

FIBRE OPTICS

PART 1: GENERAL

1.1 DESCRIPTION OF WORK

- .1 The Work described herein is for the supply and installation of HDPE conduit, Fibre Optic Cable, Fibre optic vaults, and termination of fibre optics into city buildings.

1.1 CLASSIFICATION OF WORK

- .1 Conduit shall be classified on the basis of number of conduits, conduit size, expressed as the nominal inside diameter of the pipe and fittings, pipe material type, and installation depth.
- .2 Fibre Optic Cable shall be classified on the basis of number of cables, and number of strands in each cable.
- .3 Vaults shall be classified on the basis of material type, vault dimensions, and minimum rated static load capacity.

1.2 REQUIRED SUBMITTALS

- .1 Materials List as per Section 01-030 Submittals.

PART 2: PRODUCTS

2.1 CONDUIT

- .1 Conduit shall be High Density Polyethylene (HPDE) having a DR rating of 17. Conduit shall be coloured orange.
- .2 Conduit size shall be as described on the drawings, the unit price schedule or as noted in section 01002 Scope of Work.

2.2 FIBRE OPTIC CABLE

- .1 Fibre Optic Cable shall be Corning Cablesystems Freedom LST gel-free, single mode, loose tube, indoor/outdoor FT-4 fibre cable or approved equivalent.
- .2 Fibre optic cable strand count shall be as described on the drawings, the unit price schedule or as noted in section 01002 Scope of Work.

2.3 LOCATOR TRACER WIRE

- .1 Locator Tracer Wire shall be 12 AWG (minimum), copper wire coated with 30mm (minimum) polyethylene jacket designed specifically for direct burial.

2.4 VAULTS

- .1 Vaults shall be 1200mm x 760mm x 900mm (LxWxD) polymer concrete, suitable for underground bury with a minimum rated capacity of either 20,000 psi static load or 10,000 psi static load, as specified in the Contract Documents.

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- .1 20,000 psi vaults shall be Channel product GLB3048 (GLB304836C28C31Axx) or approved equal; 20,000 psi static load c/w broadband identification, 2 piece polymer concrete lid, hex bolt locking, and no additional accessories.
- .2 10,000 psi vaults shall be Channel product SGLB3048 (SGLB3048361B1100) or approved equal; 10,000 psi static load, c/w broadband identification, green coloured cover, "L" bolt locking, and no additional accessories.

PART 3: EXECUTION

3.1 CONDUIT

- .1 All conduit shall be installed 1.2m below grade, measured vertically from the top of the conduit to the existing or proposed ground surface, unless otherwise noted on the Drawings. Excavate the roadway or lane to the depth, line and limits as required to accommodate installation.
- .2 Trenchless methods of installation shall be used where feasible. Open cut methods of installation shall be approved by the Engineer prior to installation.
- .3 Backfill all open excavations with Unshrinkable Backfill in accordance with 02210 Excavation, Bedding & Backfill.

3.2 FIBRE OPTIC CABLE

- .1 All runs of Fibre Optic Cable shall start and end in the appropriate building as shown on the Drawings and shall be continuous lengths with no splices.
- .2 Supply additional (slack) Fibre Optic Cable at locations indicated, or as requested by the Engineer.

3.3 VAULTS

- .1 Vaults shall be installed where shown on the Drawings to ease cable installation and maintenance.
 - .1 Each vault shall contain a minimum of 30m additional (slack) Fibre Optic Cable for each cable installed, unless otherwise noted on the Drawings.
 - .2 A continuous locator or tracer wire shall be installed with each run of conduit between Vaults.
 - .3 Vaults shall be installed level and at the same elevation as the surrounding surface.
 - .4 Vaults shall be installed on a 200mm thick foundation of compacted Bedding Gravel, as specified in Section 03-010, Excavation, Bedding & Backfill. The Bedding Gravel shall extend 50mm into the vault cavity.

3.4 BUILDING TERMINATIONS

- .1 The incoming HDPE fibre optic conduit shall transition into a 50mm PVC conduit at minimum 0.300m below grade; which shall run continuous to a building mounted fibre termination box.
- .2 Fibre Termination box shall be IP65 rated, be mounted 4' above existing grade or directed by city and shall be secured to the wall with appropriate mounting hardware for the surface.
- .3 All terminations holes into the building shall be cored or drilled and sealed leaving a weather tight seal.

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- .4 Cable routing on the interior of the building shall be encased and ran through a 1.5" galvanised steel conduit from the building termination point to end desired location of the fibre optic cable identified by the city.
- .5 Any required splicing of fibre optic cables shall be completed in a wall mounted fibre splice box suitable for the type and number of cables being spliced.

PART 4: METHOD OF MEASUREMENT

4.1 CONDUIT

- .1 Measurement for each class and type of 'Conduit' described in this specification and as indicated in the Contract Documents will be based on the number of linear metres of each class and type of 'Conduit C/W Fibre Optic Cable' acceptably supplied and installed, measured horizontally on the ground along the centerline of the conduit from vault to vault.
- .2 No additional measurement will be made when multiple conduits are installed in a common trench.

4.2 FIBRE OPTIC CABLE

- .1 Measurement for each class and type of 'Fibre Optic Cable' described in this specification and as indicated in the Contract Documents will be based on the number of linear metres of each class and type of 'Fibre Optic Cable' acceptably supplied and installed, measured horizontally on the ground along the centerline of the cable from vault to vault.

4.3 VAULTS

- .1 Measurement for each class and type of 'Vault' described in this specification and as indicated in the Contract Documents will be based on the actual number of each class and type of 'Vault' acceptably supplied and installed as measured by the Engineer.

4.4 BUILDING TERMINATION

- .1 No measurement will be made for each class and type of 'Building Termination' described in this specification and as indicated in the Contract Documents.

PART 5: BASIS OF PAYMENT

5.1 CONDUIT

- .1 Payment for each class and type of 'Conduit' will be at the price set forth in the Unit Price Schedule for each class and type of 'Conduit' measured as specified herein, which shall be payment in full for those operations described in this specification and as indicated in the Contract Documents, including:
 - .1 Supply and installation of barricades, construction and maintenance of detour routes, traffic control, temporary fencing;
 - .2 Common Excavation of roadway, sidewalks, concrete curbs and boulevards;
 - .3 Excavation of trenching, boring or augering;
 - .4 Supply and installation of conduit, adaptors, couplers, and fittings required to join conduit;

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- .5 Support of existing utilities;
 - .6 Loading, transportation and disposal of surplus and unsuitable materials, rough grading and trimming;
 - .7 Compaction of sub grade, dewatering, trench backfill;
 - .8 Road, curb, sidewalk, parking lot and boulevard repairs;
 - .9 Supply and installation of pull tape;
 - .10 Supply and installation of locator tracer wire;
- .2 And all other operations considered incidental to the supply and installation of 'Conduit' for which no price or prices or provisions for payment are included in the Contract Documents.

5.2 FIBRE OPTIC CABLE

- .1 Payment for each class and type of 'Fibre Optic Cable' will be at the price set forth in the Unit Price Schedule for each class and type of 'Fibre Optic Cable' measured as specified herein, which shall be payment in full for those operations described in this specification and as indicated in the Contract Documents, including:
- .1 Supply and installation of Fibre Optic Cable;
 - .2 Coiling and tying additional slack cable in vaults and buildings;
- .2 And all other operations considered incidental to the supply and installation of 'Fibre Optic Cable' for which no price or prices or provisions for payment are included in the Contract Documents.

5.3 VAULTS

- .1 Payment for each class and type of 'Vault' will be at the price set forth in the Unit Price Schedule for each class and type of 'Vault' measured as specified herein, which will be payment in full for those operations described in this specification and as indicated in the Contract Documents, including:
- .1 Common excavation of roadway, sidewalks, concrete curbs and boulevard;
 - .2 Excavation of trenches;
 - .3 Supply, placement and compaction of Bedding Gravel;
 - .4 Supply and installation of vaults, cable adaptors, couplers, gaskets, flanges, glands, nuts, bolts, washers, lubricants, and restraint devices required to join conduit;
 - .5 Loading, transportation and disposal of surplus and unsuitable materials, rough grading and trimming;
 - .6 Compaction of sub-grade, dewatering, trench backfill;
 - .7 Road, curb, sidewalk, parking lot and boulevard repairs, and;
 - .8 Performing all other operations considered incidental to the supply and installation of 'Vault' for which no price or prices or provisions for payment are included in the Contract Documents.

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5.4 BUILDING TERMINATION

- .1 Payment for each class and type of 'Building Termination' will be at the lump sum price set forth in the Unit Price Schedule for each class and type of 'Building Termination' measured as specified herein, which shall be payment in full for those operations described in in this specification and as indicated in the Contract Documents, including:
 - .1 Coring or drilling, making good the penetration on the exterior of the building at a location determined by the Engineer;
 - .2 Supplying all required conduit and bends, termination box, splice box, and all other materials required;
 - .3 All pulling and splicing of fibre optic cable required to complete the routing to desired hook up location by the City. (hookup of fibre optics to server tower by others);
 - .4 Making good the interior and exterior of the building including surface repairs and restorations to any structures or surfaces damaged by the Work, and;
 - .5 Performing all other operations considered incidental to the supply and installation of 'Building Termination' for which no price or prices or provisions for payment are included in the Contract Documents.

END OF SECTION