



Dufferin-Peel Catholic District School Board

STANDARD TEXT GUIDELINE FOR

Integrated Telephone/PA System

FOR NEW CONSTRUCTION OF

ELEMENTARY AND SECONDARY SCHOOLS

Prepared by the IT and Plant Departments

Formatted by the Design Department

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INSTRUCTIONS TO ARCHITECTS

SPECIAL NOTES

The enclosed is not a specification. It is a Guideline of minimum requirements for the Integrated Telephone/PA System for Elementary/Secondary Schools.

The Integrated telephone/PA System is to be tendered POST General Contract Tender. The system is to be installed by a Voice Communication Contractor, independent of the General Contractor.

Included in the General Contract, however, is the installation of some rough-in items such as ceiling and/or wall mounted back boxes for paging speakers etc. Refer to the *Secondary and Elementary School Guidelines, Design Criteria and Fitments* for specifics.

It is the responsibility of the Consultants not to rely on this document other than as a Guideline, but to develop a specification to be reviewed by the Construction Department of the Board, prior to tendering.

1 GENERAL

1.1 GENERAL

- 1.1.1 Provide a complete and operating integrated digital telephone/public address system as described herein.
- 1.1.2 Do all Work in accordance with the General Contractor's schedule to meet the completion date and all specified interim schedules.

1.2 DEFINITIONS

- 1.2.1 "Provide" means to supply and install the products and services specified.
- 1.2.2 "The Work" means the total construction required by the Contract Documents and includes all labour, Products and services.
- 1.2.3 "Products" means all material, machinery, equipment and devices forming the completed Work as required by the Contract Documents.

1.3 INTENT

- 1.3.1 Provide all Products and methods specified or shown in the Contract Documents complete with incidentals necessary for a complete operating installation. Provide all tools, instruments, equipment and services required to do the Work.

- 1.3.2 Wherever differences occur in the Contract Documents, the maximum conditions will govern and be allowed for in the Tender price. The item to be incorporated will be at the option of the Consultant.
- 1.3.3 The Specifications are integral with the Drawings which accompany them. Neither is to be used alone. Any item or subject omitted from one, but included in the other is properly specified.

1.4 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- 1.4.1 Submission of a Tender confirms that the Contract Documents and site conditions are accepted without qualifications unless exceptions are specifically noted in the Tender.
- 1.4.2 Obtain accurate dimensions from site measurement. Locations and elevations of services are appropriate and must be verified before construction is undertaken.

1.5 SHOP AND RECORD DRAWINGS

- 1.5.1 Provide five (5) copies of shop drawings of all products for approval after award of Contract.
- 1.5.2 Assume full responsibility for submission of shop drawings. Allow two (2) weeks for Consultant's review.
- 1.5.3 Submit shop drawings showing the following:
 - 1.5.3.1 Project name
 - 1.5.3.2 Project number
 - 1.5.3.3 Manufacturer's name and model number
 - 1.5.3.4 Dimensions
 - 1.5.3.5 Electrical characteristics
 - 1.5.3.6 Bill of materials and finishes
- 1.5.4 The Consultant's review shall not relieve this Contractor from responsibility to provide materials and equipment in accordance with the design intent and Contract Documents.
- 1.5.5 Drawings will be marked and action taken as follows:

CONSULTANT'S MARKINGS	ACTION BY CONTRACTOR
Reviewed:	Proceed with work.
Reviewed as noted:	Proceed in accordance with markings. Resubmit revised Drawings for record.
Revise and resubmit.	Submit revised Drawings for review before proceeding.

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- 1.5.6 Upon completion of the work, submit one (1) complete set of updated print copies of all final as-built record documents to the Board for review purposes.
- 1.5.7 Prepare record drawings showing the following:
 - 1.5.7.1 Schedule for location of different types of phones as noted above
 - 1.5.7.2 All changes to the work due to Change Orders
 - 1.5.7.3 All Addenda changes
 - 1.5.7.4 All changes to the Work during construction
 - 1.5.7.5 Location and designation of all items requiring access or service in a hidden location

1.6 SCHEDULING

- 1.6.1 Comply with the General Contractor's construction schedule.
- 1.6.2 Before submission, co-ordinate the schedule with the General Contractor's construction schedule.
- 1.6.3 Notify the General Contractor, Owner and Consultant of any conflicts between the General Construction and the Telephone/P.A. work.

1.7 CLEANING

- 1.7.1 Before energizing the system, inspect and clean the inside of all cabinets to ensure that they are completely free from dust and debris.
- 1.7.2 Remove all debris, surplus material and tools.

1.8 PROTECTION

- 1.8.1 Protect the systems from damage due to carrying out of this Work.
- 1.8.2 Keep equipment dry and clean at all times.
- 1.8.3 Cover openings in equipment and materials.

1.9 OPERATION AND MAINTENANCE MANUAL

- 1.9.1 Assemble two (2) manuals, each containing data sheets, brochures, operating, maintenance, recommended spare parts, and programming instructions and a complete set of reviewed shop drawings and bind in hard cover. Identify cover as follows:
 - Operation and Maintenance Manual for ----- (Sec. or Elem. School)
 - Integrated Telephone/P.A. System"
- 1.9.2 Manuals shall be separated with dividers in logical sections and volumes.

1.10 FIELD REVIEW

- 1.10.1 The Owner and Consultant shall review the work during the construction schedule.
- 1.10.2 Provide all gauges, instruments and other necessary measuring equipment required for review of the Work.
- 1.10.3 Correct any deficiencies as they are reported during the performance of the Work.
- 1.10.4 Application for final review will be considered when the Work has been completed and written declarations submitted that all testing, adjustment, set up and documentation is complete. Final review shall be done when:
 - 1.10.4.1 All reported deficiencies have been corrected.
 - 1.10.4.2 All systems are operational.
 - 1.10.4.3 The Owner's Representative has been instructed in the operation and maintenance of all equipment. The instructions shall include for at least three (3) days of training with dates to be confirmed with Owner; one (1) day for preliminary training and two (2) days for detailed training including review of available options.
 - 1.10.4.4 All manuals have been submitted and reviewed.
 - 1.10.4.5 All tags and nameplates are in place and all data submitted and reviewed.
 - 1.10.4.6 Cleaning up is finished in all respects.
 - 1.10.4.7 All certificates are furnished.
 - 1.10.4.8 All record drawings have been submitted and reviewed.

1.11 SYSTEM DESCRIPTION

EQUIPMENT	MANUFACTURER ON WHICH CONTRACT DOCUMENTS ARE BASED	ACCEPTABLE ALTERNATE MANUFACTURERS
Telephone System	Nortel BCM 200/450	None Applicable
Public Address Amplification	TOA	None Applicable
Audio Sources	Tascam	Denon Yamaha Panasonic Sony
Page Zoning	Bogen	Wheelock
Speakers	TOA	Electro-Voice Yamaha Bose
Master Program Control Unit	Simplex	Edwards

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- 1.11.1 The Telephone/P.A. system shall provide comprehensive internal and external communications. External communication is provided via connection with the Board Wide Area Network using IP virtual trunks and the carrier service's public switched network using analog trunks.
- 1.11.2 Internally, the system will enable staff to make announcements (announcements from classrooms must be restricted) and page teachers from their telephones, through the paging speakers or the built-in telephone speaker.

1.11.3 Telephone System:

Telephone system shall be a Nortel BCM using digital and IP sets, integrated with paging system, and integrated with other Board phone systems via VoIP.

- 1.11.3.1 The School Board will be responsible for setting up the carrier trunk lines to provide telephone public-switched network access to the school.
- 1.11.3.2 The School Board will be responsible for providing the network access to allow use of IP.
- 1.11.3.3 System must be initially setup in stand alone mode pending the installation of a high speed fibre WAN. This will use four local trunks, local auto-attendant and voice mail.
- 1.11.3.4 Once the fibre WAN is in place, the phone system will be integrated with the Board VoIP installation to use central trunks and central Call Pilot voice mail.
- 1.11.3.5 Extensions as per Board combined dial-plan. Configure TCP/IP networking on the telephone system as per the direction of the School Board.
- 1.11.3.6 The Telephone System shall accommodate analog trunk lines, IP virtual trunks, and station extensions with integration for audio paging, output to public address paging speakers, and the BCM auto-attendant.

1.11.4 Paging System:

The paging system shall be integrated with the Telephone System and the Master Program Control Unit. The system must include at least the following "paging" capabilities/hardware:

- 1.11.4.1 Centrally amplified paging component systems
- 1.11.4.2 Access paging from telephone by user entering programmed paging code or depressing the talk switch on the desk microphone shall activate the zone
- 1.11.4.3 Automatic muting of the page channel unless signal activated

- 1.11.4.4 Auxiliary night ringer interface capability
- 1.11.4.5 Music and auxiliary program source distribution to speakers or telephone system interface
- 1.11.4.6 Integration with master program control unit and general purpose sound system
- 1.11.4.7 Flexible paging to allow zoning to different sections of school (refer to schedule)
- 1.11.4.8 Independent tone generation for inside and outside speaker signals
- 1.11.4.9 If the building includes a distinct, isolated section for another organization such as a day-care facility or public library:
 - a.) Place one or more PA speakers for minimal coverage of the separate area in a separate paging zone.
 - b.) Wire this zone to an on/off switch on the audio equipment rack so these speakers can be used in the event of all-building emergencies and disabled at all other times.

1.12 TECHNICAL STANDARDS, CODES AND FEES

- 1.12.1 All equipment must be CSA approved.
- 1.12.2 Cabling systems is to be in compliance with CSA-T529-M91 and T530-M90 (ANSI/EIA/TIA), EIA/TIA 568 wiring standards.
- 1.12.3 Obtain and pay for all permits, licences and certificates required for the work of this Contract.

1.13 APPLICATION FOR PAYMENT

- 1.13.1 Conform to the Consultant's method of submission of application for payment which will be issued after the award of Contract.

1.14 INSTALLATION REQUIREMENTS

- 1.14.1 The Consultants' drawings and instructions govern the location of all items.
- 1.14.2 Install equipment neatly to the satisfaction of the Consultant. Unless noted otherwise install all Products and services to follow building planes. Installations shall permit free use of space and maximum headroom.
- 1.14.3 Confirm the exact location of outlets and connections. Confirm location of connection points for equipment supplied under other Divisions.
- 1.14.4 Install all equipment and apparatus to allow free access for maintenance, adjustment and eventual replacement.

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- 1.14.5 Provide suitable shielding and physical protection for all devices.
- 1.14.6 Install all Products and services in accordance with the manufacturer's requirements and/or recommendations.
- 1.14.7 Provide all supports and fasteners. Secure all Products and services so as not to impose undue stresses on the systems.
- 1.14.8 Be responsible for any damages done to finished surfaces and damages to ceiling tiles done by the work of this Contract.

1.15 MANUFACTURER'S CERTIFICATION

- 1.15.1 Submit letters from the manufacturers of all equipment certifying that their technical representatives have inspected and tested their equipment and are satisfied with the methods of installation and operation.
- 1.15.2 These letters shall state the names of persons present at testing, methods used and a list of functions performed with location and room numbers where applicable.

1.16 CORRECTION AFTER COMPLETION

- 1.16.1 Attend immediately, at no cost to the Owner, to any and all defects occurring during a period of one (1) year from the issuing of the "Certificate for Substantial Performance" of the completed Work.
- 1.16.2 Repair all defects in a manner to prevent recurrence.
- 1.16.3 Instruct all manufacturers and suppliers that guarantees on Products will commence at the date for Substantial Performance and not from the date the Products are put into operation.

2 PRODUCTS

2.1 TELEPHONE SWITCH MODULAR EQUIPMENT

- 2.1.1 Prior to VoIP connection over Wide Area Network:
 - 2.1.1.1 Use three analog trunks for inbound/outbound calling plus fax trunk as a backup.
 - 2.1.1.2 Set up two local mailboxes for general office and attendance prior to VoIP connection.
 - 2.1.1.3 Connect the BCM to the school network.
- 2.1.2 Upon integration with VoIP over Wide Area Network, the Board shall:
 - 2.1.2.1 Integrate the telephone system with the existing central Call Pilot Voice Mail system at the Board office via VoIP.

- 2.1.2.2 Integrate the telephone system into the unified dial plan, allowing direct extension dialling between buildings equipped with VoIP phone systems.
- 2.1.2.3 Use IP virtual trunks for all outbound calling with the exception of 911 calls and deliberate "line1" or "line 2" calls from Office sets.
- 2.1.2.4 Implement all required voice mail on the central Call Pilot.
- 2.1.2.5 Set the main analog trunk to "Call-Forward-Busy" to a central DID which routes all calls after the first to the BCM via IP trunks from a central PRI trunk pool.
- 2.1.3 Telephone system shall be a Nortel BCM and must include at least the following "telephone" capabilities/hardware:
 - 2.1.3.1 Support for both digital and TCP/IP telephones.
 - 2.1.3.2 Trunk and station modules and associated components providing the following capacities:
 - a.) For new *Elementary Schools* – supply a BCM 200 with the capacity of 4 trunk lines (ports), 16 IP virtual trunks, and 64 digital phone sets (ports).
 - b.) For new *Secondary Schools* – supply a BCM 450 with the capacity of 4 trunk lines (ports), 32 IP virtual trunks, and 176 digital phone sets (ports).
 - 2.1.3.3 Trunk modules shall be loop start analog trunk type as directed by the School Board and co-ordinated with the service provider.
 - 2.1.3.4 Expansion modules, system cabinets, and connecting cables for connecting trunks or sets as required for system configuration.
 - 2.1.3.5 Provide the Board with the most current release of BCM software with all appropriate licencing and key codes as required for system configuration.
 - 2.1.3.6 The system hardware shall be connected to an approved building ground (cold water pipe, etc.).
 - 2.1.3.7 Paging port contacts and DTMF capabilities.
 - 2.1.3.8 Power supply - standard 120 VAC, 3 wires.
 - 2.1.3.9 Provide surge protection to be CSA approved for system and Uninterrupted Power Supply (UPS) – minimum one (1) hour battery backup. It is necessary to provide continuous duty pulse complete with inverter, rectifier/charger, automatic bypass circuits, and EMI/RFI filtering. UPS must be secured and off the floor.

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- 2.1.3.10 Common equipment shall be wall mounted on the provided backboard.
- 2.1.3.11 Place all main-office phones in a single call-pickup group.
- 2.1.3.12 Classroom phone sets are restricted from dial-out.
- 2.1.3.13 Classroom sets configured to not accept calls from other buildings (across VoIP trunks, inside dial plan).
- 2.1.3.14 All 911 and 9,911 calls directed forced to fax line.
- 2.1.3.15 Standard multi-line telephone sets will be model T7208, charcoal colour.
- 2.1.3.16 Standard office telephone set will be model T7316, charcoal colour.
 - a.) Office sets shall have “Line 1” and “Line 2” keys tied to the main and fax numbers respectively for use in the event of VoIP or network outages.
- 2.1.3.17 The attendant telephone set will be model M7324 with one Liberation head-set, central answering position modules and auxiliary power supply units as required for system configuration.
 - a.) In *Elementary Schools* a single central answering position module shall be provided in the main office.
 - b.) In *Secondary Schools* one central answering position module shall provided in the main office and one in the guidance office.
- 2.1.3.18 An auto-attendant menu shall answer the main number.
 - a.) Option 0 to main answer position
 - b.) Option 1 to leave a message at attendance mailbox
 - c.) Auto-attendant configured on last DN in extension range of the school
 - d.) Other menu options as required in consultation with school staff (guidance department etc.).
- 2.1.3.19 Provide one analog terminal adapter to interface the digital telephone system with auxiliary analog devices such as interval hydro meters.
- 2.1.3.20 Provide door phone with single call button programmed with auto dialling for intercom communication for areas such as handicap washrooms as directed by the School Board, and programmed to communicate with a designated phone.

2.2 AUXILIARY PHONES

- 2.2.1 Provide one (1) emergency analog phone capable of use during power outage. Locate outlet in main office and connect to the trunk for the school main telephone number.
- 2.2.2 Provide Higgins International "The Stick" (<http://faxswitch.com/stick.html>) tone discriminator or approved equivalent line sharing device on fax line.
- 2.2.2.1 Connect Fax line trunk to CA38A jack for Security Panel. Security Panel must have priority line access.
 - 2.2.2.2 Connect Line share device behind CA38A jack (Security Panel is between carrier and Line share device).
 - 2.2.2.3 Connect BCM phone system, Main office Fax machine, and Elevator port/auto-dialler to the line share device.
 - 2.2.2.4 Route inbound fax calls to main office fax machine.
 - 2.2.2.5 Route inbound voice calls to BCM phone system auto-attendant.
- 2.2.3 Connect elevator cab as per:
- 2.2.3.1 In *Elementary Schools* containing a "lift":
 - a.) Provide an auto-dialer device dialing to phone number designated by the Board.
 - b.) Connect auto-dialer to line-share device.
 - c.) Provide phone jack in Lift machine room back to auto-dialer.
 - d.) Mount analog telephone set in cab and coordinate connection with traveller cable provided by Elevator contractor.
 - 2.2.3.2 In *Secondary Schools* containing an elevator:
 - a.) Provide phone jack in elevator machine room back to line share device.
 - b.) Phone Set in cab, auto-dialer, and traveller cable will be provided by Elevator contractor.

2.3 PAGING SYSTEM MIXER AND AMPLIFIER

- 2.3.1 Paging system shall incorporate solid-state, electronic paging and associated component systems.
- 2.3.2 For *Elementary Schools*, provide one TOA M-900MK2, 8 channel mixer and one TOA P-924MK2, 240 watt amplifier, wired and equipped to power up the zoned speakers.

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- 2.3.3 For *Secondary Schools*, provide one TOA M-900MK2, 8 channel mixer and four TOA P-924MK2, 240 watt amplifiers, wired and equipped to power up the zoned speakers.
- 2.3.4 Provide manually adjustable or screwdriver adjustable controls for all parameters of the system.
- 2.3.5 LED or LCD or analog meter displays for all parameters of the system.
- 2.3.6 The system shall be connected to an approved building ground (cold water pipe, etc.).
- 2.3.7 Mixer input modules for connection to tuner, tape, CD unit, microphone (low impedance-balanced) and auxiliary sources.
- 2.3.8 Units are to be mounted in the general office cabinet.
- 2.3.9 Power supply - standard 120 VAC, 3 wires.
- 2.3.10 Provide surge protection to be CSA approved for system and Uninterrupted Power Supply (UPS) system - minimum one (1) hour battery backup. Provision must be made for continuous duty pulse complete with inverter, rectifier/charger, automatic bypass circuits, and EMI/RFI filtering. UPS must be secured and off the floor.
- 2.3.11 Provide interface connections to paging zone modules and the telephone system access configuration including the zoning of music to individual sections of the building.

2.4 AM/FM TUNER, COMPACT DISC PLAYER

- 2.4.1 Provide one commercial quality TOA DT-930, AM/FM tuner with quartz locked, frequency synthesized digital tuning.
- 2.4.2 Provide a Sony, five (5) cartridge compact disc player with direct track access, 20-track random play, support for mp3 files, remote control unit and rack mounting hardware. Unit frequency response is to be from 2 to 20,000 Hz and signal to noise ratio of 108 dB.
- 2.4.3 All the above mentioned components shall be complete with rack mounting hardware and shall be installed in the general office equipment cabinet.

2.5 ZONE PAGING MODULE

- 2.5.1 Provide "Bogen" zone paging modules compatible with the telephone paging circuits and audio input sources. The module shall incorporate the capability for providing a total of six (6) zones, for *Elementary Schools* and twelve (12) zones for *Secondary Schools* including the zoning of music over the speakers to individual parts of the building, of switched paging plus an "All Call" feature. The unit shall be field programmable with volume controls of input sources.

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- 2.5.2 The six (6) paging zones, for *Elementary Schools*, shall be (1) - all interior speakers; (2) - all corridors and other areas (i.e., other than classrooms); (3) - all classrooms; (4) G.P Room/Gymnasia and stage; (5) exterior speakers; (6) spare.
- 2.5.3 The twelve (12) paging zones, for *Secondary Schools*, shall be as noted above, plus six paging zones as directed by the School Board.
- 2.5.4 An "All Call" page includes all internal zones except any zone for separate facilities such as public libraries.
- 2.5.5 A "Master All Call" includes all speakers and horns in the system including all zones, both internal and external.

2.6 SPEAKERS

- 2.6.1 Speakers shall be dual cone or co-axial type, power handling of 12 WRMS, multi-power taps, 8" (200 mm) diameter, 10 oz. permanent magnet, with a voice coil of 1" (25 mm) and shall have an impedance of 8 ohms. The continuous power rating shall be 2 watts. The speakers shall be supplied complete with a 25/70 volt, line matching transformer. Speakers shall be installed in a steel, acoustically treated back box and square speaker baffle as identified below. Supply and installation of back boxes will be by the Electrical Sub-Contractor (Division 16000).
- 2.6.2 Speakers in ceilings shall be mounted flush with ceiling, inside back boxes and provided with prime coated white enamel finished grille baffle.
- 2.6.3 Speakers and baffles in classroom control panels shall be mounted flush with control panel, inside back boxes and provided with prime coated white enamel finished grill baffle. Supply and installation of back boxes are by Electrical Sub-Contractor (Division 16000). Voice Communication Sub-Contractor shall be responsible for proper selection and installation, on site and shall co-ordinate with General Contractor to ensure the timely and correct installation of back boxes, into ceilings and classroom control panels.

2.7 MASTER PROGRAM CONTROL UNIT

- 2.7.1 Provide a master program control unit to interface with the P.A. system for tone signalling over speakers and the synchronization of Tel/PA system's internal clock. The master program control unit shall be a Simplex Series 6300 or Edwards 2000-MTC 4 circuit unit suitable for operation on a 120 volt, AC supply with surface mounting box. The program unit shall be wired to provide automatic operation of electronic tone program signalling and telephone system's internal clock.
- 2.7.2 The master program control shall be a micro-processor based self-regulating unit capable of operating four (4) circuits of signals. The master unit shall include 4 hour battery back-up and a 4-circuit programmer for automatically sounding signals on each circuit on a minute interval basis

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for a 24-hour day, 7 day week as instructed by the School Owner. The program machine shall include switches for each circuit to permit manually sounding or silencing of signals. A calendar shall permit daily repetition of program schedules, or omission of any 2-hour program period of any day of the week.

2.8 HORNS

- 2.8.1 Horns shall be weather-proof indoor/outdoor paging horn with frequency response from 150 to 15 kHz sound pressure level of 120 dB at 3' (1 m) with an input of 1 watt, and power handling capacity of 15 watts (25 volt tap). Horns shall be corrosion, vibration and vermin resistant and shall be complete with protective wire guard.

2.9 OFFICE DESK PHONE

- 2.9.1 The office desk microphone shall be a TOA PM660U, desk top unidirectional type, complete with push to-talk bar and locking switch compatible with system. Include XLR type wall mount receptacle for microphone.

2.10 CABLING

- 2.10.1 Cable runs must conform to the following minimum requirements:
- 2.10.1.1 Voice telephone cables: 4 pair, solid copper, 22 AWG cable, unshielded twisted pair (UTP), category 3, FT-6 rated throughout.
 - 2.10.1.2 All speaker cables shall be one (1) pair twisted AWG 18 type with an overall PVC jacket.
 - 2.10.1.3 The microphone cable shall be one (1) pair of twisted, shielded 22 AWG stranded conductors, PVC jacket.

2.11 GENERAL OFFICE CABINET

- 2.11.1 Provide a metal portable cabinet, complete with castors and hinged, lockable glass door, for the installation of public address equipment. The cabinet will be located in the General Office's Work Room or as indicated on the drawings. Location of cabinet is to be coordinated with Division 16000.

3 EXECUTION

3.1 INSTALLATION

- 3.1.1 The complete cabling system shall be provided and installed from the "telco" demarcation point through the central telephone paging common equipment and to all jacks.
- 3.1.2 Administration digital telephones - shall be located in the Principal, Vice-Principal, Assistant Secretary, and Nurses' Office.
 - 3.1.2.1 Attendant telephone set shall be located in the Administration office.
 - 3.1.2.2 Multi-line digital telephones shall be located in Guidance Office, all other General Offices, all typical classrooms, Caretakers' Rooms, service rooms or other designated rooms identified on the Drawings.
- 3.1.3 Paging speakers will be located in corridors and various rooms throughout the school and outside as indicated on the drawing documents. Speakers are to be zoned as per Board's directives.
- 3.1.4 Each telephone station and speaker zone cable run will be homed to the equipment room, where all common equipment will be installed.
- 3.1.5 Every run must be labelled in two (2) places, at each end, after being pulled and trimmed.
- 3.1.6 Terminations - Each cable terminations is to be punched down onto a labelled connection block arrangement (IDC) in the equipment room.
- 3.1.7 Jacks in offices are to be mounted 300 mm (12") above the floor. Wall mounted telephones and associated jacks to be installed at 1200 mm (4 ft.) above finished floor. Provide an emergency "power fail" jack adjacent to the main answer position in the General Office.

3.2 GENERAL CONTRACT PROVISIONS

- 3.2.1 All wire and cable shall be installed in existing empty conduit systems. Co-ordinate wiring installation with Electrical Sub-Contractor on site. Exact conduit system configuration and routing to be verified on site.
- 3.2.2 Co-ordinate the installation and location of all outlets with the Electrical Sub-Contractor. Install cover plates to outlets as required. Any jacks not wired or installed with a phone shall be provide with a cover plate to match existing wall plates.
- 3.2.3 Work provided by Electrical Sub-Contractor on base building and included in their Tender is as follows:
 - 3.2.3.1 Provision and installation of flush single gang outlet boxes for all wall outlets, speaker back-boxes for classroom control

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panels. All boxes and junction covers in ceiling colour coded by the Electrical.

- 3.2.3.2 Designated 120 volt receptacles shall be located in a closet of a selected room and the Electrical Room.
- 3.2.4 Where ceiling tiles have been installed, this Contract shall be responsible for removal and re-installation of tiles. Tiles and grid members which have been marked or damaged during installation of this system shall be replaced by this Contract.
- 3.2.5 Co-ordinate all work with the General Contractor and Electrical Sub-Contractor on site. Verify existing conditions on site.
- 3.2.6 All wiring at selected room closet and Electrical Room shall be identified by number markers and a list of numbering and descriptions supplied with shop drawings.

3.3 EQUIPMENT ROOM TERMINATIONS

- 3.3.1 All voice telephone cables must be punched down onto a wall mounted IDC block, Northern Telecom BIX assemblies or approved equal type connection blocks, and be properly labelled in accordance with an approved numbering plan. Cables must be neatly installed and properly secured (tie-wrapped) and affixed to backboard via use of separating rings. Blocks must be installed with at least 20% spare capacity.
- 3.3.2 Speaker zone cables are to be terminated directly onto zone paging module terminal blocks, and be neatly tie-wrapped and secured.
- 3.3.3 Provide proper grounding of equipment to manufacturer's recommendations, back to building ground point.
- 3.3.4 Install and connect the paging zone module adjacent to the telephone common equipment. Public address line input and output cables to be run from the general office equipment cabinet to the paging zone modules.

3.4 STATION TERMINATIONS

- 3.4.1 Voice cable runs must be terminated on standard jacks (RJ11, RJ12 or RJ21), installed in approved outlet box with cover plate.
- 3.4.2 Speaker cabling must be terminated on terminals, integral to speakers.
- 3.4.3 Horizontal cables shall be bundled to a maximum of thirty (30) and properly supported with self-locking cable tie wraps every 1520 mm (5 ft.).

3.5 TESTING AND PROGRAMMING

- 3.5.1 Test all cables for correct continuity and polarity.
- 3.5.2 Provide all programming and adjusting of all features and balancing all components to the satisfaction of the Board's representative.

3.6 INTERFACING WITH SERVICE CARRIER & AUXILIARY SYSTEMS

- 3.6.1 Co-ordinate the interfacing with the Board's designated service carrier.
- 3.6.2 Provide lines (ports) and connections to auxiliary systems (such as master program control unit, Gym/Auditorium sound systems, monitoring systems, etc.) as shown on Drawings and co-ordinate with appropriate systems.

3.7 TRAINING

- 3.7.1 Perform on-site training of users (including the provision of user guides) prior to cut-over and attend at the school the week following cut-over to ensure that all staff are properly trained in the operation of the system. Training to consist of three (3) full days; one (1) day on school start-up to give training on basic use, and two (2) days to give detailed training on function by function use of system.

3.8 WARRANTY

- 3.8.1 Warranty to include the following:
 - 3.8.1.1 One (1) year repair or replacement warranty on all components.
 - 3.8.1.2 Warranty is to begin upon system acceptance by the Board.
 - 3.8.1.3 The support of an operational remote maintenance capability.
 - 3.8.1.4 Repair response times for problems defined as routine to be addressed and corrected within forty-eight (48) hours, excepting statutory holidays and weekends.

END OF INTEGRATED TELEPHONE/PA SYSTEM GUIDELINE

LATEST REVISION IN GREEN FONT

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