PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Extent of duct bank and electrical cable work as indicated by drawings and schedules.

B. Underground manholes.

C. Duct spacers and cable rack assemblies.

D. Grounding.

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Use rigid steel, galvanized where exposed above ground or stubbed up poles. All 90 degree bends shall be long sweeping galvanized steel.

B. All underground conduit runs shall be schedule 40 PVC and shall be encased in concrete.

C. Refer to the attached “Primary Duct Bank Detail” for a typical 15KV duct bank installation and concrete encasement requirements.

2.02 UNDERGROUND MANHOLES

A. Furnish and install precast concrete manholes as indicated on the drawings and specified hereinafter. The products shall be similar and equal to those as manufactured by Oldcastle Precast, Inc. of Lebanon, Tennessee.

B. Manholes shall be furnished 6'Wx12'Lx7'H. The sizes shall be clear inside dimensions of the hole. Provide two manhole openings 36" diameter. There shall be conduit duct windows to allow for the entry of the conduits in the installation of the duct as detailed. Concrete shall be rated at 5,000 pounds per square inch compression strength at 28 days. Provide reinforcing steel to support highway

C. Each manhole shall be equipped with Unistrut inserts in the side walls and pulling eyes in the side wall at the floor opposite each duct window opening.

D. Covers and collars for manholes shall be level with the finished grade. Build up masonry wall between manhole top and manhole cover collar as required for leveling with finished grade.

E. All cables in manholes shall be wrapped with fireproofing materials manufactured by 3M Company.

2.03 DUCT SPACERS AND CABLE RACKS

A. A horizontal and vertical separation between the duct of 2 inches shall be maintained by installing high impact polystyrene duct spacers manufactured by Underground Devices Inc. Spacers shall be interlocked horizontally only. Along the length of the duct run spacers shall be staggered at least 6 inches vertically and shall be placed at an interval of 4 spacers per 20 feet.

B. Cables shall be supported on walls by heavy duty non-metallic cable racks. The cable racks consist of stanchion that shall be attached to the manhole wall in accordance with the manufacturer’s recommendations and adjustable arms that lock into the stanchion. Underground Devices Inc. Provide unless otherwise specified:

1. At least two stanchions shall be installed on each manhole wall.
2. Cable rack arm lengths shall be appropriate for the manhole size and amount of cable being installed.
3. At least two spare arms shall be installed at each stanchion position.

C. Cable rack stanchions and arms shall be made from 50% glass reinforced nylon. The stanchion shall be 36 inches long and incorporate multiple arm mounting holes. Holes or slots shall be provided in the arms for cable wire ties. All mounting hardware for stanchions shall be 316 stainless steel. Install per manufacturer’s instructions.

2.04 GROUNDING
A. Grounding shall be provided throughout the underground duct system and utility structures to establish a solid ground system.

B. Install #4/0 soft drawn bare copper in the bottom of the duct bank trenches prior to the pouring of concrete backfill. Connect this #4/0 conductor to the ground loop in each manhole. In manholes, install a #4/0 bare copper grounding conductor around the interior face of the walls of the manhole and locate midway between the floor and ceiling of the manhole. Secure #4/0 ground conductor with anchor bolts and clamps on 18" centers.

C. Install two copper clad 5/8" x 8' ground rods at each manhole separated minimum 10 feet apart. Connect ground rods to the grounding conductors in each manhole.

D. Grounding connections in manholes shall be exothermic type. The ground shield on the 15-KV conductor insulation shall be brought out and connected to this grounding conductor in accordance with the conductor manufacturer’s recommendations. Bond ground rods to ground loop in manhole with #4/0 bare copper.

PART 3 - EXECUTION:

3.01 INSTALLATION:

A. Install duct banks as indicated on the attached drawing “Primary Duct Bank Detail”.

B. The hole to receive a manhole shall be dug to the proper depth to receive the manhole and cover plus 8 inches of crushed stone in bottom of hole. Manholes shall be set in place by the fabricator of the pre-cast manhole and inspected prior to backfilling.

C. Manholes shall be set in place, backfilled, prior to installing underground duct banks. The excavation to receive the manhole shall be a minimum of 6" clear of manhole side in order to allow adequate backfilling and tamping of the earth fill along its side. The manholes shall be completely backfilled and sod and surface replaced prior to the excavation for underground duct lines.

D. Conform to the manufacturer’s recommendations. Ground rods shall be driven in place in the hole and conductors connected thereto prior to placing the manhole into position.

E. Provide any shoring necessary for the installation of manholes.
F. Grounds shall be provided to all equipment frames, housing, and secondary neutrals. Neutral conductors shall be grounded repeatedly wherever occurring near a grounding conductor.

G. All ground connections in manholes shall be exothermic type. Ground connections exterior of manholes shall be exothermic type.

END OF SECTION 16120
EARTH OR CRUSHED ROCK OR ASPHALT. CONSTRUCTION TO MATCH EXISTING SURFACE.

CAUTION MARKER.

COMPACTED BACKFILL.

#4 REBAR CONTINUOUS ALONG DUCT LINE.

CONCRETE ENCASEMENT FILL ALL VOIDS 4000PSI MIN, NO GUNITE OR SHOTCRETE WILL BE ALLOWED.

PROVIDE CONDUIT SPACERS 5' O.C. ENTIRE LENGTH OF DUCT

2-5" SCHEDULE 80 PVC CONDUITS FOR UG PRIMARY.

#4 REBAR TIE DOWN BRIDGE 6'-0" O.C. ENTIRE LENGTH OF DUCT.

#4/0 BARE COPPER BURIED BELOW CONCRETE BACKFILL.

24" MIN.

5.5"

5.5"

7.5"

3'-0" MINIMUM

12"

12"