

Part 1 GENERAL**1.01 SECTION INCLUDES**

- .1 Digital Communications Controllers (DCC's)
- .2 Digital Communication Expanders (DCE's)
- .3 Administrator Software for configuring and maintaining system
- .4 Intercom master stations
- .5 Intercom stations

1.02 REFERENCE DOCUMENTS

- .1 CSC Specifications:
 - .1 ES/SOW-0101 – Procurement & Installation of Electronic Security Systems (Revision 3)
 - .2 ES/SOW-0102 – Quality Control for Procurement and Installations of Electronic Security Systems (Revision 5)
 - .3 ES/SOW-0404 – Electronic System Proposal Evaluation Criteria (Revision 1)
 - .4 ES/SPEC-0006 – Conduit, Space, and Power Requirements for Security Systems Use in Federal Correctional Institutions (Revision 2)
 - .5 ES/SPEC-0303 – Limited Call Intercom System for Use in Federal Correctional Institutions (Revision 2)
 - .6 ES/SPEC-0500 – Inmate Cell Call System for Use in Federal Correctional Institutions (Revision 2)
 - .7 ES/SPEC-0900 – Door/Barrier/Gate Control System for Use in Federal Correctional Institutions (Revision 2)
 - .8 ES/STD-0204 – Fixed/Zoom Lens Closed Circuit Television (Revision 1)
 - .9 ES/STD-0207 – High Security Enclosure Closed Circuit Television (Revision 1)
 - .10 ES/STD-0221 – Fixed Network Colour Closed Circuit Television Camera (Revision 0)
 - .11 ES/STD-0222 – Indoor Network Colour Dome Camera (with Pan/Tilt/Zoom) Closed Circuit Television (Revision 0)
 - .12 ES/STD-0227 – LCD Colour Computer Monitor Closed Circuit Television (Revision 0)
 - .13 ES/STD-0228 – Network Video User Station Closed Circuit Television (Revision 0)
 - .14 ES/STD-0229 – Network Video Recorder Closed Circuit Television (Revision 0)

- .15 ES/STD-0230 – NTSC-IP Video Converter Closed Circuit Television (Revision 0)
- .16 ES/STD-0231 – IP-NTSC Video Converter Closed Circuit Television (Revision 0)
- .17 ES/STD-0803 – Video Display Unit Electronic Systems (Revision 2)
- .2 EIA-310-C Electronic Industries Association Standard for Racks, Panels and Associated Equipment.
- .3 CSA-C22.1-98 Canadian Electrical Code (CEC) Part 1.
- .4 UL 2572.
- .5 Drawings.

1.03 DEFINITIONS

- .1 ATP - Acceptance Testing Procedure/Plan
- .2 BSCS – Building Security & Communication System
- .3 CEC - Canadian Electrical Code
- .4 CER - Common Equipment Room
- .5 CSA - Canadian Standards Association
- .6 CSC - Correctional Service of Canada
- .7 DCS - Door Control System/subsystem
- .8 EIA - Electronic Industries Association
- .9 ES - Electronic Systems
- .10 FAAS – Facility Alarm Annunciation System
- .11 FAT - Factory Acceptance Test
- .12 FDR - Final design Report
- .13 GFE - Government Furnished Equipment
- .14 GUI - Graphical User Interface
- .15 I/O - Input/Output
- .16 KVM - Keyboard/Video/Mouse
- .17 LAN - Local Area Network
- .18 LCIS - Limited Call Intercom System
- .19 LCP - Local Control Post

- .20 MCCP – Main Communications Control Post
- .21 MTBF - Mean Time before Failure
- .22 OFC - Optical Fibre Cable
- .23 PC - Personal Computer
- .24 PDC - Power Distribution Centre
- .25 PDR - Preliminary Design Report
- .26 PE - Principal Entrance
- .27 PLC - Programmable Logic Controller
- .28 PIU – Perimeter Intrusion Unit
- .29 PWC - Public Works Canada (PWGSC's predecessor)
- .30 PWGSC - Public Works & Government Services Canada
- .31 PTT - Push-to-Talk
- .32 RU - Rack Units (1.75" vertical space in an EIA-310C standard equipment rack)
- .33 SAC - System Administration and Control
- .34 SCP - Secure Control Post
- .35 SOW - Statement of Work
- .36 SPEC - Specification
- .37 STD - Standard
- .38 T&E - Telecommunications and Electronics
- .39 TES - Telecommunications Equipment Space
- .40 UPS - Uninterruptible Power Supply
- .41 VAC - Volts, Alternating Current
- .42 VDC - Volts, Direct Current

1.04 PERFORMANCE REQUIREMENTS

- .1 Security Clearance
 - .1 No employee of the Contractor will be permitted to enter or work in the Institution without a current valid security clearance issued by CSC.
- .2 Precedence of Institutional Operations

- .1 While working on this project, it is essential that Contractors take every precaution to reduce any disturbance to normal institutional operations to a minimum. Onsite work may have to be performed at night or during other periods set by the Institution. The Contractor must recognize that it is essential that his personnel working onsite cooperate fully with the security staff at the institution by conforming to operational security requirements.
- .3 All work shall be coordinated with the Technical Authority and the institutional staff.
- .4 Contractor Experience
 - .1 The contractor shall provide evidence of five years' experience in the detail design, supply and installation of Closed Circuit Television Systems in Federal Correctional Facilities. Due to the complex IP virtual matrix design, contractor to provide evidence of team member IT technology and PC Network competency (MCSE or equal).
 - .2 Contractor shall demonstrate full compliance with the mandatory requirements set out in ES/SPEC-0404, including corporate capability; qualifications and experience of personnel assigned to the project; a full understanding, and capability to fulfil warranty obligations; ability to obtain the necessary level of security clearance for its onsite personnel to the installation locations; and the ability to execute the Contract in the language designated at the installation site.
- .5 Service Response Capability.
- .6 Contractor shall provide service response capability within 24 hours both during and after the system warranty period.

1.05 DESIGN PERFORMANCE REQUIREMENTS

- .1 Expand the existing Intercommunication System in accordance with the CSC ES/ES/SPEC-0303 and as shown on the drawings.
- .2 Provide high quality Intercommunication System components utilizing state-of-art technology with major brand name from a manufacturer with ISO9001 or better standards.
- .3 Provide a completed system with high quality voice intelligibility, all necessary components, programming, commissioning, patch cables, and interface devices as required and regardless of mention to provide a complete functioning system.
 - .1 Integrate the intercom system with the door control system.
- .4 Provide all required software updates and telephone technical support for no less than five (5) years from the date of substantial completion.
- .5 All cables will be installed in raceways supplied by Division 26. Review the scope of work as defined in Division 26 and include any additional raceways that may be required to suit the system being installed.
- .6 Use Shielded CAT-6 cable with specific colour from the rest of the facility's colour coding to clearly identify the cable as for use with intercom.
- .7 Provide third party written test results on a station-by-station basis as part of the base bid.

- .8 Provide an equipment enclosure (rack) to house the central exchange complete with all necessary ventilation fans, power supplies, storage drawers, keyboard/mouse/LCD monitors as required to run the system with rear locking door and front smoked glass locking door. Rack must meet CSC standard for Racks EIA-310-C.
- .9 Provide all specified spare parts and service manuals for maintenance of the Intercommunications and Program system. Provide complete listing of provided parts including quantity, manufacturer, model number, and unit price.

1.06 WARRANTY

- .1 Manufacturer's Warranty: Submit, for Consultant's acceptance, manufacturer's standard warranty document executed by authorized company official.
- .2 Provide one year warranty on defective parts and installation labour, commencing on the date of system acceptance by CSC.

1.07 PRODUCT DATA

- .1 Submit product data in accordance with CSC Specification ES/SOW-0101 – Procurement & Installation of Electronic Security Systems (Revision 3)
- .2 Include riser diagram, talk paths of complete intercom system.

1.08 SUBMITTALS

- .1 General: Submit two (2) sets hardcopy (paper) plus one (1) set softcopy (computer files) documentation at each submittal.
- .2 Preliminary Design Report (PDR): Provide documentation defined by ES/SOW-0101 Section 4.1
- .3 Final Design Report (FDR): Provide documentation defined by ES/SOW-0101 Section 4.3.
- .4 Acceptance Testing Plan (ATP): Provide documentation defined by ES/SOW-0101 Sections 6.1 and 7.2. ATP shall also include test procedure and certificate for fibre optic communications channels.
- .5 Training Plan and Course Materials: Provide documentation defined by ES/SOW-0101 Section 8.2.
- .6 Operator Manual: Provide generic manual for touch-screen operation, as well as system-specific information summarizing the operator-training course content.
- .7 Provide data for incorporation into maintenance manual specified in CSC Specification ES/SOW-0101 – Procurement & Installation of Electronic Security Systems (Revision 3).
- .8 Include description of system operation.
- .9 Include parts list using component identification numbers standard to electronics industry.

1.09 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Consultant.
- .5 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products**2.01 MATERIALS**

- .1 Intercommunications system and software to be designed and manufactured in accordance with ISO-9001 1994 Quality System Standard.
- .2 Manufacturer's quality control program to be registered in accordance with the above noted standard.
- .3 Units of the same type of equipment shall be products of a single manufacturer. All material and equipment shall be new and currently in production. Each major component of equipment shall have the manufacturer's name and address, and the model and serial number in a conspicuous place. Material will conform to the applicable requirements of the Underwriters Laboratories and the National Standards Institute. Each major component of equipment shall have the manufacturer's name and address, and the model and serial number in a conspicuous place.
- .4 All system equipment and field devices to be held securely in place. Fastenings and supports shall be selected to provide a safety factor of three.
- .5 All systems equipment equipped with plug in power connectors to be connected to a dedicated receptacle. Do not use tap connectors for plugging in multiple plugs into a single receptacle.
- .6 Approved Manufacturers
 - .1 The following manufacturers and their named products are approved for use in this Work:
 - .1 Harding Instrument Co. Ltd; MicroComm DXL

2.02 DIGITAL COMMUNICATION CONTROLLERS (DCC'S)

- .1 Digital Communication Controllers to each form an intercom exchange capable of independent local operation. Exchange capacity to be increased by connecting up to four (4) Digital Communication Expanders to each DCC.

- .2 Multiple DCC's to be networked together via digital audio trunks and Ethernet data networks to form larger systems.
- .3 Each DCC to include:
 - .1 A Process Control Card (PCC)
 - .2 A Master Control Card (MCC)
 - .3 Two Station Control Cards (SCC's)
 - .4 An optional internal PCI card.
 - .5 A front panel keypad/display for system setup and maintenance.
 - .6 A 110 VAC, 60 Hz power supply for internal functions.
- .4 Process Control Card:
 - .1 Process Control Card to contain system configuration and data, control exchange operations and switching, and provide exchange network ports.
 - .2 Process Control Card to include:
 - .1 USB network ports for exchange expansion.
 - .2 Ethernet network ports for system expansion and external control by touch screen computers and graphic control panels.
 - .3 Fiber optic or copper digital audio trunk ports.
 - .4 Two (2) serial ports.
 - .5 An internal modem for transmitting and receiving data over a telephone line.
- .5 Master Control Cards:
 - .1 Include ports for any combination of two (2) intercom or telephone set master stations.
 - .2 Include two (2) line level audio inputs with status and control.
 - .3 Include two (2) line level audio outputs with status and control.
 - .4 Convert incoming audio signals to digital format and outgoing signals to analog format.
 - .5 Intercom master station audio, press-to-talk and hook switch status transmitted over two single shielded pair cables with wiring supervision to detect open circuit and short circuit faults.
 - .6 Telephone set master station functions all transmitted over a single wiring pair.
- .6 Station Control Cards:

- .1 Each provide sixteen half-duplex intercom station ports which can be employed in adjacent pairs for full duplex devices.
- .2 Provide an interface for intercom stations. Units to convert incoming audio signals to digital format and outgoing signals to analog format. Each channel to monitor the status of up to two (2) switches associated with each intercom station.
- .3 Each card interfaces with sixteen (16) half-duplex channels. Each channel includes a separate audio power amplifier for non-blocking call operation and sixteen (16) independent software controlled volume settings.
- .4 All station audio, switch, and power functions on 400 Series and 401 Series cards to be transmitted over a single shielded pair cable with supervision to detect open circuit and short circuit faults.
- .5 Audio and switch functions on 300 Series (Generic Intercom) station control cards to be transmitted on separate wiring pairs.

2.03 DIGITAL COMMUNICATION EXPANDERS (DCE'S)

- .1 Digital Communication Expanders to provide master station and intercom features similar to the DCC's to facilitate exchange expansion.
- .2 Each DCE to include:
 - .1 A slave Process Control Card (PCC) without exchange control or network functions.
 - .2 A Master Control Card (MCC).
 - .3 Two (2) Station Control Cards (SCC's).
 - .4 A 110 VAC, 60 Hz power supply for internal functions.

2.04 ADMINISTRATOR SOFTWARE

- .1 Administrator Software to function on a standard PC to support system configuration, diagnostics, maintenance, and logging but not be required for system operation.
- .2 Administrator Software to employ Windows features including views of system tree structure, tables of devices, screens for system settings and adjustments, and tables of operational data.
- .3 Configuration features to include:
 - .1 Creation of overall system architecture.
 - .2 Creation of multiple device templates.
 - .3 Copy and paste functions with auto-numbering and auto-assignment to create device schedules.
 - .4 Configuration error detection and alerts.

- .5 Device naming and call routing functions.
- .6 Device setting and performance functions.
- .4 Diagnostic and Maintenance features to include:
 - .1 Verification of system configuration and installation.
 - .2 Verification of system networks.
 - .3 Verification of device connections.
 - .4 Verification of system operation.
 - .5 Diagnostics via modem or Ethernet ports.
- .5 Logging features to include:
 - .1 Display of system activity with filtering options.
 - .2 Search by time and date.
 - .3 Search by device.
 - .4 Search by parameter.

2.05 INTERCOM MASTER STATIONS

- .1 Desktop loudspeaker/microphone unit is to include compact, slim line bottom plate with stainless steel face, and rubber shock isolation mounting feet.
- .2 Unit to include a 12 inch, black, slim line electret gooseneck (flush mounted electret) microphone, front mounted loudspeaker, front mounted rotary volume control, and front access headphone jack.
- .3 Unit to include support for a privacy handset.
- .4 Unit to include a line level audio output of the speaker signal.
- .5 The network connection shall be a 10/100Mbps (RJ45 connector) Ethernet port with support for IEEE 802.3af inline power. A separate power connector shall also be provided in case an IEEE 802.3af compliant Ethernet switch is not available. The master station shall also provide support for the IEEE 802.1p/Q Quality of Service (QoS) standard.
- .6 Unit to include a 2-port 10/100Mbps Ethernet switch to facilitate the connection of a second Ethernet device.

2.06 INTERCOM STATIONS

- .1 Intercom stations are to be designed for mounting on standard 2-gang outlet boxes. Faceplates to be constructed of 11 gauge brushed stainless. Internal steel offset grille to restrict inserting objects through speaker grille. Stations to be ruggedly constructed and resistant to damage from soil and sprays.

- .2 Each intercom station is to incorporate an internal loudspeaker, microphone preamplifier and function multiplexing circuitry. One (1) pushbutton is to be provided on each station. Pushbuttons to be software assignable for placement of call requests or control of auxiliary functions.
- .3 Pushbuttons to be single piece stainless steel construction and are backstopped to prevent excessive travel. Switch to have positive tactile action with 1 million-operation lifetime.
- .4 Loudspeakers to be waterproof mylar cone type.
- .5 All intercom station functions to be transmitted over a single shielded pair cable. Stations to be provided with MTA type insulation displacement connector that requires no wire stripping for installation.
- .6 Outdoor intercom stations are to be identical in all respects to standard intercom stations except that all metal plates and hardware to be stainless steel, and internal circuitry and components to be conformally coated.

2.07 WIRE AND CABLE

- .1 Factory manufactured field interface cables to be provided, as required, for all:
 - .1 master station ports
 - .2 station control card ports
- .2 Field wiring to conform to manufacturer's recommendations.
- .3 Meet or exceed CSC specification ES/SPEC-0006 – Conduit, Space, and Power Requirements for Security Systems Use in Federal Correctional Institutions (Revision 2).

Part 3 Execution

3.01 DETAILED DESIGN DEVELOPMENT

- .1 Upon Contract Award, prepare and submit PDR to CSC Design Authority.
- .2 Upon CSC acceptance of PDR, prepare and submit FDR to CSC Design Authority.
- .3 Upon CSC acceptance of FDR, proceed with procurement, manufacture and staging of products compliant with FDR. Prepare subsystem configurations using licensed software. Prepare and submit ATP, training course outlines and materials and operating manual to CSC Design Authority.
- .4 Conduct off-site Factory Acceptance Test (FAT) witnessed by CSC Design Authority, to demonstrate compliant subsystem operation, subsystem non-interference, and system-wide control transfer and redundancy performance.

3.02 GENERAL INSTALLATION PROVISIONS

- .1 Inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

- .2 Verify the accuracy of all dimensions, allowances, and clearances on site prior to commencing with any work that may be affected by those dimensions, allowances, and clearances.
- .3 Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- .4 All wall mounted devices will be housed in steel blocks wherever there is a concrete block wall.
- .5 Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- .6 Supervise construction activities to ensure that no part of the Work, completed or in progress is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- .7 Precautions shall be taken to guard against electrostatic and electromagnetic susceptibility and interference.
- .8 Provide adequate ventilation for all heat radiating equipment.
- .9 Install equipment so as to provide maximum safety to the operating and maintenance personnel.
- .10 Nylon tubing for Section 11 19 20 shall be run with the low voltage device wires in conduit, raceways or cable trays. Low voltage wire and pneumatic tubing shall be pulled in the same conduit raceway by Sections 27 51 23, 28 13 27, 28 13 29 and 28 23 00. Nylon tubing must be run continuously from pneumatic lock to manifold in BSCS Room, or other designated location where pneumatic manifolds will be installed. Splices or tees shall **NOT** be permitted. Sections 27 51 23, 28 13 27, 28 13 29 and 28 23 00 Contractor is responsible for pulling the nylon tubing.

3.03 METHOD OF WORK

- .1 Work to be performed by fully competent technicians in a thorough manner.
- .2 All workmanship to be of the highest quality and meet recognized standards of craftsmanship.
- .3 Areas of installation deemed not acceptable by the Owner to be redone at the Contractor's expense.

3.04 PROTECTION OF EXISTING PROPERTY

- .1 Be responsible for protecting all existing property including floors, walls, ceilings, furniture, and furnishings from damage, dust and other construction related activities. Provide all necessary dust covers and protective pads required for performance of the Work.
- .2 Remove all debris and protective coverings at the end of each work period. Leave premises in condition found at start of work in each room or area of work.

- .3 Except for scheduled activities, do not inconvenience user due to construction operations.

3.05 INSTALLATION

- .1 Install equipment as indicated and in accordance with manufacturer's instructions.
- .2 Interconnect system components.

3.06 TESTS

- .1 Perform tests in accordance with CSC Specification ES/SOW-0101 – Procurement & Installation of Electronic Security Systems (Revision 3) and ES/SOW-0102 – Quality Control for Procurement and Installations of Electronic Security Systems (Revision 5).

END OF SECTION