

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**
11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet CCTV SYSTEM AT EDMONTON INSTITUTION		
Solicitation No. - N° de l'invitation 21120-158586/A		Date 2014-12-12
Client Reference No. - N° de référence du client 21120-158586		
GETS Reference No. - N° de référence de SEAG PW-\$\$HN-334-66338		
File No. - N° de dossier hn334.21120-158586	CCC No./N° CCC - FMS No./N° VME	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-01-23		Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>		
Address Enquiries to: - Adresser toutes questions à: McLaughlin, Michael		Buyer Id - Id de l'acheteur hn334
Telephone No. - N° de téléphone (819) 956-3622 ()		FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: CORRECTIONAL SERVICE OF CANADA 340 LAURIER AVE W. ATTN: MIRCEA SLOBOZIANU OTTAWA Ontario K1A0P9 Canada		

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Electrical & Electronics Products Division
11 Laurier St./11, rue Laurier
7B3, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

21120-158586/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

hn334

Client Ref. No. - N° de réf. du client

21120-158586

File No. - N° du dossier

hn33421120-158586

CCC No./N° CCC - FMS No/ N° VME

This page has been intentionally left blank.

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION

1. Introduction
2. Requirement
3. Debriefings

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions
2. Submission of Bids
3. Enquiries - Bid Solicitation
4. Applicable Laws
5. Mandatory Site Visit

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures
2. Basis of Selection

PART 5 - CERTIFICATIONS

1. Mandatory Certifications Required Precedent to Contract Award
2. Additional Certifications Required with the Bid

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement
2. Financial Capability
3. Condition of Materiel

PART 7 - RESULTING CONTRACT CLAUSES

1. Requirement
2. Standard Clauses and Conditions
3. Security Requirement
4. Term of Contract
5. Authorities
6. Payment
7. Invoicing Instructions
8. Certifications
9. Applicable Laws
10. Meeting
11. Contractor's Facilities
12. Delay by Canada
13. Procedures for Design Change or Additional Work
14. Priority of Documents
15. After Sales Services
16. Lifetime Spares
17. Disclosure of Information

18. T1204 - Information Reporting by Contractor

List of Annex:

The following annex forms part of this requirement:

Annex "A" - Pricing Sheet Upgrade of Closed Circuit Television System at the Edmonton Institution.

Annex "B" - Point Rated Technical Evaluation Criteria

Annex "C" - Federal Contractors Program for Employment Equity - Certification

FORM

The following form is attached to the solicitation document:

- 1) Institutional Access - CPIC Clearance Request, CSC/SCC 1279
- 2) Design Change/Deviation, PWGSC-TPSGC 9038

SUPPLIED UNDER SEPARATE COVER (ATTACHMENT 1):

- 1) Statement of Technical Requirements (STR), Statements of Work and applicable Electronic Engineering Specifications and Standards

PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation and resulting contract document is divided into seven parts plus annexes as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation and states that the Bidder agrees to be bound by the clauses and conditions contained in all parts of the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, if applicable, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Pricing Sheet (ANNEX A) and an electronic attachment (Attachment #1) which includes, the Requirement and various forms. Refer to the Table of Contents.

2. Requirement

2.1 Summary

The Correctional Service of Canada (CSC) has a requirement to upgrade the existing Closed Circuit Television (CCTV) system at the Edmonton Institution located in Edmonton, AB.

The Edmonton Institution is a maximum security institution. Work will have to be accomplished with minimum disruption to the daily operation and security of the institution.

The work includes the design, supply, installation, testing and provision of operational and technical training on the upgrade to the CCTV system as described in the Statement of Technical Requirements (STR) (*Refer to electronic Attachment #1*).

There is a security requirement associated with this requirement. For additional information, see Part 6 -Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses.

2.2 Delivery Requirement

Delivery is requested to be completed within 28 weeks after contract award.

2.2.1 Delivery Offered

While delivery is requested as indicated above, the best delivery that could be offered is _____

2.3 Contractor Contacts

Name and telephone number of the person responsible for :

General enquiries

Name: _____
Telephone No.: _____
Facsimile No.: _____
E-mail address: _____

Delivery follow-up

Name: _____
Telephone No.: _____
Facsimile No.: _____
E-mail address: _____

2.4 Warranty Repairs

It may be necessary for warranty repairs to be performed on site. You are requested to provide response time and location of nearest office/depot providing staff for this work. Response time shall not exceed forty-eight (48) hours. The contact person is as follows:

Response Time: _____
Name: _____
Telephone No.: _____
Facsimile No.: _____
Email/Internet Address: _____

2.5 Emergency Services/Repairs

If requested by Correctional Service Canada, the Contractor shall be required to provide on-site emergency service/repairs not covered under the warranty provision of the General Conditions 2030 during the contract period. The emergency crew shall be paid as indicated herein. The response time shall not exceed four (4) hours. The contact person is as follows:

Name: _____
Telephone No.: _____
Facsimile No.: _____
Email/Internet Address: _____

2.6 Lifetime Spares

It shall be a condition of any contract resulting here from that the Contractor undertakes to supply spare parts for the equipment proposed during the life expectancy of the equipment.

The Bidder must indicate the number of years for the life of the equipment. _____ years.

3. Debriefings

After contract award, bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions* (<http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>) Manual issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of this bid solicitation and accept the terms and conditions of the resulting contract.

The 2003 (25/09/2014) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days

Insert: ninety (90) days

2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) **BID RECEIVING UNIT** by the date, time and place indicated on page 1 of the bid solicitation.

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a "proprietary" nature must be clearly marked "proprietary" at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

5. Mandatory Site Visit

It is mandatory that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for a site visit to be held on **January 8th 2015 @ 9:00 a.m, at the Edmonton Institution. Interested Bidders shall meet at the Principal Entrance of the Edmonton Institution, 21611 Meridian Street, Edmonton, AB T5J 3H7.** Bidders will be required to sign an attendance form at each site visit. Bidders should confirm in their bids that they have attended the site visit. Bidders who do not attend or send a representative to the site visit will not be given an alternative appointment and their bids will be rejected as non-compliant.

The onus is on the bidders to arrive at the site visit in a timely manner. **Bidders arriving late may not be permitted to attend the site visit.**

The Bidder must have at least one attendee at the site visit.

It is also a **mandatory** condition of this requirement that all attendees have a site clearance prior to the site visits. To apply for the site clearance, the bidders shall complete a CPIC Clearance Request form (preferably in **typed format**) and submit the duly completed and signed form by each participant, by fax to (819) 953-4944 or by e-mail to michael.mclaughlin@pwgsc-tpsgc.gc.ca. It is a mandatory condition that the CPIC Clearance Request be submitted for the site visits. It is requested that the CPIC Clearance Requests be received by this office no later than 2:00pm EST on January 5th 2015. **Site Clearance Request Forms received after January 5th 2015 will not be accepted.** A site clearance obtained for work performed under similar requirements is not acceptable. Bidders are requested to clearly identify the name of the participant, the name of the company they represent, telephone number, facsimile number and e-mail address.

Bidders should submit in writing to the Contracting Authority, a list of issues that they wish to table and the language they would like to address questions and answers, no later than five (5) calendar days prior to the scheduled site visit.

Bidders are advised that any clarifications or changes resulting from the site visit shall be included as an amendment to the bid solicitation document through buyandsell.gc.ca

As proof of attendance, the Bidder must sign the attendance form provided by the CSC representative at the site visit.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I:	Technical Bid (3 hard copies)
Section II:	Management Bid (3 hard copies)
Section III:	Support Bid (3 hard copies)
Section IV:	Financial Bid (1 hard copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders are encouraged to :

- 1) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

The Technical, Management and Support Bids should be concise and address, but not necessarily be limited to, the points that are subject to the evaluation criteria against which the bid will be evaluated. Bidders should address these evaluation criteria in sufficient depth in their bid. Simply repeating the statement contained in the solicitation document is not sufficient. Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

In order to facilitate the evaluation of the bid, Canada requests bidders to address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bid by identifying the specific paragraph and page number where the subject topic has already been addressed.

THE BIDDER MUST ADDRESS ON A PARAGRAPH BY PARAGRAPH BASIS THE STATEMENT OF TECHNICAL REQUIREMENTS, THE STATEMENT OF WORK AND THE ELECTRONIC ENGINEERING SPECIFICATIONS AND STANDARDS, BY INDICATING WHERE APPLICABLE “COMPLY, UNDERSTOOD, NOTED, OR NOT APPLICABLE”. WHERE REQUIRED, THE BIDDER MUST PROVIDE ADDITIONAL INFORMATION.

Section I: Technical Bid

In their technical bid, bidders must demonstrate their understanding of the requirement and describe how they intend to meet the technical requirements.

THE TECHNICAL PROPOSAL SHALL MEET ALL OF THE TECHNICAL REQUIREMENTS OF THE STATEMENT OF REQUIREMENT (STR) AND APPLICABLE STATEMENTS OF WORK AND ELECTRONIC ENGINEERING SPECIFICATIONS AND STANDARDS. FAILURE TO MEET THE

TECHNICAL REQUIREMENTS WILL RENDER YOUR BID NON- RESPONSIVE AND NO FURTHER CONSIDERATION WILL BE GIVEN.

Section II: Management Bid

In their management bid, bidders must describe their capability and experience, the project management team and provide client contact(s).

Section III: Support Bid

In their support bid, bidders must demonstrate their understanding of the requirement and describe how they intend to meet the support requirements (operator / maintenance training, manuals, spare parts list and plan).

Section IV: Financial Bid

1.1 Bidders must submit their financial bid on **Annex "A" - Pricing Sheet** in accordance with the following Basis of Pricing:

1.2 Basis of Pricing

All prices must be firm in Canadian dollars, Delivery Duty Paid (Edmonton, AB), Goods and Services Tax or the Harmonized Sales Tax extra, transportation costs to destination and all applicable Custom Duties and Excise Taxes included.

1.2.1 Design and Equipment

The bidder must submit a firm lot price for the design and related equipment for the upgrade of the existing CCTV system at the Edmonton Institution, excluding spare parts and test equipment.

1.2.2 Installation and Testing Costs

1 The bidder must submit a firm lot price. The price must include all costs, excluding travel and living, related to the installation and testing of the equipment.

2 Installation and Testing of Equipment for Emergency Repairs, Delays and Design Changes.

The bidder must submit a firm hourly rate for installation and testing during and outside normal working hours for each labour category required.

These hourly rates will apply for emergency repairs, delays and design changes and will be in effect for the entire length of any resulting contract.

Normal working hours are Monday to Friday, 7:30 to 16:30 with exception of statutory holidays.

1.2.3 Travel and living expenses associated with the installation of the equipment

The bidder must indicate if there are travel and living expenses associated with the installation and testing of the equipment (excluding training). Where applicable, the bidder must submit a firm lot price, the estimated number of people and the estimated number of days (excluding training).

1.2.4 On-site training as detailed in the STR, paragraphs 5.1 and 5.2.

The bidder must submit a firm lot price for on-site training session including any associated travel expenses.

1.2.5 Documentation

The bidder must submit a firm lot price for the following:

As-built drawings as detailed in STR, paragraph 5.4.

Operator and Maintenance Manuals as detailed in STR, paragraph 5.3.

1.2.6 Software/Integration

The bidder must submit a firm lot price for the software/integration.

1.2.7 Spare parts/Test Equipment List (s)

Spare Parts and/or Test Equipment List(s) as detailed in STR, paragraph 5.15. The bidder must submit a Spare Parts and/or Test Equipment List identifying each recommended spare parts and/or test equipment required. The bidder must also submit a firm unit price for each recommended spare part required.

1.3 SACC Manual Clauses

C3011T (11/06/2013), Exchange Rate Fluctuation

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical, management, support and financial evaluation criteria specified below.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

1.1 Technical Evaluation

1.1.1 Mandatory Technical Criteria

To be declared responsive, a bid must:

- a) address on a paragraph by paragraph basis the Statement of Technical Requirements, the Statement of Work and the technical specifications, by indicating where applicable "comply, understood, noted, or not applicable". Where required, the bidder should provide additional information;
- b) comply with all of the technical requirements of the statement of requirement (STR); applicable statements of work and electronic engineering specifications and standards as well as all amendments to the bid solicitation issued prior to bid closing date;
- c) obtain the required minimum points (70%) for the technical, management and support evaluation criteria which are subject to point rating;

1.1.2 Point Rated Technical Criteria

The Technical Bid will be evaluated and rated as per Annex "B" attached.

1.2 Financial Evaluation

1.2.1 Mandatory Financial Criteria

The following **Mandatory** factors will be taken into consideration in the evaluation of each bid;
Compliance with Basis of Pricing;
Prices must be submitted for all items listed in the **Annex "A" - Pricing Sheet**.

The Aggregate Bid Price will be determined by adding the firm lot prices for items 1, 2.1, 3, 4, 5.1, 5.2, and 6 in ANNEX "A".

2. Basis of Selection

The responsive bidder with the lowest evaluated aggregate bid price will be recommended for award of a contract.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and documentation to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default, if any certification made by the Bidder is found to be untrue whether during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with this request will also render the bid non-responsive or will constitute a default under the Contract.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from [Human Resources and Skills Development Canada \(HRSDC\) - Labour's](#) website

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex [Federal Contractors Program for Employment Equity - Certification](#), before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

2. Additional Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

2.1 Status and Availability of Resources

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

Signature

Date

2.2.2 Education and Experience

The Bidder certifies that all the information provided in the résumés and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.

Signature

Date

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement

A site clearance is required prior to the site visit and prior to admittance to the institution. For additional information, see Part 2, Article 5 - Mandatory Site visit and Part 7, article 3, Security Requirement.

2. Financial Capability

1. Financial Capability Requirement: The Bidder must have the financial capability to fulfill this requirement. To determine the Bidder's financial capability, the Contracting Authority may, by written notice to the Bidder, require the submission of some or all of the financial information detailed below during the evaluation of bids. The Bidder must provide the following information to the Contracting Authority within fifteen (15) working days of the request or as specified by the Contracting Authority in the notice:
 - (a) Audited financial statements, if available, or the unaudited financial statements (prepared by the Bidder's outside accounting firm, if available, or prepared in-house if no external statements have been prepared) for the Bidder's last three fiscal years, or for the years that the Bidder has been in business if this is less than three years (including, as a minimum, the Balance Sheet, the Statement of Retained Earnings, the Income Statement and any notes to the statements).
 - (b) If the date of the financial statements in (a) above is more than five months before the date of the request for information by the Contracting Authority, the Bidder must also provide, unless this is prohibited by legislation for public companies, the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement), as of two months before the date on which the Contracting Authority requests this information.
 - (c) If the Bidder has not been in business for at least one full fiscal year, the following must be provided:
 - (i) the opening Balance Sheet on commencement of business (in the case of a corporation, the date of incorporation); and
 - (ii) the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests this information.
 - (d) A certification from the Chief Financial Officer or an authorized signing officer of the Bidder that the financial information provided is complete and accurate.
 - (e) A confirmation letter from all of the financial institution(s) that have provided short-term financing to the Bidder outlining the total of lines of credit granted to the Bidder and the amount of credit that remains available and not drawn upon as of one month prior to the date on which the Contracting Authority requests this information.
 - (f) A detailed monthly Cash Flow Statement covering all the Bidder's activities (including the requirement) for the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures on a monthly basis, for all the Bidder's activities. All assumptions made should be explained as well as details of how cash shortfalls will be financed.
 - (g) A detailed monthly Project Cash Flow Statement covering the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures, for the

requirement, on a monthly basis. All assumptions made should be explained as well as details of how cash shortfalls will be financed.

2. If the Bidder is a joint venture, the financial information required by the Contracting Authority must be provided by each member of the joint venture.
3. If the Bidder is a subsidiary of another company, then any financial information in 1. (a) to (f) above required by the Contracting Authority must be provided by the ultimate parent company. Provision of parent company financial information does not satisfy the requirement for the provision of the financial information of the Bidder, and the financial capability of a parent cannot be substituted for the financial capability of the Bidder itself unless an agreement by the parent company to sign a Parental Guarantee, as drawn up by Public Works and Government Services Canada (PWGSC), is provided with the required information.
4. Financial Information Already Provided to PWGSC: The Bidder is not required to resubmit any financial information requested by the Contracting Authority that is already on file at PWGSC with the Cost and Price Analysis Group of the Policy, Risk, Integrity and Strategic Management Sector, provided that within the above-noted time frame:
 - a) the Bidder identifies to the Contracting Authority in writing the specific information that is on file and the requirement for which this information was provided; and
 - b) the Bidder authorizes the use of the information for this requirement.

It is the Bidder's responsibility to confirm with the Contracting Authority that this information is still on file with PWGSC.

5. Other Information: Canada reserves the right to request from the Bidder any other information that Canada requires to conduct a complete financial capability assessment of the Bidder.
6. Confidentiality: If the Bidder provides the information required above to Canada in confidence while indicating that the disclosed information is confidential, then Canada will treat the information in a confidential manner as permitted by the Access to Information Act, R.S., 1985, c. A-1, Section 20(1) (b) and (c).
7. Security: In determining the Bidder's financial capability to fulfill this requirement, Canada may consider any security the Bidder is capable of providing, at the Bidder's sole expense (for example, an irrevocable letter of credit from a registered financial institution drawn in favour of Canada, a performance guarantee from a third party or some other form of security, as determined by Canada).

3. Condition of Materiel

SACC Manual clause B1000T (26/06/2014) Condition of Materiel

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

1. Requirement

The Contractor shall design, supply, install, test and provide operational and technical training on the upgrade of the CCTV system as described in the Statement of Technical Requirement (STR). The contractor shall provide acceptable documentation for the maintenance of this system.

Refer to Attachment #1 for Statement of Technical Requirements (STR), Statements of Work and applicable Electronic Engineering Specifications and Standards. The purpose of the STR document is to define the technical aspects for the upgrade of the CCTV system at the [Edmonton Institution](#). The STR will indicate the extent to which both general and particular CSC specifications are applicable to the implementation of this requirement.

1.1 Additional Work

The Design Authority may, at any time before issuing the final acceptance notice, order work or material in addition to that provided for in the Statement of Work. The contractor shall perform the work in accordance with such orders, deletions and changes pursuant to Part 7, Article 13 - Design Change, Additional Work of New Work and on the same terms and conditions contained or referenced herein.

1.2 Option to Purchase Spare Parts/Test Equipment

- a) The Contractor hereby grants to Canada and Canada shall retain an irrevocable option exercisable at any time during the Contract to procure any or all of the spare parts and/or test equipment described in the supplier's proposal.
- b) The Contractor shall be given a minimum of "30" working days notice in writing by the Contracting Authority indicating that Canada intends to exercise the option.
- c) The option may only be exercised by the Contracting Authority, and the exercise of the option will be evidenced through a formal Contract Amendment.
- d) Price support may be requested.

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions](http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp) (<http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>) Manual issued by Public Works and Government Services Canada.

2.1 General Conditions

2030 (25/09/2014) General Conditions - Higher Complexity - Goods

2.2 Supplemental General Conditions

4003 (16/08/2010) Licensed Software

4006 (16/08/2010) Contractor to Own Intellectual Property Rights in Foreground Information

2.3 SACC Manual Clauses

SACC Reference	Section	Date
B1501C	Electrical Equipment	16/06/2006
A9068C	Site Regulations	11/01/2010
A2000C	Foreign Nationals (Canadian Contractor)	16/06/2006
A2001C	Foreign Nationals (Foreign Contractor)	16/06/2006

3. Security Requirement

3.1 Site clearance

A site clearance is required prior to admittance to the institution. The contractor must submit completed CPIC forms for all staff who will be working at the institution(s). The duly completed and signed CPIC forms must be submitted ten (10) working days prior to start-up date as stipulated in the Statement of Technical Requirement.

3.2 Classification of this document is "Not Classified".

1. NIL security screening required, no access to sensitive information or assets. Contractor personnel will be escorted in specific areas of the institution as /where required, by authorized Correctional Service Canada personnel.
2. Contractor personnel shall submit to a local verification of identity/information, by Correctional Service Canada, prior to admittance to the institution. Correctional Service Canada reserves the right to deny access to the institution, of any Contractor personnel, at any time.

4. Term of Contract

4.1 Period of Contract

The system design, the delivery of all related equipment, the completion of all installation, testing and contract related work is to be completed at the Institution on or before (*Delivery as offered and as accepted will be inserted at contract award*)

NOTE: Date of delivery will be of the essence of any resulting contract. Your attention is drawn to article 10 of General Conditions, 2030.

The Contractor must submit a final delivery and installation schedule within 10 calendar days after the contract award date.

4.2 Shipping Instructions - Delivery at Destination

1. Shipment shall be consigned to the destination specified in and delivered:

DDP Delivered Duty Paid (Edmonton, AB) Incoterms 2000 for shipments from a commercial supplier.

4.3 Inspection and Acceptance

1) Inspection

Inspection shall be carried out by the Design Authority or the authorized representative at destination.

2) Final Acceptance

a) The Contractor shall be required to present the work, for final acceptance, when such work has been designed, manufactured, delivered to site and installed and has successfully passed all tests in strict accordance with the specification and terms and conditions, and the Contractor has performed all other work and complied with all the terms and conditions of the contract.

b) Upon verification of the above, the Design Authority will by written notice to the Contractor so acknowledge, and such notice shall constitute final acceptance.

Final Inspection and acceptance will take place at destination when all goods are delivered/ services rendered, and after all deficiencies identified by the Design Authority or the authorized representative are rectified and accepted.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Mike McLaughlin
Public Works and Government Services Canada
Acquisitions Branch
Logistics, Electrical, Fuel and Transportation Directorate
"HN" Division
7B3, Place du Portage, Phase III
11 Laurier Street
Gatineau, QC, K1A 0S5

Telephone: (819) 956-3622
Facsimile: (819) 953-4944
E-mail address: *michael.mclaughlin@pwgsc-tpsgc.gc.ca*

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

5.2 Technical Authority (or Design Authority)

The Technical Authority for the Contract is:

will be inserted at contract

_____ (Name of Technical Authority)

_____ (Title)

_____ (Fill in Organization)

_____ (Fill in address)

Telephone: _____

Facsimile: _____

E-mail address: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.3 Contractor Contacts

Name and telephone number of the person responsible for :

General enquiries

Name: *will be inserted at contract*

Telephone No. *will be inserted at contract*

Facsimile No. *will be inserted at contract*

E-mail address: *will be inserted at contract*

Delivery follow-up

Name: *will be inserted at contract*

Telephone No. *will be inserted at contract*

Facsimile No. *will be inserted at contract*

E-mail address: *will be inserted at contract*

5.4 Warranty Repairs

The contact person for warranty repairs to be performed on site as it may be necessary is as follows:

Response Time: *will be inserted at contract*

Name: *will be inserted at contract*

Telephone No.: *will be inserted at contract*

Facsimile No.: *will be inserted at contract*

Email/Internet Address: *will be inserted at contract*

5.5 Emergency Services/Repairs

If requested by Correctional Service Canada, the Contractor shall be required to provide on-site emergency service/repairs not covered under the warranty provision of the General Conditions 2030 during the contract period. The emergency crew shall be paid as indicated herein. The response time shall not exceed four (4) hours. The contact person is as follows:

Name: *will be inserted at contract*

Telephone No.: *will be inserted at contract*

Facsimile No.: *will be inserted at contract*

Email/Internet Address: *will be inserted at contract*

6. Payment

6.1 Basis of Payment

The Contractor will be paid the firm lot prices for the equipment, installation and testing, travel expenses, on-site training, as-built drawings and manuals for the CCTV system as specified in the Contract. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

The Contractor will be paid a firm hourly rate for each labor category specified for the installation and testing for normal and outside working hours associated with emergency repairs, delays, design changes and unscheduled work arisings.

Travel and living expenses for emergency repairs, delays and design changes during the performance of the contract will be paid without any allowance for overhead or profit. These costs will be reimbursed in accordance with Treasury Board directives in effect at time of travel. The payments are subject to Government Audit. All travel must receive prior authorization from the Project Authority.

6.2 Limitation of Price

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.3 Insurance

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

6.4 Method of payment - (including design changes payments)

6.4.1 Milestone Payments

1. Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract, up to 90 percent of the amount claimed and approved by Canada if:

- (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111 (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/1111.pdf>) and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- (b) the total amount for all milestone payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
- (c) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- (d) all work associated with the milestone and as applicable any deliverable required have been completed and accepted by Canada.

2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of all Work required under the Contract if the Work has been accepted by Canada and a final claim for the payment is submitted.

6.4.2 Schedule of Milestones *(applicable to each site)*

The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

- 1st milestone: design of the system (less 10% holdback);
- Institution Name
100% Design (as per Annex A-1, Item 1)
- 2nd milestone: delivery of equipment (less 10% holdback);
- Institution Name
100% Equipment (as per Annex A-1, Item 1)
- 3rd milestone: completion of 50% of installation, including travel and living expenses (less 10% holdback);
- Institution Name
50% Installation (as per Annex A-1, Item 2)
Applicable Travel and Living (as per Annex A-1, Item 3)
- 4th milestone: installation completion, software I integration and testing, including travel and living expenses (less 10% holdback);
- Institution Name
Installation Completion (as per Annex A-1, Item 2)
100% Software integration and Testing (as per Annex A-1, Item 2 (2.1) and Item 6.)
Applicable Travel and Living (as per Annex A-1, Item 3)
- 5th milestone: on-site training and documentation (less 10% holdback);
- Institution Name
100% On-site training (as per Annex A-1, Item 4)
100% Documentation (as per Annex A-1, Item 5 (5.1 and 5.2))
- 6th milestone: holdbacks.

6.5 Method of Payment - Emergency repairs and delays payments

6.5.1 Single Payment

Canada will pay the Contractor upon completion and delivery of the Work in accordance with the payment provisions of the Contract if:

- a) an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b) all such documents have been verified by Canada;
- c) the Work delivered has been accepted by Canada.

6.5.2 Travel and living Expenses - Emergency repairs, delays and design changes payments

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the Treasury Board Travel Directive (http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TBM_113/td-dv_e.asp), and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Technical Authority.

All payments are subject to government audit.

7. Invoicing Instructions

7.1.1 Invoicing Instructions - Progress Claim (including design changes payments)

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111 (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>).

Each claim must show:

- (a) all information required on form PWGSC-TPSGC 1111;
- (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- (c) the description and value of the milestone claimed as detailed in the Contract.

2. Goods and Services Tax or Harmonized Sales Tax (GST/HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.

3. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Technical Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

The Technical Authority will then forward the original and two (2) copies of the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

4. The Contractor must not submit claims until all work identified in the claim is completed.

7.1.2 Invoicing Instructions - Emergency repairs and delays payments

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the claim is completed.

2. Claims must be distributed as follows:

- (a) The original and two (2) copies must be forwarded to the following address for certification and payment:

Correctional Service Canada
340 Laurier Avenue West
Ottawa, Ontario
K1A 0P9

Attn: Daniel Sauvé

- (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

8. Certifications

Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the entire contract period. If the Contractor does not comply with any certification or

it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

10. Meetings

A meeting may be convened after contract award at a location to be determined by the Contracting Authority to review contractual and technical requirements. The Contractor will be responsible for the preparation and distribution of the minutes of meeting. The meeting will be held with representatives of the Contractor, the Department of Public Works and Government Services and Correctional Service Canada.

11. Contractor's Facilities

The Contracting Authority and the Design Authority, or their delegated representative shall be afforded access to the Contractor's plant and all other premises where pertinent processes are being performed.

12. Delay by Canada

In the event that an installation crew proceeds to the site but is unable to perform the work due to an inmate disturbance or other delays caused by Canada at the site, the Contractor shall immediately notify the Design Authority. The cost of holding the installation crew on standby shall be paid as indicated herein. In no event shall a crew remain on standby for more than four (4) hours per day without prior authorization.

13. Procedures for Design Change or Additional Work

The Contractor must follow these procedures for any proposed design change/deviation to contract specifications.

The Contractor must complete Part 1 of form PWGSC-TPSGC 9038, Design Change/Deviation, and forward one (1) copy to the Technical Authority and one (1) copy to the Contracting Authority.

The Contractor will be authorized to proceed upon receipt of the design change/deviation form signed by the Contracting Authority. A contract amendment will be issued to incorporate the design change/deviation in the Contract.

14. Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) Supplemental General Conditions 4003 (16/08/2010) - Licensed Software;
- (c) Supplemental General Conditions 4006 (16/08/2010) - Contractor to Own Intellectual Property Rights in Foreground Information;
- (d) General Conditions 2030 (25/09/2014) General Conditions - Higher Complexity - Goods;
- (e) Statement of Technical Requirement

- (f) Annex "A", Pricing Sheet;
- (g) the Contractor's bid dated (*will be inserted at contract*), as amended _____ (*date(s) of amendment(s) if applicable will be inserted at contract*)

15. After Sales Services

The Contractor certifies that it is capable of providing after sales service, subsequent to the warranty period, including servicing personnel and facilities during the lifetime expectancy of the equipment.

16. Lifetime Spares

It shall be a condition of any contract resulting herefrom that the Contractor undertakes to supply spare parts for the equipment proposed during the life expectancy of the equipment.

Life of the equipment: (*will be inserted at contract*) years.

Should the Contractor discontinue the manufacture of the equipment being procured during the life expectancy of the equipment, it shall notify Canada sufficiently in advance to permit the purchase of spares for the remaining life of the equipment or, at the discretion of Canada, either make satisfactory arrangements with a third party to establish a continuing source of spares or provide to Canada, at no charge, a non-exclusive royalty free license to manufacture and have manufactured for its own use spare parts, and provide copies of all drawings, technical information, specifications, manufacturing instructions and patterns necessary to manufacture the spares.

17. Disclosure of Information

The Contractor shall keep confidential and shall not publish or otherwise reuse, release, disclose or make available to any third party any Background or Foreground Information concerning "**as built drawings**", **site drawings and manuals**, except as may be necessary to carry out the work under the Contract in which case the Contractor shall impose the same obligation of confidentiality on any person to whom the information is disclosed.

18. T1204 - Information Reporting by Contractor

1. Pursuant to paragraph 221 (1)(d) of the Income Tax Act, R.S.C. 1985, c.1 (5th Supp.), payments made by departments and agencies to contractors under applicable services contracts (including contracts involving a mix of goods and services) must be reported on a T1204 Government Service Contract Payments slip.
2. To enable departments and agencies to comply with this requirement, the Contractor must provide the following information within 45 calendar days from date of contract award:
 - (a) the legal name of the Contractor, i.e. the legal name associated with its business number or Social Insurance Number (SIN), as well as its address and postal code;
 - (b) the status of the Contractor, i.e. an individual, a sole proprietorship, a corporation, or a partnership;
 - (c) the business number of the Contractor if the Contractor is a corporation or a partnership and the SIN if the Contractor is an individual or a sole proprietorship. In the case of a partnership, if the partnership does not have a business number, the partner who has signed the Contract must provide its SIN;
 - (d) in the case of a joint venture, the business number of all parties to the joint venture who have a business number or their SIN if they do not have a business number.

3. The information must be sent to the person and address specified below. If the information includes a SIN, the information should be provided in an envelope marked "PROTECTED".

Contact: Anne Boisvenue

Address: 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

ANNEX "A"

PRICING SHEET

**UPGRADE OF THE
CLOSED CIRCUIT TELEVISION SYSTEM
EDMONTON INSTITUTION**

All prices must be firm in Canadian dollars, Delivered Duty Paid (Edmonton Institution, Edmonton, AB), Goods and Services Tax or the Harmonized Sales Tax extra, transportation costs to destination and all applicable Custom Duties and Excise Taxes included.

1. DESIGN AND EQUIPMENT

Firm Lot Price for the design and all related equipment, excluding spare parts.

DESIGN - FIRM LOT PRICE \$ _____

EQUIPMENT - FIRM LOT PRICE \$ _____

2. INSTALLATION AND TESTING COSTS

- 2.1** The price must include all costs excluding travel and living expenses, related to the installation and testing of the equipment.

INSTALLATION - FIRM LOT PRICE \$ _____

TESTING COST - FIRM LOT PRICE \$ _____

2.2 INSTALLATION AND TESTING OF EQUIPMENT (FIRM HOURLY RATES)

The following outlined labour rates will apply for emergency repairs, delays and design changes.

Labour Categories	Hourly Rate During	Hourly Rate Outside
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____

The bidder must submit a firm hourly rate for installation and testing during and outside normal working hours for each labour category required.

3. TRAVEL AND LIVING EXPENSES ASSOCIATED WITH THE INSTALLATION AND TESTING OF THE EQUIPMENT

Institution	FIRM LOT PRICE
<i>EDMONTON INSTITUTION</i>	
Travel required ____yes ____no	\$
Estimated Number of Individuals _____	
Estimated Number of Days _____	

4. ON-SITE TRAINING

Firm Lot Price including travel and living expenses as per STR paragraphs [5.1](#) and [5.2](#).

FIRM LOT PRICE \$ _____

5. DOCUMENTATION

5.1 AS-BUILT DRAWINGS

Firm lot price for As-Built drawings as per STR, paragraph [5.4](#).

FIRM LOT PRICE \$ _____

5.2 OPERATOR AND MAINTENANCE MANUALS

Firm lot price for all operator and maintenance manual documentation packages as per STR, paragraph [5.3](#).

FIRM LOT PRICE \$ _____

6. SOFTWARE/INTEGRATION

Firm Lot Price the software/integration as indicated in the STR, [5.5](#) and [5.11](#).

FIRM LOT PRICE \$ _____

TOTAL BID PRICE \$ _____

OPTION

7. SPARE PARTS AND/OR TEST EQUIPMENT

The bidder must submit a spare parts and/or test equipment list identifying each recommended spare parts and/or test equipment required. The bidder must also submit a firm unit price for each recommended spare parts required as per STR, [5.15](#).

FIRM LOT PRICE \$ _____

ANNEX "B"

POINT RATED TECHNICAL EVALUATION CRITERIA

1. Point Rated Technical Proposal Criteria

The Bidder must obtain an overall pass score of 70 percent of the Technical Proposal. The rating is performed on a scale of 100 points. The Technical Proposal should include, but not be limited to:

Point Rated Technical Proposal Criteria	Maximum Points
<p>1. Understanding of the Technical Requirements An understanding of the technical requirements of the system which could include preliminary drawings, diagrams, photographs and sketches showing system architecture, equipment configuration, and technical information/literature/brochure on products offered.</p> <p>(0 Points) Has not demonstrated that the Bidder understands the requirements. The Bidder has misjudged the scope of the work required. We are left with many questions. The proposal is vague.</p> <p>(or 10 Points) The proposal indicates that the Bidder generally understands the main concept of what is required but there are some questions that arise.</p> <p>(or 20 Points) The proposal indicates that the Bidder understands the main concept of what is required. The Bidder's solution meets the operability requirements, environmental requirements, reliability and maintainability requirements, and the testing and validation requirements.</p> <p>(or 30 Points) It is very clear that the Bidder understands exactly what is required and the proposed solution exceeds the requirement in some areas.</p>	30
<p>2. Compliance with the Statement of Technical Requirements (STR) Paragraph by paragraph compliance the Statement of Technical Requirements (STR), Statements of Work (SOW), Specifications and Standards of how each requirement will be met.</p> <p>(0 Points) Has not demonstrated that the Bidder complies with the requirements. The Bidder has misjudged the scope of the work required. We are left with many questions. The proposal is vague.</p> <p>(or 15 Points) The proposal indicates that the Bidder generally complies with the requirements but there are some questions that arise.</p>	40

<p>(or 30 Points) The proposal indicates that the Bidder complies with the requirements. The Bidder's solution meets the operability requirements, reliability and maintainability requirements, and the testing requirements.</p> <p>(or 40 Points) It is very clear that the Bidder complies exactly what is required and the proposed solution exceeds the requirement in some areas.</p>	
<p>3. Quality Assurance and Acceptance Test Plan Description of the proposed quality assurance procedures/processes, and acceptance test plan(s) to ensure quality requirements are met and how the bidder intends to demonstrate to the Crown that the system functions correctly, both in the plant (Factory Acceptance Testing) and after installation (Site Acceptance Testing), a detailed list of tests to be performed with pass/fail parameters. Maximum points are broken down as follows:</p>	20
<p>3.1 Quality Assurance (10 Points) How the Bidder intends to ensure quality requirements are met, a description of inspection, testing, and documentation procedures as well as quality metrics. The quality Assurance Plan and Methodology must specifically pertain to this project requirement</p> <p>(0 Points) The scope does not address the applicable products, the quality objective, limitations and validity conditions.</p> <p>(or 7 Points) The proposal indicates when how and by whom the quality requirements are to be reviewed results recorded/analyzed and conflicts resolved. The proposal indicates how documents and data are to be controlled. The proposal indicates relevant quality control for important purchases. The proposal indicates how the production, assembly and on-site installation processes will be controlled to ensure quality requirements are met.</p> <p>(or 10 Points) On top of the criteria above the proposal indicates how measuring and test equipment is controlled and describes the format and test results to be provided. The proposal indicates how non-conforming products are identified and controlled to prevent misuse until proper disposal.</p>	
<p>3.2 Acceptance Test Plan (10 Points) How the bidder intends to demonstrate to the Crown that the system functions correctly, both in the plant (Factory Acceptance Testing) and after installation (Site Acceptance Testing), a detailed list of tests to be performed with pass/fail parameters.</p>	

<p>(0 Points) The Bidder has not addressed the requirements for testing the system.</p> <p>(or 7 Points) The Bidder has provided test sheets and only pass/fail parameters, but has not provided specific parameters for testing the elements of the system.</p> <p>(or 10 Points) The Bidder has provided test sheets, pass/fail parameters as well as specific parameters, and has demonstrated that the system will be fully tested, both in the factory and on site.</p>	
<p>4. Technical Risk Elements How the Bidder intends to meet the technical requirements, a description of the technical risks elements detailing how the bidder can mitigate them.</p> <p>(0 Points) The Bidder has not identified technical risk elements or technical risk mitigation.</p> <p>(or 4 Points) The Bidder has identified technical risk elements but the Bidder does not provide a technical risk mitigation plan. The Bidder has a risk management process.</p> <p>(or 7.5 Points) The Bidder has identified technical risk elements, provided a risk mitigation plan and has a risk management process.</p> <p>(or 10 Points) The Bidder has a technical risk management process and has addressed project risks. Management, schedule, scope changes, cost overruns, cash flow, and resources issues are addressed. The impact of the technical risks is identified. The identified technical risks are associated with the bidder, supplier, subcontractor, customer, integration, or equipment performance. Mitigation strategies are described for the identified technical risks. Decision points are identified for any project mitigation approaches. Mitigation approaches support the requirements of the project.</p>	10
Total Technical Proposal (maximum 100 Points)	

2. Point Rated Project Management Proposal Criteria

The bidder must obtain an overall pass score of 70 percent for the Project Management Proposal. The rating is performed on a scale of 100 points. The Project Management Proposal should include, but not be limited to:

Point Rated Project Management Proposal Criteria	Maximum Points
1. Previous Project Management Experience Identification of the bidder, project manager, project supervisor and technicians. Detailed description of the qualification and previous experience pertaining to similar projects in terms of size, tasks, clients, responsibilities etc. Maximum points are broken down as follows:	40
1.1 Experience of the bidder within the last four (4) years. (10 Points) Similar project(s) must have been completed successfully; experience pertaining to the following: a. similarity of project in terms of scope and/or clients; b. dollar value over \$ 100K; c. Installation; d. training; e. drawings; and f. manuals. (0 Points) Bidder has experience with only three elements. (or 4 Points) Bidder has experience with only four of the elements. (or 7.5 Points) Bidder has experience with five or more of the elements. (or 10 points) Bidder has experience with six elements.	
1.2 Range of experience within the last four (4) years in the design, supply, installation and integration of systems similar to those described in the Statement of Technical Requirements (STR). (10 Points) (0 Points) Bidder has no experience in the design, supply, installation and integration of the systems similar to those described in the Statement of Technical Requirements (STR). (or 4 Points) Bidder has experience in the design, supply, installation and integration of the systems similar to those described in the Statement of Technical Requirements (STR) for private industry or provincial government.	

<p>(or 7.5 points) Bidder has experience in the design, supply, installation and integration of the systems similar to those described in the Statement of Technical Requirements (STR) for correctional services or similar organizations.</p> <p>(or 10 Points) Bidder has experience in the design, supply, installation and integration of the systems similar to those described in the Statement of Technical Requirements (STR) for Correctional Service Canada (CSC).</p>	
<p>1.3 Project Manager's Overall Experience (years, size of project & complexity) and Qualifications. (10 Points)</p> <p>(0 Points) The project manager has no experience in project management of similar projects.</p> <p>(or 4 Points) The project manager has less than four (4) years experience in project management of similar projects and does not hold any Project Management Institute (PMI) certification.</p> <p>(or 7.5 Points) The project manager has 4 to 10 years experience in the management of projects of equal size or complexity and the project manager holds a Project Management Institute (PMI) certification or the project manager has over 15 years of experience in the management of projects of equal size and complexity or similar scope.</p> <p>(or 10 Points) The project manager has more than 10 years experience in the management of projects of equal size and complexity or similar scope and the project manager holds a Project Management Institute (PMI) certification, MBA or comparable credentials.</p>	
<p>1.4 Supervisor's Overall Experience (years, size of project & complexity) and Qualifications. (5 Points)</p> <p>(0 Points) The supervisor has no experience as a project supervisor of similar projects.</p> <p>(or 2 Points) The supervisor has less than four (4) years experience as a project supervisor of similar projects and does not hold any Project Management Institute (PMI) certification.</p> <p>(or 3.5 points) The supervisor has 4 to 10 years experience in supervising projects of equal size or complexity. The supervisor holds a Project Management Institute (PMI) certification or comparable credentials.</p> <p>(or 5 Points) The supervisor has more than 10 years</p>	

experience in supervising in projects of equal size or complexity. The supervisor holds Project Management Institute (PMI) certification or comparable credentials.	
<p>1.5 Technicians' Overall Experience (years, size of project & complexity) and Qualifications. (5 Points)</p> <p>(0 points) The technicians have no experience with similar projects.</p> <p>(or 2 Points) The technicians have less than four (4) years experience with similar projects and do not hold any Technician Diploma in any of the electrical, electro-mechanical, electronics or mechanical field.</p> <p>(or 3.5 Points) The technicians have 4 to 10 years experience in engineering in projects of equal size or complexity. The technicians hold Technician Diploma in any of the electrical, electro-mechanical, electronics or mechanical field.</p> <p>(or 5 Points) The technicians have more than 10 years experience in engineering in projects of equal size or complexity. The technicians hold a Technical Diploma in any of the electrical, electro-mechanical, electronics, mechanical or telecommunications field.</p>	
<p>2. Project Management Structure and Procedures</p> <p>Project management structure and procedures describing the implementation of this project. Maximum points are broken down as follows:</p>	30
<p>2.1 Project Management Organization and Responsibilities. (10 Points)</p> <p>This refers only to management personnel and the way that the bidder plans to organize the project team for this contract.</p> <p>(0 Points) No organization in place and no plans to designate a separate project management team.</p> <p>(or 4 Points) No project management organization in place but has a well-developed plan in place to set up a team of trained personnel.</p> <p>(or 7.5 Points) There is a project management organization/structure defined with 'matrix' personnel resources that can be made available to this project. Personnel are identified for the positions of Project Manager, the Project Supervisor, technicians and electricians. Their responsibilities are defined.</p> <p>(or 10 points) Project management team structure is well defined with a back-up team. Their responsibilities are defined. Personnel resources are identified and tied</p>	

to specific tasks.	
<p>2.2 Project Management Procedures. (20 Points) This factor will rate the Bidders on their systems used to implement project management.</p> <p>(0 points) The Project Management (PM) implementation is not addressed.</p> <p>(or 7.5 Points) The PM implementation is addressed but the bidder has not provided sufficient details to demonstrate that a PM system is in place.</p> <p>(or 15 Points) A PM system is in place that will allow the bidder to manage the project. Bidder has supplied a detailed plan of his PM implementation.</p> <p>(or 20 Points) A well working PM system is in place and being used successfully. The PM system closely tracks status and progress of tasks. Project management based on PERT/CM techniques. Work breakdown structure is linked to project management.</p>	
<p>3. Schedule, Milestones and Project Management Tools A project schedule of events for all deliverables with milestones and rationale of how realistic and achievable they are. Availability and usage of a Project Management specific tool and capability of supporting a secure customer facing portal that provides real time access to project specific information. Maximum points are broken down as follows:</p>	20
<p>3.1 Schedule/Milestones (10 Points) A project schedule/schedule of events for all deliverables with milestones and rationale of how realistic and achievable they are including tools for addressing project slippage.</p> <p>(0 Points) No schedule is proposed or the proposal is lacking in 3 of the following areas: 1) major milestones are identified; 2) logical sequence; 3) contingency time identified; 4) time estimates are realistic.</p> <p>(or 5 Points) The proposed schedule is lacking in no more than 2 of the following areas: 1) major milestones are identified; 2) logical sequence; 3) contingency time identified; 4) time estimates are not realistic.</p> <p>(or 7.5 Points) The proposed schedule meets all of the following: 1) major milestones are identified; 2) logical sequence; 3) contingency time identified; 4) time estimates are realistic. The proposed schedule contains</p>	

<p>milestones, significant contract events, projected delivery dates and production schedules. The schedule is realistic and achievable, may lack of contingency time.</p> <p>(or 10 points) The proposed schedule meets all of the following: 1) major milestones are identified; 2) logical sequence; 3) contingency time identified; 4) time estimates are realistic. The proposed schedule contains milestones, significant contract events, projected delivery dates and production schedules. The schedule is realistic and achievable, with contingency time is built in.</p>	
<p>3.2 Project Management Tools. (10 Points) This factor will rate the Bidder on their availability and usage of a Project Management specific tool and capability of supporting a secure customer facing portal that provides real time access to project specific information.</p> <p>(0 Points) The Bidder has not identified the Project Management specific software.</p> <p>(or 7.5 points) The Bidder has identified the specialized PM software but does not support a secure customer facing portal that provides real time access to project specific information.</p> <p>(or 10 points) The Bidder has identified the specialized PM software and supports a secure customer facing portal that provides real time access to project specific information including schedules, reports and meeting minutes.</p>	
<p>4. Project Risks A description of the project risks related to the proposed approach and processes for managing all project risk elements (such as resources, cost, schedule and all external elements) of the project detailing how well the Bidder understands the project risks and how they propose to mitigate them.</p> <p>(0 points) The Bidder has not identified project risks or risk mitigation.</p> <p>(or 4 Points) The Bidder has identified project risks but the Bidder does not provide a risk mitigation plan. The Bidder has a risk management process. Project risks are identified and there is a mitigation plan for any high risk items.</p> <p>(or 7.5 Points) The Bidder has identified project risks and the Bidder has proposed a risk mitigation plan. The Bidder has a risk management process. Project risks are</p>	<p>10</p>

<p>identified and there is a mitigation plan for any high risk items.</p> <p>(or 10 points) The Bidder has a risk management process and has addressed project risks. Management, schedule, scope changes, cost overruns, cash flow, and resources issues are addressed. The impact of the risks is identified. The identified risks are associated with the bidder, subcontractor, customer, integration, or equipment performance. Mitigation strategies are described for the identified risks. Decision points are identified for any project mitigation approaches. Mitigation approaches support the requirements of the project.</p>	
Total Project Management Proposal (maximum 100 Points)	

3. Point Rated Support Proposal Criteria

The bidder must obtain an overall pass score of 70 percent for the Support Proposal. The rating is performed on a scale of 100 points. The Support Proposal should include, but not be limited to:

Point Rated Support Proposal Criteria	Maximum Points
<p>1. Operator Training Plan Outline, Training and Manuals</p> <p>An understanding of the Operator Training requirements. Description of the proposed training plan, approach, team and information to meet the Operator training requirements. Maximum points are broken down as follows:</p>	45
<p>1.1 Operator training plan outline. (15 Points)</p> <p>(0 Points) The operator training plan outline does not meet the requirements.</p> <p>(or 10 points) The operator training plan outline meets the requirements.</p> <p>(or 15 Points) The operator training plan outline meets and exceeds the requirements.</p>	
<p>1.2 Training approach, methodology and team. (15 Points)</p> <p>(0 Points) Has not demonstrated that the Bidder understands the objective and that the Bidder has misjudged the scope of the work required. The proposal does not meet the training requirements.</p> <p>(or 6 Points) The proposal meets the training requirements and the training team is identified. The</p>	

<p>training approach meets the requirements.</p> <p>(or 12 Points) The proposal meets and exceeds the training requirements and they have a well established training team with proven processes.</p> <p>(or 15 Points) The proposal meets and exceeds the training requirements and they have a well established training team with proven processes and the proposal identifies different training levels and different training outlines to meet the needs of different levels of operators.</p>	
<p>1.3 Manuals. (15 Points)</p> <p>(0 Points) The information does not meet the requirements.</p> <p>(or 10 Points) The information meets the requirements.</p> <p>(or 15 Points) The information meets and exceeds the requirements.</p>	
<p>2. Maintenance Personnel Training Outline, Training and Manuals</p> <p>An understanding of the Maintenance Training requirements. Description of the proposed training plan, approach, team and information to meet the Maintenance training requirements. Maximum points are broken down as follows:</p>	45
<p>2.1 Maintenance Training Plan outline. (15 Points)</p> <p>(0 Points) The maintenance training plan outline does not meet the requirements.</p> <p>(or 10 Points) The maintenance training plan outline meets the requirements.</p> <p>(or 15 Points) The maintenance training plan outline meets and exceeds the requirements.</p>	
<p>2.2 Training Approach, Methodology and Team. (15 Points)</p> <p>(0 Points) Has not demonstrated that the Bidder understands the objective and that the Bidder has misjudged the scope of the work required. The proposal does not meet the training requirements.</p> <p>(or 10 Points) The proposal meets the training requirements and the training team is identified. The</p>	

<p>training approach meets the requirements.</p> <p>(or 15 Points) The proposal meets and exceeds the training requirements and they have a well established training team with proven processes.</p>	
<p>2.3 Manuals (15 Points)</p> <p>(0 Points) The information does not meet the requirements.</p> <p>(or 10 Points) The information meets the requirements.</p> <p>(or 15 points) The information meets and exceeds the requirements.</p>	
<p>3. Spare Plan and Spare Parts List</p> <p>An understanding of the Spare Plan and spare parts requirements. Description of the proposed Spare Plan and Spare Parts List approach, and information to meet the Spare Plan and Spare Parts List Requirement.</p> <p>(0 Points) The spare plan and spare parts list are not provided.</p> <p>(or 4 Points) The spare plan and spare parts list are incomplete.</p> <p>(or 7.5 Points) The spare plan and spare parts list meet the requirement.</p> <p>(or 10 Points) The spare plan and spare parts list exceeds the requirement.</p>	10
Total Support Proposal (maximum 100 Points)	

ANNEX C

FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with such request by Canada will also render the bid non-responsive or will constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit [HRSDC-Labour's](#) website.

Date: _____ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

- ☐ A1. The Bidder certifies having no work force in Canada.
- ☐ A2. The Bidder certifies being a public sector employer.
- ☐ A3. The Bidder certifies being a [federally regulated employer](#) being subject to the *Employment Equity Act*.
- ☐ A4. The Bidder certifies having a combined work force in Canada of less than 100 employees (combined work force includes: permanent full-time, permanent part-time and temporary employees [temporary employees only includes those who have worked 12 weeks or more during a calendar year and who are not full-time students]).
- A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

- ☐ A5.1. The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with HRSDC-Labour.

OR

- ☐ A5.2. The Bidder certifies having submitted the [Agreement to Implement Employment Equity \(LAB1168\)](#) to HRSDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to HRSDC-Labour.

B. Check only one of the following:

- ☐ B1. The Bidder is not a Joint Venture.

-208OR

- ☐ B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

FORM

- 1) Institutional Access - CPIC Clearance Request, CSC/SCC 1279**
- 2) Design Change/Deviation, PWGSC-TPSGC 9038**

(3 PAGES ATTACHED)



Correctional Service Canada
Service correctionnel Canada

PROTECTED
PROTÉGÉ **B** ONCE COMPLETED
UNE FOIS REMPLI

**INSTITUTIONAL ACCESS
CPIC CLEARANCE REQUEST**

**ACCÈS À UN ÉTABLISSEMENT
DEMANDE DE VÉRIFICATION
DU DOSSIER AU CPIC**

PUT AWAY ON FILE – CLASSER AU DOSSIER
ADMINISTRATIVE OR OPERATIONAL FILE
DOSSIER ADMINISTRATIF OU OPÉRATIONNEL

► Original = 3170-12

► PLEASE PRINT INFORMATION CLEARLY - VEUILLEZ ÉCRIRE EN LETTRES MOULÉES

Institution – Établissement

Request received
Demande reçue le

Date (YYAA-MM-DJ)

PUT AWAY ON FILE
CLASSER AU DOSSIER

► 3170-12

A. PERSONAL INFORMATION – RENSEIGNEMENTS PERSONNELS

Surname
Nom de famille

Full name (no nicknames or initials)
Nom au complet (pas de surnoms ou d'initiales)

Maiden name (if applicable)
Nom de jeune fille (s'il y a lieu)

Date of birth
Date de naissance (YYAA-MM-DJ)

Place of birth – Lieu de naissance
City/Town – Ville ou municipalité

Province/State – Province ou état

Country – Pays

B. PHYSICAL DESCRIPTION – DESCRIPTION PHYSIQUE

☐ Male
Homme

☐ Female
Femme

Height – Grandeur

Weight – Poids

Eye color – Couleur des yeux

Hair color
Couleur des cheveux

C. ADDRESS – ADRESSE

Street – Rue

City/Town – Ville ou municipalité

Province

Postal Code – Code postal

Telephone number – Numéro de téléphone
Home – Domicile

Work – Bureau

Representing (name of company/organization) – Représente (nom de la compagnie ou de l'organisation)

D. GENERAL INFORMATION – RENSEIGNEMENTS GÉNÉRAUX

1. Have you ever been convicted of a criminal offence for which you have not been granted a pardon, or an offence for which you have been granted a pardon and such a pardon has been revoked?
Avez-vous déjà été reconnu coupable d'une infraction criminelle pour laquelle on ne vous a pas octroyé un pardon ou d'une infraction pour laquelle on vous a octroyé un pardon qui a été révoqué?
2. Do you personally know of any person incarcerated in a correctional facility?
Connaissez-vous personnellement une personne qui est incarcérée dans un établissement correctionnel?
3. Do you have any reason to believe coming into contact with this person could pose a risk to your or their personal safety?
Avez-vous des raisons de croire que le fait d'entrer en contact avec cette personne pourrait présenter un risque pour votre sécurité personnelle ou la sienne?
4. Are you related/associated to an inmate or on an inmate's visiting list?
Êtes-vous apparenté ou associé à un détenu ou inscrit sur la liste des visiteurs d'un détenu?

If you have answered YES to any of the above, please explain below. – Si vous avez répondu OUI à une des questions ci-dessus, veuillez fournir une explication ci-après.

E. SIGNATURE (When sections A to E are filled out completely, please return the completed form to the institution for approval.)

(Une fois que les sections A à E ont été remplies, veuillez retourner le formulaire dûment rempli à l'établissement aux fins d'approbation.)

In making this application, I hereby give the Correctional Service of Canada my consent to use the information provided on this form to conduct such inquiries with police authorities as may be necessary to ascertain my suitability. Finally, I acknowledge that the Correctional Service of Canada has no responsibility for any harm that may come to me in the course of my activities, except where such harm is a direct result of negligence on the part of an employee(s) of the Service.

NOTE: Access may be denied for submitting false information. Passes may be issued for those receiving clearance and approval.

En soumettant la présente demande, j'autorise le Service correctionnel du Canada à se servir des renseignements fournis dans le formulaire afin de mener, auprès des services de police, toute enquête jugée nécessaire pour vérifier mon admissibilité. Par ailleurs, je conviens que le Service correctionnel du Canada ne peut être tenu responsable d'un préjudice subi dans le cadre de mes activités sauf si ce préjudice est directement attribuable à la négligence d'un ou de plusieurs employés du Service.

NOTA : Tout demandeur qui fournit de faux renseignements peut se voir refuser l'accès à l'établissement. Un laissez-passez peut être émis aux demandeurs dont la demande d'accès est approuvée.

Applicant's signature – Signature du demandeur

Date (YYAA-MM-DJ)

F. FOR OFFICE USE ONLY – RÉSERVÉ AU SCC

Reason for clearance – Motif justifiant la demande d'accès

Department making the request (please print)
Unité qui soumet la demande (en lettres moulées s.v.p.)

Signature of Division Head
Signature du chef de la division

Date (YYAA-MM-DJ)

☐ No criminal record
Aucun casier judiciaire

☐ A possible criminal record #:
Numéro du casier judiciaire possible :

Last entry:
Dernière entrée :

☐ An outstanding warrant/charge held by:
Auteur du mandat non exécuté/accusation en instance :

SIGNATURES

☐ Approved
Approuvée

☐ Not approved
Non approuvée

The individual has been advised. – Le demandeur a été informé de la décision.

☐ Yes
Oui

☐ No
Non

By:
Par :

Security Intelligence Officer
Agent de renseignements de sécurité

Date (YYAA-MM-DJ)

Institutional Head
Directeur de l'établissement

Date (YYAA-MM-DJ)

Visit Review Board
Comité des visites

Date (YYAA-MM-DJ)

CORRECTIONAL SERVICE OF CANADA
TECHNICAL SERVICES BRANCH
ELECTRONICS SYSTEMS
MAINTENANCE HANDOVER REPORT FORM

INSTITUTION:

DATE:

SYSTEM/EQUIPMENT:

APPLICABLE CONTRACT NO:

DSS FILE NO:

SPECIFICATIONS:

EQUIPMENT SUPPLIER (NAME AND ADDRESS):

SUPPLIER CONTACT (NAME AND TELEPHONE):

WARRANTY DETAILS:

Expiry date on materials/parts:

Expiry date on installation:

Expiry date on factory labor:

Travel & living expenses during the warranty period:

chargeable to CSC ☐

not chargeable to CSC ☐

Equipment transportation costs are paid by CSC for:

sending to the supplier ☐

returning from the supplier ☐

Negotiated rates for emergency repairs at site due to misuse/abuse during warranty period are as follows:

Not applicable.

Negotiated rates for labor at site after warranty period are as follows:

Not applicable.

DEFICIENCIES:None remain ☐List attached ☐**DOCUMENTATION:**

Maintenance manual:

Supplied ☐

Due by ;

As-built drawings, cabling and wiring diagrams:

Supplied ☐

Due by ;

Acceptance test results:

Supplied ☐

Due by ;

DISTRIBUTION OF DOCUMENTATION:

1 copy to CESM sent on:

1 copy to RATIS/RTEO sent on:

2 copies to institution sent on:

SPARES:All delivered ☐

Delivery to be completed by ;

EQUIPMENT LIST:See attached list. ☐**MAINTENANCE TRAINING:**Completed ☐

Scheduled for ;

SIGNATURE: Project Manager**DISTRIBUTION:** CESM, NHQ
RATIS/RTEO, RHQ
AWMS, Institution

**Correctional Service Canada
Technical Services Branch
Electronics Systems**

**ES/SOW-0101
Revision 3
15 April 2004**

**ELECTRONICS ENGINEERING
STATEMENT OF WORK


PROCUREMENT & INSTALLATION OF
ELECTRONIC SECURITY SYSTEMS**

AUTHORITY


This Statement of Work is approved by Correctional Service Canada for the procurement and installation of all telecommunications and electronic security systems, subsystems, and equipment in Canadian penal institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:


**Manager,
Electronics Systems Research**

Approved by:


**Director,
Engineering Services**
15 Apr 04

RECORD OF REVISIONS

Revision	Paragraph	Comment
3	10.1 – Manuals and Drawings	Added equipment operating software
	10.4 – Documentation Format	Added equipment operating software

TABLE OF CONTENTS

TABLE OF CONTENTS	3
ABBREVIATIONS	5
DEFINITIONS.....	6
1.0 INTRODUCTION.....	7
1.1 Commercial-Off-The-Shelf Equipment	7
1.2 Technical Acceptability.....	7
1.3 Equipment Procurement.....	8
1.4 Quantity of Equipment.....	8
2.0 APPLICABLE DOCUMENTS	9
3.0 REQUIREMENTS	10
4.0 SYSTEM DEVELOPMENT	11
4.1 Preliminary Design	11
4.2 Preliminary Design Review	12
4.3 Final Design	12
4.4 Final Design Review	12
4.5 Design Change Control	12
4.5.1 Type I	12
4.5.2 Type II	13
4.6 Design Change Request (DCR).....	13
4.7 In-Plant Testing	13
5.0 SYSTEM INSTALLATION	14
5.1 Schedule	14
5.2 On-Site Inspections	14
5.3 On-Site Coordination.....	14
5.4 Facility Criteria.....	14
5.5 Installation Design	14
5.6 Subcontractor Supervision	15
5.7 System Checkout	15
5.8 As-Built Drawings	15
6.0 SYSTEM ACCEPTANCE	16
6.1 Acceptance Test Plans (ATPs)	16
6.2 System Testing.....	16
6.3 Deficiency Lists (DL)	16
6.4 Technical Acceptance	16

7.0	QUALITY ASSURANCE (QA	17
7.1	Quality Control Program.....	17
7.2	System Test Program.....	17
7.2.1	System Test Plan	17
7.2.2	Test Procedures.....	17
7.2.3	Contractor Testing.....	18
7.2.4	Test Reports.....	18
8.0	TRAINING	19
8.1	Classroom Training	19
8.2	Training Documentation	19
9.0	MAINTENANCE and SPARES	20
9.1	Maintenance Plan.....	20
9.2	Spares Plan.....	20
9.3	Spares List	20
9.4	Test Equipment	20
10.0	DOCUMENTATION.....	21
10.1	Manuals and Drawings.....	21
10.2	List of Equipment.....	21
10.3	Baseline Measurements.....	21
10.4	Documentation Format.....	21
10.5	Operator Manuals.....	22
10.6	Maintenance Manuals	23
11.0	PROJECT PROVISIONS	24
11.1	Monthly Progress Reports.....	24
11.2	Monthly Review Meetings	24
11.3	Maintenance Support	24
11.4	Shipment and Delivery	25
12.0	SYSTEM AVAILABILITY	26
12.1	Common Facilities.....	26
12.2	Single Point of Failure	26
12.3	Availability Model.....	26
12.4	Availability	26
12.5	Expected Life Duration	27
13.0	INTERFERENCE	28
13.1	Interference to the System	28
13.2	Interference by the System	28
14.0	LIGHTNING PROTECTION	29

ABBREVIATIONS

The following abbreviations are used in this specification:

ATP	Acceptance Test Plan
CM	Corrective Maintenance
COTS	Commercial-Off-The-Shelf
CSC	Correctional Service Canada
DA	Design Authority
DCR	Design Change Request
DES	Director, Engineering Services
DL	Deficiency List
FDR	Final Design Report
MRT	Mean Response Time
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
PDR	Preliminary Design Report
PM	Preventative Maintenance
PW&GSC	Public Works & Government Services Canada
QA	Quality Assurance
RFP	Request For Proposal
SOW	Statement of Work
STR	Statement of Technical Requirement

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

This Statement of Work (SOW) defines the work and responsibilities for the design, procurement, installation, test and integration of all telecommunications and electronic security equipment in CSC Institutions.

The SOW provides guidelines, procedures and responsibilities to the contractor and/or the project officer for the implementation of all telecommunications and electronic security systems in CSC facilities.

All work performed shall adhere to this SOW, CSC Specifications, Standards and Statement of Technical Requirements (STRs).

1.1 Commercial-Off-The-Shelf Equipment

The contractor shall use commercial off-the-shelf (COTS) equipment and proven designs to the maximum extent possible. All new equipment shall meet the specified lifespan requirements. New equipment designs shall be restricted to unique interfaces and common control console.

1.2 Technical Acceptability

The Correctional Service Canada (CSC) operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of penal institutions. Maintaining national security, the safety of staff and offenders alike is CSC's commitment to the government and public. Electronic security systems operating in this unique environment shall maintain very high standards of dependability and reliability.

The CSC Engineering Services Division has established technical specifications and equipment standards for specific electronic security systems which are based on very specific and restrictive operational performance criteria as detailed in its Electronic Engineering Standard. Technical acceptability of these systems means that the equipment complies with the pertinent CSC specifications and standards.

The technical acceptance process shall involve system and subsystem evaluation in accordance with the applicable CSC specifications in one of CSC facilities or may be tested in a CSC facility to verify the effectiveness of the proposed technologies when subjected to the restrictive operational environment.

CSC shall also verify in depth any of the system technical specifications called up. CSC may when it deems necessary, request the supplier to arrange for a full site demonstration. CSC may rely on manufacturer's test results for specific areas of the specification where an independent test facility has conducted the test, and the facility is deemed acceptable to CSC.

It is the supplier's responsibility to make new developments in products available to CSC for evaluation. Equipment qualification is an ongoing process and can be initiated at any time by a vendor. Any vendor can have access to the CSC specifications and standards. Any new development or products should be submitted to the CSC Engineering Services Division, Technical Authority in a suitable time frame prior to any tendering process to allow for an acceptable evaluation period. The evaluation period may take up to sixteen (16) months.

1.3 **Equipment Procurement**

Any ordering of equipment/material before the approval of the final design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after the preliminary design review.

1.4 **Quantity of Equipment**

The quantity and location of the equipment required for CSC institutions will be contained in the specification identified in the STR.

2.0 APPLICABLE DOCUMENTS

CSC Specifications, Standards and STRs are approved by the Director of Engineering Services (DES) for the procurement and installation of all telecommunications and electronic security systems in all CSC facilities. These documents promulgate DES policy and shall not be modified or changed without prior consultation and approval of the Director. The documents of the issue in effect will form part of the Request for Proposal (RFP) issued by the contract authority.

3.0 **REQUIREMENTS**

3.1 The contractor shall:

- a. Design, procure or manufacture, install, test and document the installation of all electronic security and telecommunications systems in accordance with the CSC specifications, standards and STR;
- b. Provide the operator and maintenance training in accordance with the CSC requirements;
- c. Provide the maintenance support and spares in accordance with the CSC maintenance requirements;
- d. Provide quality assurance (QA) to ensure equipment performance and reliability are in accordance to CSC requirements;
- e. Provide warranty coverage to include spare parts provision and equipment repair;
- f. Provide a program schedule to show all major elements from a contract award to completion of the warranty period and shall include anticipated time of occurrence, interrelationships between events, and time scale; and
- g. Be responsible for the integration of the proposed system to any existing telecommunications and electronic security systems.
- h. Provide a lightning protection system for the installation of all electronic security systems/equipment in the CSC facilities. As a minimum, surge suppression type lightning arrestors shall be required for all power, communications and antenna cables/wires entering or leaving a building.

4.0 **SYSTEM DEVELOPMENT**

The contractor shall design systems and equipment to meet all of the requirements stipulated in the applicable CSC specifications. The system design shall be modular and address the following criteria:

- a. ease of operation and maintenance;
- b. optimize and concentrate control functions and capabilities;
- c. enhance the security of the working environment, extend staff capabilities to observe and control; and
- d. minimize the number and types of display and control devices.

4.1 **Preliminary Design**

The preliminary design baseline shall be established by the review and approval of the preliminary design report (PDR) by the Design Authority (DA) or his designate. Specifications, drawings and the approved PDR shall make up the preliminary design baseline.

The contractor shall prepare and submit two (2) copies of the PDR to the Design Authority and one (1) copy to the Contract Authority at least ten (10) days prior to the PDR meeting. The PDR shall consist of:

- a. performance specifications with functional block diagrams of the proposed system. The technical analysis and equipment performance data shall verify system requirements;
- b. preliminary equipment layouts including control consoles and racks;
- c. list of off-the-shelf equipment with part number, model number, manufacturer and the quantity of each item;
- d. list of custom designed equipment with model number and the quantity of each item;
- e. functional schematics for all custom designed equipment;
- f. conceptual drawings for all custom designed equipment;
- g. a proposed product assurance plan;
- h. a proposed maintenance plan;

- i. proposed sparing plan; and
- j. proposed training plan.

4.2 Preliminary Design Review

The PDR meeting shall be convened by the contractor to review the PDR contents. The contractor shall provide the venue and all of the necessary facilities. The Design Authority will identify any portions of the PDR that are not acceptable to CSC.

4.3 Final Design

The final design baseline shall be established by the review and approval of the Design Authority of the final design report (FDR). It establishes the start of change control in equipment design and performance. The FDR shall consist of:

- a. all elements of the preliminary design baseline;
- b. control console mockups, ergonomics considerations, etc., as necessary;
- c. drawings and operational descriptions for the custom designed equipment including interface specifications;
- d. Installation drawings and instructions; and
- e. availability model and analysis updates to reflect the final system design and hardware selection.

The FDR shall be prepared to good commercial practice. Two (2) copies shall be submitted to the Design Authority at least ten (10) working days before the FDR meeting.

4.4 Final Design Review

The final design review meeting shall be convened to review the contents of the FDR. The contractor shall provide the venue and all of the necessary facilities. All of the contractor's staff responsible for the system/equipment engineering shall be available.

4.5 Design Change Control

Design changes shall be in accordance with the following procedure:

- 4.5.1 **Type I.** Changes that affect cost, schedule, reliability, maintainability, or availability shall be submitted as a design change request (DCR).

Changes shall not be actioned until specifically directed in writing by the Design Authority through the Contract Authority.

- 4.5.2 **Type II.** Changes to correct a design error without affecting cost, schedule, reliability, maintainability, or availability shall not require a DCR.

Changes shall be reported to the Design Authority and the final design baseline shall be updated by the contractor. The Design Authority will review and acknowledge the change.

4.6 **Design Change Request (DCR)**

Type I changes shall be forwarded to the Design Authority through the Contract Authority on DCRs initiated by either the contractor or the Design Authority.

DCRs shall be reviewed and approved before implementation and shall include:

- a. specification requirement being effected;
- b. final design baseline element being changed;
- c. description of the design change;
- d. reason for the change;
- e. impact on cost, schedule, reliability, maintainability and availability; and
- f. trade-off recommendations.

4.7 **In-Plant Testing**

Details of in-plant tests are contained in the ES/SOW-0102, Statement of Work. In-plant tests shall be performed according to the Design Authority approved procedures.

Equipment with deficiencies as the result of the in-plant tests shall be subject to retest. The Design Authority reserves the right to add or modify tests.

5.0 SYSTEM INSTALLATION

The contractor shall be responsible for ensuring that sufficient site utilities are available. No work will be permitted at the site before the approval of the Design Authority. All installation activities shall be conducted in accordance with ES/SOW-0102, Statement of Work.

5.1 Schedule

The contractor shall provide a detailed work schedule for the installation activities. This schedule shall reflect the complete implementation plan by identifying the nature of the work to be performed and the area affected.

5.2 On-Site Inspections

Design Authority or an appointed CSC representative shall perform ongoing inspections of the contractor's activities. These inspections shall verify compliance with the project requirements, the quality of work performed and assess the contractor's progress in relation to the approved schedule. Installation deficiencies requiring corrective action will be brought immediately to the contractor's attention in writing.

5.3 On-Site Coordination

Design Authority shall be responsible for the appointment of an on-site CSC representative. This representative will handle all site related matters and will periodically inspect the installation.

When electronic system installations are part of a construction program or a major redevelopment that involves Public Works & Government Services of Canada, the electronic system installation contractor shall coordinate all activities with the relevant site manager and shall comply with this SOW.

5.4 Facility Criteria

The contractor shall provide the facility criteria data in the proposal. Details as to the power, cooling, space and/or other requirements relating to electronic security system installation at the site must be provided. Final facility criteria information must be provided as part of the FDR.

5.5 Installation Design

The system installation design and planning shall make maximum use of existing ducts, conduits, and other cable routing facilities. Where this is not possible, the contractor shall design and install facilities in a manner acceptable to the Design Authority.

5.6 Subcontractor Supervision

The contractor shall provide an on-site supervision of all subcontractors. The subcontractors shall abide by the regulations of this Statement of Work and the conditions in the contract.

5.7 System Checkout

Before conducting the formal on-site testing for the CSC acceptance, the contractor shall conduct and document a system checkout to assure the system readiness for formal testing and on-line operations. The test sheets used for the system checkout shall be signed by a company representative and provided to the Design Authority at least seven (7) days prior to the scheduled date of the Acceptance testing. The Design Authority will verify readiness through review of the checkout report. The report may be used as reference during the formal witnessed testing for acceptance.

5.8 As-Built Drawings

Thirty (30) days after the system installation acceptance, the contractor shall deliver a complete set of equipment and installation as-built drawings for Design Authority's review and approval. Within thirty (30) days after CSC approval, two (2) complete sets of revised drawings shall be delivered to the Design Authority.

The contractor shall update these drawings throughout the warranty period by the design control procedures. Within thirty (30) days of completion of the warranty period, the contractor shall deliver one (1) set of final revised drawings reflecting all changes to the Design Authority. Upon final CSC approval, the contractor shall deliver two (2) sets of original prints of the final drawings.

6.0 **SYSTEM ACCEPTANCE**

System acceptance shall occur when the acceptance testing has been completed according to the ES/SOW-0102, Statement of Work and when all of the other requirements of the contract have been completed to the satisfaction of the Design Authority. A final acceptance certificate signed by the Design Authority shall certify the system acceptance.

On-site system acceptance testing shall not begin until all of the on-site installation activities have been completed.

6.1 **Acceptance Test Plans (ATPs)**

The contractor shall provide ATPs for all system, subsystem and equipment tests for Design Authority review and approval. The requirements for the ATP are detailed in the ES/SOW-0102, Statement of Work.

6.2 **System Testing**

The contractor shall conduct the approved ATP and record the results. The Design Authority or an appointed CSC representative shall witness the tests.

6.3 **Deficiency Lists (DL)**

The contractor shall prepare and submit a list of deficiencies divided into three categories:

- a. Visual/Mechanical,
- b. Operational, and
- c. Technical/Functional.

6.4 **Technical Acceptance**

Upon verifying that all of the deficiencies have been corrected, the Design Authority shall issue a letter of Technical Acceptance.

7.0 **QUALITY ASSURANCE (QA)**

The QA program shall include quality control and system tests/verification programs to verify that new design and off-the-shelf equipment requirements have been met. System tests/verification will be conducted by the contractor in-plant and on-site, and may be witnessed by the CSC representatives where appropriate. The system shall pass all tests before approval will be given to commence the operator and maintenance training programs and warranty period.

7.1 **Quality Control Program**

The contractor shall provide a description of their internal quality control programs for CSC review and approval. CSC reserves the right to audit and verify that all materials destined for use in CSC systems have been thoroughly inspected and that QA procedures are applied during production and testing.

7.2 **System Test Program**

The contractor shall prepare and provide the documents describing: number, type and details of equipment, subsystem and system tests for CSC review and approval. These documents must be approved before any formal testing and will consist of the following:

7.2.1 **System Test Plan.**

This plan shall contain the test philosophy, the tests to be conducted, the pass-fail criteria, the retest requirements, and the instructions for the validation and the sign-off of all final design baseline requirements.

Before witnessing these tests, the CSC representative will perform a visual and mechanical inspection to ensure that the system installation meets the requirements of ES/SOW-0102, Statement of Work.

7.2.2 **Test Procedures.** These procedures shall ensure that:

- a. all equipment supplied meets the performance specification;
- b. each subsystem meets the applicable performance requirements; and
- c. the overall system meets the performance requirements.
- d. test procedure contains the step sequence for each test to be conducted, and the expected results.

7.2.3 Contractor Testing.

All tests are conducted by the contractor and may be witnessed by an appointed CSC representative. Tests are conducted as stipulated in the approved plan and procedures. The contractor shall inform CSC at least five (5) working days before the test start date.

7.2.4 Test Reports.

The contractor shall submit final copies of the test results for CSC review and approval within ten (10) working days of the completion of the testing. Two copies of the report shall be submitted and shall include:

- a. a summary description of the tests;
- b. test results consisting of completed test procedures verified by a CSC representative;
- c. incident reports, including analysis and corrective action; and
- d. results of any retest.

8.0 TRAINING

The contractor shall develop, document and conduct training for both the operational and the technical staff. The training shall be conducted on-site at the institution in the period designated by the schedule.

8.1 Classroom Training

Classroom lectures and demonstrations will be conducted on-site to train operations staff in the use and technical personnel in the maintenance of the systems.

8.2 Training Documentation

The contractor shall develop and deliver a complete training plan to the Design Authority for comments and approval. This plan must be submitted to CSC at least thirty (30) days in advance of the training date to allow for CSC review. As a minimum, the training material shall contain:

- a. training plans for CSC operations trainers and technical personnel;
- b. manuals for each student to add notes;
- c. training aids; and
- d. student materials.

Training material shall be provided in the language that is dominant at the site (French in Quebec). Sufficient copies of all student materials shall be provided by the contractor at the beginning of the training course to assure one copy for each student. CSC shall stipulate the number of staffs who are to be trained. Upon approval by the Design Authority, two (2) copies of all material shall be delivered to CSC.

9.0 **MAINTENANCE and SPARES**

The contractor shall provide maintenance and spares support plans according to the ES/SOW-0102, Statement of Work for the Design Authority approval. These plans shall be submitted according to the schedule.

9.1 **Maintenance Plan**

The maintenance plan shall describe the philosophy, the Preventive Maintenance (PM) procedures and schedules, the Corrective Maintenance (CM) methods and response times, Mean-Time-To-Repair (MTTR) for all systems. The plan shall recommend tools, jigs and test equipment, and detail the recommended manning method for the system. Issue of the final maintenance support plan will be contingent on Design Authority approval.

9.2 **Spares Plan**

The spares plan shall list the required spares and recommended quantities. The quantity recommendations shall be supported by system availability and reliability analysis and available experience data. The bidder shall identify spare parts and components by their original manufacturer's code, cross-referenced to the equipment vendor's part number.

9.3 **Spares List**

The spares list shall identify the following:

- a. the spare parts and the subassemblies with the recommended quantities;
- b. the cross-reference listings between the vendors and the original manufacturer's codes;
- c. the unit and extended prices for stocking; and
- d. the expected life or the annual consumption of each part.

The contractor shall maintain the spares plan through to the end of the warranty period, and shall ensure that any changes because of approved design changes are incorporated in the spares list.

9.4 **Test Equipment**

The contractor shall provide a list of test equipment required for the on-site maintenance of the system within thirty (30) days from Design Authority's acceptance of the final design.

10.0 **DOCUMENTATION**

All final documentation in hard-copy format shall be in a 3-ring binder with all foldout pages having reinforced ring holes.

10.1 **Manuals and Drawings**

The following items make up the final documentation requirements:

- a. Operator Manual,
- b. Maintenance Manual,
- c. Installation As-built Drawings,
- d. Equipment As-built Drawings, and
- e. Equipment Operating Software.

The contractor shall prepare and submit all manuals and drawings to the Design Authority for review and approval. The manuals and drawings will be approved when all changes have been satisfactorily incorporated. All drawings must be produced with AUTOCAD (latest available version)

10.2 **List of Equipment**

The contractor shall provide a list of equipment itemizing the location, quantity, model number, serial number and revision level of all installed equipment.

10.3 **Baseline Measurements**

The contractor shall provide a copy of the final test results. These results will be used as a reference baseline measurement for monitoring system degradation over time.

10.4 **Documentation Format**

All manuals, documentation including as-built drawings, lists of equipment and baseline measurements shall be submitted as per the following schedule:

- One (1) hard-copy version of all documentation.
- One (1) electronic version of all documentation in a 'read-only' format on a 3½ inch diskette medium; suitable for duplication without any special requirements.

- One (1) electronic version of all documentation in a full 'read-write' format to serve as a master of the documents and drawings.
- all software requirements to access the electronic versions of the documentation.
- One (1) CD containing the equipment operating software.

10.5 **Operator Manuals**

The contractor shall provide CSC approved manuals to support the operation of the system in the format as outlined in section 10.4 of this specification. These manuals shall be prepared to the best commercial standards. Photo copies shall not be accepted. All hard-copy versions shall be on paper stock 8 1/2" x 11" and shall be presented in a 3-ring binder. The manuals shall comply with the following format and content requirements:

- a. title page;
- b. revision notice page, lined, with columns for revision numbers, dates and initials;
- c. table of contents;
- d. warnings and cautions;
- e. introduction - general information including a description of equipment or system and summary of capabilities;
- f. theory of operation including an explanation of all major system components;
- g. detailed description and use of all user accessible computer screens; and
- h. block diagrams.

A hard copy draft version of the manual(s) shall be submitted for CSC approval on or before the date given in the schedule. Upon acceptance and approval by the Design Authority, a total of two copies shall be provided for use during the warranty period. The contractor shall update these manuals through the warranty period and provide revision bulletins to record manufacturers' recommended modifications, etc. during the life of the equipment.

Within thirty (30) days of the warranty expiry date the contractor shall submit one (1) set of final, updated manuals for CSC approval. Following the final CSC approval, the required number of sets of operator manuals shall be delivered to the Design Authority in the format as specified in section 10.4 of this Statement of Work.

10.6 Maintenance Manuals

The contractor shall provide CSC approved manuals to support the maintenance of the system in the format as outlined in section 10.4 of this specification. These manuals shall be prepared to the best commercial standards. Photo copies shall not be accepted. All hard-copy versions shall be on paper stock 8 1/2" x 11" and shall be presented in a 3-ring binder. The manuals shall comply with the following format and content requirements:

- a. title page;
- b. warranty page - explaining the warranty period and expiry dates;
- c. revision notice page, lined, with columns for revision numbers, dates and initials;
- d. table of contents;
- e. introduction - general information including a full description of equipment or system, technical summary, specifications and detailed block diagrams;
- f. theory of operation including a detailed explanation of all circuits and parts;
- g. alignment and test procedures;
- h. repair procedures including step by step fault finding or fault localizing;
- i. block diagrams;
- j. circuit schematics (clear, easy to read, foldout type);
- k. complete parts list;
- l. mechanical drawings, chassis layout illustrations and wiring data lists; and
- m. drawings including as-built and as-installed drawings.

A hard copy draft version of the manual(s) shall be submitted for CSC approval on or before the date given in the schedule. Upon acceptance and approval by the Design Authority, a total of two copies shall be provided for use during the warranty period. The contractor shall update these manuals through the warranty period and provide revision bulletins to record manufacturers' recommended modifications, etc. during the life of the equipment.

Within thirty (30) days of the warranty expiry date the contractor shall submit one (1) set of final, updated manuals for CSC approval. Following the final CSC approval, the required number of sets of maintenance manuals shall be delivered to the Design Authority in the format as specified in section 10.4 of this Statement of Work.

11.0 PROJECT PROVISIONS

11.1 Monthly Progress Reports

The contractor shall submit monthly progress reports. These reports shall report the activities for the previous period. One (1) copy shall be delivered to the Design Authority and one (1) copy to the Contract Authority by the fifth (5th) day of each month. A review meeting may be required.

Monthly reports shall contain the following:

- a. summary of the month's activities;
- b. scheduled shortfalls and rescheduled dates;
- c. problem areas and proposed solutions;
- d. review of next month's activities;
- e. summary of meetings held during the month; and
- f. cash flow forecast.

11.2 Monthly Review Meetings

Review meetings shall be held at the contractor's premises, Design Authority's office, Contract Authority's office, or the site depending on the need. The contractor shall make the design staff members available upon request by the Design Authority.

11.3 Maintenance Support

During the training period, the contractor shall provide maintenance support. This support is expected to be not less than on-site coverage during the normal working day.

11.4 Shipment and Delivery

Contractor shall be responsible for the shipment and delivery of equipment and materials to the site. Packing, crating, and shipment of equipment shall be to good commercial practice, and any damage to, or loss of equipment shall be repaired or replaced to the satisfaction of CSC. The contractor must properly label all shipments to assure correct identification and disposition on arrival at the site, as specified in ES/SOW-0102, Statement of Work.

12.0 **SYSTEM AVAILABILITY**

All elements of customed and off-the-shelf equipment shall be designed to operate in a highly reliable fashion, consistent with available technology, with a minimum of system downtime due to scheduled and unscheduled maintenance. System availability will be achieved when each of the included subsystems availabilities have been proved as required.

12.1 **Common Facilities**

Where units or subsystems are integrated into common facilities no single failure of a component, assembly subassembly, or subsystem shall result in the failure of any other subsystem; nor result in reduced capacity or quality of performance of other subsystems or parts of it.

12.2 **Single Point of Failure**

The system shall be designed such that no failure of a single component, unit, subassembly or subsystem will result in failure of the next higher hierarchical elements of that subsystem or the system.

12.3 **Availability Model**

The bidder's technical proposal shall include a complete model and analysis of the availability of each subsystem and of the complete system being offered. This analysis shall include both MTBF and MTTR calculations and shall treat the Mean-Response-Time (MRT) as zero. This availability analysis may be based on either:

- a. summation of failure rates of the individual components; or
- b. the bidder's documented experience with the same equipment operating in a similar physical environment.

In either case, the source of all failure-rate shall be clearly shown.

The contractor shall maintain the availability model and analysis up-to-date throughout the contract period. A statement of impact of the proposed change would have on the availability model and analysis shall be submitted with all Type I DCRs.

12.4 **Availability**

Availability is the probability that the system, or subsystem will meet operational performance requirements at all time. Time includes the operating time, the active repair time and the administrative and logistic time. To calculate this availability, the contractor must include all of the pertinent factors such as:

12.4.1 Mean Time Between Failure (MTBF).

The total operating time of the equipment divided by the total number of failures of that equipment.

12.4.2 Mean Time To Repair (MTTR).

The repair time divided by the number of failures.

12.4.3 Mean Response Time (MRT).

The time to respond to a call for service divided by the number of calls.

12.5 Expected Life Duration

This is the time during which the equipment is expected to provide useful service, without an unusual amount of service and without becoming obsolete.

13.0 **INTERFERENCE**

13.1 **Interference to the System**

Performance of the system shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are as follows:

13.1.1 CB transceivers at 1 metre or more;

13.1.2 VHF and UHF transceivers at 1 metre or more;

13.1.3 Other radio frequency transmitting, receiving and re-distribution equipment at 5 metres or more; and

13.1.4 Personal computer and/or computer work stations at 5 metres or more.

13.2 **Interference by the System**

The system shall not interfere with any standard electronic equipment used at the institution, any commercial TV or radio equipment at a minimum distance of 5 metres, or any other electronic security systems at a distance of 1 metre or more.

14.0 **LIGHTNING PROTECTION**

Surge suppression-type lightning arrestors shall be installed to protect all power, communications and antenna cables or wires entering or leaving a building.

These arrestors must be installed where the cable enters the building i.e. not in the CER or other equipment room.

PRESCRIPTIONS DE SÉCURITÉ À L'INTENTION DES ENTREPRENEURS EN DISPOSITIFS ÉLECTRONIQUES DE SÉCURITÉ TRAVAILLANT DANS LES ÉTABLISSEMENTS DU SCC

1. Lois et règlements

- a. L'entrepreneur doit, en tout temps, se conformer entièrement à la dernière version des lois et des règlements suivants :
 - 1. La loi sur la santé et la sécurité au travail de la province où le travail est effectué;
 - 2. le *Code canadien du travail*, Partie II;
 - 3. le Code national du bâtiment, Partie VIII;
 - 4. les règlements de la Commission des accidents du travail de la province où le travail est effectué;
 - 5. les règlements et les procédures de sécurité préparés par l'établissement où le travail est effectué;
 - 6. tout autre règlement sur la sécurité en vigueur dans le lieu de travail.
- b. En cas de conflit entre les dispositions énoncées par les différents organismes susmentionnés, la disposition la plus stricte s'applique.

2. Plan de sécurité

- a. L'entrepreneur doit s'assurer qu'un plan de sécurité propre à l'établissement a été dressé et est conservé sur le lieu de travail. Il doit fournir ce plan de sécurité sur demande au personnel de l'établissement et aux agents et aux inspecteurs responsables de la sécurité autorisés en vertu des lois et des règlements énumérés au paragraphe 1.a ci-dessus. Le plan de sécurité doit comprendre une évaluation des dangers, les mesures de prévention, un plan d'urgence et une stratégie de communication.
- b. L'entrepreneur doit effectuer une évaluation des dangers. Toutes les tâches critiques et les dangers correspondants doivent être identifiés.
- c. Une fois que les dangers ont été identifiés, des mesures de prévention doivent être mises en place pour réduire les risques. Ces mesures peuvent inclure, sans s'y limiter, des pratiques de travail sécuritaires, des procédures d'exploitation normalisées et des inspections de sécurité.
- d. Un plan d'urgence tenant compte de tous les dangers identifiés et des problèmes qui pourraient se produire durant le projet doit être préparé. Le plan d'urgence doit donner un aperçu des procédures d'urgence à suivre en cas d'accident et contenir le nom et le numéro de téléphone des personnes-ressources des services d'intervention en cas d'urgence. La liste des services et personnes chargés d'intervenir en cas d'urgence devrait inclure les services suivants, sans s'y limiter :
 - service d'ambulance;
 - service d'incendie;
 - service de police;
 - agent responsable de la sécurité de l'établissement.
- e. Une stratégie de communication doit être établie en vue d'assurer que l'information concernant les dangers, les mesures de prévention et le plan d'urgence est communiquée au personnel de l'entrepreneur, aux sous-traitants, aux opérateurs d'équipement, aux fournisseurs de matériaux, aux entreprises chargées des essais et des inspections et aux organismes de réglementation travaillant dans l'établissement.
- f. Le plan de sécurité doit être fondé sur les lois et les règlements indiqués au paragraphe 1.a ci-dessus.

- g. g. La remise d'un plan de sécurité au SCC ne doit pas libérer l'entrepreneur de toute obligation légale spécifiée dans les lois et les règlements énumérés au paragraphe 1.a ci-dessus.

3. Formation en matière de sécurité

Le personnel de l'entrepreneur, les sous-traitants, les opérateurs d'équipement, les fournisseurs de matériaux, les entreprises chargées des essais et des inspections et les organismes de réglementation travaillant dans l'établissement doivent avoir suivi la formation en matière de sécurité prescrite dans les lois et les règlements énumérés au paragraphe 1.a. ci-dessus.

**Correctional Service Canada
Technical Services Branch
Electronics Systems**

**ES/SPEC-0006
Revision 2
14 January, 2002**

**ELECTRONICS ENGINEERING

SPECIFICATION
CONDUIT, SPACE AND POWER REQUIREMENTS
FOR SECURITY SYSTEMS FOR USE IN
FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

This Specification is approved by the Correctional Service of Canada for the procurement and Installation of Conduits for Electronic Security Systems in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

**Manager,
Electronics Systems Research**

Approved by:

**Director,
Engineering Services**

TABLE OF CONTENTS

TABLE OF CONTENTS	2
ABBREVIATIONS	5
DEFINITIONS.....	6
1.0 INTRODUCTION.....	7
1.1 General.....	7
1.2 Scope	7
1.3 Off-The-Shelf Equipment	7
1.4 Equipment Procurement	7
2.0 APPLICABLE DOCUMENTS	8
3.0 REQUIREMENTS	9
3.1 General.....	9
3.2 Environmental Conditions	9
3.3 Conduits, Cable Troughs and Raceways.....	10
3.3.1 Conduits	10
3.3.2 Cable Troughs and Raceways	10
4.0 SYSTEM REQUIREMENTS.....	12
4.1 Perimeter Intrusion Detection Systems.....	12
4.1.1 Motion Detection System	12
4.1.1.1 Conduit Requirements	12
4.1.1.2 Space Requirements.....	12
4.1.1.3 Power Requirements.....	12
4.1.2 Fence Disturbance Detection System.....	12
4.1.2.1 Conduit Requirements	13
4.1.2.2 Space Requirements.....	13
4.1.2.3 Power Requirements.....	13
4.1.3 PIDS Microwave.....	13
4.1.3.1 Conduit Requirements	13
4.1.3.2 Space Requirements.....	13
4.1.3.3 Power Requirements.....	13
4.1.4 PIDS Closed Circuit Television	14
4.1.4.1 Conduit Requirements	14
4.1.4.2 Space Requirements.....	14
4.1.4.3 Power Requirements.....	14

4.1.5	MCCP Console	15
4.1.5.1	Conduit Requirements	15
4.1.5.2	Space Requirements.....	15
4.1.5.3	Power Requirements.....	15
4.2	Facility Alarm Systems.....	16
4.2.1	Inmate Cell Call System	16
4.2.1.1	Conduit Requirements	16
4.2.1.2	Space Requirements.....	16
4.2.1.3	Power Requirements.....	16
4.2.2	Fixed Point Security Alarm System	16
4.2.2.1	Conduit Requirements	17
4.2.2.2	Space Requirements.....	17
4.2.2.3	Power Requirements.....	17
4.2.3	Personal Portable Alarm System	17
4.2.3.1	Conduit Requirements	17
4.2.3.2	Space Requirements.....	17
4.2.3.3	Power Requirements.....	17
4.2.4	Portable Alarm Location System	18
4.2.4.1	Conduit Requirements	18
4.2.4.2	Space Requirements.....	18
4.2.4.3	Power Requirement	18
4.3	Access Control & Supplementary Systems.....	18
4.3.1	Door Control & Corridor Monitoring System.....	18
4.3.1.1	Conduit Requirements	18
4.3.1.2	Space Requirements.....	18
4.3.1.3	Power Requirements.....	19
4.3.2	Closed Circuit Television System.....	19
4.3.2.1	Conduit Requirements	19
4.3.2.2	Space Requirements.....	19
4.3.2.3	Power Requirements.....	19
4.3.3	Supplementary Intrusion Detection System	19
4.3.3.1	Conduit Requirements	19
4.3.3.2	Space Requirements.....	19
4.3.3.3	Power Requirements.....	20
4.3.4	Voice Recording Equipment.....	20
4.3.4.1	Space Requirements.....	20
4.3.4.2	Power Requirements.....	20
4.3.5	Video Recording Equipment	20
4.3.5.1	Space Requirements.....	20
4.3.5.2	Power Requirements.....	20
4.4	Communications Systems.....	21
4.4.1	Two Way Communications Radio.....	21
4.4.1.1	Conduit Requirements	21
4.4.1.2	Space Requirements.....	21
4.4.1.3	Power Requirements.....	21
4.4.2	Public Address System	21

4.4.2.1	Conduit Requirements	22
4.4.2.2	Space Requirements.....	22
4.4.2.3	Power Requirements.....	22
4.4.3	Limited Call Intercom System (LCIS).....	22
4.4.3.1	Conduit Requirements	22
4.4.3.2	Space and Power Requirements	22
4.4.4	Restricted Visit Intercom System	22
4.4.4.1	Conduit Requirements	23
4.4.4.2	Space Requirements.....	23
4.4.4.3	Power Requirements.....	23
4.4.5	Entertainment Cable Television	23
4.4.5.1	Conduit Requirements	23
4.4.5.2	Space Requirements.....	23
4.4.5.3	Power Requirements.....	23
4.5	Control Posts (CP) and Terminal Equipment Spaces (TES)	24
4.5.1	Conduit Requirements	24
4.5.2	Space Requirements.....	24
4.5.3	Power Requirements.....	24
4.6	Installation Requirements.....	24
4.7	Documentation Requirements.....	24
5.0	QUALITY ASSURANCE.....	25
5.1	General.....	25
6.0	DELIVERY.....	25
APPENDIX A SUMMARY OF SYSTEM CONDUIT REQUIREMENTS		26
APPENDIX B SUMMARY OF SYSTEM SPACE REQUIREMENTS		28
APPENDIX C SUMMARY OF SYSTEM POWER REQUIREMENTS.....		31

ABBREVIATIONS

The following abbreviations are used in this specification:

CER	Common Equipment Room
COTS	Commercial-Off-The- Shelf
CSA	Canadian Standards Association
CSC	Correctional Service Canada
DES	Director Engineering Services
EIA	Electronic Industries Association
EMT	Electrical Metallic Tubing
GFE	Government Furnished Equipment
MCCP	Main Communications and Control Post
PVC	Polyvinyl Chloride
RFP	Request for Proposal
SOW	Statement of Work
STR	Statement of Technical Requirements
TES	Terminal Equipment Space

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

1.1 General

This specification defines the requirements for the design and installation of conduits, cable troughs and raceways as well as space and power requirements for telecommunications and electronic security systems in the Correctional Service of Canada (CSC) facilities.

1.2 Scope

This specification has been developed to ensure high standards for the installation of conduits, cable troughs and details equipment space and power requirements for electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for reliability, maintainability, longevity, appearance and operational use.

1.3 Off-The-Shelf Equipment

The contractor shall provide commercial off-the-shelf (COTS) materials wherever possible. COTS materials shall meet or exceed the manufacturing standards as listed in this specification.

Where COTS material is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured materials shall meet or exceed the best commercial equipment manufacturing standards.

1.4 Equipment Procurement

Any ordering of material before the approval of the system design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after a preliminary design review of the proposed system.

2.0 **APPLICABLE DOCUMENTS**

The following documents of the issue in effect on the date of the Request for Proposal (RFP) shall form a part of this specification to the extent specified herein.

ES/SOW-0101	Statement of Work for Procurement and Installation of Electronic Systems
ES/SOW-0102	Statement of Work for Quality Control of Electronic Systems
EIA-310-C	Electronic Industries Association Standard for Racks, Panels and Associated Equipment.
CSA C22.1	Canadian Electrical Code - Part 1 Safety Standard for Electrical Installations
CSA C22.2	Canadian Electrical Code - Part II

3.0 REQUIREMENTS

3.1 General

The contractor shall supply all necessary conduits, cable troughs and raceways and any other items that may be required for the satisfactory completion of the specified project. All installation workmanship shall be performed in accordance with the Statement of Work, Standards specified in Section 2.0 of this specification and all applicable national, provincial, and local electrical codes.

A conduit diagram shall be supplied in the installation documentation to detail where connections terminate and how conduits are routed and terminated.

Conduits, ducts, trays, etc. may be either Government Furnished Equipment (GFE) or supplied and installed by the contractor depending on the particular institution. The determination will be made by the Design Authority and will be identified in the STR.

The contractor shall provide Electronic Industries Association (EIA) standard racks, panels and associated hardware according to the space requirements of this specification.

The contractor shall provide all necessary wiring, circuit panels, circuit breakers and associated hardware according to the power requirements of this specification.

3.2 Environmental Conditions

All materials and equipment which are used in CSC installations shall be chosen with consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall perform over the following environmental ranges:

a. Indoor Equipment

Temperature: 0° C to 50° C; and

Humidity: 20% to 95% non-condensing.

b. Outdoor Equipment

Temperature: -40° C to +55° C; and

Humidity: up to 100% condensing.

3.3 Conduits, Cable Troughs and Raceways

3.3.1 Conduits

Conduits installed above ground, and accessible to the inmate population, shall be rigid steel. Metal conduits installed in secure and inmate accessible areas shall be fitted with double the normal quantity of support hangars.

In locations subject to extreme temperature changes, and/or where conduit lengths are of non-standard size, the contractor shall make provisions for the inclusion of conduit expansion joints.

Outdoor conduit shall not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

Rigid Polyvinyl Chloride (PVC) conduits shall be used only in buried applications. Rigid PVC conduits shall not be threaded, but may be used with approved adapters and couplings applied in a manner consistent with industry standards. PVC conduits which cross roadways shall be encased in poured concrete. The contractor shall provide a suitable means of protecting the buried conduit against damage caused by digging or excavating. The preferred method is installing a tape marker directly above the conduit path.

Electrical Metallic Tubing (EMT) conduit may be used in administrative areas, and locations which are not normally assessable to the inmate population.

Liquid-tight flexible metal conduits may be used where a flexible connection is required, ie. cameras, microwave dishes, etc. In such applications, the length of "flex" conduit shall not exceed one (1) metre.

In addition to these requirements, the latest issue of applicable industrial standards apply, including:

- a. CSA Standard C22.2 - Rigid Metal Conduit
- b. CSA Standard C22.2 - Flexible Metal Conduit

3.3.2 Cable Troughs and Raceways

Cable troughs and raceways shall be continuous and shall be constructed of metal. The contractor shall provide adequate mounting devices which will permit the use of fastening devices that will not damage conductor insulation.

Cable troughs, raceways, and fittings shall be free from burrs or other sharp edges which may cause damage to the cable or insulated conductors. All troughs and raceways shall be installed as a complete system before the conductors or cables are installed.

Cable troughs may be either ventilated or solid and unless otherwise specified, shall be equipped with covers and steel guards to protect against damage.

In addition to these provisions, the latest issue of appropriate standards shall apply, including:

- a. CSA Standard C22.2 - Cable Troughs and Fittings.
- b. CSA Standard C22.2 - Raceways and Fittings.
- c. CSA Standard C22.2 - Surface Raceways and Fittings.

4.0 **SYSTEM REQUIREMENTS**

Summary tables of the electronic security systems minimum conduit, space and power requirements are provided as Appendix A, Appendix B and Appendix C respectively to this specification.

4.1 **Perimeter Intrusion Detection Systems**

4.1.1 **Motion Detection System**

The Motion Detection System (MDS) is designed to detect motion between the fences. One system which is type approved for use in CSC uses the Leaky Coax - buried cable technology. The perimeter is divided into sectors and two sectors are controlled by a single local control module. Signal and power fed to the field mounted electronic controllers via the buried coax cables. The main MDS control modules are installed in the common equipment room (CER).

4.1.1.1 **Conduit Requirements**

Cable entry to the area between the two perimeter fences is made at a single point, usually at the gatehouse. One (1) 38 mm conduit is required from the CER to the area between the two perimeter fences. This conduit is stubbed underground between the fences several meters from the gatehouse.

4.1.1.2 **Space Requirements**

The MDS control equipment will normally occupy about half of the area of a 2.483 meter rack, usually supplied by the PIDS contractor.

4.1.1.3 **Power Requirements**

The power requirement for the MDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptable power supply.

4.1.2 **Fence Disturbance Detection System**

The Fence Disturbance Detection System (FDS) is designed to detect particular movement and vibration patterns on the inner perimeter fence. This is accomplished by mounting electro-mechanical fence sensors (geophones, electret or piezoelectric vibration detectors) on the fence. The perimeter is divided into sectors and one array of sensors covers one sector. The cables from all the sectors are run along the top of the fence to the gatehouse and to the control equipment mounted in the CER.

4.1.2.1 Conduit Requirements

FDS cable entry to the inner perimeter fence is made at a single point, usually at the gatehouse. Depending on the size of the perimeter and the number of sectors, the requirement is for a minimum of one (1) 38 mm conduit from the gatehouse to the top of the inner fence. The conduit is capped with a weather proof cable outlet.

4.1.2.2 Space Requirements

The FDS control equipment will normally occupy approximately half of the area of a 2.483 m rack supplied by the contractor.

4.1.2.3 Power Requirements

The power requirement for the FDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power supply.

4.1.3 PIDS Microwave

Bistatic microwave (beam) systems are normally installed across the pedestrian and vehicle entrance portals (sallyports) to detect movement in the area. The microwave systems are integrated into the PIDS motion detection system. These systems allow small portal sectors to be turned off to allow authorized staff and vehicle access without effecting the entire perimeter security.

4.1.3.1 Conduit Requirements

Microwave cable to each of the pedestrian and vehicle sallyport areas are required from the closest motion detection system (MDS) local control module. One buried (1) 19 mm PVC conduit is required from each sallyport to the closest perimeter MDS unit.

4.1.3.2 Space Requirements

The control equipment will normally occupy approximately 0.5 metre of rack space supplied by the contractor.

4.1.3.3 Power Requirements

The power requirement for the microwave equipment in the CER is a 110.0 VAC, 15.0 ampere, interruptible power supply.

4.1.4 PIDS Closed Circuit Television

Closed Circuit Television (CCTV) monochrome cameras are placed in strategic positions around the perimeter fence. The cameras monitor the institutional side of the inside perimeter fence and the area between the fences. When there is an alarm on the FDS and/or MDS, the CCTV cameras monitoring the appropriate sector inside fence and between the fences are selected for viewing. During an alarm period the video displayed on the monitors from the selected cameras are recorded on a time-lapse video cassette recorder.

The CCTV cameras are usually grouped at the corners of the perimeter and mounted on self supporting towers. 110 VAC power is provided to an VAC distribution panel mounted at each corner of the perimeter. VAC power is distributed to the cameras.

External vertical synchronization of the CCTV cameras is by the distribution of an independent vertical pulse to all the cameras and components of the system.

4.1.4.1 Conduit Requirements

CCTV Signal and Control. Two (2) 50 mm conduits run from the CER to the cameras in the corners of the perimeters in both directions. These conduits for the CCTV camera signal and control wiring terminate in a exterior distribution box mounted on the closest camera towers. Two (2) 50 mm conduits run around the perimeter terminating at each of the camera groups at the perimeter corners.

CCTV AC Power. Two (2) 38 mm conduits are required from the power distribution panel in the CER to the power junction box on the closet perimeter camera tower. One conduit is required to run in both directions. VAC power is required for the cameras and the heater and wipers in the camera housings. One (1) 38 mm conduit is required to run from the power junction box around the perimeter providing power to each camera group.

4.1.4.2 Space Requirements

The video distribution and switching equipment in the CER require approximately 1.0 m of rack space.

The four video monitors, wiper control and camera on/off switch panels in the MCCP console require space in one (1) EIA standard console cabinet..

A separate standalone rack in the MCCP is provided to accommodate five (5) time lapse VCRs.

4.1.4.3 Power Requirements

The power required in the CER for video switching and control equipment is one 110.0 VAC, 15.0 ampere uninterruptible power supply.

The power requirement for the perimeter cameras is a 110.0 VAC, 20 ampere supply to each group of usually four (4) cameras from the power distribution panel in the CER.

A camera and housing requires 300 watts each, including heaters, wipers and all other the environmental control units for the camera housing units.

4.1.5 **MCCP Console**

The control and annunciation equipment for the PIDS and the Facility Alarm Annunciation System are mounted in the console cabinets in the MCCP. The control and annunciation units are normally connected to processing equipment in the CER by cables running under the computer flooring. There is a requirement for rigid conduit between the MCCP and the CER for the 110 VAC uninterruptible power supply (UPS).

4.1.5.1 **Conduit Requirements**

One (1) 19 mm conduit is required from the UPS location in the CER to the MCCP console.

4.1.5.2 **Space Requirements**

The console cabinet space requirement will depend on the number of systems provided at the institution and usually consists of six console racks in the MCCP joined together to form the control console. One medium equipment rack for the maintenance video display unit (VDU) and a low profile cabinet with sliding shelves for the time-lapse VCRs and printer.

The MCCP will require a room with a floor area of no less than approx. 23.6 square metres. The CER will require a room with a floor area of no less than 9.0 square metres for the equipment and approx. 6.3 square metres for spare equipment storage and maintenance. Both rooms require computer flooring, all conduits entering will be stubbed or terminated under the computer floor. Both rooms need to be as square as possible to allow for optimum equipment placement.

The UPS will require a room with a floor area of approx. 6.3 square metres if the UPS is located at a different site to the CER. The UPS can be located in the CER within the requirement shown above. The floor may be concrete.

The ventilation system in the CER should keep the temperature below 29.0 degrees C and vent to the outside to eliminate gases that may escape during battery operation or charging.

4.1.5.3 **Power Requirements**

The power requirement for the MCCP console is two 110.0 VAC, 15.0 ampere, uninterruptible power circuits.

4.2 Facility Alarm Systems

4.2.1 Inmate Cell Call System

The ICCS is provided so that an occupant of a cell may request assistance from the control post. This is achieved by operating a call originating device (COD) mounted in the cell. The call is annunciated in the control post, the guard responds to the call and cancels the call by operating a call cancelling device (CCD) external to the cell and adjacent to the cell door.

4.2.1.1 Conduit Requirements

One (1) 15 mm conduit is required from each cell, the conduits from four cells are combined in a junction box in the pipe chase. Two or three of these junction boxes are linked together by 25 mm conduit. One (1) 38 mm conduit connects the group to the terminal equipment space (TES) where they are terminated.

One (1) 25 mm conduits are provided from the TES to the control post. These are shared by the electronics contractors with each contractor using at least one each.

The cables interconnecting the equipment in the TES to the CER are normally installed in a cable tray which runs throughout the institution.

4.2.1.2 Space Requirements

The equipment should normally occupy half the area of an one (1) 2.483 m rack in each TES.

4.2.1.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.

4.2.2 Fixed Point Security Alarm System

The FPSA system is provided so that an occupant of designated rooms may request assistance from the control post. This is achieved by operating a call originating device (COD) mounted on the wall or under a desk. The call is annunciated in the control post, the guard responds to the room.

4.2.2.1 Conduit Requirements

One (1) 15 mm conduit is required from each designed room, the conduits from these rooms may be combined in a junction box. Two or three of these junction boxes may be linked together. The link will be 25 mm conduit and one (1) conduit (38 mm) is then run to the CER where it is terminated under the computer flooring.

4.2.2.2 Space Requirements

The FPSA COD is mounted on a wall or under the desk in the designated room.

4.2.2.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.

4.2.3 Personal Portable Alarm System

The PPA system is used by CSC staff working in all areas of the institution to alert the central security post staff to serious incidents or potentially dangerous personal security or safety situations. The PPA system consists of a central controller, a central receiver and a number of portable wireless transmitting devices (transmitters) in belt worn leather cases. PPA alarms are sent to the security post when these small portable transmitters are activated by the staff member. Alarm identification, alarm time and cancellation may be recorded on a data logger.

4.2.3.1 Conduit Requirements

One (1) 15 mm conduit is required from the PPA receiver which is located in a central area of the institution to the MCCP where the PPA controller is located. This conduit will accommodate the twisted and alarm signal wires. One (1) 15 mm conduit is required between the PPA receiver and the antenna which is located on the roof, the side of a building or on an existing radio tower.

4.2.3.2 Space Requirements

The PPA receiver will be mounted in a rack or on the wall in a central location of the institution. The PPA controller will be mounted in the MCCP control or on a shelf in the CER.

4.2.3.3 Power Requirements

The power requirement for the PPA equipment in the MCCP is a 110 VAC, 15.0 ampere, uninterruptible power circuit.

4.2.4 **Portable Alarm Location System**

The PAL system operates in conjunction with the Personal Portable Alarm (PPA) system to locate an area where the PPA alarm is originating from. The PAL system consists of central monitoring equipment, a number of nodes and a number of wireless sensors distributed within an institution. PPA alarm locations can be determined and sent to the security post. Alarm identification, alarm time and cancellation are data logged.

4.2.4.1 **Conduit Requirements**

One (1) 15 mm conduit is required from each PAL node which is located throughout the institution to the CER where the PAL controller is located. This conduit will accommodate a co-axial cable for the alarm signal from each node.

4.2.4.2 **Space Requirements**

The PALS nodes and wireless sensors will be mounted in the ceilings throughout the institution. The PALS controller in the CER will require approximately three (3) feet of rack space.

4.2.4.3 **Power Requirement**

The power requirement for the PALS equipment in the CER is one 110 VAC, 15.0 ampere, uninterruptible power circuit.

4.3 **Access Control & Supplementary Systems**

4.3.1 **Door Control & Corridor Monitoring System**

This system provides room and corridor access by door control from a designated CP. The door control system is usually integrated with a CCTV system to allow staff to view the person(s) requesting access.

4.3.1.1 **Conduit Requirements**

Two (2) 15 mm conduits are required from under the CER floor or the TES to the room and corridor doors requiring controlled access. One conduit will accommodate the CCTV system for video and camera control purposes. The other conduit is required for the door access control system.

4.3.1.2 **Space Requirements**

The rack space requirement will usually consists of approximately two (2) feet of one (1) 2.483 m rack in the CER or TES and one rack in the MCCP control console or CP console.

4.3.1.3 Power Requirements

The power requirement for the door control and monitoring system is one 110.0 VAC, 15.0 ampere circuit.

4.3.2 Closed Circuit Television System

This system allows observations to be made in cells, corridors, exercise yards and other locations where there is a need. The system usually consists of several cameras mounted at these locations with monitors grouped together at a convenient point such as the control post or the MCCP.

4.3.2.1 Conduit Requirements

Two (2) 15 mm conduits are required to each camera location, one for signal wiring and the other for VAC power to the camera and housing. If the camera has pan/tilt/zoom facilities, one of the two conduits may have to be increased in size to 19 mm to accommodate possible control wiring.

4.3.2.2 Space Requirements

The only space requirement for this system is rack space in a console for the monitors and possibly a pan/tilt/zoom controller.

4.3.2.3 Power Requirements

The power requirement for the CCTV equipment is one 110.0 VAC, 15.0 ampere circuit.

4.3.3 Supplementary Intrusion Detection System

This system provides supplement outdoor intrusion detection from the MCCP. The SIDS monochrome CCD camera is usually mounted on a high tower or roof top to provide surveillance and assessment of designated area(s).

4.3.3.1 Conduit Requirements

Two (2) 15 mm conduits are required from under the CER floor to the outdoor camera location. One conduit will accommodate the CCTV system for video and camera control cables. The other conduit is required for the camera and enclosure VAC power.

4.3.3.2 Space Requirements

Rack space in the MCCP control console is required for the SIDS monitor and camera Pan/Tilt/Zoom controller. The size of the rack space will depend on the size of the monitor and controller.

4.3.3.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.3.4 Voice Recording Equipment

The Voice Recorder Equipment (VRE) records all conversations on the telephones, radios, PA and PIDS PA systems in the MCCP.

VRE wiring can be run under the computer flooring and conduit is not normally required.

4.3.4.1 Space Requirements

The VRE is self contained in its own moveable rack and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access. It can be mounted with its back against a wall if required, however this is not preferable.

4.3.4.2 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.3.5 Video Recording Equipment

The Video Cassette Recorders (VCR) record all video from the various CCTV cameras installed throughout the institution. VCR installed in the MCCP will record the PIDS video from the perimeter cameras. VCR install in Security CP throughout the institution will record the video from their particular areas of surveillance interest.

VCR wiring can be run under the computer flooring and conduit is not required.

4.3.5.1 Space Requirements

The VCRs are normally installed in moveable racks and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access. Due to limited space in some CP, the VCRs may be on shelves under the desks.

4.3.5.2 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4 Communications Systems

4.4.1 Two Way Communications Radio

The two way radio system provides routine operational, maintenance as well as emergency response communications between control posts, guards and vehicles in and around the facility. Base station radios and Digital Interface Units are installed in standard EIA electronic equipment racks in the CER.

The MCCP base station radios are connected to a common antenna mounted on an external tower. In the repeater configuration, the base stations are connected via a series of filters to a common antenna. Rack mounted remote radio controllers are mounted in the MCCP console. Digital Interface Units (DIU) are used to configure the base station radios for digital communications

Base station radios located in security control posts and maintenance control centres are connected to their own local antennas.

4.4.1.1 Conduit Requirements

One (1) 19 mm conduit is required from the CER to the antenna tower. The conduit may terminate at the base of the tower, if the tower is mounted on the roof. In the case of a ground mounted tower the conduit will continue up the tower. The lower portion of the tower is protected by anti climb shields.

4.4.1.2 Space Requirements

Three base station radios with associated DIUs will use approximately half of a EIA standard 2.483 m equipment rack in the CER. If the radios are configured as repeaters and filters are used, another EIA standard 2.483 m rack will be required.

In the MCCP console, the remote controller will require 5¼ inches (3 U) of console cabinet space.

4.4.1.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4.2 Public Address System

The PA system is designed to allow the entire institution to be addressed or limited areas to be addressed from various points throughout the institution.

4.4.2.1 Conduit Requirements

Loudspeakers are distributed throughout the institution in areas where they are required. They are mounted in 254 mm x 254 mm x 102 mm back boxes mounted in the walls or in the ceilings. The boxes are joined in series by 15 mm conduit for the first ten or so boxes and then by 19 mm conduit to the cable tray. Where two strings of speaker boxes combine into one the resultant conduit is usually 19 mm. A 25 mm conduit is used between a TES and its respective control post.

4.4.2.2 Space Requirements

The PA equipment requires approximately half of a 2.483 m rack in the CER or half of a 2.483 m rack in a TES.

4.4.2.3 Power Requirements

The power requirement is for a 110 VAC, 15.0 ampere supply in the CER or a 110 VAC, 15.0 ampere supply in a TES.

4.43 Limited Call Intercom System (LCIS)

The LCIS is designed to provide communications between the control posts and points such as beyond a barrier controlled by the post. The control post has a master station mounted in a console and the remote station is mounted in a back box in the wall.

4.4.3.1 Conduit Requirements

The remote station is mounted in a 102 mm x 102 mm x 65 mm back box placed 1500 mm from the floor. One (1) 15 mm conduit connects these points to the TES or the cable tray. One (1) 25 mm conduit is used between a TES and its respective control post.

4.4.3.2 Space and Power Requirements

The LCIS usually forms part of the PA. Refer to the PA section for space and power requirements.

4.4.4 Restricted Visit Intercom System

The purpose of the RVIS is to provide a means of two-way (full-duplex) voice communication between an inmate and visitor while denying physical exchange. Typically, by providing transparent partitioning between the inmate and visitor, physical access is denied while allowing visual contact between each half of a restricted visiting booth. Within each booth, telephone handset will allow voice communication between the two halves. The control post has a master station mounted in a console.

4.4.4.1 Conduit Requirements

One (1) 15 mm conduit is required from each booth to the Restricted Visit Control Post.

4.4.4.2 Space Requirements

The RVIS telephone handsets are securely mounted on the wall of the booths. The RVIS controller is mounted in the console in the Restricted Visit CP.

4.4.4.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4.5 Entertainment Cable Television

The Entertainment Cable Television (ECTV) System distributes FM radio and television signals to each cell and various other points throughout the institution.

The signals are received off-air via an antenna array for local and satellite signals or from a cable company. A signal from a VCR can be introduced. All these signals are processed in the head-end equipment and then distributed via splitters and amplifiers distributed throughout the system.

4.4.5.1 Conduit Requirements

A conduit outlet is required in each cell and in various inmate and staff lounges. Groups of four cell block outlet boxes are connected to a junction box by 19 mm conduit. The junction boxes are linked in groups of two or three and then to the TES using 38 mm conduit.

All other locations utilize 19 mm conduit to their respective TES locations.

The cable distributing the signals to the TES from the head end location is installed in a cable tray which runs throughout the institution. One (1) 19 mm conduit is required between the head-end equipment rack and the antenna site.

4.4.5.2 Space Requirements

The head-end equipment will occupy a half of a 2.483 m rack in the equipment room closest to the antenna site. The remainder of the equipment consists of amplifiers and splitters and is accommodated in a 400 mm x 400 mm x 100 mm cabinet located in each of the pertinent TES. This cabinet can either be mounted on the wall or placed under the computer flooring.

4.4.5.3 Power Requirements

The power requirement for this system is a 110 VAC, 15.0 ampere supply.

4.5 **Control Posts (CP) and Terminal Equipment Spaces (TES)**

There are several control posts and TES's throughout the institution. They are usually paired and connected by banks of conduits to enable connection between the main equipment of the various systems and the control panels that are associated with them. The number of conduits provided is normally very generous and provides for any possible expansion or replacement of the systems.

4.5.1 **Conduit Requirements**

All the consoles in the control posts with computer flooring do not require conduits. Normally the TES and CP locations are connected by cable trays or at least one 50 mm conduit.

4.5.2 **Space Requirements**

In each TES accommodation is required for two 2.483 racks, one rack to house the cell call system and the other the PA and LCIS equipment.

4.5.3 **Power Requirements**

Two (2) 110.0 VAC, 15.0 ampere power circuits are required.

4.6 **Installation Requirements**

The conduit shall be installed at the site in accordance with the ES/SOW-0101, Statement of Work and the ES/SOW-0102, Statement of Work.

4.7 **Documentation Requirements**

All as-build drawings and documentation shall be in accordance with the ES/SOW-0101, Statement of Work.

5.0 **QUALITY ASSURANCE**

5.1 **General**

All on-site installation work, and installation acceptance shall be conducted in accordance with the ES/SOW-0101, Statement of Work.

6.0 **DELIVERY**

Delivery requirements for drawings, plans, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

APPENDIX A

SUMMARY OF SYSTEM CONDUIT REQUIREMENTS

System	Conduit Requirements
MDS	One 38 mm conduit from the CER to the area between the two perimeter fences.
FDS	One 38 mm conduit from the CER to the inner perimeter fence.
MICROWAVE	One 19 mm conduit from the closest local control module to the sallyport area.
PIDS CCTV	Signal and Control. Two 50 mm conduits from the CER to the perimeter camera towers in both directions with junction boxes at each of the towers. One 19 mm conduit from the junction box to the cameras on the tower. VAC Power. Two 50 mm conduits from the electrical distribution panel in the CER to the junction box on the perimeter. One 38 mm conduit around the perimeter providing power to each camera group.
PIDS PA	Two 25 mm conduits from the CER to the first group of speakers on the perimeter fence, one in each direction. One 25 mm conduit between speaker locations.
MCCP	Control and signal cables (no conduit required) under the computer flooring to the CER. VAC UPS power in 19 mm conduit from the CER.
ICCS	One 15 mm conduit from each cell to a junction box in the pipe chase. Junction boxes linked together by 25 mm conduit. One 38 mm conduit from the group junction box to the CP/TES. One 25 mm conduit from the TES to the CP.
FPSA	One 15 mm conduit from each designed room to a junction box. Junction boxes connected by 25 mm conduit. One 38 mm conduit from a main junction box to the CER.
PPA	One 15 mm conduit from the PPA receiver to the MCCP. One 15 mm conduit from the PPA receiver to the antenna.
PALS	One 15 mm conduit from each PALS node to the CER.
Door Control	Two 15 mm conduits (one for CCTV, one for power) from the CER or from the TES to the room and/or corridor doors requiring controlled access.

System	Conduit Requirements
Supp. CCTV	Two 15 mm conduits to each camera location, one for signal wiring and the other for AC power to the camera and housing. If the camera has pan/tilt/zoom facilities, one of the two conduits may have to be increased in size to 19 mm to accommodate additional control wiring.
SIDS	Two 15 mm conduits from the CER to the camera location. One conduit for video and camera control cables. The other conduit for the camera and enclosure VAC power.
MCCP/VRE	Cables under the computer flooring.
MCCP/VCR	Cables under the computer flooring.
Two-way Radio	One 19 mm conduit from the Base Station to the antenna location.
Interior PA	One 15 mm conduit between speaker locations. Combine speaker locations require one 19 mm conduit. One 25 mm conduit from the TES to the CP.
LCIS	One 15 mm conduit from remote stations to the TES or the cable tray.
RVIS	One 15 mm conduit from each booth to the RVIS CP.
ECTV	One 15 mm conduit to in each cell and various inmate lounges. Groups of cell outlet boxes are connected to a junction box by 19 mm conduit. One 38 mm conduit from junction boxes to the TES. One 19 mm conduit from the head-end equipment rack and the antenna site.
CER/TES	CER and various TES are linked by one 50 mm conduit.

APPENDIX B

SUMMARY OF SYSTEM SPACE REQUIREMENTS

System	Space Requirements
MDS	The MDS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the CER.
FDS	The FDS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the CER.
MICROWAVE	The microwave control equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
PIDS CCTV	<p>The video distribution and switching equipment require approximately 1.0 m of EIA standard equipment rack space in the CER.</p> <p>The PIDS CCTV equipment in the MCCP requires approximately 1.0 m of EIA standard console cabinet space.</p> <p>A separate standalone rack is required to housed five (5) time lapse VCRs in the MCCP.</p>
PIDS PA	The PIDS PA equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
MCCP	<p>The MCCP console usually consists of six EIA standard console cabinets joined together to form the control console.</p> <p>The maintenance video display unit (VDU) and ancillary equipment require approximately 1.0 m of EIA standard equipment rack space in the MCCP.</p> <p>The time-lapse VCRs and printer require a low profile cabinet with sliding shelves in the MCCP.</p>
ICCS	The ICCS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the TES.
FPSA	The FPSA control equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
PPA	The PPA receiver requires to be mounted on a shelf in a rack or on the wall in a central location of the institution. The PPA controller mounted on a shelf requires approximately 0.25 m of the rack space in the ancillary equipment rack space in the MCCP.

System	Space Requirements
PALS	The PALS nodes and wireless sensors will be mounted in the ceilings throughout the institution. The PALS controller requires approximately 1.0 m of EIA standard equipment rack space in the CER.
Door Control	The hall and door control equipment require approximately 1.0 m of EIA standard equipment rack space in the CER or TES. The operator control equipment requires approximately 0.25 m of rack space in the control console.
Suppl. CCTV	<p>Video switchers, multiplexers, etc. require rack space in EIA standard equipment racks in the CER or TES. The space requirement will depend on the type and amount of video equipment being used.</p> <p>The space requirement in the control console for the monitors and the pan/tilt/zoom controller if applicable will depend on the type and amount of video equipment being used.</p>
SIDS	The space requirement for the SIDS control equipment in the CER will depend on the type of equipment being used. Rack space in the control console is required for the monitors and a pan/tilt/zoom controller if applicable.
MCCP/VRE	The Voice Recording Equipment is usually self contained in its own moveable rack in the MCCP and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access.
MCCP/VCR	The Time Lapse Video Cassette Recorders are normally installed in moveable racks in the MCCP and require a floor area of 650 mm square with an equal area in front and behind for operator and technician access.
Two-way Radio	<p>Three base station radios with associated DIUs require approximately 1.5 m of EIA standard equipment rack space in the CER. If the radios are configured as repeaters, another EIA standard equipment is required for the filters.</p> <p>In the MCCP console, the remote controller requires 5¼ inches (3 U) of console cabinet space.</p>
Interior PA	The Public Address equipment requires approximately 1.5 m of EIA standard equipment rack space in the TES.

System	Space Requirements
LCIS	The Limited Call Intercom System usually forms part of the interior PA system.
RVIS	The Restricted Visit Intercom System controller is mounted in the console in the Restricted Visit CP.
ECTV	<p>The Entertainment Cable TV system head-end equipment requires approximately 1.5 m of EIA standard equipment rack space close to the antenna site.</p> <p>Amplifiers and splitters will be accommodated in the EIA standard equipment racks in the TES or amplifiers and splitters can be a small cabinet mounted on the wall or placed under the computer flooring.</p>
TES	Each TES requires two EIA standard equipment racks, one rack to house the inmate cell call system and ancillary equipment. The other rack will house the interior PA and LCIS equipment.

APPENDIX C

SUMMARY OF SYSTEM POWER REQUIREMENTS

System	Power Requirements
MDS	The power requirement for the MDS equipment in the CER is one 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
FDS	The power requirement for the FDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
MICROWAVE	The power requirement for the microwave equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
PIDS CCTV	The power required in the CER for video switching and control equipment is one 110.0 VAC, 15.0 ampere uninterruptible power circuit. The power requirement for the perimeter cameras is a 110.0 VAC, 20 ampere circuit to each group of usually four (4) cameras from the power distribution panel in the CER.
PIDS PA	The power requirement for the PIDS PA equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
MCCP	The power requirement for the MCCP console is two 110.0 VAC, 15.0 ampere, uninterruptible power circuits.
ICCS	The power requirement for the Inmate Cell Call System equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
FPSA	The power requirement for the Fixed Point Security Alarm system equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.
PPA	The power requirement for the Personal Portable Alarm system equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
PALS	The power requirement for the Portable Alarm Location System equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.
Door Control	The power requirement for the Hall, Corridor and Door Monitor and Control system in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
Suppl. CCTV	The power requirement for the Supplementary CCTV system equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
SIDS	The power requirement for the Supplementary Intrusion Detection System equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.

System	Power Requirements
MCCP/VRE	The power requirement for the Voice Recording Equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
MCCP/VCR	The power requirement for the Video Cassette Recorder equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
Two-way Radio	The power requirement for the Radio Communications system equipment is a 110.0 VAC, 15.0 ampere circuit.
Interior PA	The power requirement for the Interior Public Address system equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
LCIS	The Limited Call Intercom System is usually part of the Interior PA system. If a standalone LCIS installed, the power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.
RVIS	The power requirement for the Restricted Visits Intercom System equipment in the RV Control Post a 110.0 VAC, 15.0 ampere circuit.
ECTV	The power requirement for the Entertainment Cable TV system equipment is a 110.0 VAC, 15.0 ampere circuit.
TES	The power requirement for the Terminal Equipment Space room is two 110.0 VAC, 15.0 ampere circuits.



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0205
Revision 2
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
FIXED OUTDOOR CAMERA ENCLOSURE
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer
Electronics Security Systems

Approved by:

Director,
Electronics Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0		Original issue
1	3.2	Condensing humidity from 95% to 100%
	7.1	Maximum maintained internal temperature from 40 to 50°C
2	All	Reformat and rationalization

TABLE OF CONTENTS

TABLE OF REVISIONS.....	2
TABLE OF CONTENTS.....	3
TABLE OF ABBREVIATIONS.....	4
TABLE OF DEFINITIONS.....	5
1 INTRODUCTION	6
1.1 Overview.....	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment.....	8
3.3 Interference	8
3.4 Reliability.....	8
3.5 Safety	8
4 OPERATIONAL.....	9
4.1 Enclosure	9
4.2 Wiper.....	9
5 INTERFACE	10
5.1 Ports	10
5.2 Power	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
CSC	Correctional Service Canada
FoV	Field of View
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronics Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for an outdoor fixed camera enclosure for use at federal correctional institutions.

1.2 Purpose

- .1 These enclosures are for deployment in outdoor fixed camera locations such as:
 - .1 facility perimeter; and
 - .2 outdoor walkways.
- .2 These enclosures are for Fixed Network Colour Cameras for Enclosures (ES/STD-0221).

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T
ES/STD-0221	Electronics Engineering Standards Fixed Network Colour Camera for Enclosures

3 PHYSICAL

3.1 Dimensions

- .1 The enclosure must:
 - .1 measure less than 300mm high;
 - .2 measure less than 300mm wide;
 - .3 measure less than 800mm long;
- .2 The enclosure window opening must:
 - .1 pass the camera's complete Field of View (FoV);
 - .2 include a wiper;
 - .3 include a sun shield (include in the enclosure measurements);
- .3 The enclosure camera mount must:
 - .1 include an adjustable camera mount;
 - .2 have ¼-20 threaded mounting holes;
 - .3 include elevation blocks for large lens/low optical centre-line cameras;

3.2 Environment

- .1 The enclosure must:
 - .1 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .2 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .3 operate for external temperatures between -40°C to 50°C;
 - .4 meet or exceed IEC EN60529 IP66 dust and water resistance when mounted;

3.3 Interference

- .1 The enclosure must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The enclosure must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The enclosure must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Enclosure

- .1 The enclosure must:
 - .1 be capable of continuous operation;
 - .2 maintain an internal temperature between 5°C to 50°C for defined operational temperature range;
 - .3 start and operate from 0 to 100% condensing humidity;
 - .4 prevent ice, snow, and condensation on the enclosure window;

4.2 Wiper

- .1 The enclosure wiper must be remotely controllable;

5 INTERFACE

5.1 Ports

- .1 The enclosure does not require an output for camera power.

5.2 Power

- .1 The enclosure must use less than 150W excluding any camera power.



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0221
Revision 3
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
FIXED NETWORK COLOUR CAMERA FOR ENCLOSURE
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer
Electronics Security Systems

Approved by:

Director,
Electronics Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0		Original issue
1	7.1	Imager changed to ¼ inch or larger
	7.9	Remove numeric quantity on AGC, just yes
	7.12	Added iris requirement
	7.12 – 7.17	Renumber paragraphs
2	6.1	Added CMOS imager
3	All	Reorganized and cleaned to new format

TABLE OF CONTENTS

TABLE OF REVISIONS	2
TABLE OF CONTENTS	3
TABLE OF ABBREVIATIONS	4
TABLE OF DEFINITIONS	5
1 INTRODUCTION	6
1.1 Overview	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment	8
3.3 Interference	8
3.4 Reliability	8
3.5 Safety	8
4 OPERATIONAL	9
4.1 Camera	9
4.2 Lens	9
4.3 Video	9
5 INTERFACE	10
5.1 Ports	10
5.2 Power	10
5.3 Recording Compatibility	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CB	Citizen's Band
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol
UHF	Ultra High Frequency
VHF	Very High Frequency

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronics Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for a fixed focus, network capable camera to be mounted in an enclosure for use at federal correctional institutions. The camera is for deployment in either existing indoor enclosures or Fixed Outdoor Camera Enclosures (ES/STD-0205).

1.2 Purpose

- .1 The cameras are deployed for both observation and evidentiary use.
- .2 These cameras are for deployment in outdoor fixed enclosures such as:
 - .1 facility perimeter; and
 - .2 outdoor walkways.
- .3 These cameras are for deployment in existing indoor fixed enclosures such as:
 - .1 indoor hallways;
 - .2 gymnasiums;
 - .3 weight rooms;
 - .4 passage doors/barriers; and
 - .5 explosive environments.
- .4 The camera is used indoors where enclosures already exist and are being reused. New indoor installations must use Fixed Network Colour Dome Cameras (ES/STD-0232) except for new installations in explosive environments.

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T
ES/STD-0205	Electronics Engineering Standards Fixed Outdoor Camera Enclosure
ES/STD-0232	Electronics Engineering Standards Fixed Network Colour Dome Camera

3 PHYSICAL

3.1 Dimensions

- .1 The camera with lens must:
 - .1 measure less than 75mm high;
 - .2 measure less than 100mm wide;
 - .3 measure less than 250mm long;

3.2 Environment

- .1 For use either in indoors enclosures or in outdoor heated enclosures.
- .2 The camera must:
 - .1 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .2 be capable of continuous operation;
 - .3 start and operate from 0°C to 50°C;
 - .4 start and operate from 0 to 85% non-condensing humidity;

3.3 Interference

- .1 The camera must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

- .1 The camera must retain its configuration over a power cycle.
- .2 The image sensor must:
 - .1 include automatic or remote back focus;
 - .2 have a minimum of 480,000 pixels (horizontal x vertical);
 - .3 have day (colour) and night (black and white) modes;
 - .4 automatic removable infrared cut filter for day/night transition;
 - .5 have 0.5 lux or less minimum required illumination for day mode;
 - .6 have 0.1 lux or less minimum required illumination for night mode;
 - .7 include Automatic Gain Control (AGC);
 - .8 include extended dynamic range processing;

4.2 Lens

- .1 The camera lens must:
 - .1 have a 35° to 80° or greater horizontal angular view vari-focal lens
 - .2 be approved by the manufacturer of the camera for that camera;

4.3 Video

- .1 The video encoding must:
 - .1 support H.264 configurable I-frame frequency of at least 3 per second;
 - .2 support H.264 constant bit rate transmission mode;
 - .3 support H.264 frame rate transmission mode;
 - .4 support at least 3 levels of H.264 image quality;
 - .5 support at least 3 levels of MJPEG image quality;
- .2 The video output must:
 - .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
 - .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
 - .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

- .1 The camera must:
 - .1 interface over IPV4 TCP/IP;
 - .2 be able to operate on 100Base-TX (IEEE 802.3u);
 - .3 connect using an RJ-45 connector;
 - .4 be ONVIF compliant;

5.2 Power

- .1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

- .1 The camera model must be identified as “Certified” or “Supported by Design” in the current Genetec Omnicast Supported Hardware camera list.



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0223
Revision 2
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
PAN/TILT/ZOOM NETWORK COLOUR DOME CAMERA
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer,
Electronic Security Systems

Approved by:

Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	Paragraph 7.12 Paragraph 7.21	Optical zoom increased to 30x Added electronic image stabilization
2	All	Reformat and indoor/outdoor standard merge

TABLE OF CONTENTS

TABLE OF REVISIONS	2
TABLE OF CONTENTS	3
TABLE OF ABBREVIATIONS	4
TABLE OF DEFINITIONS	5
1 INTRODUCTION	6
1.1 Overview.....	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment.....	8
3.3 Interference	8
3.4 Reliability.....	8
3.5 Safety	8
4 OPERATIONAL	9
4.1 Camera	9
4.2 Lens	9
4.3 Video	9
5 INTERFACE	9
5.1 Ports	10
5.2 Power	10
5.3 Recording Compatibility	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CB	Citizen's Band
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
PTZ	Pan Tilt Zoom
TCP/IP	Transmission Control Protocol/Internet Protocol
UHF	Ultra High Frequency
VHF	Very High Frequency

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronic Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for a pan, tilt, zoom (PTZ), network capable, dome camera for use at federal correctional institutions. PTZ cameras are deployed to allow detailed examination of areas typically covered by fixed cameras or areas without regular evidentiary coverage.

1.2 Purpose

- .1 The cameras are deployed primarily for observation use. Given they may be pointed anywhere, they are not assumed to be evidentiary coverage.
- .2 These cameras are for deployment for all outdoor PTZ camera locations.
- .3 These cameras are for deployment for all indoor PTZ camera locations.

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

- .1 The camera case and dome must:
 - .1 measure a base diameter less than 250mm;
 - .2 measure from base to top of dome of less than 400mm excluding any mount;
 - .3 weigh less than 5kg excluding mounting hardware;

3.2 Environment

- .1 The camera case and dome must:
 - .1 meet or exceed IEC EN60529 IP66 dust and water resistance when mounted;
 - .2 if deployed within 5 metres of inmates, meet or exceed IEC EN62262 IK10 impact resistance;
 - .3 if surface mount, have threaded openings for conduits;
 - .4 if pendant mount, have all cables enter through the attachment pipe;
 - .5 if pendant mount, have no other openings in the enclosure excluding the dome assembly;
 - .6 have a threaded plug to seal all unused openings;
 - .7 have set-screws to secure all conduit and plugs from inside the dome;
 - .8 have tamper resistant heads on all externally accessible screws;
 - .9 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .10 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .11 have a smoked dome with a light attenuation factor of 1 f-stop;
- .2 The camera must:
 - .1 be capable of continuous operation;
 - .2 start and operate from -40°C to 50°C;
 - .3 start and operate from 0 to 100% condensing humidity;

3.3 Interference

- .1 The camera must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

- .1 The camera must retain its configuration over a power cycle.
- .2 The image sensor must:
 - .1 include automatic or remote back focus;
 - .2 have a minimum of 480,000 pixels (horizontal x vertical);
 - .3 have day (colour) and night (black and white) modes;
 - .4 automatic removable infrared cut filter for day/night transition;
 - .5 1.0 lux or less minimum illumination for day mode;
 - .6 0.1 lux or less minimum illumination for night mode;
 - .7 include Automatic Gain Control (AGC);
 - .8 include extended dynamic range processing;

4.2 Lens

- .1 The camera lens must:
 - .1 have a horizontal field of view optical zoom range including 3.5° to 50°;
 - .2 be integral to the camera assembly;

4.3 PTZ

- .1 The PTZ must:
 - .1 have a pan range of 360° continuous (endless);
 - .2 have a minimum tilt range of 180°;
 - .3 include automatic image inversion at 90° tilt;
 - .4 have a minimum pan and tilt speed of 0.1°/sec or slower;
 - .5 have a maximum pan and tilt speed of 100°/sec or faster;

4.4 Video

- .1 The video encoding must:
 - .1 support H.264 configurable I-frame frequency of at least 3 per second;
 - .2 support H.264 constant bit rate transmission mode;
 - .3 support H.264 frame rate transmission mode;
 - .4 support at least 3 levels of H.264 image quality;
 - .5 support at least 3 levels of MJPEG image quality;
- .2 The video output must:
 - .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
 - .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
 - .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

- .1 The camera must:
 - .1 interface over IPV4 TCP/IP;
 - .2 be able to operate on 100Base-TX (IEEE 802.3u);
 - .3 connect using an RJ-45 connector;
 - .4 be ONVIF compliant;

5.2 Power

- .1 The camera must be a Type 1 or Type 2 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, 3, or 4.

5.3 Video Management System Compatibility

- .1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/STD-0227
Revision 0
12 April, 2004

ELECTRONICS ENGINEERING
STANDARDS

LCD COLOUR COMPUTER MONITOR
CLOSED CIRCUIT TELEVISION

Prepared by:



Manager,
Electronics Systems Research

Approved by:



Director,
Engineering Services

22 Apr 04

RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.

1.0 SCOPE

This standard defines the requirements of Correctional Service of Canada (CSC) for Closed Circuit Television (CCTV) Liquid Crystal Display (LCD) computer monitors at federal correctional institutions.

2.0 GENERAL

The LCD colour computer monitor is used in indoor and outdoor security surveillance and assessment systems. It is mounted in standard EIA 19 inch racks, attached to walls and ceilings by brackets, and/or is located on desks and shelves.

3.0 ENVIRONMENTAL REQUIREMENTS

The LCD colour computer monitor shall meet all operational requirements over the following operating ranges:

- 3.1 Temperature: 5° C to +40° C; and
- 3.2 Humidity: up to 95% non-condensing.

4.0 POWER REQUIREMENTS

The monitor shall use standard single phase commercial VAC power within the following limits:

- 4.1 Voltage: 120 VAC \pm 10%;
- 4.2 Frequency: 60 Hz \pm 1.5%;
- 4.3 Transients: up to five times nominal voltage for up to 100 msec durations. Changes in the input power or any fluctuations within the above limits shall not cause damage to the unit; and
- 4.4 Power: power consumption up to 45 watts.

5.0 MECHANICAL REQUIREMENTS

- 5.1 Free standing monitor cabinets shall be metal or metal with plastic front.

-
- 5.2 Rack mounted units shall be metal, and come complete with all hardware required to install in standard EIA 19" racks.
 - 5.3 External dimensions, weight, diagonal effective viewing area and mounting configuration of the monitors are application dependent. These requirements shall be specified in the functional specification for the specific application.
 - 5.4 All controls and test points used during calibration and testing shall be easily accessible and permanently labelled.

6.0 DESIGN REQUIREMENTS

- 6.1 All controls for the operation of the monitor shall be on the front of the unit and shall be easy accessible to the operator.
- 6.2 There must be clear permanent labelling of and easy access to all controls and test points used for calibration and testing by maintenance staff.
- 6.3 Where applicable, the monitor must be modular with plug-in circuit cards and assemblies. A standard extender board must be included with the equipment if applicable.
- 6.4 The monitor must be designed and built to high quality standards and have a Mean Time Between Failure (MTBF) of at least five years.
- 6.5 Labels must be permanently affixed to the exterior of the monitor which identify the manufacturer, model number, serial number and the power requirements.

7.0 TECHNICAL REQUIREMENTS

The colour computer monitor shall meet the following minimum requirements:

- 7.1 Native Resolution: $\geq 1024 \times 768$;
- 7.2 Brightness: $\geq 200 \text{ cd/m}^2$;
- 7.3 Contrast Ratio: $\geq 300:1$;
- 7.3 Aspect Ratio: 4 to 3;
- 7.4 Viewing Angle: minimum 120° Horizontal;
minimum 100° Vertical;

-
- | | | |
|-----|--------------|---|
| 7.5 | Display : | Thin Film Transfer, active matrix, LCD; and |
| 7.6 | Video Input: | VGA/SVGA/XGA; |

8.0 FUNCTIONAL REQUIREMENTS

- 8.1 The monitor shall provide a visual indication of power on/off.
- 8.2 Front panel controls shall be easy accessible to the operator and include the following functions: Power on/off; Contrast; Brightness; Tint; and Colour.

9.0 INTERFERENCE

Performance of the monitor and video quality shall not be affected by the presence and use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are as follows:

- 9.1 CB transceivers at 1 metre or more;
- 9.2 VHF and UHF transceivers at 1 metre or more;
- 9.3 Other radio frequency transmitting, receiving and distribution equipment at 5 metres or more;
- 9.4 Personal computer and/or work stations at 5 metres or more.

10.0 SAFETY

- 10.1 The colour monitor must be CSA, UL, ULC or CE approved, as required by law.

- END OF TEXT -

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/STD-0228
Revision 0
13 October, 2004

ELECTRONICS ENGINEERING
STANDARDS

NETWORK VIDEO USER STATION
CLOSED CIRCUIT TELEVISION

Prepared by:



Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services


7 Oct 04

RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.

1.0 SCOPE

This standard defines the requirements of a Network Video User Station (NVUS) in Closed Circuit Television (CCTV) systems used by Correctional Service of Canada (CSC).

2.0 GENERAL

NVUSs are used in security surveillance and assessment applications in institutions. The NVUS provides control and monitoring of CCTV equipment in a client-to-server configuration. The system shall use common off-the-shelf operating systems and computers. The system shall require user login and passwords to view recorded and live video. User video access and priorities are defined in the system configuration. The system shall be capable of having a minimum of 32 NVUS stations logged into the system.

3.0 ENVIRONMENTAL CONDITIONS

The system shall meet all operational requirements over the following operating range:

- 3.1 Temperature: 5° C to 40° C; and
- 3.2 Humidity: 20 to 80% relative, non-condensing.

4.0 POWER REQUIREMENTS

The equipment shall use standard commercial VAC power within the following range:

- 4.1 Voltage: 120 VAC $\pm 10\%$;
- 4.2 Frequency: 60 Hz $\pm 1.5\%$; and
- 4.3 Power: power consumption shall not exceed 400 watts.

5.0 MECHANICAL REQUIREMENTS

The dimensions and weight shall not exceed the following:

- 5.1 Width: 450 mm;
- 5.2 Height: 200 mm;
- 5.3 Depth: 450 mm; and

5.4 Weight: 30 kg.

6.0 DESIGN REQUIREMENTS

- 6.1 The unit must be self contained and the NVUS computer must fit in a standard 19" rack.
- 6.2 The control functions must be usable with either a mouse or LCD touch screen.
- 6.3 Memory Backup shall protect timer settings in the event of power failure.
- 6.4 All test points on the NVMS computer shall be clearly labelled and easily accessible for calibration and maintenance.
- 6.5 All equipment shall be modular with plug-in circuit cards and assemblies.
- 6.6 The design Mean Time Between Failure (MTBF) shall be at least 10,000 hours.
- 6.7 Emergency repair or parts and labour for detective NVMSs shall be available within 24 hours after notification of equipment unserviceability to any authorized dealer service centres across Canada.

7.0 TECHNICAL REQUIREMENTS

The NVUS shall meet the following requirements:

- 7.1 Video Format: NTSC (colour and black/white);
- 7.2 Video Frame Rate: 30 frames/second/channel (max);
- 7.3 Video Freeze: yes
- 7.4 Video Output: SVGA;
- 7.5 Audio: Synchronized with video input;
- 7.6 Interface: 100Base-T/10Base-T (auto fallback); and
- 7.7 Protocol: Internet Interface Protocol.

8.0 FUNCTIONAL REQUIREMENTS

The NVUS shall interface to the network and provide access and control of all CCTV surveillance and assessment systems as follows:

8.1 General

- a. User login shall be through password protection that limits the user to specific cameras, both live and recorded.
- b. The Graphic User Interface (GUI) shall provide mapping functions to display camera locations. Cameras can be selected by camera number, or by dragging and dropping to a display.
- c. Alarms shall be able to be displayed on the map or through a text message.
- d. The system shall log all user operations.

8.2 Viewing

- a. Ability to have live and recorded viewing of a minimum of 16 cameras.
- b. Full control of all Pan/Tilt/Zoom (P/T/Z) cameras through user login of access rights to predefined cameras. Minimum of 16 priority levels to access cameras.
- c. Ability to set up guard tour and multiple camera sequences.
- d. Ability to display video in single, quad or step format.
- e. Full duplex audio capability. The GUI application provides the ability to control talk paths and listen to audio inputs at camera locations.
- f. Any live or recorded camera in the system shall be accessible through the single GUI interface without the need to change screens or applications.

8.3 Recording

- a. Ability to set record mode to automatically start recording on any appropriate alarm input, for example, a signal from the Fence Detection System.
- b. Ability to set record mode to stop when it receives any reset signal (one input per video input);
- c. Ability to manual initiate record mode.

- d. Ability to initiate record mode on motion.
- e. Ability to initiate record mode based on time.
- f. Ability to be configured to stop recording when the hard drive is full, or configured to overwrite the oldest files.
- g. Provide an open or closed contact when the NVUS stops recording for any reason.

8.4 **Playback**

- a. Ability to control playback speed.
- b. Ability to have multiple view playback.
- c. Ability to export single images and video sequences.
- d. Ability to search for motion in continuous recordings.
- e. Ability to search video sequences based on either date, time or motion.

8.5 **System**

- a. Capable of triplex operation: record, search and playback simultaneously.
- b. Placing the unit into either the Search or Playback mode shall not interrupt any recording in process.
- c. Searching and viewing of stored images, and reconfiguration of system parameters shall be available via a TCP/IP connection through a LAN. Any remote access software required shall be provided for installation on a standard Windows based computer; and
- d. Transfer viewing software automatically to the CD when downloading audio and video for archive purposes. It should be possible to review the archived audio and video from any CSC PC with Windows XP without additional software.
- e. Should indicate Power on/off; Hard Drive Full Alarm; Time/Date; and Recording; on the operator console;
- f. Should have controls for Power on/off; Record; Play/Stop; Forward/Reverse Field Advance; Time, Date and Recording Mode on the operator console;
- g. Control signals available on the back of the NVUS shall include Automatic Alarm Input; and Manual Alarm Input;

- h. System messages must be contained in a log file available for downloading or printing.
- i. Multiple users shall be able to share common resources, with individual users being assigned different system access capability with password protection.

9.0 INTERFERENCE

The NVUS performance and video quality shall not be affected by the presence or use of standard CSC electronic equipment. The units shall work at the following distance limits:

- 9.1 CB transceivers at 1 metre or more;
- 9.2 VHF or UHF transceivers (25W) at 1 metre or more;
- 9.3 Other radio frequency transmitting, receiving and distribution equipment at 5 metres or more; and
- 9.4 Personal computers and/or computer work stations at 5 metres or more.

The NVUS shall not interfere with any standard electronic equipment used at the institutions.

10.0 SAFETY

- 10.1 The NVUS must be CSA, UL, ULC or CE approved, as required by law.

- END OF TEXT -



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0232
Revision 1
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
FIXED NETWORK COLOUR DOME CAMERA
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer,
Electronics Security Systems

Approved by:

Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	All	New structure and change to merge indoor and outdoor.

TABLE OF CONTENTS

TABLE OF REVISIONS	2
TABLE OF CONTENTS	3
TABLE OF ABBREVIATIONS	4
TABLE OF DEFINITIONS	5
1 INTRODUCTION	6
1.1 Overview.....	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment.....	8
3.3 Interference	8
3.4 Reliability.....	8
3.5 Safety	8
4 OPERATIONAL	9
4.1 Camera	9
4.2 Lens	9
4.3 Video	9
5 INTERFACE	9
5.1 Ports	10
5.2 Power	10
5.3 Recording Compatibility	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CB	Citizen's Band
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol
UHF	Ultra High Frequency
VHF	Very High Frequency

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronic Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for a fixed focus, network capable, dome camera for use at federal correctional institutions.

1.2 Purpose

- .1 The cameras are deployed for both observation and evidentiary use.
- .2 These cameras are for deployment for all outdoor fixed camera locations **except**:
 - .1 facility perimeter;
- .3 These cameras are for deployment for all indoor fixed camera locations **except**:
 - .1 observation cells;
 - .2 principal entrance panoramic;

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

- .1 The camera case and dome must:
 - .1 measure a base diameter less than 200mm;
 - .2 measure from base to top of dome of less than 175mm excluding any mount;
 - .3 weigh less than 2.5kg;

3.2 Environment

- .1 The camera case and dome must:
 - .1 meet or exceed IEC EN60529 IP66 dust and water resistance when mounted;
 - .2 meet or exceed IEC EN62262 IK10 impact resistance;
 - .3 have threaded openings for conduits;
 - .4 have a threaded plug to seal all unused openings;
 - .5 have set-screws to secure all conduit and plugs from inside the dome;
 - .6 have tamper resistant heads on all externally accessible screws;
 - .7 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .8 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
- .2 The camera must:
 - .1 be capable of continuous operation;
 - .2 start and operate from -40°C to 50°C;
 - .3 start and operate from 0 to 100% condensing humidity;

3.3 Interference

- .1 The camera must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

- .1 The camera must retain its configuration over a power cycle.
- .2 The image sensor must:
 - .1 include automatic or remote back focus;
 - .2 have a minimum of 480,000 pixels (horizontal x vertical);
 - .3 have day (colour) and night (black and white) modes;
 - .4 automatic removable infrared cut filter for day/night transition;
 - .5 have 0.5 lux or less minimum illumination for day mode;
 - .6 have 0.1 lux or less minimum illumination for night mode;
 - .7 include Automatic Gain Control (AGC);
 - .8 include extended dynamic range processing;

4.2 Lens

- .1 The camera lens must:
 - .1 have a 35° to 80° or greater horizontal angular view varifocal lens
 - .2 be approved by the manufacturer of the camera for that camera;

4.3 Video

- .1 The video encoding must:
 - .1 support H.264 configurable I-frame frequency of at least 3 per second;
 - .2 support H.264 constant bit rate transmission mode;
 - .3 support H.264 frame rate transmission mode;
 - .4 support at least 3 levels of H.264 image quality;
 - .5 support at least 3 levels of MJPEG image quality;
- .2 The video output must:
 - .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
 - .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
 - .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

- .1 The camera must:
 - .1 interface over IPV4 TCP/IP;
 - .2 be able to operate on 100Base-TX (IEEE 802.3u);
 - .3 connect using an RJ-45 connector;
 - .4 be ONVIF compliant;

5.2 Power

- .1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

- .1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0233
Revision 1
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
INDOOR NO-GRIP CORNER MOUNT NETWORK COLOUR CAMERA
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer,
Electronic Security Systems

Approved by:

Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	All	New document structure and addition of TCP/IP and PoE interfaces.

TABLE OF CONTENTS

TABLE OF REVISIONS	2
TABLE OF CONTENTS	3
TABLE OF ABBREVIATIONS	4
TABLE OF DEFINITIONS	5
1 INTRODUCTION	6
1.1 Overview	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment	8
3.3 Interference	8
3.4 Reliability	8
3.5 Safety	8
4 OPERATIONAL	9
4.1 Camera	9
4.2 Lens	9
4.3 Camera Case	9
4.4 Video	9
5 INTERFACE	10
5.1 Ports	10
5.2 Power	10
5.3 Video Management System Compatibility	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CB	Citizen's Band
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol
UHF	Ultra High Frequency
VHF	Very High Frequency

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronics Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for an indoor, fixed focus, network capable, corner mounted, no-grip camera for use at federal correctional institutions.

1.2 Purpose

- .1 The cameras are deployed for both observation and evidentiary use.
- .2 These cameras are for deployment only in:
 - .1 observation cells;

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

- .1 The camera case must:
 - .1 measure less than 300mm in all dimensions;
 - .2 weigh less than 2.5kg;

3.2 Environment

- .1 The camera case must:
 - .1 meet or exceed IEC EN60529 IP65 dust and water resistance when mounted;
 - .2 meet or exceed IEC EN62262 IK10 impact resistance;
 - .3 have tamper resistant heads on all externally accessible screws;
 - .4 be grip-less and anchor-free;
 - .5 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .6 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
- .2 The camera must:
 - .1 be capable of continuous operation;
 - .2 start and operate from 0°C to 50°C;
 - .3 start and operate from 0 to 85% non-condensing humidity;

3.3 Interference

- .1 The camera must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

- .1 The camera must retain its configuration over a power cycle.
- .2 The image sensor must:
 - .1 include automatic or remote back focus;
 - .2 have a minimum of 480,000 pixels (horizontal x vertical);
 - .3 have day (colour) and night (black and white) modes;
 - .4 automatic removable infrared cut filter for day/night transition;
 - .5 have 0.5 lux or less minimum illumination for day mode;
 - .6 have 0 lux minimum illumination for night mode;
 - .7 if required for night mode, use invisible illumination (typically infra-red LEDs);
 - .8 include Automatic Gain Control (AGC);

4.2 Lens

- .1 The camera lens must:
 - .1 provide a view of the entire floor and all four walls of a room at least 3.5m x 3.5m including the walls to which it is attached from the mounting height to the floor;
 - .2 be approved by the manufacturer of the camera for that camera;

4.3 Camera Case

- .1 The camera case must:
 - .1 have a programmatically controlled visible LED indicator to show when the video feed is being observed;

4.4 Video

- .1 The video encoding must:
 - .1 support H.264 configurable I-frame frequency of at least 3 per second;
 - .2 support H.264 constant bit rate transmission mode;
 - .3 support H.264 frame rate transmission mode;
 - .4 support at least 3 levels of H.264 image quality;
 - .5 support at least 3 levels of MJPEG image quality;
- .2 The video output must:
 - .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
 - .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
 - .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

- .1 The camera must:
 - .1 interface over IPV4 TCP/IP;
 - .2 be able to operate on 100Base-TX (IEEE 802.3u);
 - .3 connect using an RJ-45 connector;
 - .4 be ONVIF compliant;

5.2 Power

- .1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

- .1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.



**CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS**



ES/STD-0235
Revision 2
2014 February 18

**ELECTRONIC ENGINEERING STANDARD
INDOOR PANORAMIC NETWORK COLOUR CAMERA
FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS**

AUTHORITY

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

Electronic Systems Engineer,
Electronics Security Systems

Approved by:

Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue
1	7.4	Frame rate increase
2	All	New format and change to cover indoor and outdoor

TABLE OF CONTENTS

TABLE OF REVISIONS.....	2
TABLE OF CONTENTS.....	3
TABLE OF ABBREVIATIONS.....	4
TABLE OF DEFINITIONS.....	5
1 INTRODUCTION	6
1.1 Overview.....	6
1.2 Purpose	6
2 REFERENCES	7
2.1 Specifications, Standards, and Statements of Work	7
3 PHYSICAL	8
3.1 Dimensions	8
3.2 Environment.....	8
3.3 Interference	8
3.4 Reliability.....	8
3.5 Safety	8
4 OPERATIONAL.....	9
4.1 Camera	9
4.2 Lens	9
4.3 Video.....	9
5 INTERFACE	10
5.1 Ports	10
5.2 Power.....	10
5.3 Recording Compatibility	10

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CB	Citizen's Band
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol
UHF	Ultra High Frequency
VHF	Very High Frequency

TABLE OF DEFINITIONS

Term	Definition
Design Authority	Director, Electronic Security Systems

1 INTRODUCTION

1.1 Overview

- .1 This standard defines the requirements of Correctional Service Canada (CSC) for a panoramic, network capable, camera for use at federal correctional institutions.

1.2 Purpose

- .1 The cameras are deployed for both observation and evidentiary use.
- .2 These cameras are for deployment at:
 - .1 principal entrance;

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

- .1 Access to non-government specifications is the responsibility of the contractor.

Number	Title
IEC EN60529	International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
IEC EN60950-1	International Electrotechnical Commission Information technology equipment – Safety
IEC EN62262	International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
IEEE 802.3at	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
IEEE 802.3u	IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

- .1 The camera case and dome must:
 - .1 measure a base diameter less than 200mm;
 - .2 measure from base to top of dome of less than 250mm excluding any mount;
 - .3 weigh less than 2.5kg;

3.2 Environment

- .1 The camera case and dome must:
 - .1 meet or exceed IEC EN60529 IP65 dust and water resistance when mounted;
 - .2 meet or exceed IEC EN62262 IK10 impact resistance;
 - .3 have threaded openings for conduits;
 - .4 have a threaded plug to seal all unused openings;
 - .5 have set-screws to secure all conduit and plugs from inside the dome;
 - .6 have tamper resistant heads on all externally accessible screws;
 - .7 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
 - .8 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
- .2 The camera must:
 - .1 be capable of continuous operation;
 - .2 start and operate from 0°C to 50°C;
 - .3 start and operate from 0 to 80% non-condensing humidity;

3.3 Interference

- .1 The camera must operate correctly in the presence of:
 - .1 5 watt CB transceiver at 1 metre or more;
 - .2 6 watt VHF and UHF transceivers at 1 metre or more;
 - .3 25 mW 400-450 MHz Personal Portable Transmitters at 1 metre or more;
 - .4 Other radio frequency transmitting, receiving, and distribution equipment at 5 metres or more;
 - .5 Computer work stations at 5 metres or more;

3.4 Reliability

- .1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

- .1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

- .1 The camera may use a single lens or a multi-lens/multi-camera configuration.
- .2 The camera must retain its configuration over a power cycle.
- .3 The image sensor must:
 - .1 include automatic or remote back focus;
 - .2 have a minimum of 1,000,000 pixels (horizontal x vertical, sum for multi-lens units);
 - .3 have day (colour) and night (black and white) modes;
 - .4 automatic removable infrared cut filter for day/night transition;
 - .5 have 0.5 lux or less minimum illumination for day mode;
 - .6 have 0.1 lux or less minimum illumination for night mode;
 - .7 include Automatic Gain Control (AGC);

4.2 Lens

- .1 The camera lens must:
 - .1 minimum angle of view 180°x160° (multi-lens combined);
 - .2 be approved by the manufacturer of the camera for that camera;

4.3 Video

- .1 The video encoding must:
 - .1 support H.264 configurable key frame frequency of at least 3 per second;
 - .2 support H.264 constant bit rate transmission mode;
 - .3 support H.264 frame rate transmission mode;
 - .4 support at least 3 levels of H.264 image quality;
 - .5 support at least 3 levels of MJPEG image quality;
- .2 The video output must:
 - .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
 - .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 1,000,000 pixel resolution;
 - .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 1,000,000 pixel resolution;
 - .4 support virtual pan/tilt/zoom;

5 INTERFACE

5.1 Ports

- .1 The camera must:
 - .1 interface over IPV4 TCP/IP;
 - .2 be able to operate on 100Base-TX (IEEE 802.3u);
 - .3 connect using an RJ-45 connector;
 - .4 be ONVIF compliant;

5.2 Power

- .1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

- .1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.



**Correctional Service Canada
Facilities Branch
Electronics Security Systems**



November 18, 2014

**STATEMENT
OF
TECHNICAL REQUIREMENTS**

RANGE CLOSED CIRCUIT TELEVISION SYSTEM

AT

EDMONTON INSTITUTION

AUTHORITY

This Statement of Technical Requirements is approved by the Correctional Service of Canada for the upgrade of the Range Closed Circuit Television System at Edmonton Institution.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:

**J.B.Koelmans
Chief Electronic Security Maintenance
Electronic Security Systems**

Reviewed by:

**Edwin Morton
Electronic Security Systems and Installation Engineer
Electronic Security Systems**

Reviewed by;

**Mircea Slobozianu
Project Officer
Electronic Security Systems**

Approved by:

**Marc St-Amand
Director,
Electronic Security Systems**

TABLE OF CONTENTS

ABBREVIATIONS	5
TABLE OF DEFINITIONS	7
1.0 INTRODUCTION	10
1.1 GENERAL.....	10
1.2 SCOPE.....	10
1.3 REQUIREMENT/PURPOSE.....	10
1.4 SITE VISITS	10
1.5 TECHNICAL ACCEPTABILITY.....	11
2.0 APPLICABLE DOCUMENTS.....	12
2.1 APPLICABILITY	12
2.2 APPLICABLE STANDARDS AND SPECIFICATIONS.....	12
2.3 DRAWINGS.....	12
2.4 LANGUAGE.....	13
3.0 OPERATIONAL CRITERIA	14
3.1 GENERAL.....	14
3.2 VIDEO MANAGEMENT SYSTEM	14
3.3 SYSTEM SPECIFICS	14
3.3.1. <i>VMS Integration</i>	14
3.3.2. <i>Video Archiver</i>	14
3.3.3. <i>Licences</i>	14
4.0 TECHNICAL REQUIREMENTS.....	15
4.1 CONCEPT OF OPERATION	15
4.1.1. <i>Video Surveillance</i>	15
4.1.2. <i>User Interfaces</i>	15
4.2 EXISTING CAMERA SYSTEM VERIFICATION.....	15
4.2.1. <i>Testing of Operating Equipment Characteristics</i>	15
4.2.2. <i>Testing of Fibre Optic Cable</i>	15
4.3 EXISTING CAMERA SYSTEM CONFIGURATION	16
4.3.1. <i>Existing Camera System Configuration</i>	16
4.3.2. <i>Existing Network Switch Configuration</i>	16
4.3.3. <i>Existing Camera Locations</i>	16
4.4 NEW SYSTEM INSTALLATION	16
4.4.1. <i>Cameras</i>	16
4.4.2. <i>Servers</i>	17
4.4.3. <i>Switches</i>	17
4.4.4. <i>Integration</i>	17
4.4.5. <i>System Operation</i>	17
4.4.6. <i>Installation schedule</i>	17
4.4.7. <i>Conduits and Cabling</i>	17
4.4.8. <i>Conduits and Cabling</i>	18
4.5 EQUIPMENT RACKS.....	18
4.6 REMOVAL OF EQUIPMENT AND CABLES	18
4.6.1. <i>Disposition</i>	18
4.6.2. <i>Inventory List</i>	19
4.7 CAMERA TYPES.....	19
4.8 CAMERA POWER SUPPLIES.....	19

4.9	EXPANDABILITY.....	19
4.10	NETWORK ARCHITECTURE	19
4.10.1.	General	19
4.10.2.	Network Traffic.....	20
4.10.3.	Inter Switch Traffic.....	20
4.10.4.	Switch Configuration	20
4.10.5.	Network Access Control and Security	21
4.10.6.	Core network	21
4.10.7.	Edge network	22
4.11	NETWORK VIDEO RECORDER SYSTEM	23
4.11.1.	Required Server and SAN Storage Functionality	23
4.11.2.	Directory Servers	23
4.11.3.	Failover mode	23
4.11.4.	Storage Capacity and compression format	23
4.11.5.	Required Server and SAN Storage Functionality	23
4.11.6.	Basic Storage configuration	24
4.11.7.	Availability.....	24
4.11.8.	Scalability and Performance	25
4.11.9.	Management	25
4.11.10.	Directory Servers.....	26
4.12	UNINTERRUPTIBLE POWER SUPPLY	26
4.12.1.	General	26
4.12.2.	Existing UPS	26
4.12.3.	UPS Shutdown process	26
4.13	NETWORK VIDEO USER STATION	27
4.14	MONITORS	27
4.14.1.	Environment and Power	27
4.14.2.	Configuration	27
4.15	COMPUTERS	27
4.16	FIBRE REQUIREMENT.....	28
4.17	FINISHING.....	28
5.0	ADDITIONAL REQUIREMENTS	29
5.1	SUPPORT.....	29
5.1.1.	National Distribution:	29
5.1.2.	Escalation Plan:	29
5.1.3.	Local Technicians:	29
5.1.4.	System Support:.....	29
5.2	OPERATOR TRAINING.....	29
5.3	MAINTENANCE TRAINING	30
5.4	EQUIPMENT FAILURE	30
5.5	MANUALS AND DRAWINGS.....	30
5.6	SOFTWARE DOCUMENTATION	31
5.6.1.	Acceptance Testing Procedures	31
5.6.2.	Institution Operations	32
5.6.3.	Institution Address	32
5.6.4.	Integration Responsibility	32
5.6.5.	Existing Equipment Removal	32
5.6.6.	Security.....	32
5.6.7.	Schedule	33
5.6.8.	Safety.....	33
5.6.9.	Communication Responsibility	33

Appendix A - Maintenance Handover Report Form

Appendix B - Safety Regulations for Security Electronics Contractors Working at CSC Institutions

Appendix C- CPIC Form

ABBREVIATIONS

The following abbreviations are used by CSC and may be found throughout this document:

Abbreviation	Expansion
ACL	Access Control List
API	Application Programming Interface
ATP	Acceptance Test Procedure
BIFMA	Business & Industrial Furniture Manufacturers Association
CA	Contract Authority
CCDA	Command Control and Data Acquisition
CCTV	Closed Circuit Television
CD	Commissioner's Directive
CER	Common Equipment Room
COS	Class of Service
COTS	Commercial-Off-The- Shelf
CSA	Canadian Standards Association
CSC	Correctional Service Canada
DA	Design Authority
DCMS	Door Control and Monitoring System
DES	Director Engineering Services
DCS	Door Control System
DSCP	Differentiated Services Code Point
EIA	Electronic Industries Association
ESS	Electronic Security Systems
FAAS	Facility Alarm Annunciation System
FAR	False Alarm Rate
FDS	Fence Disturbance Detection System
FIU	FAAS Interface Unit
FOV	Field of View
GFE	Government Furnished Equipment
GUI	Graphical User Interface
IP	Internet Protocol
IEEE	Institute of Electronic and Electrical Engineers
MCCP	Main Communications and Control Post
IVRMS	Inmate Voice Recording and Management System
MDS	Motion Detection System
MTBF	Mean Time Between Failure
MTTR	Mean Time to Repair
NAR	Nuisance Alarm Rate
NTP	Network Time Protocol
PA	Public Address
PC	Personal Computer
Pd	Probability of Detection
PIDS	Perimeter Intrusion Detection System
PIU	Perimeter Intrusion Detection System Integration Unit
PLC	Programmable Logic Controller
RFP	Request for Proposal
RTEO	Regional Technical and Engineering Officer
PPA	Portable Personal Alarm
PPAL	Portable Personal Alarm Locatable
QoS	Quality of Service

Abbreviation	Expansion
RTE	Request to Exit
SCC	Security Control Centre
SIO	Security Intelligence Officer
SOW	Statement of Work
SPB	Shortest Path Bridging
STR	Statement of Technical Requirements
TOS	Type of Service
TCP/IP	Transport Control Protocol/Internet Protocol
TCP-UDP	Transport Control Protocol – Small For-Factor
TER	Telecommunications Equipment Room
UPS	Uninterruptible Power Supply
V&C	Visits and Correspondence
VDU	Video Display Unit
VID	VLAN Identification
VIRS	Visits Intercept and Recording System
VMS	Video Management System

TABLE OF DEFINITIONS

The following definitions are used by CSC and may be found throughout this document:

#	Term	Example(s)	Description	Function
1	Administrative User Interface		Monitor and Software that supports task specific User Interaction for System Administrators, located in a secure area	Provides Administrative Personnel with the ability to map enrolled users to the functional domains that they are allowed to access and change
2	Application	Cell Call Management, PA Management	Software that is used to deliver Application Support functionality for a sub-system	Software that provides the Operator Interface and supporting logic that allows a sub-system (Control Domain) to be managed
3	CCTV Monitor	PIDS or Range CCTV Monitor	Computer Monitor Hardware	Displays CCTV images for Operator viewing
4	Client		Rack mounted computer located in a secure area away from a Control Post or Control Desk.	Runs software and supports one or more Application
5	Configuration Data	Site floor plans showing quantity of cameras, doors, cells etc. Camera locations. Number of User Interfaces required in a Post.	Site and System specific information typically supplied by CSC that defines how a sub-system Application is to be set-up for a site, location within a site, or post.	The configuration data provides the information that a sub-system application requires to tailor it to meet site, location within a site, or post user requirements.
6	Configuration User Interface		Monitor and Software that supports task specific User Interaction, located in a secure area	Allows suppliers or qualified personnel to add, delete and modify Application Configuration
7	Contract Authority		Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.	
8	Contractor		The company selected as the successful bidder.	
9	Control Console	MCCP Console, Living Unit Control Post Console	Console, typically located in a Control Post. Serves as the physical support infrastructure for Operator User Interfaces	Contains User Interfaces or Control Panels used by staff to execute their management responsibilities and interact with the Domains over which they have Control
10	Control Desk	Living Unit Control Desk	Desk, typically located in a Control Post or Office. Serves as the physical support infrastructure for Operator User Interfaces	Equipped with User interfaces used by staff to execute their management responsibilities and interact with the Domains over which they have Control
11	Control Domain	Cell Call, Guard Tour, Public Address	A group of Physical and Virtual devices or objects, often supported by specialized hardware and software, that performs a set of related functions	Collect information, or activate capabilities in their operational domain

#	Term	Example(s)	Description	Function
12	Control Panel	PACP, Fire Alarm	Hardware and Software device that provides an Operator Interface (I/O device), located in a Control Post	Allows Operators to manage one or more Domain
13	Control Post	Living Unit Control Post/MCCP	Room or a area, typically located in a secure area in an institution	Room used by staff to execute their management responsibilities and interact with the Domains over which they have Control
14	Custom Equipment		Equipment designed and/or manufactured specifically for a specific contract.	
15	Design Authority		Director, Electronic Security Systems (DES) Correctional Service of Canada (CSC) is responsible for all technical aspects of the system design and implementation.	
16	Device	CCTV Camera, Managed Door, Call Origination Device	A specialized device, typically consisting of hardware and software	Provides data collection or activate functions associated with a specific system or sub-system
17	Enrolment User Interface		Monitor and Software that supports task specific User Interaction, located in a secure area	Allows Designated Personnel to enroll and delete Users from the Command, Control and Data Acquisition System.
18	Maintenance User Interface		Monitor and Software that supports task specific User Interaction, located in the CER or Maintenance Service Provider Office	Provides Maintenance Personnel with the ability to interact with one or more Systems to carry out their day to day tasks to troubleshoot and maintain Systems and Subsystems
19	Notification	Notification that a door is opened, or a door is closed, or a sensor is in alarm	A notification is a message that can be shown on a User Interface and/or logged in a database that represents a change in state or a command initiated by an operator.	
20	Off-the Shelf		Equipment currently on the market with a available field reliability data, manuals, engineering drawings and parts price list.	
21	Operator User Interface	PIDS Display, Door Control and Monitoring System Display	Computer Monitor and Software that supports User Interaction (I/O device)	Provides an Operator with the ability to interact with one or more Systems to carry out their day to day tasks at a Control Console or Control Desk
22	Project Officer		A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.	
23	Reporting User Interface		Monitor and Software that supports task specific User Interaction, located in a secure area	Provides Management Personnel with the ability to access pre configured reports and to create custom reports

#	Term	Example(s)	Description	Function
24	Server	Network Video Recorder	Rack mounted computer that runs software and is located in an equipment room such as a CER or TER	Runs software that is used to deliver services that support Command and Control Applications to connect to sub-systems
25	State		The state of a device as reported to a sub-system or system	This is a logical representation of the state of a device that is being monitored or managed
26	Sub-system	Cell Call, Guard Tour	A group of Physical and Virtual devices or objects, often supported by specialized hardware and software, that perform a specific set of related functions	Collects information, or activates capabilities in their operational domain
27	System	PIDS	A group of Physical and Virtual devices or objects, often supported by specialized hardware and software, including devices from sub-systems that perform a more general set of related functions	Collects information, or activates capabilities in their operational domain
28	Touch Screen User Interface	Door Control and Monitoring System User Interface	Typically an LCD Monitor with touch screen technology	Allows an Operator to view and interact with the Systems presented on the Monitor
29	Workstation		Rack mounted computer located in a secure area away from a Control Post or Control Desk	Runs software that is used to deliver Command and Control Capabilities

1.0 INTRODUCTION

1.1 General

Correctional Service Canada (CSC) has a requirement to upgrade the existing range Closed Circuit Television (CCTV) equipment installed Edmonton Institution into the existing Genetec, Omnicast 4.8 VMS digital CCTV video recording system. In certain areas where additional CCTV coverage is required new network cameras must be installed. This Statement of Technical Requirements (STR) will cover the technical requirements for the required work.

The primary purpose of the Range CCTV is to provide video surveillance and recording. The CCTV system is monitored and managed from the living unit control posts and the MCCP.

The Edmonton Institution is a maximum security facility located near Edmonton Alberta. Work must be accomplished with minimum disruption to the daily operation and security of the institution. To satisfy this requirement, the existing system must remain operational as long as possible to ensure the integrity of the security systems impacted. The contractor may be required to work afterhours on major changes of the infrastructure.

1.2 Scope

The contractor must supply, install, test, and provide operational and maintenance training on the CCTV system, as described in this STR. The contractor must provide acceptable documentation for the operation and the maintenance of this system. The replacement of existing CCTV equipment must be 100% integrated into the existing Genetec Omnicast 4.8 VMS software.

1.3 Requirement/Purpose

This Statement of Technical Requirements is being issued to support the procurement and installation of Electronic Security Systems and equipment to be installed in CSC Facilities. The STR provides prospective suppliers with sufficient information that they can define the scope of the system architecture, equipment, installation, testing, acceptance, training and handover steps required to deliver a fully functioning CCTV System including all necessary sub-systems and equipment to replace the existing range CCTV systems.

The STR also defines the technical aspects for the removal of the existing redundant equipment, and the installation of new equipment.

This STR will also indicate the extent to which both general and particular CSC specifications are applicable to the implementation of this requirement. Bidders must comply with the STR and the listed specifications and standards unless identified in this STR. The STR takes precedence over the subordinate documents such as a Statement of Work, a Specification or a Standard.

1.4 Site Visits

The DA, or the authorized representative, will coordinate a site visit, if requested by the contractor, and identify to the contractors the exact locations of equipment. Wherever possible, drawings and documentation will be made available.

The visits may be useful to determine:

- a. The space, power, spare cable pairs, etc. which are available at equipment mounting locations at these sites,
- b. The conduit and cable requirements for power, video and control signals to the cameras and other equipment locations at these sites,
- c. Condition of existing power, video and control cables, and,

-
- d. General layout and operating environment at the site.

1.5 Technical Acceptability

The CSC operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of penal institutions. Maintaining national security, the safety of staff and offenders alike is CSC's commitment to the government and public. Electronic security systems operating in this unique environment must maintain very high standards of dependability and reliability.

The CSC Engineering Services Division has established Statements of Work (SOW), technical specifications and standards for security electronic systems, which are based on very specific, and restrictive operational performance criteria. Technical acceptability of these systems means that the systems equipment and components comply with the pertinent CSC SOWs, specifications and standards.

2.0 APPLICABLE DOCUMENTS

2.1 Applicability

The provisions contained in the documents listed in the following paragraphs will apply to all aspects of this requirement, unless these provisions have been exempted or modified by this STR.

2.2 Applicable Standards and Specifications

- a. ES/SOW-0101 Electronics Engineering Statement of Work - Procurement and Installation of Electronic Security Systems
- b. ES/SOW-0102 Electronics Engineering Statement of Work - Quality Control for Procurement and Installation of Electronic Security Systems
- c. ES/SOW-0110 Electronics Engineering Statement of Work - Structured Cable Systems for Electronic Security Systems
- d. ES/SPEC-0006 Electronics Engineering Specification - Conduit, Space and Power Requirements for Security Systems for use in Federal Correctional Institutions
- e. ES/STD-0205 Electronic Engineering Standard – Fixed Outdoor Camera Enclosure
- f. ES/STD-0221 Electronic Engineering Standard – Fixed Network Colour Camera for Enclosure
- g. ES/STD-0223 Electronic Engineering Standard – Pan/Tilt/Zoom Network Colour Dome Camera
- h. ES/STD-0227 Electronics Engineering Standard, LCD Colour Computer Monitor, Closed Circuit Television
- i. ES/STD-0228 Electronics Engineering Standard, Network Video User Station, Closed Circuit Television
- j. ES/STD-0232 Electronic Engineering Standard – Fixed Network Colour Dome Camera
- k. ES/STD-0233 Electronic Engineering Standard – Indoor No-Grip Corner Mount Network Colour Camera
- l. ES/STD-0235 Electronic Engineering Standard – Indoor Panoramic Network Colour Camera

2.3 Drawings

Site construction conceptual drawings **MAY** be available for review at a site visit. The contractor must be responsible for verifying the accuracy of the drawings and for recommending any changes to the DA. AutoCAD version may be provided on request.

2.4 Language

The language at Edmonton Institution is English; all CCTV display and control information must be in English. The operator, maintenance manuals and as-built drawings must be provided in English. Training and documentation must be provided as per Paragraphs 5.1 through 5.4.

3.0 OPERATIONAL CRITERIA

3.1 General

The operational parameters of the installed equipment shall meet the performance and operational requirements outlined in this STR.

3.2 Video Management System

The system upgrade must require an expansion of the existing Genetec VMS software and additional Genetec camera licenses. The system expansion must require that all network and camera hardware be properly programmed to be 100% compatible on a Genetec VMS platform. All Work on the VMS software, video storage solution, network support equipment and (but not limited to) CCTV cameras must be integrated by a certified Genetec reseller employing trained and certified Genetec installation/integration technicians. Installation technicians Genetec certifications qualifications must be confirmed with Genetec.

3.3 System Specifics

3.3.1. VMS Integration

This project will result in the installation of a turnkey digital CCTV system at Edmonton Institution. This system must be complete with all necessary mounts, cable dressing brackets and straps. All conduit and cable provided must meet CSC Electronics standards and specifications. All new equipment provided must seamlessly integrate into existing digital CCTV equipment and the project will result in an expansion of the existing GENETEC Omnicast Video Management System.

3.3.2. Video Archiver

Provision of a fully redundant video archive system as detailed in section 4.12 of this document.

3.3.3. Licences

Additional Genetec Omnicast camera licenses to provide capacity for integration and recording of up to 80 CCTV cameras.

4.0 TECHNICAL REQUIREMENTS

4.1 Concept of Operation

4.1.1. Video Surveillance

Video surveillance of certain sensitive areas is required to maintain a safe and secure environment for both staff and inmates. CCTV cameras must be installed at various locations on or in a number of buildings to provide the required video surveillance

4.1.2. User Interfaces

All control functions such as selection and control of the Pan/Tilt/Zoom (PTZ) and spot monitor selection of a camera must be through the use of a mouse. Playback, recording, searching or archiving of video to external media must be accomplished through the use of a mouse and keyboard on NVUS clients.

4.2 Existing Camera System Verification

The institution is currently equipped with a CCTV system comprised of digital cameras which are connected to servers, archivers and workstations managed by Genetec Omnicast software. Some existing range cameras are located inside control posts and view through glass. Cameras are monitored and controlled at all Control Posts, Security Intelligence Office, MCCP and Crisis Centre.

4.2.1. Testing of Operating Equipment Characteristics

The contractor must test the operational characteristics of all existing equipment and systems, whose equipment is in proximity to where work will be carried out or which must be reused, prior to removal or installation of any equipment and provide a written record of those tests for the Design Authority.

The contractor must identify any operational deficiency of equipment or else risk being held accountable for system deficiencies during the commissioning period.

The contractor is to take digital images of all Field Of Views (FOVs) for reference when installing the replacement cameras. A copy of these images must be provided to the project authority 2 weeks **prior** to removing any existing equipment. The lenses supplied with the new cameras must be adjusted to provide the same or better FOVs. Any changes to any FOV will be provided to the contractor in writing from the project authority. Any unauthorised FOV changes must be rectified at the contractor's expense.

4.2.2. Testing of Fibre Optic Cable

The contractor must test all existing fibre optic cabling to be reused in this project and provide detailed light budget analysis and OTDR readings for all fiber strands. Test results must include the following:

- Origin and destination of cable
- Light loss in dB over cable – pass/fail – dB
- Length of cable – in meters
- Pass/fail

The contractor must test all existing structured cabling to be reused in this project with a certified CAT6 LAN Analyzer and provide detailed analysis and LANCAT readings for all cables.

- Wire map - pass/fail
- Propagation Delay – pass/fail
- Cable Length – pass/fail – length
- Insertion Loss – pass/fail – dB
- Return Loss – pass/fail
- NEXT – pass/fail
- ELFEXT – pass/fail

4.3 Existing Camera System Configuration

4.3.1. Existing Camera System Configuration

The digital network is comprised of approximately QTY (111) Axis 211, QTY(4) Axis216FD, QTY(12) Axis221, QTY(31) Axis225FD, QTY(10) Panasonic WV-NS954, QTY (4) Bosch NEI368F02-21W, QTY(10) Panasonic WV-NW964 and QTY(20) WV-SP306 cameras.

4.3.2. Existing Network Switch Configuration

The digital network also includes QTY(12) FS728TP, QTY(4) GS110TP, QTY(1) GSM-7212, QTY(6) GXM-7224, QTY(3) GSM 7324, QTY 1) GSM-7352 network switches and QTY(8) PO-3012/AC PowerDsine POE switches.

4.3.3. Existing Camera Locations

Cameras are located in A/B,C/D,E/F,G/H -Range cameras, Exercise Yd. Cameras, Hallway cameras ,Servery Cameras, Common room cameras, East/West Programs, Tunnel Entrance, East/West Tunnel, Kitchen 1,2&3, CP 3 Program Rm, Industries N Door, Industries S Door, Brotherhood Dr. N, Brotherhood Dr. S, Industries Hall W, Industries Hall E, SIS Door N, SIS Door S, Maintenance N, Maintenance S, School Dr. W, School Dr. E, Aboriginal Programs 1, Aboriginal Programs 2, Aboriginal Programs 3, Control 3 hallway, Healthcare HCC Cell 125 - HCC Observation Cell - Health Care Back area , Courtyard West, Courtyard East, Gym Yard, Gatehouse, Tower 1, Tower 4, Back 40, V&C Internal Cameras, PFV external camera, breezeways, 96 Bed, all D&S cameras and all PIDS cameras.

4.4 New System Installation

The contractor must supply, install and test a complete and fully functional IP based CCTV system. The CCTV system must meet or exceed all of the performance and operational requirements contained in the SOW's, specifications and standards listed in Section 2.2. Where there is a conflict between a published specification and this STR; this STR will be the document of reference.

4.4.1. Cameras

The contractor must supply, install two (2) new cameras on the upper and lower floors of each range of each Living Unit at Edmonton Institution. This site is comprised of Living Units A/B, C/D, E/F, G/H and Dissociation/Segregation. The sixteen (16) new cameras for each Living Unit equate to a total a requirement for 80 new cameras. These cameras must be viewed on monitors from individual control posts, SIO office and M CCP and Crisis Centre. The contractor must replace all existing cameras that cannot provide H264 format.

4.4.2. Servers

The contractor must supply and install a new server in the electrical room adjacent to the AGT room. All system computers must be located in this room. IP KVM extenders must be used.

4.4.3. Switches

The contractor must supply new and replace all existing network switches in accordance with the requirements identified in section 4.9.

4.4.4. Integration

The contractor must supply, install, integrate and test the new CCTV equipment to ensure a complete and fully functional, IP based CCTV system. The new CCTV system must meet or exceed all of the performance and operational requirements contained in the SOW's, specifications and standards listed in Section 2.2.

4.4.4.1. FAAS Integration

The Genetec Omnicast Server must be connected to the FAAS using the Starcom over IP Protocol and should be equipped with an integral driver that allows data in the Starcom over IP format to be sent and received directly between the Genetec Server and a Network enabled S100 based PIDS and FAAS over an Ethernet connection. If the S100 is not network enabled at the time of the installation, the appropriate hardware (NIC card), software (S100 and QNX release) and installation and testing services must be provided to update the PIDS and the FAAS at the time of the installation.

4.4.4.2. Event Logging

The Genetec Omnicast Server must provide the capability for all events and logs to be collected and stored locally.

The Genetec Omnicast Server must provide the capability to connect to the Data logger and export events and logs to it in real time using Starcom over IP Protocol.

4.4.4.3. Starcom over IP protocol

Details of this protocol will be provided at the bidders meeting.

4.4.5. System Operation

The existing CCTV system must remain operational throughout the installation of the new equipment. All integration must be coordinated with the institution's operational management in accordance to an Integration Plan which requires prior approval by the Technical Authority.

4.4.6. Installation schedule

The contractor must provide a phased approach schedule. CSC requests that the network head end and all network switches are installed and tested before any work is scheduled for the ranges. It is requested that electrical work in the ranges be combined with the installation of new and replacement of existing cameras. All work must be completed on a range by range basis.

4.4.7. Conduits and Cabling

The contractor must avoid, as much as possible, the use of conduit in inmate accessible areas. The contractor must utilize existing pipe chases, existing conduit in the walls, etc., where possible. New lengths of conduit must be of the minimum necessary length. The contractor must install rigid conduit in all ranges. All newly installed conduits carrying video for this project must be identified, except in inmate accessible areas, by prominent labels with **BRIGHT GREEN**

wording. These labels must be located at each end of the conduit run, on both sides of any penetration of a wall, and at 3.5 meter points along its length. Patching and painting must be done around new conduit installations, however painting the conduit is not required.

4.4.8. Conduits and Cabling

The deployment of this CCTV switching infrastructure must use existing on-site Fibre cabling connections between buildings and/or switches.

Full deployment and benefits of the core with active-active links must use 2 Multi-mode fibre strand pairs, one connected to each of the core switches to provide active-active links from each of the connected Nodes to the core switches. This reduces single points of failure and dependencies of the network on any individual switch or link.

All data cables and data jumper cables (minimum 23 gauge), jacks and connector boots installed as part of this project, whether CAT 6 or fibre optic, must be BRIGHT GREEN in colour. All cables must be FT4 rated. All patch cables must be labeled at each end with **mechanically produced labels** designed specifically for cable labeling. All fibre optic strands must be terminated with connectors. All CAT6 premises wiring solutions must come with a minimum 10 year warranty on the connectivity between terminations on all premises cabling solutions deployed.

All patch cables are to be stranded cable with RJ45 connectors. All installed runs of CAT6 cable are to be solid conductor cable and terminated into patch panels in equipment racks. Cameras must be connected directly to installed cable either terminated with a TIA compliant CAT6 RJ45 solid conductor connector or a TIA compliant factory assembled stranded CAT6 pigtail with RJ45 connector on the end of the installed cable. Faceplates and patch cables for camera connections will not be acceptable.

An installed cable is any cable that is run through a conduit, run from one area in a building to another area or any cable that travels farther than the adjacent equipment cabinet in a series of cabinets. Note: Equipment cabinets must be abutting and without side panels to be considered adjacent. Conduit and/or cable trays are available between the cameras and the CER.

Rigid conduit must be used in all inmate accessible areas e.g. walkways, low ceilings, and gymnasiums.

Media converters for long run outdoor connections may be either temperature hardened or installed in heated enclosures.

4.5 Equipment Racks

The contractor must supply new equipment cabinets in the West Electrical room adjacent to the AGT room for the Network Video Recorders. The contractor is responsible for all costs associated to include sufficient cooling for all CCTV hardware. The contractor must provide a solution which includes venting through the exterior wall of the room.

4.6 Removal of Equipment and Cables

4.6.1. Disposition

The contractor must remove all of the redundant cables, conduit and equipment located in and on various buildings. Care must be taken to ensure that any cables and conduits of other systems are not damaged. All electronic equipment must be handed over to CSC in good condition. The

contractor must dispose of all of the removed cables and conduit off site in an environmentally friendly way.

4.6.2. Inventory List

The contractor must provide, to the Design Authority, a list of all equipment to be removed 2 weeks prior to any equipment removal. This list must contain the following information as a minimum; location, make, model and serial number. The contractor must return all removed equipment to the local ADGA electronic maintenance workshop, where it will be inventoried and tagged for disposal. This information will be used to ensure the removal of the equipment from the maintenance contract, and its proper disposal.

4.7 Camera Types

Each type of camera provided must meet all operating specifications listed associated Electronics Engineering Standards unless specifically otherwise stated in this statement of technical requirement.

All provided cameras will provide a minimum of 2 simultaneous video streams, one of which must be an H264 video stream in 800x600 resolutions.

The lenses must be of the same manufacturer as the cameras, or approved by the camera manufacturer. Unproven third party lenses are not acceptable.

Analogue cameras are NOT acceptable for any new installation.

4.8 Camera Power Supplies

All new CCTV cameras must be powered via PoE over the interconnecting Ethernet cable, outdoor PTZ cameras may be powered by separate rack mount PoE, PoE+ or PoE++ injecting power supplies located at the closest NODE or electronics equipment cabinet to the camera. It is preferred all cameras are powered via PoE directly from the supporting network switch. Where separate PoE, PoE+ and PoE++ injectors are necessary they must be securely rack mounted, if more than 4 PoE injectors are necessary in a cabinet, they must be mounted into a manufacturer designed chassis designed specifically to host the injectors and reduce cabinet density. All exceptions must receive approval by the Technical Authority.

Where exceptions are approved by the Design Authority, the contractor must supply and install camera power supplies that must provide the required voltage and amperage to power the cameras. The power supplies must be installed in the electronic equipment rooms or in a secure location identified by the Technical Authority.

4.9 Expandability

It must be possible to expand the system beyond the originally installed capacity through the installation of additional hardware. The system expandability must not be limited in this regard. It must be possible to use the digital backbone for other applications in the future, such as Voice Paging, Voice Intercom, Access Control, Door Control, etc. These systems may be installed by a different manufacturer than installed the original IP video system. A minimum of 50% spare capacity is required for expandability on the new distribution.

4.10 Network Architecture

4.10.1. General

CSC proposes to deploy an upgraded network infrastructure capable of providing integrated support for multiple Electronic Security System (ESS) sub systems. For this deployment, this network infrastructure must support the deployment of CCTV cameras and associated client computers. The system must be expandable to scale to support additions to this CCTV network infrastructure and/or addition of further ESS sub-systems within the institution as required in the future. This network infrastructure will provide an integrated, end-to-end “virtualized” architecture for the systems connected to it, using state of the art techniques for the network operation and configuration as described in sections below.

The new network switching infrastructure must be sourced by one switch vendor with the ability to interface in a multi-vendor manner to other vendors equipment should existing or future requirements deem this necessary.

4.10.2. Network Traffic

The traffic on this network will be predominantly streaming video from CCTV camera operation. The provided network infrastructure must be optimized for (H.264) multicast video operation for both cameras covered by this deployment and the addition of further cameras which may be added in the future; optimization including the perspectives of:

- 4.10.2.1. simplicity and efficiency of protocols involved;
- 4.10.2.2. efficient video streaming with required low latency, high bandwidth and network resiliency for predictable, always on connectivity;
- 4.10.2.3. connectivity to the associated video management system (VMS), storage and viewing stations (NVUS).

The system must be capable of supporting thousands of independent streams. The system must be configured with readiness for sub-second failover recovery in the event of any failure, with no visible loss of data, once active-active links are deployed within the institution. The faster recovery is to maintain connectivity and avoid data or packet loss and minimize pixilation of video data.

4.10.3. Inter Switch Traffic

The network infrastructure must provide an open system, multi-vendor capable, communication environment utilizing IEEE 802.1aq Shortest Path Bridging (SPB) to forward and control traffic between switches.

4.10.4. Switch Configuration

4.10.4.1. Capacity

The network infrastructure must consist of a Core network infrastructure in the main Communications equipment room and Edge switches to be built primarily from stackable 24 or 48-port switch devices as range capacities demand.

4.10.4.2. Optimal configuration for sparing

The contractor is responsible for taking all steps to minimize the number of network equipment devices required to minimize sparing requirements.

4.10.4.3. Quality of Service

All switches must include QoS (Quality of Service) and security management capabilities. Each switch must have the ability to classify, mark and prioritize traffic into priority queues, and/or weighted round robin queues on every port, and maintain QoS across the virtual / stack backplane. Classification controls and ACL (Access Control List) strategies must include the ability to sort traffic based on: MAC Address, 802.1Q VLAN Identification (VID), IP Address,

TCP/UDP Ports, CoS (Class of Service), ToS (Type of Service), and DSCP (Differentiated Services Code Point).

4.10.4.4. Traffic Segregation

The network infrastructure must provide a layer 2 SPB VID (VLAN identification) environment in which each ESS subsystem has its own allocated VID to provide for secure traffic segregation for each sub system and thus ease of monitoring, troubleshooting and maintenance. Each VID must be logically separate from any other and thus allow multiple services and systems to operate independently on the same wired infrastructure.

4.10.4.5. Network Topology

The network infrastructure must be capable of supporting flexible topology configurations e.g. star, full or partial mesh or ring topology to allow for optimal use of additional data paths as these become available and thus provide extra resiliency and readiness for redundancy in network connectivity connections.

4.10.4.6. Switch Mounting Configuration

All network switches within the network infrastructure must be mountable in 19" mounting rail racks, and that the switches do not exceed the depth of communication racks and cabinets.

4.10.5. Network Access Control and Security

For network access control and security, the network system must provide software for automatic edge device authentication to ensure edge devices are compatible devices for installation, manage device permissions and monitor the health of connected devices. All network switches must be capable of network access control (NAC) via device authentication and IEEE802.1x Port-based NAC, and include a management GUI interface for maintenance equipment. Where deployment of the NAC authentication mechanism requires the installation of a server for its functionality this MUST be provided by the contractor.

Each switch must support end-to-end (system-wide) network infrastructure support for a flexible and robust, optimally high availability and reliable (Best in class mean time between failure) network (that is always on), with high throughput (1Gbp) and providing a lossless environment with lowest latency (<4ms) for an evolving, high performance CSC institution data center environment.

The network architecture must support zero down time for maintenance to core switches allowing for the continuous operation of video surveillance and other connected ESS subsystems and services.

Technical requirements:

- 350 W, 120 V power supply; POE switches must be able to concurrently deliver up to POE+ per port
- Must support up to 50 Ethernet ports (48 port version)
- Must provide software support for IPv4 and IPv6

Temperature range of operation: OoC to 40oC

Operating humidity range: 0 to 95% relative humidity

4.10.6. Core network

The core network must consist of a switch cluster, with a minimum of two L2/ L3 switches acting

as one logical switch, providing active-active switch operation and linkage capability to be located in the main Communications Equipment Room. This switch cluster must provide high availability connectivity and performance utilizing active-active links to each connected Switching Node, and provide overall management of the SPB network. Thus, if one core switch becomes inoperable (maintenance update, equipment failure) bandwidth is dropped by a factor of 50%, but the second unit maintains 100% of the connectivity requirement and maintains uninterrupted operation of the overall network.

Core Switches must include clustering capabilities, whereby the physical core switches can be logically combined to appear as a single L2 switch, from the perspective of any edge switch or switch stack, and from any multi-NIC equipped server or appliance. These 'virtual' links between the edge and the core cluster must be Active-Active (i.e. spanning tree, and other loop avoidance or hot-standby methods must be disabled), load sharing, and capable of scaling up to a 8 physical interfaces, spread across a stack (or separate module slots in the event of a chassis based core switch), bound into a single virtual trunk. It is imperative that service outages normally associated with network disruption, such as the restart, module alteration, power outage, or software/firmware reload of a single core switch does not disrupt the flow of traffic through the entire virtual / clustered core.

This switch cluster must be made up of 19" rack mountable 1RU switches providing the capability to be configured with Layer 2 and layer 3 switching features.

The core switches and network infrastructure must support ease of provisioning via edge only device and service provisioning, providing ease of configuration at the edge devices automatically informing the network infrastructure of a move, add or change and not require core configuration when changes to the network are required. The edge only provisioning must be capable of adding a new device to the associated VID.

Each of the core-switch cluster switches must support a minimum of 1 Gbps wire speed, (with migration option for 10Gb future uplinks), and must provide hot-swappable power supplies with redundant fans..

4.10.7. Edge network

The edge switches must be stackable 48 (or where appropriate 24) port network switches utilizing 802.1aq SPB allowing for ease of future expansion of the network infrastructure and the capability for multiple connections into different switches in the stack utilizing load balanced network paths to provide an extra level of resiliency within the network in case of any switch failure. This provides flexible scalability for connectivity of future subsystems and equipment.

Each stacked switch must be hot swappable such that any failed unit within the associated stacked switches can be replaced without impact to the rest of the network operation and when replaced the system must provide automated self-configuration such that the replaced switch assumes its prior configuration and operation without need for manual operator configuration.

The edge switches must provide:

- a) Minimum of L2+ switching
- b) 10/100/1000 Mbps switching
- c) 1GBps SFP+ uplinks (with migration option for 10Gb future uplinks) resilient, always on connectivity
- d) Wire-speed performance and non-blocking throughput to support a variety of applications including requirements for low latency, high bandwidth, reliable video surveillance
- e) Field replaceable redundant power supplies for increased resilience
- f) maximum POE wattage to support CCTV surveillance cameras deployed with capacity for

- g) further additions; must be able to concurrently deliver up to POE+ per port
- h) Flexibly support for IEE 802.3af POE and IEEE 802.3at POE+ devices per port, optimized for video surveillance (including PTZ devices, HD)
- i) Provide one-touch edge provisioning for edge devices with any move, add or change communicated automatically throughout the network infrastructure
- j) capability (via stackable functionality) to add further network capacity as required without impacting current operational switching
- k) Support IEEE 802.1aq SPB
- l) Advanced QOS and prioritization
- m) Support for both IPv4 and IPv6 management addresses

The Edge switches must provide for edge-provisioning, automatically informing the rest of the network of the change/ addition, eliminating the need for manual configuration of the core switches when changes are made

4.11 Network Video Recorder System

4.11.1. Required Server and SAN Storage Functionality

The term “NVRs” refer to a “Network Video Recording System” consisting of a video directory, video archivers and video storage. RAID redundancy may be used in the directories, archivers or for virtualization of both directories and archivers over redundant appliances. Video storage is detailed below. The provided NVR must be a Genetec certified storage solution.

4.11.2. Directory Servers

The provided NVR must be controlled by contractor provided, installed and integrated dual redundant directory servers operating the Genetec Omnicast 4.8 VMS. Each directory must mirror the sister directory and in the event of a directory failure, the mate directory must seamlessly continue to manage all video from the CCTV network to the video archivers. Each directory must be equipped with as a minimum:

- 1) Dual redundant power supplies, each supply to be hot swappable.
- 2) Minimum Intel Core i7 3770 4 core processor or better
- 3) Minimum 16GB DD3 RAM
- 4) Minimum 2 x 256GB SATA3 SSD configured in a RAID 1 array for redundancy
- 5) Minimum 2 x 1Gb Ethernet NICs
- 6) Minimum 1x 16x DVD+/- RW drive

4.11.3. Failover mode

The provided NVR must use the Genetec failover feature. A failover array must be provided at a ratio of 2:10 (2 failover arrays for every 10 active arrays). If an array experiences a failure or if more than 33% of the drives in an array experience failures, or more than 33% of the drives are removed or switch to off-line status, the entire array must automatically switch to off-line status and all cameras being recorded on the array must seamlessly switch to a failover array with no loss of video recording:

4.11.4. Storage Capacity and compression format

The provided NVR must have sufficient capacity to record up to 400 cameras at 800x600 pixels minimum, assuming a data rate of 6Mbit/second, at a frame rate of 30 fps for a minimum time period of 168 hours (~455 GByte/camera). The compression method must be H.264. Compression must be 70% where 100% is highest quality.

4.11.5. Required Server and SAN Storage Functionality

The hardware platform must have the ability to run video management applications concurrently with shared storage on a common hardware platform using the VMware vSphere Hypervisor whereby;

- a) Separate physical VMS servers are not required.
- b) Separate physical failover VMS servers are not required.
- c) Power and cooling for both server and storage functionality is contained within a common 2U platform.
- d) Rack and floor space for both server and storage functionality is contained within a common 2U platform.
- e) Applications running on each integrated platform must have access to the combined capacity of the storage in all platforms that are clustered together.
- f) Applications running on each integrated platform must have access to the combined bandwidth of the storage in all platforms that are clustered together.
- g) The integrated Server/SAN platform must support automated application recovery to reduce downtime.
- h) Both storage and server operations must be resilient to an appliance failure.
- i) Failover of the server application must be automatic in the case of an appliance failure
- j) The integrated Server/SAN platform must support Windows Server and Linux operating system environments.
- k) The platform must support Microsoft Storage Server for optional NAS share access.
- l) The platform must support Linux running SAMBA for optional NAS share access.

4.11.6. Basic Storage configuration

- a) Storage must be addressable by up to 128 external servers or hosts.
- b) Storage must be IP attached via Gigabit Ethernet using commonly available networking configurations and equipment.
- c) Storage must conform throughout to the iSCSI standard.
- d) Storage must be SATA-based for cost effectiveness.
- e) System must support SLC solid-state cache for database performance.
- f) Storage system must be UL and CE certified.
- g) Storage system must conform to and be deployable in industry standard 19" rack configurations.
- h) Storage system must support at least 12TB raw storage per 2U (3.5") of vertical rack space.

4.11.7. Availability

- a) Storage system must support high availability with no single point of failure causing loss of data or interrupting access to data.
- b) Storage must protect data for up to five simultaneous disk failures with no loss of data or loss of access to data.
- c) Storage must protect against loss of a storage appliance or controller with no loss of data or loss of access to data.
- d) Storage must protect against loss of a networking path between servers and storage, including network interface card, cables and switches, with the ability Storage must support dynamic replacement of hardware components without interrupting access to data.
- e) Storage must support the ability to replace disk drives without the need to interrupt data access.
- f) Storage must support the ability to replace power supplies without the need to interrupt data access.
- g) Storage must support the ability to replace fan modules without the need to interrupt data access.

- h) Storage must support the ability to replace entire appliances without the need to interrupt data access.
- i) Storage must support the ability to replace network switches without the need to interrupt data access.
- j) Storage must support dynamic management features to ensure continuous data access.
- k) Storage must be expandable by the addition of disk capacity without the need to interrupt data access.
- l) Storage must be expandable by the addition of network bandwidth without the need to interrupt data access.
- m) Storage must support the ability to dynamically alter data protection options (RAID level) without the need to interrupt data access to the affected data.
- n) Storage must provide flexible, selectable data protection options.
- o) Storage must provide enhanced RAID 6 data protection for critical data protection environments.
- p) Storage must provide enhanced RAID 5 data protection for storage-efficient protection.
- q) Storage must provide enhanced RAID 1 data protection for higher 10 performance data protection.
- r) Data protection options must be selectable and configurable on a volume-by- volume basis.
- s) Storage system must provide advanced data recovery methods to maximize data availability.
- t) Storage systems must include dynamic sparing capability to allow immediate rebuilding of failed drives
- u) System must conduct background disk data verification to ensure maximum data availability
- v) System must have the ability to prioritize data recovery versus data access and to have that priority dynamically alterable before or during data recovery
- w) System must have the ability to prioritize recovery tasks by volume
- x) System must provide predictive sparing to identify poor performing drives in advance of failure

4.11.8. Scalability and Performance

- a) Storage system must be scalable in capacity, supporting a single volume growth to 288TB;
- b) Capacity must be added to the system in modular increments of 12 or 24TB.
- c) Capacity scaling must be non-disruptive allowing new capacity to be dynamically added to the system without interrupting access to data.
- d) Physical capacity added to the system must be configurable into new volumes or added to existing defined volumes without the need to interrupt data access
- e) Storage I/O performance must be scalable
- f) Support up to 12 controllers; complete Active/Active.
- g) System must support a minimum throughput of 2 Gigabits per second and 30,000 IOs per second.
- h) System must allow additional bandwidth and I/O processing to be configured scaling to at least 24 Gigabits per second throughput and 360,000 IOs per second.
- i) System must allow scaling of solid-state write cache to 600GB
- j) Addition of I/O performance capability must be non-disruptive and not require data access to be interrupted
- k) Storage system must support multiple storage hosts without the requirement for additional host software license charges
- l) Storage system must support future capacity expansion with newer technology
- m) System must provide a solid-state write-cache that scales across appliances. The system write-cache must protect in-flight data against loss of a complete appliance

4.11.9. Management

- a) The system must provide an easy-to-use graphical management capability
- b) The system must self-discover its hardware configuration
- c) The system must provide capacity and performance usage statistics
- d) The system must allow dynamic configuration of volumes
- e) The system must allow volume attributes including RAID type and volume size to be dynamically alterable without interruption of data access
- f) The system must have the ability to prioritize data migration versus data access and to have that priority dynamically alterable before and during data migration
- g) The system must provide administrator security controls
- h) The system must include a scriptable Command Line Interface
- i) The system must include advanced maintenance and manageability features.
- j) The system must log configuration changes and system events.
- k) The system must detect drive failures and graphically (via GUI) and physically (via lights) identify the failing drive.
- l) The system must provide an audible alarm option.
- m) The system must detect controller failures and graphically identify the failing controller.
- n) The system must perform predictive failure assessment of disk drives to proactively manage low performing disk drives
- o) Simple Network Management Protocol (SNMP) traps have been increased thus providing more remote notification alarms to the PIDS and FAAS Display Units in the MCCP.

4.11.10. Directory Servers

The provided NVR must be controlled by contractor provided, installed and integrated dual redundant directory servers operating the Genetec Omnicast VMS. Each directory must mirror the sister directory and in the event of a directory failure, the mate directory must seamlessly continue to manage all video from the CCTV network to the video archivers. Each directory server must be deployed on a server equipped with as a minimum:

- a) Dual redundant power supplies, each supply to be hot swappable.
- b) Minimum Intel Core i7 3770 4 core processor or better
- c) Minimum 16GB DD3 RAM
- d) Minimum 2 x 256GB SATA3 SSD configured in a RAID 1 array for redundancy
- e) Minimum 2 x 1Gb Ethernet NICs
- f) Minimum 1x 16x DVD+/- RW drive

4.12 Uninterruptible Power Supply

4.12.1. General

All components of this system must be supported by rack mount UPSs, including cameras, switches, media converters, video converters, NVRs, and NVUSs, except NVUS monitors.

4.12.2. Existing UPS

There is an existing Liebert Nfinity 16 KVA/11.2KW UPS in the West electrical room that may be expanded to support all new CCTV equipment in the new server room. Prospective bidders will be provided with the opportunity to determine the current capacity of the UPS and its configuration during the site visit. This will provide sufficient information to allow bidders to include the provision for any additional capacity that may be required to support the upgrade.

4.12.3. UPS Shutdown process

All UPS units provided to support NVUS (clients) must be connected with the UPS client software to allow the UPS to command a controlled shutdown of the client when the UPS has reached a

state in which only 10% of rated capacity is left.

4.13 Network Video User Station

All NVUS must be rack mounted and installed in the new Server room and/or the AGT room. Monitors, keyboards, mice, and joysticks must be remotely controlled to the user area. A NVUS must present no more than 9 images and must support no more than 2 monitors. KVM extenders must be IP based. Where NVUS must be placed in an office or user area the NVUS noise levels must not exceed 50db at 3ft from the computer. NVUS video viewing streams must be the same size, frame rate and bandwidth as the recording streams. Existing NVUS stations must be replaced with new stations. Each command post location must have the ability to control video monitor screens available for display viewing. The SIO must have the ability to retrieve and retain evidentiary data.

4.14 Monitors

The contractor may be able to use existing monitors. This is to be determined at the site visit and further qualified in the proposal and subsequent Preliminary Design Reports. In the event that monitors are required, must supply three 22" LCD security surveillance, narrow bezel monitors in each of the five security range control posts, The monitors must incorporate control panel lock out features. Existing monitors must be removed if not reused.

4.14.1. Environment and Power

The monitors provided must meet the environmental, power, mechanical and technical requirements for the monitors as specified in ES/STD-0227.

Type 1 Monitor – Control Post Monitor 22" LED

The NVUS monitors are not required to be connected to a UPS, but must be connected to the institution's emergency power supply.

4.14.2. Configuration

Monitors provided must meet the following criteria:

- Have a minimum resolution of: 1920x1080
- Aspect Ratio: 16:9
- Response Time: 5ms or better
- Contrast Ratio: 3000:1 and incorporate automatic pixel shift technology to prevent static image burn-in
- Input Connectors: D-Sub & HDMI
- 178° / 178° Viewing Angle (Horizontal / Vertical) VESA compliant mount

4.15 Computers

All computers must be equipped with at a minimum;

Intel Core i7 2600 @ 3.4 GHz
16 GB of RAM DDR3
500 GB SATA II hard drive for OS and Security Center applications
1 GB PCI-Express x16 dual-head video adapter
1600 x 1200 or higher screen resolution
100/1000 Ethernet Network Interface Card
16x DVD+/- RW Drive
3 Year Hardware Warranty

4.16 Fibre Requirement

If required, any new Fibre installations must comply with ES/SOW-0110. All new fibres must be tested in both directions with an OTDR with all signal strength values documented and provided at Acceptance Testing. The contractor must replace and/or repair any video, power, conduit and junction boxes used to complete this project in accordance to the electrical code.

4.17 Finishing

Where walls are cut, opened or damaged the contractor must repair the wall to its original appearance, including taping, sanding and colour matching existing paint.

Where the contractor must use wire mold or expose conduit in office areas or other work areas the contractor must paint the exposed conduit to colour match the office where it is installed.

5.0 ADDITIONAL REQUIREMENTS

5.1 Support

The Contractor must meet the following support requirements:

5.1.1. National Distribution :

- a) Contractor to have the ability to provide national distribution and local parts and service outlets.

5.1.2. Escalation Plan:

- a) Upon contract award, the Contractor must provide the name and credentials of qualified service technician(s) or manager(s) who must be responsible for ensuring that all inquiries or service issues related to the system are addressed satisfactorily and in a timely fashion.
- b) This/these individual(s) must have the authority, resources, and responsibility to address technical issues, dispatch a service representative to the site if required, escalate any issue that cannot be resolved within the expected time frame, and keep CSC informed at regular intervals until issues are resolved.
- c) Provide your company's definitions for problem types with expected response resolution times, and company's procedures for escalating service issues that are not resolved within expected time frames.

5.1.3. Local Technicians:

- a) The Contractor is to provide one or more local technicians to handle on-site maintenance and repair of the equipment at the institution.
- b) The local technician(s) must be trained, certified, and available for dispatch to the Institution any time a system problem cannot be diagnosed and rectified by CSC personnel.
- c) Should it become necessary, the Contractor must be willing and able to dispatch additional technicians to the Institution?
- d) If on-site service is to be provided by a subcontractor, identify the proposed subcontractor and describe the subcontractor's qualifications to provide this service.
- e) The Contractor is fully responsible for all work performed by a Contractor-provided subcontractor.

5.1.4. System Support:

- a) The Contractor must provide full support for all elements of the system through completion and acceptance by CSC and for three full years after acceptance.
- b) This support must include system upgrades (as they become available), troubleshooting, the correction of any system bugs or deficiencies, and the resolution of any operating problems.

5.2 Operator Training

The contractor must prepare and present a one-day training course, in English, to two groups with five Operator/Trainers in each group, responsible for the operation of the equipment in accordance with the specification ES/SOW-0101 Statement of Work. The course must concentrate on the features and proper operation of the installed system. The course must be presented on the site within two weeks of the successful acceptance testing of the system. , the Contractor must also meet the following training requirements:

- a) Log all operators' names who receive the informal training.
- b) Provide one session of formal operator's training for each living unit.
- c) Provide an interactive Power-Point Presentation as a training aid for the operator's training that is suitable for use during formal training and for later use by CSC for refresher training.

- d) The training plan must be included with the proposal.

5.3 Maintenance Training

The contractor must prepare and present a two-day training course, in English, to five individuals responsible for the maintenance of the equipment to the technicians responsible for the operation of the equipment in accordance with the specification ES/SOW-0101 Statement of Work. The course must concentrate heavily on the material contained in the technical manual and site manual. The course must be presented on the site within two weeks of the successful acceptance testing of the system.

The contractor is responsible to ensure that CSC maintenance technicians receive training to be able to provide 1st level monitoring equipment, the Contractor must also meet the following training requirements:

- a) Provide an in-depth maintenance course for the electronic maintenance technicians (ADGA). Course duration must be at least two days.
- b) Log all the names of all technicians who receive the informal training.
- c) Provide one session of formal operator's training for each living unit.
- d) Provide an interactive Power-Point Presentation as a training aid for the operator's training that is suitable for use during formal training and for later use by CSC for refresher training.
- e) All manuals and as-built drawings must be available for the training sessions.
- f) The maintenance training plan must be included with the proposal.

5.4 Equipment Failure

In the event of any failure of equipment under this STR, including the network switching infrastructure, the contractor is responsible for immediate resolution for resumption of full system operation. This must include provision of a support for three years from system acceptance, including a response time to a service call of within 4 hours.

In order to facilitate this, the contractor must be required to ensure appropriate maintenance support agreements are in place with the switch vendor to provide immediate support in the event of equipment failure. The contractor must provide proof of the availability of certified maintenance support.

5.5 Manuals and Drawings

The contractor must provide at least four sets of complete documentation including 4 CD's or DVD's, which must include operation manuals, service manuals, and as-built documentation for the system in English; including drawings in AutoCAD 2013 and PDF format. This documentation must be provided be in accordance with CSC document ES/SOW-0101 unless superseded by this ST.

In addition to the requirements defined in the above documents, the documentation must also meet these requirements:

- a) Operator's manuals must include both a complete binder with all detailed information, and a single laminated sheet with Condensed instructions.
- b) Condensed Instructions must be laminated for durability.
- c) Provide at least 10 operator's manuals including the Condensed Instructions.
- d) Maintenance Manual: Upon completion of the project submit to CSC three (3) electronic copies (DVD disk) containing PDF files and three (3) paper copies (in loose leaf binder) of operation and maintenance manual. Include all operational and maintenance documents. Manual must include but not limited to:
 - I. Contractor/Suppliers list

- II. System Description and Operation Data clearly explaining all system features and functions.
 - III. Detailed System Parts Specifications and Information.
 - IV. All as-built drawings c/w detailed block and wiring diagrams and schematics.
 - V. Testing and Commissioning (T & C) Reports.
- e) All Manuals must be delivered to the CSEM at Regional Headquarters, Prairies, 2313 Hanselman Place, PO Box 9223, Saskatoon, Saskatchewan, S7K 3X5
 - f) Electronic manuals must be structured based on a database framework with direct links to the appropriate PDF files. Document retrieval and viewing must be executed through a menu driven approach. All PDF files must be enhanced with appropriate bookmarks to facilitate searching of information within the document or linked 10 other relevant documents for references.

Provide a handover report which includes details of the equipment, dates of warranties, contractor contact information and other project information. A copy of this document is provided as Annex A.

5.6 Software Documentation

The contractor must provide CD copies of all system software in accordance with specification ES/SOW-0101 Statement of Work. The contractor must provide two copies of the software to the site, one to the Design Authority and one to the CSEM.

5.6.1. Acceptance Testing Procedures

- 5.6.1.1. The contractor must provide a detailed ATP to the DA, or his designated representative, by fax or email, for approval at least two weeks prior to the start of installation of the CCTV equipment and system.
- 5.6.1.2. The contractor must complete *one hundred percent* of the tests outlined in the ATP prior to the ATP testing being carried out by the DA.
- 5.6.1.3. The contractor must provide a *fully completed and signed copy* of the ATP to the DA, or his designated representative, by fax or email, at least two working days prior to the start of the final ATP testing. This copy of the ATP must include all of the results of the tests carried out in Section 5.6.2.
- 5.6.1.4. In the case where subcontractors have been used, the contractor must provide written confirmation that the work of their subcontractor has been inspected and verified. This verification must be sent to the DA or his designated representative, by fax or email, at least two days prior to the start of the ATP.
- 5.6.1.5. Testing may be carried out by the DA, a designated representative or a third party contractor.
- 5.6.1.6. The DA may repeat all of the ATP tests done by the contractor or a percentage of them. During the ATP, if an unacceptable level of failed tests is encountered, the ATP testing must be halted until the contractor has corrected the failures.
- 5.6.1.7. If the DA during the ATP testing finds a minor deficiency that does not affect the operational effectiveness of the CCTV equipment or system, the ATP testing may continue. If a major deficiency is found during the ATP testing that does affect the operational effectiveness of the CCTV equipment or system; the testing must cease until the deficiency has been corrected.

- 5.6.1.8. ATP testing must be done during normal working hours, 08:00 to 16:00, Monday to Friday. ATP testing at other times will only be done in an emergency situation.
- 5.6.1.9. The DA or designated representative will sign-off on the ATP, upon the successful conclusion of the testing. Any minor deficiencies noted during the testing must be indicated on the ATP form. This signature indicates the Conditional Acceptance of the system.
- 5.6.1.10. System must be subjected to operational testing for a period of two (2) weeks following the Conditional Acceptance of the system. CSC will formally accept the system from the Contractor at the end of this two (2) week period, but only if ALL deficiencies have been corrected.
- 5.6.1.11. Any deficiencies noted by CSC during this two (2) week operational testing period must be communicated to the Contractor, who will then be required to correct the deficiencies. The two (2) week operational testing period will begin again after all deficiencies have been cleared.

5.6.2. Institution Operations

The contractor must take every precaution to minimize any disturbance to institutional operations. Equipment and systems operational down time must be kept to a minimum. All down time must be coordinated with the Assistant Warden Operations on site or designate. The contractor's staff may be required to work during evenings, nights and/or weekends to reduce the amount of down time and to meet operational requirements. The contractor and his staff on site must cooperate fully with operational staff and conform to all security requirements.

5.6.3. Institution Address

Edmonton Institution
21611 Meridian Street
P.O. Box 2290
Edmonton Alberta
T5J 3H7
Telephone: (780) 472-6052
Fax : (780) 495-6036

5.6.4. Integration Responsibility

The contractor is responsible for providing a fully functional system

5.6.5. Existing Equipment Removal

It is the responsibility of the contractor to remove from service any equipment that is being decommissioned as a result of this Paging/Intercom System upgrading. Equipment must be turned over to the local CSC Design Authority or other designated authority.

The contractor must remove and dispose of all of the wiring rendered redundant, as a result of an advanced design, off site in an environmentally friendly way.

5.6.6. Security

The Contractor must submit completed CPIC forms for all staff who will be working at the Institutions. The CPIC forms must be submitted to the CSC Project Manager, or his designate, ten (10) working days prior to the start-up date. The contractor and his staff on site must

cooperate fully with operational staff and conform to all security requirements. (Form 1279-1 included)

5.6.7. Schedule

In accordance with ES/SOW-0101, the contractor must provide a detailed work schedule for the installation activities. This schedule must reflect the complete implementation plan by identifying the nature of the work to be performed and the area affected.

5.6.8. Safety

The Contractor must comply with the document titled "Safety Regulations for Security Electronics Contractors Working at CSC Institutions" attached as Annex B.

5.6.9. Communication Responsibility

The contractor is responsible for briefing institution staff prior to leaving the work site for the day. The briefing must be given to the Correctional Manager Operations (CMO), and must include, as a minimum:

- a) Work performed that day
- b) Operation status of the system, including any limitations in functionality or peculiarities
- c) Contact name and number in the event of a system failure

The contractor must maintain a record of these briefings complete with time, date and attendees. The contractor must provide a monthly report on the status of the project in accordance to CSC specifications. A teleconference to include stakeholders may be required.

**Correctional Service Canada
Technical Services Branch
Electronics Systems**

**ES/SOW-0102
Revision 6
1 May, 2008**

**ELECTRONICS ENGINEERING
STATEMENT OF WORK**

**QUALITY CONTROL FOR
PROCUREMENT AND INSTALLATIONS OF
ELECTRONIC SECURITY SYSTEMS**

AUTHORITY

This Statement of Work is approved by Correctional Service Canada for the procurement and installation of all telecommunications and electronic security systems, subsystems, and equipment in Canadian penal institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:



**Manager,
Electronics Systems Research**

Approved by:

**Director,
Engineering Services**


18 Aug 08

RECORD OF REVISIONS

Revision	Paragraph	Comment
3	5.1 - Design Considerations	Tabletop or wall mount power supplies/transformers
4	3.1.1 - Wiring/Cabling Methods	Wiring/cable access
	3.2.1 - AC Wiring	Power outlet strip
		Separate circuit breakers connected to opposite phases of the AC feed
	3.2.2 - AC Power Connections	Power connections via flexible armoured cable
5	Abbreviations	Additions
	1.4 – Manufactured Equipment	Approval of custom equipment
	1.5 – Commonality of Equipment	Add security screws
	3.1.1 – Wiring and cabling	Single conductor wire only on IDC connectors
		Identification of conductors
	3.1.2 – Cable/Wiring Labelling	Acceptable labelling
	3.2.1 – AC Wiring	Mounting of power strips
	3.3.4 - Labelling	Acceptable labelling of racks, boxes, etc.
	5.1 – Design Considerations	DIN rail power supplies preferred
6	2.1 – Environmental Conditions	Expand airborne containments
	2.6 – Finish Application	Change finish material definition
	2.2.2 - Plastic	Remove last sentence
	3.1.1 – Wiring/Cabling Methods	Change “Hydro Codes” to “Electrical Authority”
	3.3.2 - Enclosures	Add requirement to meet IP64

TABLE OF CONTENTS

TABLE OF CONTENTS	3
ABBREVIATIONS	5
DEFINITIONS.....	6
APPLICABLE DOCUMENTS	7
1.0 INTRODUCTION.....	8
1.1 General.....	8
1.2 Scope	8
1.3 Off-The-Shelf Equipment.....	8
1.4 Manufactured Equipment	8
1.5 Commonality of Equipment	8
2.0 MATERIAL AND EQUIPMENT REQUIREMENTS	9
2.1 Environmental Conditions	9
2.2 Materials.....	9
2.2.1 Metals.....	9
2.2.2 Plastic.....	10
2.2.3 Natural Rubber	10
2.2.4 Wood	10
2.3 Toxic Materials	10
2.4 Flammable Materials	10
2.5 Fungus and Insect Supporting Materials.....	10
2.6 Finish Application	10
3.0 INSTALLATION REQUIREMENTS.....	11
3.1 Wiring and Cabling	11
3.1.1 Wiring/Cabling Methods	11
3.1.2 Cable/Wiring Labelling	12
3.1.3 Exterior Cabling.....	12
3.1.4 Slack	13
3.1.5 Terminations	13
3.1.6 Splicing and Joining	14
3.1.7 Shielding	14
3.1.8 Protection	15
3.1.9 Support.....	15
3.1.10 Clearance	15
3.1.11 Inductive and Capacitive Effects	15
3.2 Power Wiring	15
3.2.1 AC Wiring	16
3.2.2 AC Power Connections	16

3.3	Conduits, Enclosures, Cable Troughs and Raceways	16
3.3.1	Conduits	16
3.3.2	Enclosures	17
3.3.3	Cable Troughs and Raceways	18
3.3.4	Labelling	18
3.4	Soldering	19
3.5	Welding	19
3.6	Crimping	20
3.7	Cleaning	20
4.0	GROUNDING REQUIREMENTS	21
4.1	General	21
4.2	Signal Ground	21
4.3	Frame Ground	22
4.4	Combined Signal and Frame Ground	22
4.5	Main Ground Connection Point	22
4.6	Ground to Chassis	22
4.7	Shielding	23
4.8	Lightning Protection	23
5.0	ELECTRICAL/MECHANICAL DESIGN REQUIREMENTS	24
5.1	Design Considerations	24
5.2	Assemblies	24
5.3	Printed Circuit Board (PCB)	25
5.4	Components	25
6.0	QUALITY ASSURANCE REQUIREMENTS	26
6.1	In-plant Inspection	26
6.2	Test Equipment	27
6.3	Calibration	27
6.4	Safety Design Aspects	28
7.0	ON-SITE INSTALLATION	29
7.1	Inspections	29
7.2	Damage to Government Property	29
7.3	Protection of Surfaces	29
7.4	Cutting, Patching and Digging	30
7.5	Visual-Mechanical Inspection	30
7.6	Final System Acceptance	31
7.7	On-Site Maintenance	32
8.0	DELIVERY	33
8.1	Packaging	33
8.2	Addressing	33

ABBREVIATIONS

The following abbreviations are used in this specification:

AC	Alternating Current
ATP	Acceptance Test Procedure
BER	Beyond economical repair (repair cost in excess of 60% of replacement cost)
CER	Common Equipment Room
COTS	Commercial -of-the-Shelf
CSC	Correctional Service Canada
CSA	Canadian Standards Association
DC	Direct Current
DA	Design Authority
DES	Director, Engineering Services
EIA	Electronic Industries Association
EMT	Electrical Metallic Tubing
IDC	Insulation Displacement Connector
ISO	International Standards Organization
PCB	Printed Circuit Board
PVC	Polyvinyl Chloride
QA	Quality Assurance
RFP	Request For Proposal
STR	Statement of Technical Requirements

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES), Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Service Canada (PW&GSC) and/or the Materiel Management Division of CSC is responsible for all contractual matters associated with the system design and implementation.
Project Manager	A CSC employee and/or a contracted person designated by DES to be responsible for the implementation of the project.
Project Officer	A CSC employee and/or a contracted person designated by DES to provide technical and/or engineering services in support of the project.
Contractor	The company selected as the successful bidder.
Off-the-shelf	Equipment which is commercially, complete with field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request For Proposal (RFP) shall form a part of the specification to the extent specified herein.

CSA STANDARD C22.1-1986 Canadian Electrical Code - Part 1 Safety Standard for Electrical Installations

EIA STANDARD EIA-310-D Racks, Panels and Associated Equipment

CSA STANDARD C22.2 Canadian Electrical Code - Part II

EIA RS-406/IPC-C--405A Connectors, Electric, Printed Wiring Boards

Any other applicable industrial safety and control standards governing specific aspects for equipment and/or installations.

1.0 INTRODUCTION

1.1 General

This document defines the quality control requirements for the design, installation, testing and acceptance of telecommunications and electronic security systems in all Correctional Service Canada (CSC) facilities.

1.2 Scope

This specification has been developed to ensure high standards for the installation of electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for equipment reliability, maintainability, longevity, appearance and operational use.

1.3 Off-The-Shelf Equipment

The contractor shall provide commercial off-the-shelf (COTS) equipment wherever possible. COTS equipment shall meet or exceed the manufacturing standards as listed in this specification.

1.4 Manufactured Equipment

Where COTS equipment is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured equipment shall meet or exceed the best commercial equipment manufacturing standards. Approval of the final design, appearance and ergonomics of all custom manufactured equipment shall rest with the DES, Project Manager or CSC delegate.

1.5 Commonality of Equipment

The contractor shall provide commonality of hardware components within the design parameters ie. switch locks, racks, panels, security screws, etc. All equipment, if appropriate shall be interchangeable.

2.0 MATERIAL AND EQUIPMENT REQUIREMENTS

2.1 Environmental Conditions

All materials and equipment which is used in CSC installations shall be equal to, or better than the standards established in the original equipment and shall be chosen with due consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall be suitable to perform over the following environmental ranges:

a. Indoor Equipment

Temperature: 0° C to 40° C; and
Humidity: 20% to 95% non-condensing.

b. Outdoor Equipment

Temperature: -40° C to +50° C; and
Humidity: 0 to 100%, condensing.

Outdoor equipment shall operate reliably and not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

Complete assemblies of indoor equipment shall be resistant to liquid spills, airborne contaminants (dust, pollen and water droplets), shock and vibration.

2.2 Materials

2.2.1 Metals

Metals used shall be either corrosion resistant or be suitably treated to resist corrosion in all potential atmospheric conditions, including tear gas, to which the installation may be subjected.

For the connection of copper to a cadmium or galvanized surface, effective "wiping" of the copper surface shall be considered satisfactory protection.

No cut galvanized fitting shall be used without protection equal to or greater than the original galvanized surface. All parts shall be free from burrs and sharp edges.

Metal which has been cut, scraped, or drilled shall be properly treated (primed and painted) to retain a uniform appearance.

2.2.2 **Plastic**

Plastic materials must be stable and shall retain their original shape and finish over the range of operating environmental conditions specified in 2.1

No material shall be used that softens or hardens within the storage environment in a way which is detrimental to its suitability as replacement parts for existing equipment.

Metal screws shall not be threaded into plastic materials.

2.2.3 **Natural Rubber**

The use of natural rubber is prohibited.

2.2.4 **Wood**

The use of wood or wood products is not acceptable.

2.3 **Toxic Materials**

Materials capable of producing harmful toxic effects under any operating condition, equipment malfunction, or accidental cause shall not be used.

2.4 **Flammable Materials**

Materials, used either for electrical insulation or mechanical purposes which are combustible or capable of causing an explosion, shall not be used.

2.5 **Fungus and Insect Supporting Materials**

Materials capable of providing a nutrient medium for fungus or insects shall not be used.

2.6 **Finish Application**

Finish shall be applied to all surfaces where consideration of appearance and protection against corrosion, toxicity, and other deterioration exists.

Application of finish shall not impair equipment performance, and will maintain uniformity in outward appearance.

Finish materials must be scratch resistant, not react to normal cleaning products and applied so as to last at least ten years.

3.0 INSTALLATION REQUIREMENTS

3.1 Wiring and Cabling

Prior to the installation, all wires and cables shall be tested in accordance with the manufacturer's instructions and shall meet all performance parameters.

Wire and cable harnesses shall be neatly formed and clamped in position. If brackets, forms or clamps are required, these shall be the responsibility of the contractor.

All wires and cables shall be stranded. Single conductor type wires are not acceptable except when such cables are specified to terminate on an IDC type connector. This does not apply to coaxial cables with single centre conductors.

Electrical tape, masking tape, or its equivalent shall not be used on wires, cables or any installed equipment.

3.1.1 Wiring/Cabling Methods

Three (3) or more individual wires or cables which are located in one(1) cable run shall be formed into a cable harness, properly dressed, supported and securely tied with flat lacing twine or equivalent.

Wires and cables which are installed by the contractor external to consoles, equipment racks, pull boxes and junction boxes shall be contained in securely mounted conduit or cable tray systems.

Plastic PVC conduits may be used in underground installations unless otherwise specified at time of bidder's conference.

A rigid steel conduit shall be used in indoor, security sensitive areas and outdoor above-ground applications.

Signal and 120 VAC power wiring shall not be run in the same conduit, cable tray, or raceway; and shall be separated in accordance with the local Electrical Authority.

Wire splicing in cable runs shall not be permitted. All cable runs shall be continuous. If continuous cable runs are not possible, terminal block configurations are acceptable provided they are approved by the Design Authority.

Cross-connects installed on BIX. or similar blocks, must not pass across the face of the block, but must be carried around the block, so as not to impede access to the connections.

BIX, or similar, blocks are to be used for solid wire only. Stranded wires are not to be directly terminated on BIX, or other IDC terminations.

Wires in multi-conductor cables which terminate on connectors, and which are not being used, must be twisted around the cable in a neat fashion. They are not to be cut off.

Wires in multi-conductor cables which terminate on BIX or similar IDC connector blocks, and which are not being used, must be punched down on the block. They are not to be cut off.

All conductors on IDC and any other type of terminal block will be identified with a cable marker and cross referenced in the as-built drawings.

Rectangular slots shall be cut in the computer floor, underneath any cabinets, racks, and consoles, for the running of cables. These slots must constitute at least 1/2 of the available floor area. Sharp edges on the computer floor shall be supplied with suitable protection to eliminate possible nicks, tears or wear in cable insulation sheaths. Individually drilled holes for the purpose of carrying cables from the under floor to the inside of the cabinet, rack or enclosure are not permitted.

3.1.2 Cable/Wiring Labelling

The contractor shall label all cables and cable runs. The labelling method shall be logical and conform to industry standards.

All cables shall be identified with commercially produced or machine printed alpha numeric labels protected by clear heat shrink tubing. Hand printed labels are not acceptable.

All wiring shall be identified at both ends of the wire. The coding shall enable a technician to identify the wire or cable without referring to manual tracing methods, test equipment or as-built drawings.

Cable identification labels shall be attached as follows:

- a. within 30 cm of the termination for both ends.
- b. in the middle of any access point, i.e. pull box, wall shaft opening, cable tray, etc.

All individual wires shall be labelled according to a cable numbering system or wire function plan, which is acceptable to the Design Authority.

All terminal strips shall be identified with its own unique terminal number and function.

3.1.3 Exterior Cabling

Where a cable enters or exits an exterior box, chassis, or conduit, the cable entrance shall be completely sealed to prevent an influx of water. A drip loop shall be formed in the cable to assist in maintaining this weather tight seal.

Conduit bushings shall be used on all conduit entrances/exits.

Sharp edges on metal boxes or chassis enclosures shall be supplied with suitable protection to eliminate possible nicks, tears or wear in cable insulation sheaths.

3.1.4 **Slack**

Wires and cables shall be as short as practical, with sufficient slack to:

- a. allow a minimum of three (3) reconnects due to wire breakage;
- b. prevent undue stress on cable forms, wires, terminals and connections;
- c. enable parts to be removed and replaced during servicing without disconnecting adjoining wires or circuits;
- d. facilitate movement of equipment for maintenance purposes; and
- e. provide drip loops in exterior cabling.

Slack shall be provided in junction boxes where space permits. Slack shall not exceed one single loop of cable forming the circumference of the junction box.

Slack shall be provided below equipment racks and shall be neatly coiled below the access flooring. The length of slack shall be equal to the height of the associated equipment rack. Units in drawers and slide out racks shall be provided with sufficient slack to permit removing the units without severing connections.

All cross connection wiring shall be neat and tidy, properly bundled, and tied. This procedure shall allow sufficient slack for tracing of individual wires via manual methods.

Parts mounted on a hinged door shall be wired by means of a single cable, and arranged to flex without being damaged by the opening and closing of a door. If physical separation between wires is essential so as to make a single cable impractical, more than one flexible cable may be utilized.

3.1.5 **Terminations**

All terminations relying on friction for electrical and mechanical connection shall be tested in accordance with the manufacturer's instructions and shall meet the performance requirements detailed therein.

Terminal fanning strips shall be used where a number of wires are contained in a harness, shall be used unless a multi-pin connector is provided.

Spade terminal lugs shall be used on all wiring, connections to screw-thread terminals, except where solder or other type of terminal is specified.

Where wires are connected to lugs, which are clamped under screw terminals in the form of a terminal connection strip, no more than one wire shall be attached to each lug, in order that each wire may be removed individually. This requirement will not apply in the case of common connections, daisy chain distribution circuits, or similar terminations where wires will not need to be disconnected for servicing.

No more than two (2) lugs shall be attached to each terminal.

Wire and cable insulation shall be stripped back to allow for proper connection to the lug. No bare wire shall be visible between the terminal lug and the insulator.

Terminal strips must be fastened to a hard surface using a screw, or nut and bolt. Adhesive supports to secure the terminal strip, or floating terminal strips are not acceptable.

3.1.6 **Splicing and Joining**

Splicing of wires on new installations is not permitted.

Where connectors are used on cable assemblies, they shall be a locking type which will not disengage under tension.

All joints or splices in underground cable runs shall be located inside accessible, secure, waterproof, and lockable steel enclosures. The enclosures shall be located at least one (1) metre above grade and be firmly secured to existing structures or to stub pole supports.

Splices in underground cable runs, if required to repair Crown caused damage, shall be subject to approval from the Design Authority.

Stranded conductor splices shall be held by wire binding terminals in order to prevent stray strands from causing either short circuits or grounds.

Joints and splices shall be soldered and encased in waterproof shrink tubing for protection against leaching, oxidization, moisture damage, etc.

Joints and splices shall be clearly and accurately identified on applicable as-built drawings.

3.1.7 **Shielding**

Shielding shall be secured on wires and cables to prevent accidental contacting or shorting exposed current-carrying parts, grounded metal objects, or structures.

Shielding shall terminate at sufficient distance from the exposed conductors of the cable to prevent shorting or arcing between the cable conductor and the shielding.

Ends of the shielding material shall be secured against fraying.

3.1.8 **Protection**

Wires and cables shall be strategically located and protected to avoid contact with rough, irregular surfaces or sharp edges.

Wires and cables shall be protected by suitable grommets or bushings when passing through openings in metal.

Guards or other suitable protection shall be provided on insulated high voltage cables.

3.1.9 **Support**

Wires and cables shall be properly supported with adequate strain relief to prevent excessive strain on the connections, devices, or joints of any electrical apparatus connected therein.

Adhesive supports with ty-wrap products shall not be used unless they are secured by a nut and bolt device.

3.1.10 **Clearance**

Physical clearance between wires/cables and associated heat emitting parts, i.e. amplifiers, shall be sufficient to prevent deterioration of the wires or cables. Refer to Table 19 of CSA Standard C22.1 Part 1.

3.1.11 **Inductive and Capacitive Effects**

Wires and cables, including harness wire and cables, shall be located such that inductive and capacitive effects do not adversely affect system operation. The amount of twists in paired wires shall be increased over the length of wire not covered by the cable sheath.

3.2 **Power Wiring**

The contractor shall not employ "Marette" (TM) type connectors regardless of CSA Standard C22.1 regulations. All wiring shall terminate on an insulated or protected barrier strip or terminal board, and be provided with spade terminal lugs where required.

Where control and signal wires which are run in conduit, cable-harness, or cable-trough systems, shall be run in separate wire ways. The separation shall be a physical barrier of suitable material and shall conform to applicable building codes and wiring methods.

All high voltage and/or high current terminations shall be provided with protective guard devices by the contractor. The device shall be mounted to allow for maintenance access to the terminals.

Terminal lugs shall be used on all power wiring, both VAC and VDC.

Warning labels must be installed in accordance with the CSA guidelines to warn maintenance personnel of any hazardous voltages and currents.

3.2.1 AC Wiring

AC wiring methods shall conform to all local and national wiring regulations.

Outlet boxes shall be installed such that all outlets are clear of any obstructions including wiring and cabling, and shall be easily accessible.

Power distribution within a cabinet or rack shall be via a power outlet strip, as provided by the original cabinet or rack manufacturer. A third party outlet strip is not acceptable. All power strips must be mounted into the equipment cabinet with rack mounting hardware.

All power cable installations shall be completed in a neat and sturdy fashion and shall meet all requirements of the specifications detailed herein.

Power cords within equipment cabinets and racks shall be maintained as short as practicable with due consideration for maintenance needs.

Systems which use redundant equipment, such as dual microprocessors, shall power each unit from two separate breakers connected to opposite phases of the AC feed.

3.2.2 AC Power Connections

All AC power connections from the cabinet or rack power outlet strip to the AC junction box shall be via flexible armoured cable. AC power connectors are not permitted.

3.3 Conduits, Enclosures, Cable Troughs and Raceways

3.3.1 Conduits

Conduits installed above ground, and accessible to the inmate population, shall be rigid steel.

Metal conduits installed in secure and inmate accessible areas shall be fitted with double the normal quantity of support hangars.

In locations subject to extreme temperature changes, and/or where conduit lengths are of non-standard size, the contractor shall make provisions for the inclusion of conduit expansion joints.

Rigid PVC conduits shall be used only in buried applications.

Rigid PVC conduits shall not be threaded, but may be used with approved adapters and couplings applied in a manner consistent with industry standards.

EMT conduit may be used in administrative areas, and locations which are not normally assessable to the inmate population.

Liquid-tight flexible metal conduits may be used where a flexible connection is required, i.e. cameras, microwave dishes, etc. In such applications, the length of "flex" conduit shall not exceed one (1) metre.

PVC conduits which cross roadways shall be encased in poured concrete.

The contractor shall provide a suitable means of protecting the buried conduit against damage caused by digging or excavating. The preferred method is installing a tape marker directly above the conduit path.

In addition to these requirements, the applicable industrial standards apply, including:

- a. CSA Standard C22.2 No. 45-M1981 - Rigid Metal Conduit
- b. CSA Standard C22.2 No. 56-1977 - Flexible Metal Conduit

3.3.2 Enclosures

All electrical connections, terminations, and cross connections shall be made within lockable, covered steel enclosures, using good quality locks. At least two keys must be supplied to CSC.

Outdoor enclosures shall be environmentally sealed and gasketed to provide a moisture/dust free and secure environment.

Enclosures which contain electrical equipment such as circuit breakers, relays, switches, and transformers, or cable networks, connections and terminations, shall be weatherproof and dust-tight and meet the provisions of IP64.

All enclosures such as junction boxes, racks and consoles shall be positioned for ease of maintenance, service, and connection/disconnection of cables and cable harnesses.

The contractor shall provide a proper drain hole in all enclosures which are grouted in concrete.

All floor mounted cabinets, racks, and consoles shall be secured to prevent overturning when associated drawers, shelves and movable parts are extended, or when heavy objects are placed on pull out shelves or writing tables.

In addition to the provisions stated herein, the applicable industrial standards shall apply, including:

- a. CSA Standard C22.2 No. 29-M1983 for Industrial Products.
- b. CSA Standard C22.2 No. 94-1976 for Special Purpose Enclosures.

3.3.3 Cable Troughs and Raceways

Cable troughs and raceways shall be continuous and shall be constructed of metal.

The contractor shall provide adequate mounting devices which will permit the use of fastening devices that will not damage conductor insulation.

Cable troughs, raceways, and fittings shall be free from burrs or other sharp edges which may cause damage to the cable or insulated conductors.

Cable troughs and raceways shall be installed as a complete system before the conductors or cables are installed.

Cable troughs may be either ventilated or solid and unless otherwise specified, shall be equipped with covers and steel guards to protect against damage.

In addition to these provisions, the appropriate standards shall apply, including:

- a. CSA Standard C22.2 No. 126-M1980 - Cable Troughs and Fittings.
- b. CSA Standard C22.2 No. 79-1978 - Raceways and Fittings.
- c. CSA Standard C22.2 No. 62-1972 - Surface Raceways and Fittings.

3.3.4 Labelling

The contractor shall label equipment racks, junction boxes etc. The labelling method shall be logical and conform to industry standards. All equipment racks and junction boxes shall be identified with commercially produced or machine printed alpha numeric labels. Hand printed labels are not acceptable.

Identification of chassis equipment shall be located in a suitable location within the rack and affixed to the rack, not the chassis.

Approved materials used for labels include lamicoyd strip, etched metal, stamped labels, or indelible ink.

3.4 **Soldering**

On solder connections, the insulation on individual wires shall not be stripped back more than 1.5 mm from the solder area.

Soldering shall be executed so that positive electrical and strong mechanical connections are assured.

Leads shall not be wrapped more than once around the terminal.

Soldered connections on the back of connector plugs, i.e. cannon plugs, switches, relay sockets or any other device employing solder lugs, shall be insulated by means of a short length of insulating tubing placed over each wire in the connector.

"Cold" solder joints, and excessive solder on connections shall not be acceptable.

Each soldered connection shall be tested for mechanical and electrical strength to ensure that a strong connection is achieved.

Use of acid based solder flux is not permitted.

Where insulation material is subject to heating during soldering, the material shall be undamaged and the fastened parts shall not be loosened.

3.5 **Welding**

All welds shall be free of harmful defects such as cracks, porosity, undercuts, voids and gaps.

There shall be no burn through.

Weld fillets shall be uniform, smooth, and shall cover a sufficient area of the welded surface to ensure that a solid bond is achieved.

Surfaces to be welded shall be free of extraneous particles which may affect the mechanical elements of the welded area.

3.6 Crimping

Crimp connections shall be made in accordance with the manufacturer's instructions. Industry standards shall be observed at all times.

Solid conductors may be used with crimp connections where the use of solid conductor wiring cannot be avoided. In all other cases only stranded wiring shall be used on crimp connections.

Solid conductors which are connected to terminals by crimping shall be soldered as well. This provision only applies to terminal lugs. It does not apply where wires may be spliced by crimping except in the case of some LED's and indicator lights which employ pigtail leads which should be soldered or connected by screw terminals.

3.7 Cleaning

Upon completion of the installation, the equipment shall be cleaned of smudges, loose or excess solder, weld beads, metal chips, burrs, mold release agents, or any other foreign material which might detract from the intended operation, function, or appearance of the equipment.

All corrosive materials shall be removed.

The cleaning processes employed shall leave no harmful residues and shall not have a negative effect on the equipment or its parts.

4.0 GROUNDING REQUIREMENTS

4.1 General

Grounding source and distribution points shall be provided by the Crown unless otherwise specified at the bidder's conference, in the Statement of Technical Requirement (STR), or any applicable documents.

The grounding shall be such that the signal ground, equipment ground, and electrical power ground shall be connected at one point and shall follow the shortest possible path. Where necessary, ground isolation techniques shall be employed.

The path from the tie point to any ground shall be permanent, continuous, have sufficiently low impedance to limit the potential above ground, and facilitate the operation of the 'over current' devices in the circuits.

Ground conductors shall be made of copper, sized for a minimum of 200 circular mils for each 300 mm length of conductor.

Inactive wires installed in long cable or conduit runs shall be grounded to prevent stray or static electrical discharges, with proper consideration given to prevent ground loops or other grounding problems.

Installation must be such that ground loops are prevented.

4.2 Signal Ground

Signal grounds shall be used to provide a ground potential reference which is independent of the frame ground and the power equipment ground.

An insulated grounding conductor shall be connected from the equipment signal ground terminal to the main ground connection point for single units such as equipment racks.

An insulated ground plate shall be used with insulated grounding conductors for multiple units, such as common equipment room (CER) equipment, from each equipment signal ground terminal connected to the plate. The plate shall be connected to the main ground connection point by means of a single insulated grounding conductor.

4.3 **Frame Ground**

The ground connection of the receptacle may be used for the frame ground as long as that ground connection is isolated and insulated from the power equipment ground system. Such receptacles shall be clearly identified so that they will not be used to supply equipment that does not require frame grounds.

The receptacle ground connection conductor shall be insulated and isolated from the power equipment grounding system, and shall be connected from the receptacle ground connection to an isolated ground plate.

The isolated ground plate may be an insulated buss bar for low power applications,.

Size of grounding conductors shall be in accordance with the requirements of CSA Standard C22.1 Section 10 and Table 17.

4.4 **Combined Signal and Frame Ground**

Connection between the signal ground terminal and the frame ground terminal shall be part of the equipment wiring. The connection to the main ground connection point shall be similar to that for a frame ground.

4.5 **Main Ground Connection Point**

Main ground connection point shall be installed in accordance with CSA Standard C22.1 Section 10, and C22.2 No. 41.

4.6 **Ground to Chassis**

Ground connections to an electrically conductive chassis or frame shall be made by:

- a. soldering to a spot-welded terminal lug.
- b. soldering to a portion of the chassis or frame that has been formed into a soldering lug.
- c. using a terminal on the ground wire and securing the terminal by a screw, nut and lockwasher.

When using a terminal on a ground wire which is secured by a screw, nut and lockwasher, the screw shall fit in a tapped hole in the chassis or frame, or it shall be held in a through hole by a nut.

When the chassis or frame is painted, the metal around the screw hole shall be scraped clean and plated (or tinned) to provide a corrosion resistant connection.

4.7 Shielding

Shielding on wire and cable shall be grounded to the chassis or frame, in the manner specified in Section 2.5.5

4.8 Lightning Protection

All equipment with external cabling including radiating cables or other forms of antennas which may be susceptible during lightning strikes or other static discharges shall be protected fully in accordance with the relevant safety rules and regulations.

The ground rod used for lightning protection shall be copper or copper-plated steel, and shall be a minimum of 2.5 metres in length. Where the ground conditions preclude installation of a single ground rod, multiple rods of a shorter length may be used in parallel to provide the lightning protection.

The copper ground conductor shall be fastened to the ground rod using a thermic welding technique. Clamps are not acceptable.

5.0 ELECTRICAL/MECHANICAL DESIGN REQUIREMENTS

5.1 Design Considerations

All equipment shall be manufactured and finished with a degree of uniformity and grade of workmanship which shall comply with applicable industry standards, and the generally accepted principles of safe practice.

Exposed and moving parts that might constitute a safety hazard shall be provided with protective guards and warning labels.

All elements of the equipment shall be designed to operate in a highly reliable fashion, consistent with available technology, with a minimum of system downtime due to scheduled and unscheduled maintenance.

Where units or subsystems are integrated into common facilities, no single failure of a component, sub-assembly, assembly, or sub-system shall result in the failure of any other sub-system or reduced capacity or performance of other sub-systems or parts thereof.

The system shall be designed such that no failure of a single component, unit, subassembly, or subsystem will result in failure of the system or the next higher hierarchical elements.

All equipment shall be designed and installed to provide useful service, with minimal maintenance for a period of no less than 10 years, unless otherwise specified.

Tabletop or wall-mount power supplies or transformers shall not be used to power equipment installed within equipment racks and cabinets. Power supplies or transformers used within racks and cabinets shall be securely fastened to the rack equipment rails or side of the cabinet. DIN rail mounted power supplies are preferred.

5.2 Assemblies

The contractor (or manufacturing agent) shall apply special considerations in the execution of assembling system component parts.

Rack mounted equipment chassis; whose depth from the front face panel to the rear of the chassis exceeds 25 cm shall be equipped with rack slides.

Each assembly shall have a permanently fixed label showing the model number, serial number, and power requirements.

Materials used in assemblies shall be chosen with due consideration being given to the intended use, safety, durability, retention of appearance, and ability to resist corrosion from a variety of causes including tear gas.

In addition to applicable CSC/DES specifications, the appropriate industrial standards shall apply, including:

- a. EIA-310-D Racks, Panels, and Associated Equipment.
- b. CSA C22.2 No. 94-1976 Special Purpose Enclosures.
- c. CSA C22.2 No. 29-M1983 Panel boards and Enclosures.

5.3 Printed Circuit Board (PCB)

PCBs shall be constructed of non-flammable material, preferably a glass epoxy base.

The contractor shall provide extractor devices at the front of each card assembly.
All cards shall have keyed edges to prevent accidental replacement by another type of card.

Each device shall be identified and properly labelled, showing card type, and revision number.

All PCBs shall be etched. Wire wrap connections are not acceptable.

In addition to the requirements set forth herein the appropriate industrial standards shall apply, including:

- a. CSA C22.2 No.154-M1983 Data Processing Equipment.
- b. CSA C22.2 No.0.7-M1985 Equipment Electrically Connected to a Telecommunications Network.
- c. EIA RS-406/IPC-C-405A General Document for Connectors, Electric, Printed Wiring Boards.

5.4 Components

All electrical equipment, i.e. power supplies, amplifiers, etc. attached to the equipment structure shall be fastened securely and rigidly not using nuts and lockwashers.

Electrical components used in manufacturing in-house products shall be of commercial quality and shall comply with the standards of the Canadian Electrical Code, Part II.

Electronic circuit components, such as resistors, capacitors, inductors, or semiconductor devices which have no applicable standards in the Canadian Electrical Code, Part II shall comply with the test parameters as set forth in CSA C22.2 No. 154-M1983 Part 6.

6.0 QUALITY ASSURANCE REQUIREMENTS

The contractor shall provide objective evidence that the system and any major component therein have been designed, manufactured, inspected and tested under the umbrella of a quality assurance program capable of meeting the requirements of the applicable ISO Standard 9002 Series. More stringent requirements will be identified on a case by case basis, as needed.

In addition, the contractor shall develop a site-acceptance test/inspection procedure to demonstrate that all parameters of the system are fully operational and conform to the Statement of Technical Requirements.

6.1 In-plant Inspection

The equipment shall meet all functional, electrical, and visual/mechanical test parameters and shall have been fully tested and inspected by the contractor. Results shall be documented and reported to the Design Authority. Periodic inspections may be done by the Design Authority or his designated representative to verify that the equipment meets all requirements.

Particular attention shall be given to the following:

- a. Inventory of received equipment.
- b. Physical condition of equipment i.e.: scratches, dents, paint chips, etc . . .
- c. Construction techniques, board and components accessibility.
- d. Neatness, clamping and tying of wiring, cabling and harnesses.
- e. Strain relief of cables and wire connections.
- f. Legibility of nameplates, identification plates, and markings.
- g. Safety and protective covers, warning labels and grounding.
- h. Tightness of connectors, screw type fasteners, etc.
- i. Soldered and weld joints.
- j. Completeness.
- k. Operation of drawers, adjustable and sliding parts, controls etc.

-
- l. Shielding.
 - m. Cable and wire connections, ground clamps and terminal strips.
 - n. Type and quality of paint finish.
 - o. Quality of printed circuitry, etching, the electronic components and other associated parts.
 - p. Quality of locks, cabinets and other materials.

It must be noted that the in-plant tests are performed as a requirement of the financial arrangements and serve to guarantee that the design parameters of the FDR are followed and will meet the requirements of the applicable system specification. Sign-off of in-plant tests will not denote any form of final acceptance of the equipment and design.

6.2 Test Equipment

All test equipment shall be supplied by the contractor.
All instruments and test equipment shall be checked periodically by the QA Inspector in order to ensure accuracy of measurement. Records showing when the test equipment was last calibrated are to be provided as proof of accuracy.

6.3 Calibration

All test equipment used by the contractor shall bear a calibration seal showing the date calibrated and the due date for the next calibration.

The contractor shall ensure that the test equipment's calibration due date does not occur during the test period.

All equipment performance measurements shall be made with instruments whose accuracy and calibration guarantee that the results comply with the terms of the contract.

CSC reserves the right to furnish and/or require the use of any applicable instruments and standards in order to ascertain the accuracy of any measurements.

Test equipment suspected of being damaged or out of calibration shall be rejected by the Design Authority.

6.4 Safety Design Aspects

Particular attention is to be given to the safety design aspects of CSC installations, so as to minimize any hazards while in gaining access to, operating and servicing equipment. Such design aspects shall include the proper grounding of equipment, the installation of protective covers and warning labels over high voltage areas, the installation of warning labels on x-ray equipment, etc.

Radio and TV camera towers must receive careful attention in regards to make them accessible for servicing, especially during inclement weather.

7.0 ON-SITE INSTALLATION

7.1 Inspections

Inspections will be performed by the Design Authority or their designated representative. A thorough visual and mechanical inspection of the installation shall be performed to ensure that all applicable requirements and safety precautions have been met.

7.2 Damage to Government Property

Damage to Government property, including buildings, equipment, etc. during the course of the installation shall be made good by the contractor.

The contractor shall replace all equipment which has suffered major damage, i.e. damage which renders the equipment BER, unserviceable, or subject to deterioration.

If stocks of the applicable equipment are at such a level that replacement of the damaged items cannot be made, and the contractor cannot readily obtain new equipment in order to allow the installation to proceed without delay, the contractor shall:

- a. repair the damage immediately with available materials.
 - b. return to the site and replace the equipment as soon as new equipment is procured.
- Minor damage shall be repaired in a manner which leaves the government property in a condition equivalent to its original state and performing the original function, with no deterioration in appearance, performance, and/or reliability.

Any equipment where the paint finish becomes scratched or marred during the installation shall be completely refinished and repainted consistent with the appearance of new equipment.

Equipment shall neither be exposed to rain, nor be left out-of-doors during inclement weather. This stipulation does not apply to construction materials.

7.3 Protection of Surfaces

The contractor shall obtain approval from the appropriate Institution authority before moving heavy loads or equipment on floors, roofs and other surfaces.

The contractor shall adequately protect floors, finished surfaces and roofs from damage during the installation and shall implement special measures when moving heavy loads or equipment on them.

The contractor shall keep the floors free of oils, grease, or other materials likely to damage or discolour them.

The contractor shall provide dust protection for the equipment during the installation period, as related construction activities may occur simultaneously.

7.4 Cutting, Patching and Digging

The contractor shall perform all cutting, patching or digging necessary for the installation of the system.

The contractor shall be responsible for changes or damage to any existing work, cables or equipment by cutting, welding, drilling, or digging without prior consent from the Design Authority.

The contractor shall promptly repair any damage for which he is responsible in order to restore the facilities to their original condition.

7.5 Visual-Mechanical Inspection

Inspection shall be performed by the Design Authority or his designated representative.

Prior to the commencement of performance and operational testing, the installation shall be inspected to ensure that all applicable requirements and standards have been met.

Particular attention shall be given to the following:

- a. Physical condition and positioning of equipment.
- b. Neatness, clamping and tying of wire and cable harnesses.
- c. Cable and wire connections, ground clamps, and terminal strips.
- d. Soldered and welded joints.
- e. Strain relief of cables, wire connections, and cable harnesses.
- f. Cleanliness of equipment boxes under computer flooring.
- g. Nameplates, identification methodology and markings.
- h. Operation of drawers, adjustable and sliding parts and controls.

-
- i. Equipment fit, fastening devices and accessibility of parts.
 - j. Construction and finishes.
 - k. Legibility of labels and tags.
 - l. Safety aspects, including secure provisions for climbing and working on towers.
 - m. Shielding.
 - n. Grounding.
 - o. Equipment Cooling Provisions.
 - p. Washers and lock-washers.
 - q. Tightness of screw type fasteners & connectors.
 - r. Screws, nuts and bolts shall show no evidence of cross-threading or mutilation.
 - s. Bottom of equipment racks etc. shall be free of debris and loose parts.

7.6 **Final System Acceptance**

The system shall be accepted when all of the following items have been completed to the satisfaction of the Design Authority and with the written certification of the project manager:

- a. performance and operational tests.
- b. all documentation.
- c. all training.
- d. all other terms and conditions.

The system warranty shall be deemed to begin at the completion of the Final System Acceptance or when the system is taken into service with accepted deficiencies, whichever comes first.

7.7 On-Site Maintenance

Building and site maintenance shall be interpreted to include all the areas in which the contractor is carrying out installation activities.

All sites and buildings shall be maintained by the contractor in a clean and tidy condition.

Upon completion of each day's work, all areas such as hallways, stairways, elevators and storage rooms used by the contractor in delivering or storing equipment shall be left in a clean and tidy condition.

The contractor shall store all electronic components not yet installed in a lockable storage room/trailer at the end of each workday. This procedure will reduce the probability of damaged and/or stolen equipment prior to system acceptance. Prior to the commencement of performance and operational testing, the installation shall be inspected to ensure that all applicable requirements and standards have been met.

8.0 **DELIVERY**

8.1 **Packaging**

All equipment shall be packaged to ensure that the equipment will not be damaged during shipment and/or delivery to the institution, as well as any associated handling on site.

Fragile components must be clearly identified and labelled.

All circuit cards, equipment modules, etc. shall be protected by the original packaging material until the equipment is placed into service.

8.2 **Addressing**

Address labelling shall be clearly marked in a minimum of two (2) locations on each package. The following format shall be observed:

- a. Complete name of the institutional site.
- b. Complete shipping address.
- c. Clear description of contents.
- d. Complete name of the Institutional representative.

All of the above addressing items will be provided at the Bidder's Conference.

- END OF TEXT -

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SOW-0110
Revision 1
24 June, 2008

ELECTRONICS ENGINEERING
STATEMENT OF WORK

STRUCTURED CABLE SYSTEMS
FOR
ELECTRONIC SECURITY INSTALLATIONS

AUTHORITY

This Statement of Work is approved by Correctional Service Canada for the procurement and installation of all telecommunications and electronic security systems, subsystems, and equipment in Canadian penal institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:



Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services


23 July 08

RECORD OF REVISIONS

Revision	Paragraph	Comment
0	Original	Original
1	4.3.1 - Cable	Cable upgraded to meet OM3 standards
	Multiple	Copper cable upgraded to CAT 6

TABLE OF CONTENTS

TABLE OF CONTENTS	3
ABBREVIATIONS	4
DEFINITIONS.....	5
APPLICABLE DOCUMENTS	6
1.0 INTRODUCTION.....	7
1.1 General.....	7
1.2 Scope	7
1.3 Off-The-Shelf Equipment.....	7
1.4 Manufactured Equipment	7
1.5 Commonality of Equipment	7
2.0 MATERIAL AND EQUIPMENT REQUIREMENTS	8
2.1 Environmental Conditions	8
3.0 TELCOMMUNICATIONS OVERVIEW.....	9
3.1 Structured Cabling System.....	9
4.0 DESCRIPTION OF WORK	10
4.1 General System Requirements	10
4.1.1 Outline	10
4.2 Qualification Testing.....	10
4.2.1 Outline	10
4.2.2 User termination.....	11
4.2.3 Closet Termination	13
4.2.4 Cable Protection.....	13
4.2.5 Line Cords	13
4.2.6 Testing	14
4.2.7 Labelling.....	14
4.2.8 Documentation	14
4.3 Fibre Optic Backbone Cable	14
4.3.1 Cable	14
4.3.2 Terminations	15
4.3.3 Testing	15
4.3.4 Labelling.....	16
4.4 Cross Connect.....	16
4.4.1 Data Cross Connect.....	16

ABBREVIATIONS

The following abbreviations are used in this specification:

BICSI	Building Industry Consultant Service International
CER	Common Equipment Room
CET	Certified Electronic Technologist
COTS	Commercial -of-the-Shelf
CSC	Correctional Service Canada
CSA	Canadian Standards Association
CSV	Certified System Vendor
DVO	Data/Voice Outlet
EIA	Electronic Industries Association
EMT	Electrical Metallic Tubing
LOF	Laser Optimized Fiber
IDF	Intermediate Distribution Frame
OTDR	Optical Time Domain Reflectometer
RCDD	Registered Communications Distribution Designer
TC	Telecomm Closet
TIA	Telecommunications Industry Association
UTP	Unshielded Twisted Pair

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES), Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Service Canada (PW&GSC) and/or the Materiel Management Division of CSC is responsible for all contractual matters associated with the system design and implementation.
Project Manager	A CSC employee or a contracted person designated by DES to be responsible for the test and evaluation or feasibility study project.
Project Officer	A CSC employee or a contracted person designated by DES to provide technical and/or engineering services in support of the project.
Contractor	The company is responsible for assuring that all system/equipment performance and test & evaluation requirements are met.
Off-the-shelf	Equipment which is commercially, complete with field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request For Proposal (RFP) shall form a part of the specification to the extent specified herein.

- a. EIA/TIA Standard EIA/TIA-568 Commercial Building Telecommunications Wiring Standard
- b. EIA/TIA Technical Systems Bulletin TSB-36 Additional Cable Specifications for Unshielded Twisted Pair Cables
- c. EIA/TIA Technical Systems Bulletin TSB-40 Additional Transmission Specifications for Unshielded Twisted Pair Connecting Hardware.
- d. International standard ISO/IEC 11801-2nd Edition: Information technology — Generic cabling for customer premises.

Any other applicable industrial safety and control standards governing specific aspects for equipment and/or installations.

1.0 INTRODUCTION

1.1 General

This document defines the quality control requirements for the design, installation, testing and acceptance of structured cable systems for use in security systems installed in all Correctional Service Canada (CSC) facilities.

1.2 Scope

This specification has been developed to ensure high standards for the installation of electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for equipment reliability, maintainability, longevity, appearance and operational use.

1.3 Off-The-Shelf Equipment

The contractor shall provide commercial off-the-shelf (COTS) equipment wherever possible. COTS equipment shall meet or exceed the manufacturing standards as listed in this specification.

1.4 Manufactured Equipment

Where COTS equipment is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured equipment shall meet or exceed the best commercial equipment manufacturing standards.

1.5 Commonality of Equipment

The contractor shall provide commonality of hardware components within the design parameters ie. switch locks, racks, panels etc. All equipment, if appropriate shall be interchangeable.

2.0 MATERIAL AND EQUIPMENT REQUIREMENTS

2.1 Environmental Conditions

All materials and equipment which is used in CSC installations shall be equal to, or better than the standards established in the original equipment and shall be chosen with due consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall be suitable to perform over the following environmental ranges:

a. **Indoor Equipment**

Temperature: 0° C to 40° C; and

Humidity: 20% to 95% non-condensing.

b. **Outdoor Equipment**

Temperature: -40° C to +50° C; and

Humidity: 0 to 100%, condensing.

Outdoor equipment shall operate reliably and not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

Complete assemblies of indoor equipment shall be resistant to liquid spills, airborne contaminants, shock and vibration.

3.0 **TELECOMMUNICATIONS OVERVIEW**

3.1 **Structured Cabling System**

The design objective is a flexible network that is easy to re-configure, easy to manage and capable of incremental growth. The network is based on a structured cabling system conforming to Electric Industry Association/Telecommunications Industry Association Specification 568 (EIA/TIA-568) and Canadian Standards Association 529 (CSA 529) and using a star wired topology for the horizontal distribution with Category 6 Unshielded Twisted Pair (UTP) and 50/125 Micron Laser Optimized Fibre. The design will support Ethernet, Fast Ethernet, and network management.

4.0 DESCRIPTION OF WORK

4.1 General System Requirements

4.1.1. Outline

This section defines the minimum requirements for a structured cabling system to be provided on an engineered, furnished, installed, tested, and commissioned basis. Products and installation practices shall conform with the EIA/TIA documents identified in the **APPLICABLE DOCUMENTS** section of this Statement of Work.

The structured cabling system includes the following basic elements arranged into backbone feeders and horizontal distribution subsystems that are cross connected or patched together in Telecom Closets or Common Equipment Rooms on Intermediate Distribution Frames (IDFs).

- a. Unshielded Twisted Pair (Horizontal)
- b. 8-pin modular Telecom outlets
- c. Insulation displacement connector type terminal blocks
- d. LOF optic cable (Backbone)
- e. Fibre optic (duplex) interconnect patch panels
- f. Patch cords for patch panels
- g. Line cords for workstation data equipment (Office Cables)

Notes:

- 1) 3 metre length is standard for Office Cables
- 2) All cables provided for a project shall have a **GREEN** jacket.

4.2 Horizontal Data Cable

4.2.1 Cable

Each cable shall consist of 8 each of 24 AWG thermoplastic insulated solid copper conductors formed into four individually twisted pairs and enclosed by a jacket with the appropriate protection rating determined by Provincial codes.

The cable shall fully conform with EIA/TIA-568 design requirements for 100 ohm UTP cable and fully conform with EIA/TIA-568 TSB-36 transmission requirements for Category 6 cable. Cables shall bear evidence of verified Level 6 or Category 6 and also bear evidence of certification by a recognized standard or testing body. (eg: Bearing NORDX Brand name and have length clearly marked on cable sheath)

The cable bundles will be fed to locations in either a supplied cable tray or conduit system. Outlet cables will then be fed to the user locations via either pac poles or fished down hard wall offices. A pull string will remain in the conduit/cable tray for future installations.

The cable run length from the IDC to the workstation location shall NOT exceed 90 metres. The combined length for patch cords for data network horizontal distribution connections shall not exceed 10 metres for an overall length from data network hub equipment to workstation equipment not exceeding 100 metres.

4.2.2 **User Termination**

Termination at the user end will be made onto a certified Category 6 RJ45 module for data. These modules will then be housed in a certified faceplate. The faceplate to house the modules will have the capability to equip up to six each 8 pin modular jacks. Other configurations to be used will vary with locations: A duplex flush mount faceplate for drywall applications, a duplex surface mount kit for PAC pole applications and duplex single gang outlets mounted into custom furniture with adapter plates. Surface mount kits will not exceed a 6.5 cm. protrusion from the wall. For custom furniture it is assumed that the cable runs will be fed to the outlet via raceways in the legs of furniture. For security reasons, jacks are NOT be installed in exterior walls or walls not totally part of CSC space. All cables must either terminate on a patch panel or on a faceplate, loose or unterminated cables are not acceptable.

The 8 pin modular jack connectors shall comply for termination of 4 wire pairs with 24 AAWG solid copper conductors: minimum contact force of 100g and conductors separated by jack comb.

Each modular outlet will be wired per EIA/TIA-568 polarization sequence, designation T568A (reference CAN/CSA T529 Clause 11.2 Figure 11-1 and Table 10-1).

This illustration is a front view of the connector

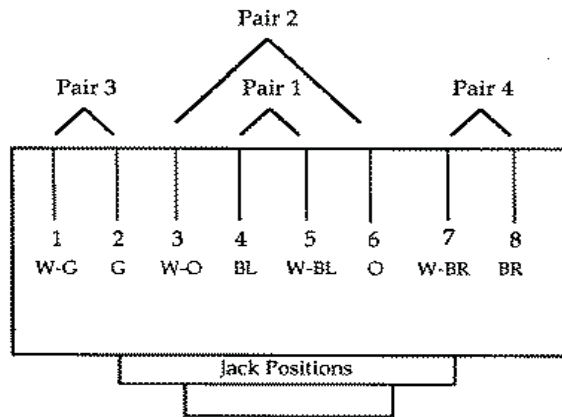


Figure 11-1
Eight-Position Jack Pin/Pair Assignments
(T568A Type)

Figure 11-1 and Table 10-1 outlines the sequencing required to construct line, office, and patch cables.

Each modular outlet will conform with EIA/TIA TSB 40 transmission requirements for Category 6 and will also be compatible with existing standard electrical outlet boxes.

Table 10-2 outlines the correct punch down positioning when using Northern Telecom T568A BIX DVOs', T568A ISDN QCBIX36DI and T568A ISDN QCBIX46DI Modular Jack Connectors, and T568A QPBIX Modular Patch Panels.

Table 10-1

Colour Codes for patch, line, and office cables		
<u>Colour Identification</u>	<u>Colour Code</u>	<u>Abbreviation</u>
Pair 1	White-Blue	(W-BL)
	Blue	(BL)
Pair 2	White-Orange	(W-O)
	Orange	(O)
Pair 3	White-Green	(W-G)
	Green	(G)
Pair 4	White-Brown	(W-BR)
	Brown	(BR)

Table 10-2

Colour Codes for punch down and modular outlets

<u>Position</u>	<u>Colour Code</u>	<u>Abbreviation</u>
1	White-Blue	(W-BL)
2	Blue	(BL)
3	White-Orange	(W-O)
4	Orange	(O)
5	White-Green	(W-G)
6	Green	(G)
7	White-Brown	(W-BR)
8	Brown	(BR)

4.2.3 Closet Termination

Supply and installation of RJ45 Category 6 hardware for system connection in communications closet using 24 NT certified patch panels rack mounted with cable organizer panels installed for each patch panel.

Active components will be connected to equipment by 8 conductor patch cords manufactured to CAT 6 compliance. Patch cords shall be stranded conductor and have a "no-snag" boot over the RJ45 connector.

Multi-Level building installations will require individual patch panels be installed for each level of the building. Patch panel(s) for each level of a multi-level building must have at least 15% unused ports. The same holds true for single story, multi ICC buildings.

4.2.4 Cable Protection

All ceiling distribution cabling shall be enclosed and protected by 3/4" and 1" rigid conduit from communications closet(s) room(s) and cabinets to all user outlets located in inmate accessible areas. In areas that CSC designated as non inmate accessible, EMT zone conduit will be allowed. Conduits must have end bushings installed to protect the cable from sharp edges.

Conduit containing Copper backbone cable must be designated "CAUTION SECURITY SYSTEM CABLE"

Conduit containing Fibre Optic backbone cable must be designated "CAUTION FIBRE OPTIC SECURITY SYSTEM CABLE"

4.2.5 Line Cords

The cabling company will supply RJ45, 8 pin modular line cords to connect owner provided data equipment to the horizontal distribution outlets at the workstation. They must be consistent with CAT 6 specification and provide end-to-end CAT 6 connectivity. Line cords shall be stranded conductor and have a "no-snag" boot over the RJ45 connector.

4.2.6 Testing

All cables/pairs will be scanned with a MicroTest Penta cable scanner or equivalent at 100 Mbps to determine DC loop resistance, near end cross talk and attenuation to meet or exceed the performance stated in EIA/TIA TSB-36 and TSB-40, noise, pair mapping and ranking. These tests must be conducted as originating from both the punch down location and modular outlet location of each cable segment.

4.2.7 Labeling

All jacks must be identified by means of labels with unique numbers. These markings will be made with printed labels. The Correctional Service of Canada expects that all drops at the user end will be sequential and not out of order.

The closet terminations must be identified with these same numbers marked on BIX labels adhered to BIX 20A designation strips and patch panels. The CAN/CSA 568 colour code will apply.

Labels will also be placed on the horizontal wire, 6-9" from termination points. This would include closets, main cabinet, and jacks.

4.2.8 Documentation

Customer to supply CAD or Visio Version 5 floor plans when available. If CAD documents are not available, contractor will be responsible to scan hard copy of plans.

Contractor to supply site plans, individual runs, risers, wire #'s, jack #'s, patch panel #'s in both hard and soft copy.

All test results shall be machine printed, hand written test result sheets are NOT acceptable.

4.3 Fibre Optic Backbone Cable

4.3.1 Cable

The cable to be supplied and installed for backbone purposes shall consist of 12 strands (6 pairs) of Laser Optimized Fibre with nominal 50/125 um core/cladding diameter formed into a single cable.

Optical cable shall physically conform with ANSI/ICEA S-83-596 mechanical and environmental specifications for outdoor fibre optic cable.

Fibre optic cable shall conform with the requirements of OM3 as per the ISO 11801-2nd Edition standards

4.3.2 Terminations

Fibre optic cables shall be terminated to SC Physical contact Connectors shall be able to sustain a minimum of 200 mating cycles per EIA/TIA-455-21 without violating specifications. These connectors will terminate within interconnect sleeves to facilitate patching in patch panels. The maximum optical attenuation per pair of mated connectors shall not exceed 0.75 db.

All fibre strands, whether used in the project or not, shall be terminated with SC type connectors and installed into a fibre patch panel: generally one duplex patch per cable (i.e. 12 connectors per panel for 12 strand fibre cable). Please note that these cables shall be SC to ST unless otherwise noted.

The patch panel proposed shall provide strain relief for each fibre as an integral part of the panel design. This standard type and size of panel should be uniformly used throughout the project.

Installed fibre panels shall be completed with all guides, brackets and other accessories to facilitate cable cross connect to active components for administration and management, including provisions for labeling that are consistent with EIA/TIA-568.

4.3.3. Testing

All terminated fibre media and related connecting hardware shall be tested with a power meter and certified at the conclusion of the initial installation with an OTDR, in both directions. Testing will include end-to-end attenuation testing that shall measure each fibre in one direction and compare with the calculated loss based on the manufacturers specifications and known length of cable using 850 nanometres and 1300 nanometres wavelengths. The difference in value between any two mated fibre shall not exceed 0.5 db.

The power levels of the terminated fibres shall be documented to allow the equipment vendor to select the correct strapping options for their equipment. This will prevent the receivers from being overloaded.

If the attenuation measurements are not within the required specifications, an Optical Time Domain Reflectometer shall be used to find the cause and location of the power loss. Any failure will be rectified.

All test results to be machine printed, and documented in duplicate and delivered complete with As-Built drawings to Corrections Canada Regional Office.

The fibre optic cable testing will also include a basic light test:

- on each of the fibres before installation to ensure that no damage had occurred during shipping;
- on each of the fibres before termination to ensure that no damage had occurred during installation.

4.3.4 **Labeling**

All fibre optic cables will be identified by means of Warning Labels located on all related conduit, pullboxes and backboards.

Both ends of all fibre cables will be labeled indicating destination and number of strands.

All ports on each Fibre optic patch panel will be labeled to identify the backbone destinations. Both ends will be labeled with this same numbering scheme.

4.4 **Cross Connect**

4.4.1 **Data Cross-connect**

Cross connection of the UTP horizontal cables to the tie field will be completed after testing of installed cables has taken place.

Jumper wire shall be provided, if requested, and will conform with EIA/TIA TSB-40 transmission requirements for Category 6.