

PWGSC Ontario	SPECIFICATION	Section 00 00 00
Region Project	TITLE SHEET	Page 1
Number R.089504.100		2018-07-06

Project Title BURLINGTON, ONTARIO
BURLINGTON LIFT BRIDGE
CCTV - OPERATION - SYSTEM

Project Number R.089504.100

Project Date 2018-07-06

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PART 1 - GENERAL

1.1 MINIMUM
STANDARDS

- .1 Execute work to meet or exceed:
 - .1 National Building Code of Canada 2015, National Fire Code of Canada 2015, Ontario Building Code 2012 and any other code of provincial or local application, including all amendments up to project date, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply as directed by the Departmental Representative.
 - .2 Rules and regulations of authorities having jurisdiction.
 - .3 Treasury Board of Canada Secretariat, Fire Protection Standard, April 1, 2010.
 - .4 Observe and enforce construction safety measures required by National Building Code 2015, Part 8 Safety Measures at Construction and Demolition Sites, Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended by O. Reg. 631/94, O. Reg. 143/99, O. Reg. 571/99, O. Reg. 145/00, O. Reg. 527/00, R.R.O. 1990, Reg. 834, O. Reg. 278/05 (Asbestos), Workplace Safety and Insurance Board and municipal statutes and authorities.
 - .5 Environmental Protection Act, O. Reg. 102/94 and O. Reg. 103/94.

1.2 AUTHORITIES
HAVING JURISDICTION

- .1 Fire Testing requirements are for ULC or WHI listed and labelled products.
- .2 Substitution of ULI or other Fire testing reports for required ULC and WHI testing is acceptable to the Departmental Representative only if the issuing organization is accredited and listed in the "Directory of Accredited Certification Organizations (CAN-P-1505C), 1993" published by the Standards Council of Canada, 1-800-267-8220. Testing shall be to the Canadian standards and the tested products shall bear the appropriate label.
- .3 Submit 3 copies of test reports under the letterhead of the accredited organization to the Departmental Representative.

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| <u>1.3 TAXES</u> | .1 | Pay applicable Federal, Provincial and Municipal taxes. |
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| <u>1.4 FEES, PERMITS, CERTIFICATES AND LETTERS</u> | .1 | Provide authorities having jurisdiction with information requested. |
| | .2 | Pay fees and obtain certificates, permits and letters required. |
| | .3 | Obtain PWGSC Fire Protection Engineer Inspection Letter of Deficiencies from Departmental Representative. Submit a copy of the letter with a list of remedial measures taken to correct deficiencies. |
| | .4 | Furnish certificates, permits and letters when requested. |
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| <u>1.5 EXAMINATION</u> | .1 | Examine existing conditions and determine conditions affecting work. |
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| <u>1.6 DOCUMENTS</u> | .1 | Keep one copy of contract documents and shop drawings on the site. |
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| <u>1.7 ELECTRONIC SUBMITTALS</u> | .1 | Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf, NMSEdit Professional spp, MS Word, MS Excel, MS Project and Autocad dwg files; on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as Oproma, as directed by Departmental Representative. |
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| <u>1.8 CONTRACTOR'S AS-BUILT DRAWINGS AND SPECIFICATIONS</u> | .1 | As work progresses, neatly record significant deviations from the Contract drawings and specifications using fine, red marker on full size white prints and specifications. Make the same changes on the electronic files. |
| | .2 | Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but |
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1.8 CONTRACTOR'S
AS-BUILT DRAWINGS
AND SPECIFICATIONS
(Cont'd)

- .2 (Cont'd)
shall be neat and accurate. Add at each title block note: "AS BUILT". Also circle on List of Drawings each title and number of drawing marked with "AS-BUILT" information. Circle on Table of Contents each specification section number and title of specification sections marked with "AS-BUILT" information.
- .3 Departmental Representative will provide one electronic set of drawings, schedules and specifications for as-built drawing and specification purposes.
.1 Drawings are in Autocad.
.2 Specifications are in NMSEdit Professional.
.3 Amendments and addenda are in MS Word.
- .4 Record following significant deviations:
.1 Field changes of dimension.
.2 Other significant deviations which are concealed in construction and can not be identified by visual inspection.
.3 Alternative materials and systems installed replacing original materials and systems specified by trade name.
- .5 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work. Submit pdf files on USB compatible with PWGSC encryption requirements, through email or alternate electronic file sharing service such as ftp.
- .6 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.9 OPERATIONS AND
MAINTENANCE DATA

- .1 On completion of project submit to Departmental Representative 3 copies of Operations and Maintenance Data assembled in three 255 x 295 mm vinyl-covered, 3-ring, loose-leaf binders with title sheet labelled "Operations Data and Maintenance Manual", project title, date and list of contents. Organize content into applicable sections between hard paper dividers with labelled tabs.

1.9 OPERATIONS AND
MAINTENANCE DATA
(Cont'd)

- .2 Include in each binder warranties and guarantees in form approved by Departmental Representative and operations and maintenance data for equipment and systems with parts list, suppliers' names and addresses, schematic diagrams for electrical hardware, complete set of final shop drawings (bound separately), names, addresses and phone numbers of sub-contractors and suppliers, list of materials with names of manufacturer and source of supply. Neatly type lists and rates. Use clear drawings, diagrams or manufacturer's literature.

1.10 SHOP DRAWINGS
AND PRODUCT DATA
SHEETS

- .1 Prior to submission check and certify as correct, shop drawings and product data sheets. Issue to Departmental Representative each submission at least 14 days before dates reviewed submission will be needed.
- .2 Where technical sections specify that shop drawings bear the stamp of a Registered Professional Engineer, the Engineer must be registered in the Province of Ontario.
- .3 Submit 3 prints and 1 electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .4 Submit 3 prints and 1 electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .5 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept. This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

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| 1.10 SHOP DRAWINGS
AND PRODUCT DATA
SHEETS
(Cont'd) | .5 | (Cont'd)
pertains solely to fabrication processes or to
techniques of construction and installation and
for co-ordination of Work of all sub-trades. |
| | .6 | Submit 3 prints and 1 electronic of product
data sheets for standard manufactured items.
Indicate VOC's in g/l for adhesives, primers,
sealants, paints, curing and sealing compounds,
sealers, particleboard, plywood, preserved wood,
and any other product that emits more than
25 g/l VOC during application, curing, initial
off gassing or end use. |
| | .7 | Responsibility for errors, omissions or
deviations from requirements of Contract
Documents is not relieved by Departmental
Representative's review of submittals. |
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| 1.11 CONSTRUCTION
PHOTOGRAPHS | .1 | Submit electronic copy of colour digital
photography in jpg format, standard resolution. |
| | .2 | Identification: name and number of project and
date of exposure indicated. |
| | .3 | Viewpoints and location of viewpoints
determined by Departmental Representative. |
| | .4 | Frequency: as directed by Departmental
Representative. |
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| 1.12 DESIGN DATA,
TEST REPORTS,
CERTIFICATES,
MANUFACTURER'S
INSTRUCTIONS,
MANUFACTURER'S
FIELD REPORTS | .1 | Prior to submission check and certify as
correct each submission. Issue to Departmental
Representative each submission at least 14 days
before reviewed submission will be needed. |
| | .2 | Submit 3 white print copies of each item
requested. |
| | .3 | Responsibility for errors, omissions or
deviations from requirements of Contract
Documents is not relieved by Departmental
Representative's review of submittals. |
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| <u>1.13 SAMPLES</u> | .1 | Identify manufacturer's name, product and colour. |
| | .2 | Installed work shall match reviewed sample. |
| | | |
| <u>1.14 ADDITIONAL DRAWINGS</u> | .1 | Departmental Representative may furnish additional drawings to clarify work. |
| | .2 | Such drawings become part of Contract Documents. |
| | | |
| <u>1.15 PROTECTION</u> | .1 | Protect existing work from damage. |
| | .2 | Replace damaged existing work with material and finish to match original. |
| | .3 | Protect existing trees and plants on site and adjacent properties. |
| | | |
| <u>1.16 EXISTING SERVICES</u> | .1 | Establish location, protect and maintain existing utility lines. |
| | .2 | Maintain existing services in occupied areas. |
| | .3 | Use designated existing sanitary facilities. |
| | .4 | Use existing water and electrical services at no cost. |
| | | |
| <u>1.17 TEMPORARY FACILITIES AND SERVICES</u> | .1 | Provide and maintain temporary facilities and services required to carry out work. |
| | .2 | Remove temporary facilities and services on completion of work. |
| | .3 | Provide and maintain temperature and enclosure required to prevent frost damage to work. |
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| <u>1.18 PUBLIC TRAFFIC FLOW</u> | .1 | Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public. |
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| <u>1.19 FIRE ROUTES</u> | .1 | Maintain access to property including overhead clearances for use by emergency response vehicles and personnel. |
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| <u>1.20 METRIC SIZED MATERIALS</u> | .1 | SI metric units of measurement are used exclusively on the drawings and in the specifications for this project. |
| | .2 | The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market. |
| | .3 | Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative. |
| | .4 | Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided. |
| | .5 | Claims for additional costs due to provision of specified modular metric sized products will not be considered. |
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| <u>1.21 MATERIAL AND EQUIPMENT</u> | .1 | Use new products unless otherwise specified. |
| | .2 | Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact. |
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1.21 MATERIAL AND
EQUIPMENT
(Cont'd)

- .3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.22 CONCEALMENT

- .1 Conceal conduits and wiring in finished areas.

1.23 CUTTING AND
REMEDIAL WORK

- .1 Co-ordinate work to keep cutting and remedial work to a minimum.
- .2 Execute cutting and remedial work required. Notify Departmental Representative before cutting, boring or sleeving structural members.
- .3 Use specialists in affected material to execute cutting and remedial work.
- .4 Match work to adjoining construction and finishes.
- .5 Fit components tight to adjoining surfaces.
- .6 Make good surfaces exposed or disturbed by work with material and finish to match existing adjoining surfaces.
- .7 After patching wall, ceiling or other painted surfaces, paint the entire wall or area up to the next change in plane or direction as directed by Departmental Representative.

1.24 FASTENINGS

- .1 Provide fastenings of type, size and spacing required to assure secure anchorage.
- .2 Obtain Departmental Representative's permission before using explosive actuated fasteners.

1.25 CO-ORDINATION
AND CO-OPERATION

- .1 Site will be occupied during execution of work.
- .2 Building will be occupied during execution of work.
- .3 Work area will be occupied during execution of work.
- .4 Execute work with minimum disturbance to occupants, public and normal use of site building and work area.
- .5 Maintain access and exits.
- .6 Where security has been reduced by work of contract, provide temporary means to maintain security.

1.26 INSPECTION AND
TESTING

- .1 When initial tests and inspections reveal work not to contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.

1.27 SCHEDULING

- .1 On award of contract submit bar chart construction schedule for work within 1 week, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

1.28 CLEANING

- .1 Maintain project free of accumulated waste and rubbish.
- .2 Final cleaning:
 - .1 Remove temporary protection.
 - .2 Remove dust, dirt and foreign matter from surfaces. HEPA vacuum interior surfaces.
 - .3 Broom clean paved exterior surfaces, rake clean other exterior surfaces.

1.29 CONSTRUCTION & DEMOLITION WASTE

- .1 For construction and demolition projects, even for those not over 2,000 m² total floor area, source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separated wastes.
 - .2 Source separate the following waste:
 - .1 Brick and portland cement concrete.
 - .2 Corrugated cardboard.
 - .3 Wood, not including painted or treated wood or laminated wood.
 - .4 Gypsum board, unpainted.
 - .5 Steel.
- .2 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
 - .1 Indicate how material being removed from the site will be reused or recycled.
- .3 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

1.30 ASBESTOS DISCOVERY

- .1 If during alteration work existing asbestos material is discovered (e.g. fireproofing, acoustic or thermal insulation, pipe or tank covering) stop work and immediately notify Departmental Representative. Do not remove any existing material containing asbestos fibres.
- .2 If during alteration work existing asbestos material, is discovered do not remove such asbestos-containing material; stop work and immediately notify Departmental Representative.

1.31 DESIGNATED SUBSTANCES

- .1 The work area has been surveyed for the presence of designated substances referred to in the Occupational Health and Safety Act and Regulations for Construction Projects, O.Reg. 213/91 as amended.

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| <u>1.31 DESIGNATED
SUBSTANCES
(Cont'd)</u> | .2 | There are no "designated substances" as defined by the Occupational Health and Safety Act Revised Statutes of Ontario, 1990, Chapter 0.1 as amended, in the work area. |
| | .3 | The list of designated substances present at the work area is attached at the end of this section. |
| | .4 | Provide copies of this list to each prospective subcontractor prior to entering into a contract with them. |
| | .5 | Post prominent notices identifying and warning of the hazardous agent in the part of the workplace in which the agent is found or used. Notices shall be in English and other languages prescribed under the Act. |
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<u>1.32 HALOCARBONS</u> |
.1 |
Comply with Federal Halocarbon Regulations 2003 under the Canadian Environmental Protection Act 1999, EPAM and PWGSC Ontario Region Halocarbon Information Sheet dated March 2010. |
|
<u>1.33 SPECIAL
PROTECTION AND
PRECAUTIONS</u> |
.1 |
Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of material safety data sheets acceptable to ESDC - Labour Program. |
|
<u>1.34 IAQ - INDOOR
AIR QUALITY</u> |
.1 |
Comply with CSA Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings and CSA B651-12, Annex A, article A.5 Indoor Air Quality. |
|
<u>1.35 POLLUTION
CONTROL</u> |
.1 |
Spills of deleterious substances:
.1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
.2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
.3 Further information on dangerous goods emergency cleanup and precautions including a |

1.35 POLLUTION	.1	(Cont'd)
CONTROL		.3 (Cont'd)
(Cont'd)		list of companies performing this work can be
		obtained from the Transport Canada 24-hour
		number (613) 996-6666 collect.

PART 2 - PRODUCTS

2.1 NOT USED	.1	Not used.
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PART 3 - EXECUTION

3.1 NOT USED	.1	Not used.
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PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian Standards Association (CSA): Canada
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2015 (NBC):
 - .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 National Fire Code 2015 (NFC):
 - .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 O. Reg. 490/09, Designated Substances.
 - .3 Workplace Safety and Insurance Act, 1997.
 - .4 Municipal statutes and authorities.
 - .5 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316§ion=text.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 11 01.
 - .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Emergency
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1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .3 (Cont'd)
Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Procedures and Evacuation Plan. Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.
 - .4 Contractor's and Sub-contractors' Safety Communication Plan.
 - .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Emergency Response requirements and procedures provided by Departmental Representative.
 - .6 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 2 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 2 days after receipt of comments from Departmental Representative.
 - .7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .8 Submit names of personnel and alternates responsible for site safety and health.
 - .9 Submit records of Contractor's Health and Safety meetings when requested.
 - .10 Submit two copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
 - .11 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
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1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)	.12	Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
	.13	Submit copies of incident and accident reports.
	.14	Submit Material Safety Data Sheets (MSDS).
	.15	Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.
1.3 FILING OF NOTICE	.1	File Notice of Project with Provincial authorities prior to commencement of Work.
	.2	Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.
1.4 WORK PERMIT	.1	Obtain building permits related to project prior to commencement of Work.
1.5 SAFETY ASSESSMENT	.1	Perform site specific safety hazard assessment related to project.
1.6 MEETINGS	.1	Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
1.7 REGULATORY REQUIREMENTS	.1	Comply with the Acts and regulations of the Province of Ontario.
	.2	Comply with specified standards and regulations to ensure safe operations at site.
1.8 PROJECT/SITE CONDITIONS	.1	Work at site will involve contact with: .1 Silica in concrete, concrete block, concrete brick and stucco. .2 Lead in paint, solder in electronic equipment, solder caulking in ball fittings of

1.8 PROJECT/SITE CONDITIONS (Cont'd)	.1	(Cont'd)
	.2	(Cont'd)
		cast iron pipes, vent and pipe flashings, and solder used on domestic water lines.
	.3	Mercury in fluorescent light tubes.
	.4	Benzene in fuel oil, paints and adhesives.
	.5	Mould in southwest room on the main floor and on wooden storage cabinet in furnace room.
	.2	Confined spaces in attic and motor room.
1.9 GENERAL REQUIREMENTS	.1	Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
	.2	Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
	.3	Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.
1.10 COMPLIANCE REQUIREMENTS	.1	Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.
1.11 RESPONSIBILITY	.1	Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
	.2	Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

- 1.11 RESPONSIBILITY .3
(Cont'd) Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.
- 1.12 UNFORSEEN .1
HAZARDS Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.
- 1.13 HEALTH AND .1
SAFETY CO-ORDINATOR Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
- .1 Have working knowledge of occupational safety and health regulations.
- .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .4 Be on site during execution of Work.
- 1.14 POSTING OF .1
DOCUMENTS Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.
- .1 Contractor's Safety Policy.
- .2 Constructor's Name.
- .3 Notice of Project.
- .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
- .5 Ministry of Labour Orders and reports.
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| 1.14 POSTING OF
DOCUMENTS
(Cont'd) | .1 | (Cont'd)
.6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
.7 Address and phone number of nearest Ministry of Labour office.
.8 Material Safety Data Sheets.
.9 Written Emergency Response Plan.
.10 Site Specific Safety Plan.
.11 Valid certificate of first aider on duty.
.12 WSIB "In Case of Injury At Work" poster.
.13 Location of toilet and cleanup facilities. |
| 1.15 CORRECTION OF
NON-COMPLIANCE | .1 | Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative. |
| | .2 | Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified. |
| | .3 | Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected. |
| 1.16 BLASTING | .1 | Blasting or other use of explosives is not permitted. |
| 1.17 POWDER
ACTUATED DEVICES | .1 | Use powder actuated devices only after receipt of written permission from Departmental Representative. |
| 1.18 WORK STOPPAGE | .1 | Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work. |
| | .2 | Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations. |
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PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian Standards Association (CSA International)
 - .1 CSA-C22.1-15, Canadian Electrical Code, Part 1 (23th Edition), Safety Standard for Electrical Installations.
 - .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .3 The Ontario Electrical Safety Code 2015, and all bulletins (Ontario).
 - .4 Electrical Safety Authority (ESA) requirements and local applicable codes and regulations.
- 1.2 DESIGN REQUIREMENTS
- .1 Operating voltages: to CAN3-C235.
 - .2 Equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
 - .3 Language operating requirements: provide identification nameplates and labels for control items in English.
- 1.3 SUBMITTALS
- .1 Submittals: in accordance with Section 01 11 01.
 - .2 Product Data: submit WHMIS MSDS.
 - .3 Shop drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
 - .2 Submit 6 number of copies of 600 x 600 mm minimum size drawings and product data to authority having jurisdiction.
 - .3 If changes are required, notify Departmental Representative of these changes before they are made.
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1.3 SUBMITTALS
(Cont'd)

- .4 Quality Control: in accordance with Section 01 11 01.
- .1 Provide CSA certified equipment and material.
 - .2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: in accordance with General Conditions of contract. Pay associated fees. Departmental Representative will provide drawings and specifications required by Electrical Inspection Department and Supply Authority at no cost.
 - .5 Submit, upon completion of Work, load balance report as described in PART 3 - Load Balance.
 - .6 Submit certificate of acceptance from Electrical Safety Authority having jurisdiction upon completion of Work to Departmental Representative.

1.4 QUALITY
ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 11 01.
- .2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices as per the conditions of Provincial Act respecting manpower vocational training and qualification.
- .1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.
 - .2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.
- .3 Site Meetings:
- .1 As Required.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.

<u>1.5 DELIVERY, STORAGE AND HANDLING</u>	.1	Material Delivery Schedule: provide Departmental Representative with schedule within weeks after award of Contract.
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	.2	Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 11 01.
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<u>1.6 SYSTEM STARTUP</u>	.1	Instruct Departmental Representative and operating personnel in operation, care and maintenance of systems, system equipment and components.
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PART 2 - PRODUCTS

<u>2.1 SUSTAINABLE REQUIREMENTS</u>	.1	Materials and products in accordance with Section 01 11 01.
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<u>2.2 MATERIALS AND EQUIPMENT</u>	.1	Provide material and equipment in accordance with Section 01 11 01.
	.2	Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - Submittals.
	.3	Factory assemble control panels and component assemblies.

<u>2.3 WARNING SIGNS</u>	.1	Warning signs: in accordance with requirements of authority having jurisdiction.
	.2	Porcelain enamel signs: minimum size 175 x 250 mm.

2.4 WIRING
TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 EQUIPMENT
IDENTIFICATION

- .1 Identify electrical equipment with nameplates and labels as follows:
.1 Nameplates: plastic laminate 3 mm thick plastic engraving sheet, matt white finish face, black core, mechanically attached with self tapping screws.
.2 Sizes as follows:

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.
- .4 Allow for minimum of twenty-five (25) letters per nameplate and label.
- .5 Nameplates for junction boxes to indicate system and/or voltage characteristics.
- .6 Identify equipment with Size 3 labels engraved "ASSET INVENTORY No. " as directed by Departmental Representative.
- .7 Pull boxes: indicate system and voltage.

2.6 WIRING
IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA-C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND
CABLE
IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20mm wide auxiliary colour.

	Prime	Auxiliary
up to 250 V	Yellow	
Other	Red	Yellow
Security Systems		

2.8 DISTRIBUTION
SYSTEM

- .1 120/240V, 1 phase, 3W, 60 Hz.
- .2 Inform other Divisions of electrical system characteristics.

2.9 WIRING SYSTEM

- .1 Power circuits in EMT with drawn-in conductors.
- .2 Use heavy wall rigid conduit where required by codes.
- .3 GTF insulated wire for final fixture connection.
- .4 #12 AWG minimum wire size.
- .5 Copper conductors.

- | | | |
|-------------------------------|----|---|
| 2.9 WIRING SYSTEM
(Cont'd) | .6 | Size branch circuits and panel feeders for maximum 2% voltage drop. |
| | .7 | Provide insulated green ground conductor in EMT conduits. |
| | .8 | Provide nylon insulated bushings on the ends of all conduits in junction boxes, pullboxes, etc. |
| | .9 | Minimum size conduit for power circuits is 21 mm. |
| 2.10 OUTLET BOXES | .1 | Steel construction. |
| | .2 | Masonry type in masonry construction. |
| | .3 | Standard FS conduit fittings for surface mounted outlets in exposed areas. |

PART 1 - GENERAL

- 1.1 REFERENCES .1 Underwriters Laboratories of Canada (ULC)
.1 ULC-S317-1996, Installation and Classification of Closed Circuit Video Equipment (CCVE) Systems for Institutional and Commercial Security Systems.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS .1 Submit in accordance with Section 01 11 01.
- .2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for video surveillance equipment and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit:
.1 Functional description of equipment.
.2 Technical data sheets of all devices.
.3 Device location plans and cable lists.
.4 Video camera surveillance chart.
.5 Video interconnection detail drawings.
- .3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.2 Submit shop drawings to indicate project layout, camera locations, point-to-point diagrams, cable schematics, risers, mounting details and identification labeling scheme including: connection to power.
.3 Submit zone layout drawings indicating number and location of zones and areas covered.
- .4 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion into work.
.3 Submit 1 sample of each camera selected complete with housing, brackets and mounting hardware.
.4 Camera will be returned for incorporation into work as appropriate.
-

1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit UL Product safety Certificates.
 - .2 Submit verification Certificate that service company is "UL List alarm service company".
 - .3 Submit verification Certificate that monitoring facility is "UL Listed central station".
 - .4 Submit verification Certificate that video surveillance system is "Certified alarm system".
- .6 Test and Evaluation Reports:
 - .1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .7 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .8 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.3 CLOSEOUT
SUBMITTALS

- .1 Operation and Maintenance Data: submit maintenance data for incorporation into manual specified in Section 01 11 01. Include following:
 - .1 System configuration and equipment physical layout.
 - .2 Functional description of equipment.
 - .3 Manufacturer's Instructions for operation, adjustment and cleaning.
 - .4 Illustrations and diagrams to supplement procedures.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 11 01 and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
-

1.4 DELIVERY,
STORAGE AND
HANDLING
(Cont'd)

- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect video surveillance materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 11 01.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials as specified in Construction Waste Reduction Workplan in accordance with Section 01 11 01.

1.5 WARRANTY

- .1 For all materials the 12 month warranty period prescribed in subsection GC3.13 of General Conditions is extended to 60 months.
- .2 Extended warranty period must include warranty against meeting specified performance requirements, for specified time period.
- .3 Manufacturer's Warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Support: camera functions such as pan/tilt and zoom fully supported by surveillance system.
 - .1 Provide operator with ability to control all camera functions.
- .2 Alarm point monitoring: system capable, upon alarm recognition, of switching IP cameras associated with alarm point.
- .3 Control: provision for any camera equipped with pan, tilt, and/or motorized zoom lens:
 - .1 Manually control pan, tilt and lens functions.

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- 2.1 DESIGN CRITERIA .3 Control:(Cont'd)
(Cont'd)
- .2 Set pan and tilt home position.
 - .3 Set and clear movement limits of pan and tilt mechanism.
 - .4 Adjust motorized zoom lens.
 - .4 Enter and edit surveillance programs and save them for future use.
 - .5 Set dwell time for viewing of any camera picture.
 - .6 Define sequence for viewing cameras on each monitor.
 - .7 Bypass cameras in system during sequencing to monitor.
 - .8 Overall control of IP cameras provided through software control, which provides complete integration of security components.
 - .9 Environment: design video components and systems to operate with specified requirements under following ambient temperatures:
 - .1 Indoor installations:
 - .1 Temperature: 0 degrees C to 30 degrees C.
 - .2 Humidity: 10 to 90%.
 - .2 Outdoor installations:
 - .1 Temperature: -40 degrees C to 60 degrees C.
 - .2 Humidity: 10 to 100%.
- 2.2 CHARACTERISTICS .1 Provide high performance infrared (IR) pan, tilt, zoom (PTZ) Video Camera:
- .1 White Colour.
 - .2 Sensitivity: intense IR night-vision of upto 122 meters.
 - .3 Resolution: 2MP @ 30fps (1920 x 1080)
 - .1 Colour: high resolution H. 264 1080p.
 - .4 Format: CMOS sensor.
 - .5 Environment: outdoor and vandal resistant IP-66 Rated weatherproof design.
 - .6 Mounting: visible.
 - .7 Lens functions: motorized auto iris.
 - .8 High speed 300°/s PTZ.
 - .9 Additional features: backlight compensation.
 - .10 Operational voltage: 12 VDC..
-

- 2.2 CHARACTERISTICS .1 (Cont'd)
(Cont'd)
- .11 Operation temperature: -40°C to 60°C.
- .2 Lenses:
- .1 Variable Focus Lens: 55° viewing angle.
- .2 Motorized Zoom Lens: 20x optical zoom.
- .3 Electronic automatic iris lens.
- .3 Video Handling:
- .1 Analytic Behaviors:
- .1 Abandoned Object: Detects objects placed within a defined zone and triggers an alarm if the object remains in the zone longer than the user-defined time allows.
- .2 Adaptive Motion Detection: Detects and tracks objects that enter a scene and then triggers an alarm when the objects enter a user-defined zone.
- .3 Auto Tracker: Detects and tracks movement in the field of view. When the AutoTracker behavior is configured, the system automatically pans and tilts to follow the moving object until the object stops or disappears from the monitored area.
- .4 Camera Sabotage: Detects contrast changes in the field of view. An alarm is triggered if the lens is obstructed by spray paint, a cloth, or a lens cap. Any unauthorized repositioning of the camera also triggers an alarm.
- .5 Directional Motion: Generates an alarm in a high traffic area when a person or object moves in a specified direction.
- .6 Loitering Detection: Identifies when people or vehicles remain in a defined zone longer than the user-defined time allows.
- .7 Object Counting: Counts the number of objects that enter a defined zone.
- .8 Stopped Vehicle: Detects vehicles stoppped near a sensitive area longer than the user-defined time allow.
- .2 Digital control system, multiple station:
- .1 Performance attributes:
- .1 Multiple station digital control system: Microsoft Windows 7 operating system Personal Computers (PC) with surveillance software with permanent licences to provide remote control of multiple camera, pan and tilt units, lenses and auxiliary functions, as specified.
-

2.2 CHARACTERISTICS .3
(Cont'd)

Video Handling:(Cont'd)
.2 (Cont'd)

- .2 Designed to select each camera station individually and provide full remote control of all functions at that camera station.
- .3 Remote monitoring capability with remote PC or mobile devices such as cell phone and tablet.
- .2 Control functions required:
 - .1 Power: on and off.
 - .2 Station select: individual station (labelled).
 - .3 Pan and tilt: left to right and up and down.
 - .4 Focus: near, far.
 - .5 Zoom: in, out.
- .4 Recording: 32 channel PoE 1080p Network Video Recording (NVR) with 32TB Hard Disk Drive.
 - .1 Features:
 - .1 Alarm recording:
 - .1 Alarm recording: provide system with capability to switch to alarm recording when an externally connected alarm sensor is triggered and begin to record situation that triggered alarm.
 - .2 Alarm display: equip unit to flash AL on screen during alarm recording and display number of alarms.
 - .3 Alarm scan: provide scan feature to search for alarm recordings and play the first 15 seconds of each alarm.
 - .2 I.D./time and date generator: provide built-in microprocessor equipped with calendar capable of setting internal timer, display current time and manage other clock-related functions on monitor and on digital display.
 - .3 Time recording: provide unit with capability to preset time recording on daily or weekly basis and special holidays. Settings to be performed and confirmed on monitor.

2.3 NETWORK VIDEO
RECORDER (NVR)

- .1 32-Channel, H.264, 5-MegaPixel Network Video Recorder with upto 80Mbps Data Throuput and 64 Network Streams for high resolution recording and monitoring.
- .2 Recording/Playback: 5MP/3MP/1080P/UXGA/720P/VGA/4CIF/DCIF/2CIF/CIF/CIF with NTSC/PAL video format
- .3 Ethernet Ports: Dual Network Interface 10/100/1000Mbps Self-adaptive RJ45 with Load Balancing & Network Redundancy.
- .4 Alarm I/O: 16 in/ 4 out.
- .5 Communication Ports: 1 x RS-232, 2 x RS-485 and 2 x USB 2.0.
- .6 Storage: RAID 32TB HDD.
- .7 Chasis: 483mm (19"), 2U Rack mounted.
- .8 Power Supply: 120V, 60 Hz built-in.
- .9 Provide lockable half size cabinet for NVR.

2.4 CAMERA HOUSINGS

- .1 Domes: outdoor with mounting hardware as indicated on drawing.
- .2 Outdoor: weatherproof and equipped with heater/blower.
- .3 Transmission Methods: Power over ethernet (PoE).

2.5 PC MONITORING
STATION

- .1 Provide PC complete dual display monitors, wireless keyboard, wireless mouse, 2 wireless camera joysticks and surveillance Software.
- .2 Processor: Intel i-7 CPU, 3.6GHz, 4 cores, 8MB smart cache.
- .3 Operating system: Microsoft Windows 7.
- .4 Memory: 16 giga bytes (GB) RAM. Video Memory: 8 GB RAM

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- 2.5 PC MONITORING STATION
(Cont'd)
- .5 Storage: 256 GB SSD and 1 TB Hard Disk Drive (HDD), 7200 rpm.
 - .6 Wi-Fi: IEEE 802.11ac Bluetooth: 4.2 LE
 - .7 USB Ports: 2 USB3.1 Front, 4 USB 3.1 rear, 2 USB 2.0 rear. Card Reader: SD
 - .8 Ethernet Port: 10/100/1000 mbps
 - .9 Display Port: 3 x Display ports, HDMI, DVI-D
Sound Card: Advanced HD 5.0
 - .10 Display Monitors: dual 813mm (32") LED monitor, 2560 x 1440 pixels, 60Hz with built-in speakers. Ceiling mount as indicated.
- 2.6 CAMERA POWER SUPPLY
- .1 Power supply: If PoE cannot provide sufficient power for cameras, accessories and camera housings, provide external mount power supplies in weatherproof enclosures suitable for them. Run 120V power cable in separate conduit.
- 2.7 Wireless Transmitter/Receiver
- .1 Mobile Wireless Video Network Bridge: Point to point video link with range up to 762m meeting IEEE 802.11a/n compliance and 300 Mbps throughput, omni-directional.
 - .1 Features:
 - .1 Security Format: 64/128 bit encrypted data system - WEP, WPA, WPA-2, WPS-2PKIP, WPA-2AES, WPA-TKIP, WPA-AES, 802.1x.
 - .2 Antenna Type: Dual Omni-directional Rubber Duck Antennas.
 - .3 Ethernet port: 10/100Mbps RJ45.
 - .4 Data Connection: 2xRJ45 Jacks PoE Capable.
 - .5 Construction: IP-67 rated all-weather design.
 - .6 Power supply: Built-in 24VDC PoE Injector.
 - .7 Power Connector: PoE Injector or 2.1mm DC power Jack.
 - .8 Mounting: Universal Wall/Pole Mount.
 - .9 Operating Temperature: -40°C to 60°C.
-

<u>2.8 IP Video Network Switch</u>	.1	Provide plug and play weatherproof 8+1 port gigabit Video Network Switch with high performance PoE device meeting IEEE 802.3af.
	.2	High speed data transmission of upto 91m (300').
	.3	Supports 10/100/1000mbps Uplink.
	.4	Operate up to 8 PoE cameras + link.
	.5	Embedded Anti-static and surge protection.
	.6	Universal mounting bracket.
	.7	Operating Voltage: 120 Volts AC, 60 Hz.
	.8	Operating temperature: -40°C to 70°C.
<u>2.9 WiFi Router</u>	.1	Provide gigabits WiFi Router meeting IEEE 802.11ac.
	.2	Operating Voltage: 120 Volts AC, 60 Hz.
	.3	Port: 8 devices connected.
	.4	Mounting: desktop.
<u>2.10 Wire and cable</u>	.1	PoE cable: Cat 6 with PoE capability.
	.2	Power Cable: 3 #12 awg copper conductors.
<u>2.11 JUNCTION BOX</u>	.1	Metal, sized to handle all system conduit interconnections with appropriate expansion.
<u>2.12 UNINTERRUPTED POWER SUPPLY (UPS)</u>	.1	Provide 500VA/320W portable UPS with:
	.1	Input: adjustable 80-120V AC, 60Hz, 1 x Nema 5-15
	.2	Output: 120V AC, 60 Hz, 4 x NEMA 5-15.
	.3	Surge suppression: 320 Joules.
	.4	Line interactive technology.
	.5	LED display, audible alarm.
	.6	Battery: Lead acid battery for 5 minutes at full load.
	.7	Operating humidity: 0-95%.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for video surveillance installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheet.
- .2 Install video surveillance equipment and components in accordance with ULC-S317.
- .3 Install cable, boxes, mounting hardware, brackets, video cameras and system components in accordance with manufacturer's written installation instructions.
- .4 Install components secure, properly aligned and in locations shown on reviewed shop drawings.
- .5 Connect cameras to cabling in accordance with installation instructions.
- .6 Install ULC labels where required.

3.3 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Obtain written reports from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product.
 - .2 Submit manufacturer's field services consisting of product use recommendations and

-
- 3.3 FIELD QUALITY CONTROL
(Cont'd)
- .1 (Cont'd)
- .2 (Cont'd)
- periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work at stages listed:
- .1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.
- .2 Twice during progress of Work at 25% and 60% complete.
- .3 Upon completion of Work, after cleaning is carried out.
- 3.4 SYSTEM STARTUP
- .1 Perform verification inspections and test in the presence of Departmental Representative.
- .1 Provide all necessary tools, ladders and equipment.
- .2 Ensure appropriate subcontractors, and manufacturer's representatives and security specialists are present for verification.
- .2 Visual verification: objective is to assess quality of installation and assembly and overall appearance to ensure compliance with Contract Documents. Visual inspection to include:
- .1 Sturdiness of equipment fastening.
- .2 Non-existence of installation related damages.
- .3 Compliance of device locations with reviewed shop drawings.
- .4 Compatibility of equipment installation with physical environment.
- .5 Inclusion of all accessories.
- .6 Device and cabling identification.
- .7 Application and location of ULC approval decals.
- .3 Technical verification: purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:
- .1 Measurements of tension and power.
- .2 Connecting joints and equipment fastening.
- .3 Measurements of signals (dB, lux, baud rate, etc).
-

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- 3.4 SYSTEM STARTUP (Cont'd) .3 Technical verification:(Cont'd)
- .4 Compliance with manufacturer's specification, product literature and installation instructions.
- .4 Operational verification: purpose to ensure that devices and systems' performance meet or exceed established functional requirements. Operational verification includes:
- .1 Operation of each device individually and within its environment.
- .2 Operation of each device in relation with programmable schedule and or/specific functions.
- .3 Operation control of camera lens, pan, tilt and zoom.
- .4 Switching of camera to any monitor.
- .5 Switching of system video recorder to selective monitor.
- .6 Set dwell times.
- .7 Demonstrate:
- .1 Sequence viewing of cameras on each monitor.
- .2 Bypass capability.
- .3 Display of stored image to cardholder.
- 3.5 ADJUSTING .1 Remove protective coverings from cameras and components.
- .2 Adjust cameras for correct function.
- 3.6 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 11 01.
- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 01.
- .1 Clean camera housing, system components and lens, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 11 01.
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|---------------------------------|----|--|
| <u>3.6 CLEANING</u>
(Cont'd) | .3 | Waste Management:(Cont'd)
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility. |
| <u>3.7 PROTECTION</u> | .1 | Protect installed products and components from damage during construction. |
| | .2 | Repair damage to adjacent materials caused by video surveillance installation. |
| <u>3.8 PROTECTION</u> | .1 | Provide 1 day training of the surveillance system to operational staff. |