CONCRETE ENCASED DUCT BANK

**From Bennington BRF 1000(16)

xx. DESCRIPTION. This work shall consist of furnishing and installing underground concrete encased conduit systems for fiber optic cable. The work shall be performed in conformance with the lines, grades, dimensions, locations, and details shown on the Plans or as determined by the Engineer.

The terms “Duct” and “Conduit” are used interchangeably in these provisions.

xx. MATERIALS. Conduit shall be PVC Schedule 40 Rigid Wall Conduit conforming to NEMA Standard TC-2. Conduit bends (sweeps) shall be galvanized steel with a minimum bend radius of 36 inches.

Concrete shall conform to the requirements of Section 541 for Concrete, Class B.

xx. GENERAL REQUIREMENTS. The Contractor shall coordinate and work with each utility company, as necessary, to ensure the conduit systems installed are constructed in accordance with the Plans and the utility company’s specifications.

xx. EXCAVATION. Concrete encased duct bank shall be placed within the limits of Structure Excavation and within the limits of Granular Backfill for Structures, or within the limits of approach roadway Subbase of Dense Graded Crushed Stone.

xx. INSTALLATION OF CONDUIT. Conduit bends shall match bends as noted on the Plans. Conduit at bends (sweeps) shall be galvanized steel with a minimum bend radius of 36 inches. No sharp bends will be allowed.

Random “main” conduit may be mandreled at the direction of the Engineer and utility companies’ inspector with a 4 inch diameter solid mandrel. The conduit structure shall be mandreled as follows:

Ten conduits or less: Mandrel two diametrically opposite conduits.

If at the time the cable is being installed in the conduit by the utility, and the cable cannot be pulled through the conduit, then the Contractor shall replace/repair (at the Contractor’s expense) the conduit.

Conduit spacers, as approved by the Engineer and utility companies’ inspector, must be used to ensure separation between the conduits as shown on the Plans. Spacers are to be placed at 6 foot intervals or as recommended by the product manufacturer.

The Contractor shall furnish and install a minimum 300 lb nylon pull-in cord in each duct. The pull-in cords shall be installed in the completed ducts. Connection of conduit to proposed conduit in the approaches installed by others will be performed by the utility.

The Contractor shall install furnished plastic warning tape, describing buried electrical lines, along the entire length of the duct bank.

Tape shall be installed approximately 6 inches deep or as directed by the utility companies' inspector.

Duct joints shall be made watertight by the use of brush-applied cement as recommended by the manufacturer.

All conduit placement will require approval by the utility companies' inspector prior to concrete placement. Any field modifications will be done only with the approval of the inspectors.

When it is expected that there will be an interval of four hours or longer between pours of concrete, reinforcement bars shall be installed across the construction joint. The bars shall be size #4 and not less than 6 feet in length. One bar shall be installed in each corner, and between ducts in the top and bottom of the concrete envelope, 4 inches from the outside surface. Each reinforcement bar shall extend an equal distance into the two pours of concrete.

Prior to pouring concrete, the duct shall be securely anchored to prevent movement during the pour. Anchors shall be within 2 feet and on each side of a joint, at each end of a bend, and at a maximum distance of 10 feet between anchors.

The Contractor shall confirm, before placing forms or duct lines, that the surface on which concrete is to be poured is firmly compacted fill free from voids, rock, or rubble.

Duct envelope shall be square or rectangular in cross section and shall provide for concrete thickness over the outside ducts as shown on the Plans.

Slump tests shall be performed on all concrete deliveries. The concrete shall be placed carefully so as not to disturb or damage the conduit. The concrete shall be consolidated as directed by the Engineer to eliminate honeycombing or other defects. The Contractor shall ensure that all clearances shown on the Plans are maintained during concrete placement.

The Contractor may place 6 inches of loose approved backfill material on the concrete as soon as the surface is set to aid in curing. However, actual backfilling shall not begin until at least 24 hours after placement of concrete.

xx. BACKFILL. After the concrete has cured for a minimum of 24 hours, and after approval by the Engineer and utilities companies' inspectors, approved material shall be placed over the encased ducts in 6 inch layers and compacted in accordance with Subsection 203.11(d) by using air or mechanical tampers. Hand tampers will not be permitted. Backfill for conduit shall have maximum 1½ inch stone.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Concrete Encased Duct Bank) of the number and size of ducts specified to be measured for payment will be the number of meters (linear feet) installed in the complete and accepted work, measured to the nearest meter (linear foot) along the center of the duct bank.

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Concrete Encased Duct Bank) will be paid for at the Contract unit price per meter (linear foot). Payment will be full compensation for furnishing, transporting, handling, and placing the materials specified, including conduit, conduit spacers, transition couplings, elbows and other fittings, caps, plugs, pull cord, concrete encasement, and all other material needed for a complete concrete encased duct bank system; excavation and backfill; placing of concrete; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.640 Special Provision (Concrete Encased Duct Bank, X Ducts)(X”)	Linear Foot