2.8 Wiring

.1 Twisted copper conductors: rated 300 V.

.2 To initiating circuits: 18 AWG minimum, and in accordance with manufacturer's requirements.

.3 To signal circuits: 16 AWG minimum, and in accordance with manufacturer's requirements.

.4 To control circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.

2.9 Manual Alarm Stations

.1 Addressable manual pull station

.1 Pull lever, surface wall mounted type, single stage, electronics to communicate station's status to addressable module/transponder over 2 wires and to supply power to station. Station address to be set on station in field.

2.10 Automatic Alarm Initiating Devices

.1 Addressable thermal fire detectors, combination fixed temperature and rate of rise, non-restorable fixed temperature element, self-restoring rate of rise, fixed temperature 57 °C, rate of rise 8.3°C per minute.

.1 Electronics to communicate detector's status to addressable module/transponder.

.2 Detector address to be set on detector head in field.

.2 Addressable smoke detector

.1 Ionization type.

.2 Electronics to communicate detector's status to addressable module/transponder.

.3 Detector address to be set on detector head in field.

2.11 Audible Signal Devices

.1 Horns: 103 db, weatherproof surface mounting, 24 V dc.

2.12 Visual Alarm Signal Devices

.1 Strobe type: flashing white, 24 V dc.

.2 Designed for weatherproof surface mounting in combination with horns.

2.13 End-of-Line Devices

.1 End-of-line devices to control supervisory current in alarm circuits and signalling circuits, sized to ensure correct supervisory current for each circuit. Open, short or ground fault in any circuit will alter supervisory current in that circuit, producing audible and visible alarm at main control panel and remotely as indicated

2.14 Remote Annunciators

.1 Display:

.1 Alpha Numerical display

.2 Alarms and troubles for alarm initiating circuits.

.3 Supervisory alarms and troubles common supervisory alarm for supervisory initiating circuits.

.4 Common system trouble.

.2 Trouble buzzer

.1 Acknowledging trouble at main panel to silence trouble buzzers in system.

.3 Minimum wiring configuration with main panel and other remote annunciators.

2.15 As-Built Riser Diagram

.1 Fire alarm system riser diagram: in glazed frame, minimum size 600 x 600 mm.

2.16 Ancillary Devices

.1 Remote relay unit to initiate fan shutdown.

3. EXECUTION

3.1 Installation

.1 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-4.

.2 Install central control unit and connect to ac power supply, dc standby power.

.3 Install manual alarm stations and connect to alarm circuit wiring.

.4 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.

.5 Connect alarm circuits to main control panel.

.6 Install signal horns and visual signal devices and connect to signalling circuits.

.7 Connect signalling circuits to main control panel.

.8 Install end-of-line devices at end of alarm and signalling circuits.

.9 Install remote annunciator panels and connect to annunciator circuit wiring.

.10 Install door releasing devices.

.11 Install remote relay units to control fan shut down.

.12 Sprinkler system: wire alarm and supervisory switches and connect to control panel.

3.2 Field Quality Control

.1 Perform tests in accordance with Section 16980 - Testing, Adjusting and Balancing of Electrical Equipment and Systems and CAN/ULC-S537.

.2 Fire alarm system:

.1 Test such device and alarm circuit to ensure manual stations, thermal and smoke detectors transmit alarm to control panel and actuate general alarm and ancillary devices.

.2 Check annunciator panels to ensure zones are shown correctly.

.3 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of systems.

.4 Addressable circuits system style DCLB:

.1 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals on line side of single open-circuit fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.

.2 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals during ground-fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.

END OF SECTION

SECURITY DOOR SUPERVISION

1. GENERAL

1.1 Related Work

.1 General Electrical Requirements: Section 16010

.2 Fire Alarm System: Section 16721

1.2 Requirements

.1 Installation subject to approval, inspection and test prior to final acceptance.

.2 All equipment to be CSA or ULC approved.

.3 Installation shall conform to the requirements of the Canadian Electrical Code.

1.3 Scope of Work

.1 Centralized card access and door monitoring system.

.2 System to be controlled by central processor unit (CPU) with non-volatile memory. Peripherals to include video display terminals (VDT), complete with keyboard, and printer as specified herein.

.3 Central processor unit to communicate to intelligent Access Control Panels.

.4 Devices hardwired into DGP's to be card access readers, electric strikes, monitors, magnetic door locks, motion detectors and release push buttons.

.5 System to be connected to base building central processor unit.

.6 Hardwiring to be electrically supervised, Class B, in both the secure and access modes. Data communication lines to be electrically supervised, Class A operation.

.7 System to connect to magnetic door locking devices and door electric strikes provided by door hardware supplier.

.8 Supply and install complete security TV system as indicated on drawings and specified herein. System to be complete with cameras, lenses, housings, mounting hardware, monitor, switches, cable and miscellaneous equipment to form a complete operating system.

1.4 Door Monitoring System Operation

.1 An access/secure program to be provided which enables the operator to place security points into the access or secure mode either individually or by group.

.2 The central processor unit to report any security point penetrated while in the secure mode.

.3 The central processor unit to monitor security point communication lines and to report to the operator the presence of any malfunction (trouble condition) in either the access or secure modes.

.4 An access summary shall be provided to list all security points currently in the access mode and their status, as specified by operator input.

.5 A secure summary shall also be provided to list all security points currently n the secure mode and their status as specified by operator input.

.6 The system shall automatically place security points in the access or secure mode based on a pre-selected time schedule.

.7 Upon operator request, the system shall output a programmed access/secure time summary.

.8 System operation: when supervised door is opened, zone indicating lamp flashes and operates audible alarm at control panel. When "acknowledge" button is operated, audible signal is silenced and flashing light changes to steady glow.

.9 System restored to normal when door is closed and "reset" key switch on control panel operated.

.10 Buzzer located at each door to give pulsating signal when door opened. Upon acknowledgment from control panel signal to change to continuous note. Buzzer at door location to be silenced only after door reclosed and "reset" key switch operated. Closing of door along not to affect signal once it has started to sound.

.11 When deactivating switch is operated, supervised door on that zone opened without causing alarm. Zone trouble lamp illuminated when zone is deactivated but audible trouble signal not to sound.

.12 Fault in wiring of one zone to cause audible signal to sound even if zone in deactivated position.

1.5 Card Access System Operation

.1 A card access system to be provided as shown on the drawings and specified herein.

.2 The system to unlock a door, opening a paring gate or provide a signal to operate a device, after verifying a valid card or an operation OPEN command providing the following conditions are met:

.1 Card reader is operations.

.2 Power is being provided to the card reader.

.3 Card is valid and has not been deleted from the system's memory.

.4 Card has been inserted into a reader of a reader group to which it is assigned; and the employee seeks access at a time within an access time zone assigned to his card.

.5 Anti-pass back programming has not been compromised.

.3 Invalid access requests and the forced opening of a door to be enunciated and alarmed. A currently printed invalid change-of-state message to also be available.

.4 A door which is propped open or has not closed after a reasonable period of time following a valid access is to be treated as an alarm.

.5 The operator must be able to add and delete card numbers on-line.

.6 System hardware and software to have a capacity to handle 20,000 valid cards regardless of how many additions and deletions are made.

.7 A minimum of 255 access time zones are to be on-line definable by the system operator.

.8 Each of the access time zones are to include a begin access time, and the days of the week to which the access time zone applies.

.9 Each card to be assigned to any combination of the eight access zones which will define the valid entry times for that card.

.10 The operator to be able to manually command a reader to operate in an access or secure mode. When in the secure mode, the reporting of valid accesses are to be inhibited and invalid attempts are to be reported. When in the secure mode, both valid and invalid access attempts are to be reported.

.11 The central processor unit to automatically place each card reader in the access or secure mode based on a pre-selected time schedule as detailed under the program function of this specification.

.12 Reader keyboards are to be provided at specified accesses requiring a higher level of security. At these accesses, a valid access request in additionally dependent on a match between the employee ID encoded on the card and that entered into the system from the associated card reader keyboard based on a pre-selected time schedule as detailed under the program function section of this specification.

.13 A programmed card access summary to be provided which contains a list of card access programs, access times, and the active days related to each program.

.14 A card ID summary to be provided which contains a list of the card Ids and their associated card access programs.

.15 The hard copy change-of-state output to include, at minimum, the following:

.1 Cardholder employee ID number.

.2 Coded card ID number.

.3 Location of card reader.

.4 Full English language action message.

.16 A backup mode of operation to automatically be provided in the event of interrupted communications between the Intelligent Access Control Panel and the central control station. In the backup mode, the system will provide 100% degrade operation and store 10,000 transactions within each panel.

.17 The system to be provided with a test/reset function to test the response of an alarm type point as specified on the point list. The test command to cause the point to go into its alarm condition. The reset command to clear this condition and cause the point to return to its present condition of either alarm or normal.

.18 Latch or hold an alarm upon command, until cleared by a reset command. Upon detection of an alarm condition for a point the system to report the alarm and ignore any return to normal condition for the point until a manual reset command is issued.

1.6 Shop Drawings

.1 Submit shop drawings in accordance with. Section 16010 - Electrical General Requirements.

2. PRODUCTS

2.1 Control Panel

.1 Control panel: [flush] [surface] mounted with [ ] supervised zone capacity, modular design. "Power on" light, "reset" key switch, "acknowledge button", common "trouble light, buzzer and silencing switch". Separate alarm lamp, trouble lamp and deactivating key switch for each zone and necessary modules, and relays as required for operation as indicated. Power supply from [ ] V ac [emergency power] circuit with rectifier to supply 24 V dc to operate complete system. Standby power of [nickel cadmium] [get cell] batteries sized to provide supervisory and trouble signal current for [ ] h. Capable of differentiating between open line condition and alarm. Panel to display "trouble" conditions when fault occurs in wiring.

2.2 Card Readers

.1 Card reader to be on-line type, hardwired to security multiplexing transponder with data communication and control to the central processor unit. Card readers and intelligent access control panels will have automatic off-line operation if communications with central processor unit are lost.

.2 Card reader to have rugged compact construction with all critical circuitry located in a remote interface unit. Remote unit to be equipped with a keyed lock and tamper alarm contact.

.3 Card reader to have two indicating lamps; one for card rejection, one for card acceptance.

.4 Card reader to be horizontal slot suitable for mounting in a wall outlet box.

.5 Card reader remote unit to supply signal to control electric door strike as specified in the hardware schedule.

.6 Card readers to be Honeywell BR450.

2.3 Access Cards

.1 Access cards to contain the specified encoded information using the high-coercivity magnetic stripe principle. Card is not to affect or be affected by other magnetic cards or devices.

.2 All cards to be encoded with the same building identifids to be capable of having photograph identification hot sealed onto card.

.3 Cards to be constructed of heavy duty plastic, with nominal measurements of 85 x 55 x 0.9 mm.

.4 Include price of 1000 photo identification access cards.

.5 Provide sample upon request.

2.4 Central Processor Unit (CPU)

.1 Central processor to be supplied by tenant, it will be a Honeywell Delta 5200 system.

.2 Central processor unit to operate three remote printers.

.3 Central processor unit to unlock doors upon receipt of alarm signal froels to be solid state, housed in all metal cabinets, suitable for surface or flush wall mounting as indicated on the drawings. Data gathering panels, or IACPs are to be fully stand alone.

2.5 Video Display Terminals with Keyboard

.1 Video display terminal (VDT), complete with keyboard, to be located at the tenant security centre.

.2 VDT to be supplied by tenant.

2.6 Duress Alarm

.1 Duress alarm to be located in rooms as shown on drawings.

.2 Duress alarm to be silent operation type, activated by a convenient single push switch. Alarm to have a stainless steel housing and an indicator flag to show switch has been depressed.

.3 Duress alarm switch mechanism to contain double-pole double-throw contacts. Alarm to be reset by a housing mounted keyswitch only.

.4 Provide two (2) keys with duress alarm.

2.7 Door Release Buttons

.1 All door release buttons will be recessed, back illuminated with wording "exit".

2.8 Motion Detectors

.1 Motion detectors for the release of magnetically held doors will be Aritech Corp. Model DR-321 and DR-301.

.2 Motion detects for use in enclosed vaults to detect presence will be Racal-Guardall Model IR747.

2.9 Security TV Systems

.1 Cameras to be RCA Model TC200 colour CCD camera complete with 8 mm wide angle lens for the 2 cameras and 16 mm lens for the camera in the east-west corridor.

.2 Monitor to be JVC Model TM2084CA, 19" colour monitor complete with rack mounting kit.

.3 Switches to be an RCA Model TC1404 sequential switch with two outputs.

.4 Camera housings to be RCA Model TC9341 housing including camera mounting hardware.

2.10 Magnetic Door Switches

.1 Door switches: suitable for [surface] [flush] [surface and flush] mounting on door as indicated.

2.11 Terminal Cabinets and Blocks

.1 Terminal cabinets: Type T.

.2 Terminal Blocks: [ ]

2.12 End-of-Line Resistors

.1 Mount end-of-line resistors to control supervisory current in each circuit, in control panel.

2.13 Local Alarm

.1 Buzzer for local alarm at each door location and mount in single gang box as indicated.

3. EXECUTION

3.1 Installation

.1 All security system wiring to be in conduit.

.2 Minimum wire size No. 18 AWG for hardwiring. Data link cables to be in accordance with manufacturer's recommendations.

.3 Conductor terminations in panels to be made on terminal strips with separate point for each conductor. All such strips to be number identified as scheduled for in wiring diagram attached to inside of door of panel. Wiring to be neatly installed to all terminal strips and clipped with nylon cable straps or laced with lace cord. Termination of cabling to be set up in such a manner that sections of the system may be isolated or shorted out for servicing a trouble or fault.

.4 All wiring to be labelled at each end, termination point or junction.

.5 Card access readers to be mounted 1200 mm above finished floor unless otherwise shown.

.6 Provide tabulated and signed verification of operation of each door monitor and card access function.

.7 Mount DGPs 1000 mm from underside to finished floor in patch panel rooms.

.8 Confirm mounting prior to installation.

.9 Provide connection from card reader remote unit to electric door strike,, and to magnetic door lock.

.10 Provide connection to magnetic door and electric strike monitoring devices.

.11 Electric strikes on stairwell doors to remain locked during power failure and fire alarm mode.

.12 Include the relocation and installation of the tenant's central processor unit terminal and 3 printers. Include for the cleaning, checking and testing of these items. The tenant will turn over the door release buttons for installation.

.13 Make connection to the base building security central processor unit to permit communication of alarms when required by the central processor unit. Make connection to the building fire alarm system to release all tenant doors (with the exception of the electric strike-held stairwell doors) in the event of a fire.

.14 Install Aritech motion detectors at all glass lobby doors having magnetic door locks. Install 120 volt, 15 amp receptacle on emergency power in ceiling space for connection of motion detector.

.15 The base building contractor has installed empty conduit and outlet boxes in the core areas i.e., floor lobby doors, stairwell doors, women's washroom doors and freight elevator lobby doors. This conduit is stubbed into the ceiling space. Make connection to these conduits and run wiring from the devices to the nearest data gathering panel. Install conduit, wire and devices for the card readers, magnetic door holders, and release pushbuttons located on the ground and P1 levels as indicated; conduit wire to tenant central processor unit. Do all remaining conduit, wire and devices for the remaining doors as required for a complete installation.

.16 All DGPs, central processor unit, printers, terminal, and devices to be wired to emergency power.

.17 Test complete system to ensure compliance with the specification.

.18 Provide a minimum of 10 hours of instruction in system operation to the tenant's security staff.

.19 Install cameras and monitor on the 5th floor as indicated. Monitor to be located in the computer room shift supervisor's office.

.20 Provide power from local circuits to the cameras; all security cameras to be powered from the same phase.

.21 Install and wire duress button indication to the 5th floor computer room shift supervisor's office alarm panel and to give indication on security system.

.22 Provide wiring from the fume hoods #3, 4 and 7 located in the 5th floor lab to the 3rd floor security room alarm panel with connection to the security system. Security system to relay alarm to C.A.S. during non-use hours.

END OF SECTION

TELECOMMUNICATIONS RACEWAY SYSTEM

1. GENERAL

1.1 System Description

.1 Empty telecommunications raceways system consists of outlet boxes, cover plates, distribution cabinets, conduits, cabletroughs, pull boxes, sleeves and caps, fish wires, service poles, service fittings, concrete encased ducts.

2. PRODUCTS

2.1 Material

.1	Conduits, Conduit Fastenings and Conduit Fittings:	Section 16111
.2	Cabletroughs:	Section 16114
.3	Wireways and Auxiliary Gutters:	Section 16116
.4	Splitters, Junction, Pull Boxes and Cabinets:	Section 16131

3. EXECUTION

3.1 Installation

.1 Install empty raceway system, including overhead distribution system, fish wire, terminal cabinets, outlet boxes, floor boxes, pull boxes, cover plates, conduit, sleeves and caps, cabletroughs; raceways, service poles, miscellaneous and positioning material to constitute complete system.

END OF SECTION

INCOMING TELEPHONE SERVICE

1. GENERAL

1.1 Description

.1 Incoming telephone service facilities from property line to main terminal underground duct direct buried.

1.2 Related Work

.1 Plywood Backboard: Division 06

1.3 References

.1 CAN/CSA-C83, Communication and Power Line Hardware and latest BC Tel standards.

1.4 Co-ordination with Telephone and Telecommunication Authorities

.1 Co-ordinate with NW Tel to ensure availability of service.

2. PRODUCTS

2.1 Material

.1 Terminals and Connectors for Communication Conductors: Section 16147

.2 Grounding: Section 16160

.3 Telecommunications raceway system: Section 16741

3. EXECUTION

3.1 Installation

.1 Install telephone service facilities.

.2 Install 19 mm thick plywood backboard in each telecommunication room.

.3 Install grounding facilities and make connections.

.4 Connect owners conduits to those of telephone company or telecommunication provider at property line.

END OF SECTION

1. GENERAL

1.1 Related Work

.1	General Requirements:	Section 16010
.2	Conduits, Conduit Fastenings and Conduit Fittings:	Section 16111
.3	Cabletroughs:	Section 16114
.4	Communication Conductors:	Section 16123
.5	Fastenings and Supports:	Section 16191

1.2 Abbreviations

.1 DGM..... Data-Grade Media

.2 ETL..... Electronic Testing Laboratories

.3 IDC ..... Insulation Displacement Connectors

.4 NEXT ..... Near-End Crosstalk

.5 STP ..... Shielded Twisted Pair

.6 UTP..... Unshielded Twisted Pair

.7 VGM..... Voice-Grade Media

1.3 Installer Qualifications

.1 Personnel installing communications cabling shall be trained and conversant with communications cabling practices required for this project. The Contractor should have authorization from the Manufacturer to certify the installation for 15 years of performance.

1.4 General Requirements

.1 The workmanship and installation shall conform with the current guidelines contained in the following:

.1 ANSI/EIA/TIA568A (or CSA T529-M), Commercial Building Telecommunications wiring standard.

.2 CSA C22.1 Canadian Electrical Code, Part 1 and NWT Amendments.

.3 CSA C22.2 Canadian Electrical Code, Part 2.

.4 ANSI/EIA/TIA (or CSA T530-M), Commercial Building standard for Telecommunications pathways and spaces.

.5 ANSI/EIA/TI-606 (or CSA T528-M), Administration standard for Telecommunications infrastructure of commercial buildings.

.6 ANSI/EIA/TIA-607 (or CSA T527), Commercial Building Grounding and Bonding requirements for telecommunications.

.7 Building Industry Consulting International (BICSI) TDM Manual.

2. PRODUCTS

2.1 Communications Outlet Assemblies

.1 Communications Outlet - Boxes:

.1 One gang 100 mm square recessed box, 63 mm minimum depth comes with 19 mm deep two-device ring. One gang wallboard adapter ring, 1.6 mm 16 AWG thickness.

.2 25 mm EMT, run from box to data rack.

.2 Communications Outlet - Housings:

.1 Formed outlet plate, Surface mounted baseplate with formed cover:

.1 Maximum dimensions: 150 mm x 150 mm x 38 mm deep.

.2 Rear and side entry of cable. Strain relief provisions for side entry of cable.

.3 Flat plate: minimum thickness 3.9 mm.

.2 Four outlets minimum of three snap-in or slide-in outlet inserts.

.3 Mounts to standard one-device electrical box opening.

.4 Constructed of high-impact fire-retardant thermoplastic.

.3 Communication Outlet - Jacks:

.1 Copper-Based inserts:

.1 Termination via removable barrel-type Lucent Technologies 110, or NORDX/CDT BIX IDCs with hinged or separate stuffer cap.

.1 Connection of removable IDCs via 8-position edge connectors plated with minimum 40 microns of nickel. Capable of minimum 250 insertion/ withdrawal cycles.

.2 Connection of removable IDCs via 8-pin header connector. Maximum 8.9 N engagement force and minimum 2.25 N disengagement force. Pins minimum 1.4 mm square.

.2 Modular Outlet - UTP:

.1 8-position keyed jack for data; 8-position unkeyed jack for voice. Capable of minimum of 200 insertion/withdrawal cycles.

.2 Copper-based contacts with 50 to 100 microns of nickel overlay uniformly coated with minimum 50 microns of gold overlay.

.3 Minimum contact force 1.1 N per contact. Minimum plug retention force 76 N.

.4 Conductors separated and aligned internally by comb structure.

.5 Compatible with 4-pair 105 ohm unshielded twisted pair.

.3 Electrical Specifications:

.1 Contacts:

.1 Dielectric strength: 1000 V rms @ 60 Hz.
.2 Insulation resistance: 10 megohms, minimum.
.3 Contact resistance: 0.02 ohms, maximum.
.4 Current rating: 1.5 amps, maximum.

.2 Insulation Displacement Connectors:

.1 Voltage rating: 250 VAC.
.2 Current rating: 5 amps.
.3 Resistance: 0.02 ohms maximum.
.4 Dielectric Withstanding: 2000 VAC for 60 sec.
.5 Insulation Resistance: 500 megohms minimum.

.2 Transmission Specifications:

.1 Rated for data transmission up to 100 MHz.

.2 Insertion Loss, maximum:

.1 0.05 dB @ 1 MHz.
.2 0.10 dB @ 10 MHz.
.3 0.15 dB @ 20 MHz.

.3 Crosstalk, maximum:

.1 - 60 dB @ 1 MHz.

.2 - 55 dB @ 10 MHz.
.3 - 50 dB @ 20 MHz.

2.2 Wiring Closet

.1 Backboard:

.1 Backboard: Poplar plywood, G1S, 1200 mm x 2400 mm x 19 mm thick. Painted gray on front and all edges, prime coat back.

.2 Rack: Free-standing cabinet, body fabricated of 2.5 mm minimum metal, equipment mounting rails fabricated of 2.0 mm minimum metal, drilled and tapped for No 10 screws, with provision to attach grounding. Designed to accept EIA standard 483 mm wide panels. ASA 61 grey in colour.

.3 Patch Panels: supply all hardware from the same manufacturer.

.1 Ports: Same type(s) as corresponding outlets Ports/Panel: maximum quantity 48.

.2 Physical, Electrical, Transmission Properties: not less than specified for outlets.

.3 Rear-mount Cable Support Bracket(s): minimum 1 per 32 incoming cables.

.4 Grounding: grounding lug hardware kit.

.5 Panel:

.1 Width 483 mm.

.2 Multiple of EIA standard module height of 44.45 mm.

.3 EIA mounting hole spacing.

.6 Panel Height: 178 mm maximum

.7 Material: metal and minimum thicknesses as follows:

.1 3 mm flat anodized aluminum.

.2 1.65 mm formed aluminum.

.3 1.9 mm flat steel.

.4 1.5 mm formed steel.

.8 Workstation Cable Connectors (rear):

.1 Following IDCs are acceptable:

.1 Lucent Technologies 110.
.2 NORDX/CDT BIX.
.3 AMP.

.2 Removable connector mating to pin header or removable edge connector style having minimum disengagement force of 11.3 N. 25-pair telco style are not acceptable.

2.3 Patch Cables

.1 UTP Type:

.1 Matching installed cable's transmission and electrical specifications.

.2 Fire Rating: plenum rated overall jacket, CSA FT-4 compliant.

.3 Modular Connectors:

.1 Matching types and minimum specifications as for outlet components.

.2 Long body type.

.3 Suitable for solid or stranded conductor as required and wire gauge.

.4 Tool-stuffed or plier stuffed with IDC contacts and plier-latched cap.

3. EXECUTION

3.1 Installation

.1 Cable Trays, Wireways and Surface Raceways:

.1 Install slotted PVC raceway on rack sides, on backboard] in riser room.

.2 Boxes and Fittings:

.1 Ensure in advance that outlet box/data outlet installation methods yield vertically-mounted data outlets.

.3 Cabinets, Enclosures, Racks, Backboards:

.1 Install at locations and heights indicated on drawings.

.2 Use green insulated 6 AWG ground conductors for grounding racks. Use grounding bushing, solderless lug, clamp, or cup washer and screw.

.3 Protect ground conductors from mechanical injury.

.4 Install ground conductors such that neither ground conductors nor data cables interfere with one another in regards to future servicing of patch panel rear connections.

.4 Connectors:

.1 Use tooling specific to connector types in use.

.2 Use connectors suitable for nature of conductor in cable, e.g.. stranded vs. solid copper.

.3 Ensure that connectors' strain relief provisions are used. Strip jackets only amount required.

.4 Maintain pair twists as close to connector as possible.

.5 Patch Panels:

.1 Ground as required by system.

.2 Mount panels to racks with as many screws as there are mounting holes or slots in panels.

.3 Provide and install necessary strain reliefs and cable support brackets, and install cables utilizing such devices.

.4 UTP Connection Configuration in accordance with AT&T T568A or CAN/CSA-T529.

Pair	Colour	RJ-45 Pins	RJ-11 Pins
1	Blue	4	2
	White/Blue	5	3
2	White/Orange	3	1
	Orange	6	4
3	White/Green	1	n/a
	Green	2	n/a
4	White/Brown	7	n/a
	Brown	8	n/a

3.2 Testing

.1 Test all runs upon completion of permanent terminations, using instrumentation acceptable to Consultant. Before commencing testing, submit sample test data sheets and information with respect to test instrumentation to be used.

.2 Copper Media:

.1 Test for the following:

.1 Continuity.
.2 Pair placement and polarity.
.3 DC resistance.
.4 Characteristics at highest contemplated frequency:

.1 Attenuation - data cable.
.2 Mutual Capacitance - data cable.
.3 Near-end crosstalk (NEXT) - data cable.

.5 Run length.

.2 Before recording results, compare readings to predicted values based on cable specification and run length, using connector and patch cord losses as part of predicted value. Retest runs with:

.1 Resistance and capacitance readings more than 10% above or below predicted values.

.2 NEXT values 5dB higher than predicted values.

.3 Attenuation values 2 dB higher than predicted values.

.4 All cables shall be tested to 100 MHz frequencies from the outlet jacks to front of patch panels including the insert jacks.

.3 Reconnect or re-install and retest as necessary to correct excessive variations.

.4 All cables shall be tested to 100 MHz from the outlet jacks to front of patch panels including the insert jacks.

3.3 Fire Stop

.1 After installation of the cable, all penetrations for conduits, sleeves, cable trays, etc. shall be sealed using material and methods that meet the requirements of ULC standards CAN4.2115 and installed according to manufacturer's specifications. The fire stop material shall allow for re-enterable access. CSA T530 Appendix B shall be used as a guide.

3.4 Guaranty

.1 All cabling, devices and workmanship and installations shall be guaranteed for a minimum of 15 years and provided by the manufacturers for the guarantee period of 15 years from the final acceptance of the project for the performance. The certificate to be submitted to Owner which indicates all data installations will have warranty by the manufacturer for performance as indicates for Category 5 for the period of 15 years.

END OF SECTION