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**Part 1            General**

**1.1                DESCRIPTION OF SYSTEM**

- .1        Complete empty raceway system consists of outlet boxes, coverplates, conduits, pull boxes, sleeves and caps, fish wires and service fittings.

**Part 2            Products**

**2.1                MATERIAL**

- .1        Conduits: PVC type, to Section 26 05 34.
- .2        Junction boxes, cabinets, to Section 26 05 31.
- .3        Outlet boxes, conduit boxes and fittings: to Section 26 05 32.
- .4        Fish wire: polypropylene type.
- .5        Minimum conduit size: 25mm for drops in walls to 100mm square box.
- .6        Cable Fasteners: to Section 26 05 29.
- .7        Concrete encased PVC duct: to Section 26 05 41.

**Part 3            Execution**

**3.1                INSTALLATION**

- .1        Installation to conform to CAN/CSA T530-M90.
- .2        Install empty raceway system, including fish wire, cabinets, outlet boxes, pull boxes, coverplates, conduit, sleeves and caps, miscellaneous and positioning material to constitute complete system.
- .3        Install bushings on ends of all conduit runs.
- .4        Conduits shall terminate within 150mm above grade.
- .5        Bond all distribution conduits to ground.
- .6        Do not install conduit fittings; use long sweep bends only. Do not use pull boxes in lieu of bend. Install a maximum of two 90° bends between pull boxes.
- .7        Seal and cap all conduits at both ends to prevent entrance of moisture.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION OF SYSTEM**

- .1        Complete telephone raceway system consists of outlet boxes, coverplates, distribution cabinets, conduits, pull boxes, sleeves and caps, fish wires and service fittings. Also, supply, installation, termination and testing of all room jacks, coverplates, cables. Cables to be Cat 5e as indicated on drawings.
- .2        Complete system to be terminated and tested as indicated on drawings and under supervision and final approval of Engineer.
- .3        Complete all testing to IBDN standards complete with qualified personnel.

**1.2                REFERENCES**

- .1        CAN/CSA C22.2 No. 214-M90, Communications Cables.
- .2        CAN/CSA C22.2 No. 182.4-M90, Plugs, Receptacles and Connectors for Communications Systems.

**1.3                COORDINATION WITH TELEPHONE AUTHORITY OR TELECOMMUNICATION PROVIDER**

- .1        Coordinate with telephone authority to ensure availability of service at agreed demarcation points in their own wiring system using the shared telecommunications raceway system.

**1.4                QUALITY ASSURANCE**

- .1        All cabling, termination hardware and connecting cords to be sourced from a certifying manufacturer to assure quality control.
- .2        Upon completion of the installation, the system must be certified by the installer and the manufacturer that it will support Category 5e applications.

**1.5                SHOP DRAWINGS AND PRODUCT DATA**

- .1        Submit shop drawings and product data in accordance with Section 26 05 00.

**1.6                MAINTENANCE TOOLS**

- .1        Provide one punch down tool for terminating wires on cross connect blocks.

**Part 2 Products**

**2.1 MATERIAL**

- .1 Conduits: PVC, to Section 26 05 34.
- .2 Conductors: Category 5e - #24UTP Northern Telecom quad pair -BDN Plus, FT4, alternate colour. All Category 5e cables to be weatherproof.
- .3 Junction boxes, cabinets, to Section 26 05 31.
- .4 Outlet boxes, conduit boxes, and fittings: to Section 26 05 32.
- .5 Devices and coverplates: white with stainless steel coverplates as per Section 26 27 26.
- .6 Fish wire: polypropylene type.

**2.2 DISTRIBUTION CABLING**

- .1 The installer must install all UTP cables, BIX blocks distribution panels mounted on 475mm relay racks, cross-connect cables, face plates, connectors and all other related devices for the cable distribution.
- .2 All voice distribution cables will be unshielded twisted pair (UTP), 24 AWG solid annealed copper, FT4 rated, Category 5e data grade, Northern Telecom BDN. One voice cable is required per outlet.

**2.3 HORIZONTAL TELEPHONE CABLES**

- .1 CSA certified Type PCC FT4 in accordance with CSA-C22.2 No. 214-94.
- .2 Meets requirements of ICEA S-90-661-1997.
- .3 Meets or exceed requirements of ANSI/EIA/TIA-568-A.
- .4 Characteristics:
  - .1 Maximum DC conductor resistance @ 20°C: 9.38 ohms/100m.
  - .2 Mutual capacitance @ 1KHz – maximum: 5.6nF/100m.
  - .3 Characteristic impedance @ 1MHz and higher – nominal: 100 ohms.
  - .4 Maximum attenuation and crosstalk (NEXT) @ 20°C:

Frequency (MHz)	Attenuation max. loss dB/100m	Crosstalk min. loss dB/100m
1.0	2.0	65.3
4.0	4.1	56.3
8.0	5.8	51.8
10.0	6.5	50.3
16.0	8.2	47.3
20.0	9.3	45.8
25.0	10.4	44.3
31.25	11.7	42.9
62.5	17.0	38.4
100.0	22.0	35.3

- .5 Construction:
  - .1 Conductors: 24AWG annealed copper, four individually twisted pair.
  - .2 Insulation: PE, colour coded, type CMR.
  - .3 Jacket:
    - .1 PVC jacket – white.
    - .2 Jacket slitting cord.
    - .3 Jacket printed at intervals not exceeding 610mm indicating cable code, AWG, UL and CSA designations and quarter and year of manufacturer.
  - .4 Nominal O.D.: 5.28mm.
  - .5 Approximate mass: 3.6kg/100m.
- .6 Packaging:
  - .1 Shipped in boxes or on spools.
- .7 Standard of acceptance:
  - .1 NORDX/CDT ‘IBDN-PLUS’.
  - .2 Avaya “1061B+”.

## **2.4 TERMINATION EQUIPMENT FOR TELEPHONE CONDUCTORS**

- .1 BIX wall mount cross connect system comprised of the following components:
  - .1 Category 5e distribution connectors for 25 pair connections (QCBIXA4).
  - .2 Mounts for twenty connectors (QMBIX10A).
  - .3 Designation labels (P0731972) and (P0731975).
  - .4 Designation strips (QSBIX20A).
  - .5 Distribution rings (QRBIX19A).
  - .6 Quantities as required.
- .2 Standard of acceptance:
  - .1 NORDX/CDT.

## **2.5 TELEPHONE CROSS CONNECT WIRE**

- .1 Category 5e, 4 pair cross connect wire is to be used to cross connect incoming cables to horizontal cables and are not to exceed 7 meters in length as per CAN/CSA-T529.  
Colour: white.
- .2 Every cross connect wire to have unique alpha-numeric labelling on each end for ease of identification.
- .3 Standard of acceptance:
  - .1 NORDX/CDT B-Plus Cross Connect Wire.

## **2.6 IDENTIFICATION**

- .1 Each telephone outlet faceplate to be identified with a typed label.
- .2 Each modular jack to be identified with an alpha-numeric label.
- .3 Each horizontal cable to have identification markers installed on both ends.
- .4 Each termination block to have corresponding labelling.

- .5 Labelling to indicate outlet location and outlet number.

### **Part 3 Execution**

#### **3.1 INSTALLATION OF UTP DATA/TELEPHONE CABLES**

- .1 Install telephone cables in raceway system.
- .2 Trim telephone cables to appropriate lengths at the cross connect blocks and at outlets. Terminate both ends using T568A pin assignment.
- .3 Restrictions:
  - .1 Maintain 300mm clearance between telephone cables and AC power conduits and fluorescent luminaires unless telephone cables are installed in conduit.
  - .2 The amount of untwisting in a cable pair to terminate to be no greater than 13mm.
- .4 Routing of cables must be such that total length does not exceed 90m.

#### **3.2 INSTALLATION OUTLET JACKS**

- .1 Connect telephone cables to telephone outlets. Use proper tool for punching down cables on terminals.
- .2 Install identification on existing outlets.

#### **3.3 INSTALLATION OF TELEPHONE TERMINATION EQUIPMENT**

- .1 Install telephone termination equipment in wharf electrical enclosure allowing adequate working clearance. Allow space for Aliant entrance equipment and termination hardware.
- .2 Ground racks using #6 AWG wire.
- .3 Install wire management.
- .4 Route horizontal telephone cables through wire management and terminate on cross connect blocks.
- .5 Cross connect incoming service cables to horizontal telephone cables using cross connect wire between termination blocks.

#### **3.4 LABELLING**

- .1 For each voice connection, label outlet jack and BIX field.
- .2 Label outlet jack with decal. Cross-connect fields may be labeled with marker.
- .3 Exact type of labeling to be determined on site.
- .4 Both ends of each cable are to be labeled with the terminating outlet identifier number.
- .5 All cables are to be routed as indicated.

### 3.5 FIELD QUALITY CONTROL

- .1 Acceptance testing:
  - .1 All wires must be tested for continuity in accordance with Northern Telecom's IBDN Document #IBDN-TEST-9104 by a Nortel IBDN certified installer.
  - .2 Certification is to be from the jack to the BIX 46DI and will include a cable length test, a cable db loss test, a cable cross-talk test, a cable noise detection test and a cable DC loop resistance test.
  - .3 Any defects are to be corrected and the circuit re-certified.
- .2 Local and National Codes:
  - .1 Installation must conform to the Canadian Electrical Code, the National Building Code, and other applicable regulatory requirements.
- .3 Test for UTP performance to 100 BaseT, Category 5e and IEEE 802.3 Standards, Tests to include, but not be limited to:
  - .1 Near-end crosstalk measurement from both ends.
  - .2 Attenuation.
  - .3 Characteristic impedance.
  - .4 Propagation delay.
  - .5 Noise.
  - .6 Attenuation-to-crosstalk.
- .4 UTP data cables to be tested using approved test equipment such as:
  - .1 Microtest Omniscanner 2.
  - .2 Fluke Corp. DSP-4000.
- .5 Test sheets indicating cable number, date, time and name of test technician to be included in maintenance manuals.
- .6 The complete system to be Category 5e certified for telephone.
- .7 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .8 Submit test results for Engineer's review.

### 3.7 STANDARD OF QUALITY

- .1 As a "standard of quality", acceptable manufacturer's catalogue designations are included in portions of this specification. These catalogue designations and descriptions are not necessarily listed in order of preference and all manufacturers meeting this "standard of quality" may not be listed.
- .2 This installation is to be considered as an "end to end" Category 5e installation. Thus, all equipment, unless specified otherwise, is to be Category 5e rated.

END OF SECTION

**Part 1            General**

**1.1                RELATED WORK**

- .1      Plywood backboard: Division 01.
- .2      Pathways for Communication Systems: Section 27 05 28.
- .3      Telephone System: Section 27 30 00.

**1.2                DESCRIPTION OF SYSTEM**

- .1      Incoming telephone service facilities from service pole to main terminal in underground duct to new wharf electrical cabinet and then to poles, fuel pump, shroud and Harbour Authority Building.

**1.3                COORDINATION WITH TELEPHONE AUTHORITY**

- .1      Coordinate with telephone authority to ensure availability of service. Prior to installation of underground services, arrange an on-site meeting with Aliant to obtain their approval for layout and construction details.
- .2      Arrange with Utility to remove existing facilities from the old wharf and install new underground cable from the service pole.
- .3      Electrical Contractor to carry lump sum amount of \$3,000.00 in his tendered price to pay for all charges by Communications Utility based on Communications Utility invoice amount with no contractor mark-up. Unused amount will be returned to the Owner.
- .4      Coordinate installation of new telephone service entrance conduits from utility pole to electrical cabinet and then to fuel pump, shroud and Harbour Authority Building.

**Part 2            Products**

**2.1                MATERIALS**

- .1      Direct buried cable ducts: Section 26 05 45 and 26 05 34.
- .2      Grounding: Section 26 05 28.
- .3      Telephone raceway system: Section 27 30 00.
- .4      Concrete encased PVC ducts: Section 26 05 41.

**Part 3          Execution**

**3.1              INSTALLATION**

- .1      Install telephone service facilities in new wharf electrical cabinet, poles, fuel pump, shroud and Harbour Authority Building.
- .2      Install #6 AWG ground wire from service entrance board to telephone backboard, leave 5.0m loop for telephone company use.
- .3      Install grounding facilities.

**END OF SECTION**