Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International):

.1 CSA-C22.2 No. 214, Communications Cables (Bi-National standard with UL 444).

.2 CSA-C22.2 No. 232, Optical Fiber Cables.

.2 Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA):

.1 TIA/EIA-568-B.1, Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements.

.2 TIA/EIA-568-B.2, Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components.

.3 TIA/EIA-568-B.3, Optical Fiber Cabling Components Standard.

.4 TIA/EIA-606-A, Administration Standard for the Commercial Telecommunications Infrastructure.

.5 TIA TSB-140, Telecommunications Systems Bulletin - Additional Guidelines for Field-Testing Length, Loss and Polarity of Optical Fiber Cabling Systems.

.6 TIA-598-C, Optical Fiber Cable Color Coding.

1.2 DEFINITIONS

.1 Refer to TIA/EIA-598-C, Annex A for definitions of terms: optical-fibre interconnect, distribution, and breakout cables.

1.3 SYSTEM DESCRIPTION

.1 Structured telecommunications wiring system consist of unshielded-twisted-pair and optical fiber cables, terminations, connectors, cross-connection hardware and related equipment installed inside building for occupant's telecommunications systems, including voice (telephone), data, and video.

.2 Installed in physical star configuration with separate horizontal and backbone subsystems:

.1 Horizontal cables link work areas to IT closet.

.2 IT closet linked to Kiosks by fibre optic backbone cables.

.3 IT closet linked to service pedestal at property line.

1.4 SUBMITTALS

.1 Provide submittals in accordance with E3 – Shop Drawings.

.2 As-built records and drawings:

.1 Provide manufacture cut sheets for equipment, cable test results, wiring/architecture diagram.

Part 2 PRODUCTS

2.1 FOUR-PAIR 100 OHM BALANCED TWISTED PAIR CABLE

.1 Four-pair, 100 ohm balanced unshielded-twisted-pair (UTP) cable, flame test classification FT4 to: CSA-C22.2 No. 214, Category 6 to: TIA/EIA-568-B.2.

2.2 WORK AREA UTP 4-PAIR MODULAR JACK

.1 Eight-position modular jack ("RJ-45"), type T568A Category 6 to: TIA/EIA-568- B.2:

.1 In self-contained flush-mount box, three jacks per box.

.2 Multi-user telecommunications outlet assembly (MUTOA), three ports, each port equipped with factory installed "RJ-45" jacks, type T568A Category 6 to: TIA/EIA-568-B.2.

2.3 TERMINATION AND CROSS-CONNECTION HARDWARE FOR UTP

.1 IDC Terminal strips, 25 pair, for terminating 4 pair 100 ohm balanced twisted pair cables and supporting cross-connections using jumper wires or compatible plug-ended patch cords: Category 6 to: TIA/EIA-568-B.2.

.2 Mount or block for housing 10 IDC terminal strips, mounted on rack 48 cm wide.

.1 Distribution rings or channels capable of externally mating with the above mount for managing cross-connection wires.

.3 Patch panel, two rack units high, and 48 ports:

.1 Each port equipped with factory installed "RJ-45" jacks, type T568A Category 6 to: TIA/EIA-568-B.2.

.2 Horizontal cable-management unit for every 48 ports.

.3 The patch panel and rack will be supplied by the City and installed by the Electrical Subcontractor.

.4 Terminate voice UTP cables to an IDC punch down block located on the same wall as the MTS demarcation in the HHW LAN Closet.

.5 Terminate data UTP cables to the patch panels located on the rack in the HHW LAN Closet.

2.4 UTP HORIZONTAL CABLING

.1 Category 6, 4 pairs to: TIA/EIA-568-B.2.

2.5 UTP PATCH CORDS

.1 1 meter long, with factory-installed male plug at one end to mate with "RJ-45" jack and with factory-installed male plug at other end to mate with "RJ-45" jack complete with stress boots, Category 6, 4- pairs to: TIA/EIA-568-B.2.

.2 The patch cords will be supplied and installed by the City.

2.6 UTP EQUIPMENT CABLE

.1 4 pair "pigtail", 3 meters long, with factory-installed male plug on one end to mate with "RJ- 45" jack and other end equipped with factory-installed male plug to mate with "RJ-45" jack complete with stress boots, Category 6 to: TIA/EIA-568-B.2.

.2 The UTP equipment cables will be supplied and installed by the City.

2.7 UTP WORK AREA CABLE

.1 The UTP work area cables will be supplied and installed by the City.

2.8 OPTICAL-FIBER CABLE

.1 Distribution without conductive members, multi-mode 50/125, laser-optimized, 2000 MHz km capacity, CSA-C22.2 No. 232 and TIA/EIA-568- B.3, flame test classification FT4, each end terminated with duplex SC connectors and stress relief boots.

.2 6-strand multi-mode fibre to security camera pole junction box fibre termination enclosure to support up to 3 cameras. Refer to drawing 16-0107-010_E13.

.3 12-strand multimode fibre to the Kiosk box fibre termination enclosure. Refer to drawing 16-0107-010_E13.

.4 All underground cables shall be non-conductive, water blocked and rated for outdoor duct installation.

2.9 OPTICAL-FIBER PATCH PANEL

.1 Mounted in rack 48cm wide, four rack units, with cover, capable of terminating 80 pairs of fiber, equipped with duplex SC compatible adapters. Located in the HHW LAN closet.

.2 The optical fiber patch panel will be supplied by the City and installed by the Electrical Subcontractor.

2.10 OPTICAL-FIBER PATCH CORDS

.1 Interconnect cable, two strands, and 1 m long, each end equipped with duplex SC connectors. Multi-Mode 50/125, laser-optimized, 2000 MHz km capacity to: TIA/EIA-568-B.3.

.2 The optical fiber patch cords will be supplied and installed by the City.

2.11 EQUIPMENT RACK

.1 The equipment racks, power supplies and cable management hardware will be supplied by the City and installed by the Electrical Subcontractor. The equipment rack will be located in the HHW LAN closet as shown on drawing 16-0107-010_E06.

2.12 OPTICAL-FIBER TERMINATION ENCLOSURE

.1 The optical-fiber termination enclosure will be supplied by the City and installed by the Electrical Subcontractor.

2.13 RACK MOUNTED UPS

.1 The rack mounted UPS's will be supplied by the City and installed by the Electrical Subcontractor.

Part 3 EXECUTION

3.1 INSTALLATION OF TERMINATION AND CROSS-CONNECT HARDWARE

.1 Install termination and cross-connect hardware in rack as indicated and according to manufacturers' instructions. Identify and label as indicated to: TIA/EIA-606-A.

3.2 INSTALLATION OF HORIZONTAL DISTRIBUTION CABLES

.1 Install horizontal cables as indicated in conduits from telecommunication closet to individual work-area jacks. Identify and label as indicated to: TIA/EIA-606-A.

3.3 INSTALLATION OF BACKBONE CABLES

.1 Install optical-fiber backbone cables from HHW LAN closet to Kiosk buildings

.1 Identify and label as indicated to: TIA/EIA-606-A.

.2 Install optical-fiber backbone cables from HHW LAN closet to the pole mounted Video Camera junction boxes.

.1 Identify and label as indicated to: TIA/EIA-606-A.

3.4 INSTALLATION OF TELEPHONE CABLES

.1 Install 4-pair Category 6 cables from telephone punch down block to RJ-45 jacks at operator workstations.

.2 Use appropriate tool for connecting conductors to terminals.

3.5 FIELD QUALITY CONTROL

.1 Test horizontal UTP cables as specified below and correct deficiencies provide record of results as hard copy.

.1 Perform tests for Permanent Link on installed cables, including spares:

.1 Category 6 using certified level IIE tester to: TIA/EIA-568-B.1.

.2 Perform tests for Channel on 100% of cross-connected data horizontal cabling installed from each telecommunications room, including shortest and longest drops from each telecommunications room.

.1 Category 6 using certified level IIE tester to: TIA/EIA-568-B.

.2 Test Optical-fiber strands for attenuation to: TIA/EIA-568-B.1 and correct deficiencies: provide record of results as hard copy.

.1 Test horizontal links need at only one wavelength (850 nm or 1300 nm) and in one direction.

.1 Attenuation to be less than 2.0 dB, unless consolidation point is used.

.2 Test backbone links in both direction. Backbone links:

.1 Test multi-mode fiber at both applicable wavelengths (850 nm and 1300 nm).

.3 Maximum attenuation: Cable attenuation + Connector loss + Splice loss.

.1 Multi-mode-fiber attenuation coefficients:

.1 3.5 dB/km @ 850 nm; and

.2 1.5 dB/km @ 1300 nm

.2 Maximum connector insertion loss: 0.75 dB per pair and maximum splice insertion loss: 0.3 db.

.3 Perform additional Tier 2 tests using optical time domain reflectometer (OTDR) on backbone fiber pairs to: TSB-140.

.1 Correct deficiencies.

.2 Provide record of results as described in SUBMITTALS.

.4 Provide record of results as hard copy to: TIA/TSB-140.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for telephone drop and underground cable terminals.

1.2 RELATED SECTIONS

.1 E3 – Shop Drawings.

1.3 REFERENCES

.1 Canadian Standards Association (CSA International):

.1 CSA C22.2 No.21402, Communications Cables (Bi-national standard, with UL 444).

.2 CSA T530, Commercial Building Standard for Telecommunications Pathways and Spaces (Adopted ANSI/TIA/EIA-569-A).

1.4 PRODUCT DATA

.1 Submit product data in accordance with E3 – Shop Drawings.

Part 2 PRODUCTS

2.1 UNDERGROUND TELEPHONE CABLE TERMINALS

.1 Coordinate with MTS to bring in a new 25-pair service from the MB Hydro pole to HHW building IT closet. The Electrical Subcontractor shall extend a 65mm rigid PVC conduit from the MB Hydro pole to the HHW building LAN closet complete with pull string as shown on drawing 16-0107-010_E02.

Part 3 EXECUTION

3.1 INSTALLATION

.1 The new utility cables shall enter HHW building LAN closet from below the concrete slab in rigid PVC conduit.

.2 Seal conduit after entry of cable.

.3 Terminate cable at IDC punch down block.

END OF SECTION