.

3. The contractor shall locate and protect all existing utilities, whether indicated on the design drawing or discovered during the work. The contractor shall immediately notify the Engineer and Oncor's authorized representative when any utility not previously indicated or inaccurately indicated on the design drawing is discovered.

4. The contractor shall supply all materials for this job including manholes, necks, frames and covers, con-seal, ground rods, PVC Conduit, PVC Bends, PVC couplings, tie-wraps, conduit spacers, PVC adhesive, concrete select backfill, pull ropes, pre-cast switchgear or transformer pads, electric cable markers, manhole ladder rungs, etc., per Oncor Electric Delivery specifications unless otherwise specified on the Drawings.

5. Concrete encased duct structure installation shall be performed as follows:

- All conduits shall be concreted encased with a minimum of 3" of concrete. The top conduits of any duct structure shall have 6" minimum cover. Refer to Oncor details and construction drawings for duct section. All concrete encasement shall have a pattern finish.
Concrete should be 5 sack, Portland Type 1 cement, 3/4 maximum size aggregate 3000 PSI at 28 days. The slump of the concrete may be increased by the contractor with the approval by Oncor inspector, in order to facilitate a wetter mix to insure total encasement of the duct. However, the slump should not be increased to the point where the ultimate yield strength of the concrete is jeopardized.
All concrete shall be installed by the use of Hopper, Trimmie, Chute, or pump truck unless otherwise specified by Oncor Electric Delivery inspector. At no time shall concrete be placed with a front-end loader or by similar method.
Concrete encased conduit shall be held down with screw jacks or equivalent means installed at intervals not exceeding 20' along the duct line. Any instance of floating or racking of conduits shall be immediately reported to Oncor Delivery Company Inspector or Designated Company Representative.
Conduit for encasement shall be NEMA TC-6, DB-60, ASTM F-512, rated for 90 degrees centigrade. All bends, elbows and couplings shall be schedule 40 PVC with a minimum radius 36".
Spacers shall be snap lock type conduit per Oncor details. Purpose-designed base, intermediate and top conduit spaces shall be used.
Finish backfill should be placed in level, uniform lifts with each lift compacted to the minimum dry density within the compaction soil moisture ranges recommended. The loose lift thickness should not exceed six (6) inches. Each layer should be properly placed, mixed, spread, and compacted to between Ninety-five (95) and one hundred (100) of standard proctor density at 0% to 3% of optimum moisture content as determined by ASTM D698.
When complete, each conduit installed will be checked by pulling both a disk mandrel and a conduit swab through the entire length of conduit.
Duct spacers are to provide 3 inches of vertical and horizontal separation between conduits.
Red powder concrete dye is to be placed on the duct encasement cap immediately after the concrete pour has taken place to aid with future location of primary duct.
Conduits for incomplete duct lines (stubs) are to remain exposed from the encasements for future retrieval. The ends shall be capped watertight and have an electronic marker installed.
Each conduit of an encased duct is to have a 6000 pound pull tape installed for future cable pulling.

6. Concrete manhole installation shall be performed as follows:

- Precast type unless otherwise noted, should be supplied by approved supplier and shall consist of two or three precast concrete sections with each section having a maximum weight of 15,000 lbs.

- 18 inches minimum pea gravel of cushion shall be installed in the bottom of excavated area prior to the manhole installation. Sand base may be used with prior Oncor approval.
Select backfill should be installed around all manholes in maximum 1 ft. lifts and compacted to 95% minimum.
Contractor shall install the frame/cover and neck. Construction plans show the approximate entrance elevation; however it is the contractor's responsibility to install the necessary amount of neck to bring the top of the cover to 2" above finished grade (or flush with street grade when cover is in street). Saw cutting or grout fill may be required to obtain the appropriate entrance elevation.
The contractor shall supply 8' x 5/8" copper clad ground rod, weld type, in each manhole at each sleeved location (minimum three). Ground rod shall be vertically driven into undisturbed soil. If rock is encountered, grounding shall be as directed by Oncor Electric Delivery inspector. All ground rods shall be installed prior to placement of top manhole section (due to height limitations). In no case shall ground rods be cut.
The contractor shall install concrete pad around all manhole entrances in all non-paved areas. See standard detail drawings for reinforced steel requirements and dimensions.
All joints between manhole sections shall be made watertight at the time of initial installation.
Do not remove the "knock out" membranes of any unused terminator position. Duct plugs should be installed in all conduits that are unoccupied by cable.
Final slope across top of manhole shall provide for a 2" minimum drop to drain water from top of manhole.

The Oncor Electric Delivery inspector is to inspect all manhole installations prior to the placing of backfill and all conduit installations prior to the placement of concrete.

Concrete shall not be placed when the temperature is below 40 degrees Fahrenheit and falling, but may be placed when the temperature is above 35 degrees Fahrenheit and rising. The temperature reading shall be taken in the shade and way from artificial heat.

The contractor shall provide verification of completion and compliance of any and all required tests to the satisfaction of Oncor Electric Delivery.

The contractor shall contact Oncor Electric Delivery to request a final walk-through inspection of the electric duct bank infrastructure work.

- Oncor Electric Delivery inspector shall be notified a minimum of 2 hours prior to the delivery of concrete and shall be presented during placement.
Contractor shall submit a written request to the appropriate Oncor Electric Delivery authorized personnel prior to any modification to the original design drawings that will change the number of bends or add 10 percent or more to the overall conduit length found on the original design plan. This written request must be provided prior to implementation of changes. This requirement includes the addition of bends as necessary to properly align conduits entering and exiting proposed equipment pads.

No separate payment shall be made for the cost of additional bends as necessary to properly align conduits entering and exiting equipment pads, such cost shall be included in the pad costs.

- Equipment pads shall be installed per DDS-4 specifications. Piers and beams are required on all equipment pads unless waived by company inspector. If required, stabilization method(s) will be determined by the company inspector. The depth shall extend to rock or a change in soil conditions sufficient to bear the load of pad and equipment, and to prevent settlement due to undercutting for conduit bend installation or washing due to drainage.
The Contractor shall fully comply with and supplement the proposed Storm Water Pollution Prevention Plan, as necessary, while conducting his activities on this project.
The Contractor shall make necessary provisions for the support and protection of all light poles, fences, trees, shrubs, utility services building foundations and all other utilities and structures both above and below the ground, the cost of which shall be included in the contract amount. These include, but are not limited to existing light poles and foundations in the median.
The Contractor shall schedule and coordinate his work with trenching operations for other utilities including telecommunications services.
Contractor shall maintain a minimum of 1 foot of clearance from outside of utility to outside of duct bank at all locations where the proposed duct bank crosses existing or proposed utilities.
Contractor shall move existing underground electric illumination lines in the vicinity of proposed manholes, as necessary, prior to installation of proposed manholes.
The unit price for transformer and switchgear pads to include all duct bank bends necessary (but not shown on the plans), to adjust duct bank alignment at pads to proper connection points. Oncor to provide location points.
Contractor to perform duct bank construction as needed at connection points to existing electric lines. Contractor will be required to meet the scheduling requirements of Oncor. Such requirements will include scheduling during off peak electrical demand hours and as such, may include night time construction.
When working near energized overhead lines the contractor shall meet all state and federal requirements for distance of equipment and personnel from energized conductors.
Oncor does not permit utility poles to be supported during construction. To prevent undermining poles, the minimum distance between the nearest edges of pole and duct bank shall be 5 feet.

Boring Notes

- Contractor shall procure all shoring material, fabricated where required, necessary to complete the project as indicated on the plans. All shoring material shall remain the property of the contractor.
Contractor shall weld all sections of the steel encasement.

- Contractor shall provide and install the appropriate number and size of conduits (Schedule 40 PVC Water Pipe) and grout injection pipes in the steel encasement, using spacers, banding, and grout.
Contractor shall take all precautions necessary to ensure the integrity of the conduits during backfill and grouting.
Spacers are to provide 3 inches of vertical and horizontal separation between conduits.
The contractor will provide steel encasement, bore spacers.
Steel encasement pipe size and spacer design shall be approved by Oncor for each bore.
Contractor shall take all precautions necessary to ensure the integrity of the conduits during backfill and grouting, including at a minimum plumbing the six inch (6") schedule 40 water pipe within the steel encasement with a circulatory system designed for a minimum change-over of water every hour for a 48-hour time period.
Contractor shall provide and install the appropriate number of six inch (6") conduits (schedule 40 pvc water pipe) and three inch (3") grout injection pipes in the steel encasement, using spacers, banding, and grout.
Contractor shall weld all sections of casing together
Weld a 3" X3" X 1/2" thick steel "L" angel into the bottom of the bore casing and grind smooth to form a continuous rail on which the bore spacers will travel to prevent spiraling.
Fill annular space between conduits with concrete grout from the following choices: TXI90032LE or Southern Star. No substitute on aloud without prior Oncor approval and formal submission of thermal resistivity test.

Electrical and Franchise Utility Duct Bank Notes

- The Contractor shall verify the location and number of all existing active utility, electrical and telecommunications services and construct new facilities up to the existing points of connection. The Contractor shall schedule the final connections with the utility company. The connection shall be phased as follows:
The utility company will de-energize the existing service.
The contractor will connect to existing conduits as directed by utility owner.
The utility will transfer/restore service.
The contractor will be required to meet the scheduling requirements of the utility. Such requirements will include scheduling during peak hours including night time construction to minimize disruption of service.
The contractor will be on call during all transfers of service to facilitate any "civil" work that may be required to complete the connections.

Water/Wastewater General Notes

- The Contractor shall verify the location and number of existing active water services affected by construction and shall maintain existing water service at all times. If necessary, the Contractor shall provide for temporary water to affected services until the new water main has been tested, approved and accepted by the Town of Addison. The Contractor shall coordinate with the Town of Addison regarding shutdown of any active water main or service and shall reconnect water services to new water mains as necessary. No Separate Pay Item.
The Contractor shall coordinate all water main tie-ins with the Town of Addison prior to making tie-ins.
The Contractor shall ensure that fire hydrants are accessible to fire trucks at all times and that existing water main valves are accessible to Town of Addison personnel at all times. The Contractor shall sequence his construction such that no more than one fire hydrant is out of service at any given time and shall notify the Town of Addison when a fire hydrant is taken out of service.
The Contractor shall verify the location and number of existing sanitary sewer services affected by construction and shall maintain existing sanitary sewer service and flow at all times. The Contractor shall reconnect sanitary sewer laterals to new sanitary sewer mains as necessary. Dye testing may be required at no additional cost to the owner. No Separate Pay Item.
The removal of existing valves, manholes, and other water and sanitary sewer appurtenances necessary for the construction and installation of the improvements shown on the project plans is considered incidental unless noted otherwise.
Water main construction to comply with TCEQ regulations.

DRAWINGS AND NOTES REVIEWED AND APPROVED BY ONCOR ELECTRIC DELIVERY

Signature of James Fangue, P.E. dated 1/28/14



Signature of Registrant: [Signature] P.E. 1-22-14 Date

FIRM REGISTRATION NUMBER: 312

Table with columns: NO., REVISION, BY, DATE

TOWN OF ADDISON DALLAS COUNTY, TEXAS

BELT LINE ROAD UNDERGROUND ELECTRICAL

GENERAL NOTES

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Table with columns: PROJECT, DESIGN, DRAWN, DATE, FILE, SHEET. Values: 29350, HALFF, HALFF, NOV. 2013, 29350 GNTS 02, GN-2

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