



- **Government of Canada**

**Type of Document**

Specifications - Issued for Tender

**Project Name**

GOCB Public Safety Cambridge Bay, Nunavut  
Fire Alarm Replacement

**Project Number**

FRE-00248257-A1

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**Date Submitted**

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PERMIT OF PRACTICE  
EXP SERVICES INC.

Signature *Eric Bell*

Date NOVEMBER 26, 2018

PERMIT NUMBER: P483  
NT/NU Association of Professional  
Engineers and Geoscientists



1 General

2 Summary of Work

2.1 REQUIREMENTS INCLUDED

- .1 Work under this Contract includes replacement and upgrades to the fire alarm system at an existing facility in Cambridge Bay, Nunavut, including electrical requirements.
- .2 Work shall be Substantially Completed by time stated in Bid Form.

2.2 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract Drawings
  - .2 Specifications
  - .3 Addenda
  - .4 Reviewed shop drawings and, if applicable, all revisions thereof
  - .5 Change Orders
  - .6 Other modifications to Contract
  - .7 Building permit(s).

2.3 CODES AND STANDARDS

- .1 Work shall conform to requirements of the National Building Code of Canada 2015 and local codes which may govern the requirements of the installation.

2.4 LAWS AND REGULATIONS

- .1 Comply with all federal, provincial, territorial, municipal or local laws and regulations of the authorities with regard to the works or having jurisdiction in the locality of the works including, but not limited to, any law, ordinance, rule or regulation of public health and safety.

2.5 PERMITS AND LICENSES

- .1 Obtain building permits and other permits and licenses required to fully comply with all laws, ordinances and regulations in connection with the performance of the works.

3 Project Coordination

3.1 GENERAL

- .1 Contractor shall provide necessary coordination between all trades on site and ensure cooperation of trades with each other.

4 Cutting, Fitting and Patching

- .1 Execute cutting, fitting and patching required to complete the work.
- .2 Remove defective and nonconforming work and replace with new at no cost to Departmental Representative.
- .3 Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- .4 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed without prior approval.

- .5 Restore work with new products in accordance with requirements of Contract Documents.
- 5 Construction Schedule
  - .1 Provide a construction schedule showing starting and completion dates for each sequence of work.
  - .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
    - .1 Award.
    - .2 Activities prior to start of construction activities
      - .1 Submission of Site Specific Health and Safety Plan.
      - .2 Submission of Shop Drawings, Samples.
      - .3 Procurement of permits.
    - .3 Mobilization.
    - .4 Major construction activities.
    - .5 Testing and Commissioning.
  - .3 Update construction schedule monthly and include with monthly progress invoice.
- 6 Quality Control
  - 6.1 INSPECTION
    - .1 The Departmental Representative shall have access to the work.
    - .2 Give timely notice requesting inspection if work is designated for special tests, inspections or approvals by Departmental Representative instructions, or the law of the place of the work.
    - .3 If the Contractor covers or permits to be covered, work that has been designated for special tests, inspections or approvals before such test is made, uncover such work, have the inspections or tests satisfactorily completed and make good such work.
  - 6.2 REJECTED WORK
    - .1 Remove defective work which has been rejected by the Departmental Representative as failing to conform to the Contract Documents. Replace or re-execute in accordance with Contract Documents.

END OF SECTION

## 1 General

### 1.1 REFERENCES

- .1 Fire Protection Standards issued by Fire Protection Services of the Department of Human Resources and Social Development, as follows:
  - .1 FCC No. 301-June 1982, Standard for Construction Operations.
  - .2 FCC No. 302-June 1982, Standard for Welding and Cutting.

### 1.2 DEFINITIONS

- .1 Hot Work defined as:
  - .1 Welding work.
  - .2 Cutting of materials by use of torch or other open flame devices
  - .3 Grinding with equipment which produces sparks.
  - .4 Use of open flame torches such as for roofing work.

### 1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 10 01 - General Requirements.
- .2 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days after contract award.

### 1.4 FIRE SAFETY REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with following:
  - .1 National Fire Code.
  - .2 Fire Protection Standards FCC 301 and FCC 302.
  - .3 Federal and Territorial Regulations.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on course of action to be followed.

### 1.5 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
  - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
  - .2 Description of the type and frequency of Hot Work required.
  - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented during performance of hot work, Departmental Representative will give authorization to proceed as follows:
  - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
  - .2 Subdivide the work into individual activities. Each activity requiring a separately written "Authorization to Proceed".
- .4 Requirement for individual authorization will be based on:
  - .1 Nature or phasing of work;
  - .2 Risk to Facility operations;

- .3 Quantity of various trades needing to perform hot work on project or;
- .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of the Facility. Follow Departmental Representative's directives in this regard.

## 1.6 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during performance of Hot Work.
- .2 Procedures to include:
  - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in Section 01 35 30 - Health and Safety Requirements.
  - .2 The step-by-step process of how to prepare and issue permit.
  - .3 Permit shall be issued by Contactor's site superintendent, or other authorized person designated by Contractor, granting permission to worker or subcontractor to proceed with hot work.
  - .4 Permit required for each Hot Work event.
  - .5 Designation of a person on site as Fire Safety Watcher, to carry out a Fire Safety Watch for a minimum of 120 minutes immediately upon completion of the Hot Work.
  - .6 Compliance with fire safety codes, standards and public health and safety regulations specified.
  - .7 Site specific rules and procedures in force at the site as provided by the Facility Manager.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific Project conditions. Label document as being the Hot Work Procedures for this contract.
- .4 Procedures shall clearly establish responsibilities of:
  - .1 Worker,
  - .2 Authorized person issuing Hot Work Permit,
  - .3 Fire Safety Watcher,
  - .4 Subcontractor(s) and Contractor.
  - .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.
  - .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification with disciplinary measures imposed as specified in Section 01 35 30 - Health and Safety Requirements.

## 1.7 HOT WORK PERMIT

- .1 Hot Work Permit to include the following:
  - .1 Project name and project number;
  - .2 Building name and specific room or area where hot work will be performed;
  - .3 Date of issue;
  - .4 Description of work type to be performed;

- .5 Special precautions required, including type of fire extinguisher needed;
  - .6 Name and signature of permit issuer.
  - .7 Name of worker (clearly printed) to which the permit is issued.
  - .8 Permit validity period, not to exceed 8 hours. Indicate start time/date and termination time/date.
  - .9 Worker's signature with time/date of hot work completion.
  - .10 Specified time period requiring safety watch.
  - .11 Fire Safety Watcher's name and signature complete with time and date; certifying that surrounding area was under his continual surveillance and inspection during the full watch period and commenced immediately upon completion of Hot Work.
- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
  - .3 Each Hot Work Permit to be completed in full, signed as follows:
    - .1 By permit issuer before Hot Work commences;
    - .2 By Worker upon completion of Hot Work;
    - .3 By Fire Safety Watcher upon termination of safety watch;
    - .4 returned to Contractor's Superintendent for safe keeping on site.
- 1.8 FIRE PROTECTION AND ALARM SYSTEMS
- .1 Fire protection and alarm systems shall not be:
    - .1 Obstructed.
    - .2 Shut-off, unless approved by Departmental Representative.
    - .3 Left inactive at the end of a working day or shift.
  - .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
  - .3 Costs incurred, from the fire department, Facility owner and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.
- 1.9 DOCUMENTS ON SITE
- .1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.
  - .2 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.
- 2 Products
- 2.1 NOT USED
- .1 Not Used.
- 3 Execution
- 3.1 NOT USED.
- .1 Not Used.

END OF SECTION

## 1 General

### 1.1 REFERENCES

- .1 Canadian Standards Association (CSA).
  - .1 CSA C22.1-15 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
  - .2 CAN/CSA C22.3 No.1-06 - Overhead Systems.
  - .3 CSA C22.3 No.7-06 - Underground Systems.
- .2 Canada Occupational Health and Safety (COSH)
  - .1 Regulations made under Part II of the Canada Labour Code.

### 1.2 DEFINITIONS

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
- .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

### 1.3 COMPLIANCE REQUIREMENTS

- .1 Perform lockouts in compliance with:
  - .1 Canadian Electrical Code.
  - .2 Federal and Territorial Public Health and Safety Acts and Regulations.
  - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
  - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on course of action to be followed.

### 1.4 SUBMITTALS

- .1 Submit in accordance with Section 01 10 01 - General Requirements.

- .2 Submit copy of proposed lockout procedures and sample of lockout permit or lock out tags for review.
- .3 Submit documentation within 21 calendar days of contract award. Do not proceed with work until submittal has been reviewed by Departmental Representative.
- .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

#### 1.5 ISOLATION OF EXISTING SERVICES

- .1 Obtain Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
  - .1 Written request to isolate the particular service or facility and;
  - .2 Copy of Contractor's Lockout Procedures.
- .3 Make Request for Isolation for each event, unless directed otherwise by Departmental Representative, as follows:
  - .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
  - .2 Where no form exist, make written request indicating:
    - .1 The equipment, system or service to be isolated and its location;
    - .2 Duration of isolation period (ie: start time & date and completion time and date).
    - .3 Voltage of service feed to system or equipment being isolated.
    - .4 Name of person making the request.
  - .3 Document to be in typewritten format.
- .4 Do not proceed until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the work.
  - .1 Departmental Representative may designate another person at the Facility as being authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.
- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
- .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of Facility) operations. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 30 - Health and Safety Requirements.

#### 1.6 LOCKOUTS

- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.
- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.

- .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
  - .4 Use industry standard lockout tags.
  - .5 Provide appropriate safety grounding and guards as required.
  - .6 Prepare type written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site to safely isolate potential energy sources and lockout/tagout facilities and equipment.
  - .7 Include within Procedures a system of requests and issuance of individual lockout permits managed by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
    - .1 Issuance of permits and lockout tags to workers.
    - .2 Determining permit duration.
    - .3 Maintaining record of permits and tags issued.
    - .4 Submitting a Request for Isolation to Departmental Representative when required as specified above.
    - .5 Designating a Safety Watcher, when one is required based on type of work.
    - .6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to workers prior to proceeding with work.
    - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
  - .8 Clearly establish, describe and allocate responsibilities of:
    - .1 Workers.
    - .2 Person managing the lockout tags/permit system.
    - .3 Safety Watcher.
    - .4 Subcontractors and General Contractor.
  - .9 Procedures shall meet requirements of Codes and Regulations.
  - .10 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
    - .1 Incorporate site specific rules and procedures in force at site as provided by Facility Manager through the Departmental Representative.
    - .2 Clearly label document as being Lockout procedures applicable to work of this contract.
- 1.7 CONFORMANCE
- .1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.
  - .2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance Notification as specified in Section 01 35 30 - Health and Safety Requirements.
- 1.8 DOCUMENTS ON SITE
- .1 Post Lockout Procedures on site in common location for viewing by workers.
  - .2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.
  - .3 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

- 2 Products
- 2.1 NOT USED
  - .1 Not Used.
- 3 Execution
- 3.1 NOT USED
  - .1 Not Used.

END OF SECTION

## 1 General

### 1.1 DEFINITIONS

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
  - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
  - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
  - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by the Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut.
- .4 PPE: personal protective equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

### 1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 10 01 - General Requirements.
- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
  - .1 Submit within 15 work days of notification of Bid Acceptance. Provide three (3) copies.
  - .2 Departmental Representative will review Health and Safety Plan and provide comments.
  - .3 Revise the Plan as appropriate and resubmit within five (5) work days after receipt of comments.
  - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
  - .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates, and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut.
  - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.

- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

### 1.3 COMPLIANCE REQUIREMENTS

- .1 Comply with Nunavut Safety Act and Regulations.
- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
  - .1 The Canada Labour Code can be viewed at: [www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
  - .2 COSH can be viewed at: [www.http://laws.justice.gc.ca/eng/SOR-86-304/n\\_e.html](http://laws.justice.gc.ca/eng/SOR-86-304/n_e.html)
  - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)
- .3 Observe construction safety measures of:
  - .1 Part 8 of National Building Code
  - .2 Local by-laws and ordinances.
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .5 Maintain Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

### 1.4 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site, and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, territorial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

### 1.5 SITE CONTROL AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
  - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
  - .1 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
  - .2 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

#### 1.6 PROTECTION

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

#### 1.7 FILING OF NOTICE

- .1 File Notice of Project with pertinent authorities prior to beginning of Work.
  - .1 Departmental Representative will assist in locating address if needed.

#### 1.8 PERMITS

- .1 Post permits, licenses and compliance certificates, specified in section 01 10 01 - General Requirements, at Work Site.
- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

#### 1.9 HAZARD ASSESSMENTS

- .1 Perform site specific health and safety hazard assessment of the Work and its site.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.
- .3 Record results and address in Health and Safety Plan.
- .4 Keep documentation on site for entire duration of the Work.

#### 1.10 MEETINGS

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative.
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

### 1.11 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
- .2 Health and Safety Plan shall include the following components:
  - .1 List of health risks and safety hazards identified by hazard assessment.
  - .2 Control measures used to mitigate risks and hazards identified.
  - .3 On-site Contingency and Emergency Response Plan as specified below.
  - .4 On-site Communication Plan as specified below.
  - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
  - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
  - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
  - .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
  - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
  - .4 Emergency Contacts: name and telephone number of officials from:
    - .1 General Contractor and subcontractors.
    - .2 Pertinent Federal and Territorial Authorities having jurisdiction.
    - .3 Local emergency resource organizations.
  - .5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of facility contacts.
- .4 On-site Communication Plan:
  - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
  - .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.
- .5 Address all activities of the Work including those of subcontractors.
- .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
- .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
- .8 Post copy of the Plan, and updates, prominently on Work Site.

### 1.12 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
  - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
  - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
  - .3 Conduct site safety orientation session to persons granted access to Work Site.
  - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
  - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
  - .1 Be qualified and competent person in occupational health and safety.
  - .2 Have site-related working experience specific to activities of the Work.
  - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
  - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
  - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
  - .3 Follow-up and ensure corrective measures are taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

#### 1.13 TRAINING

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
- .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Territory having jurisdiction and advise Departmental Representative verbally and in writing.

#### 1.14 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding requirement to abide by federal and territorial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
  - .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses, and hearing protection.
  - .2 Immediately report unsafe condition at site, near-miss accident, injury, and damage.
  - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
  - .4 Obey warning signs and safety tags.
- .2 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.

#### 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 will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

#### 1.16 INCIDENT REPORTING

- .1 Investigate and report the following incidents to Departmental Representative:
  - .1 Incidents requiring notification to Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut or to other regulatory Agency.
  - .2 Medical aid injuries.
  - .3 Property damage in excess of \$10,000.00,
  - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.
- .2 Submit report in writing.

#### 1.17 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
  - .1 Post on site.
  - .2 Submit copy to Departmental Representative.

#### 1.18 BLASTING

- .1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

#### 1.19 POWDER ACTUATED DEVICES

- .1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

#### 1.20 CONFINED SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.

#### 1.21 SITE RECORDS

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.22 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Territory having jurisdiction.
- .2 Post other documents as specified herein, including:
  - .1 Site specific Health and Safety Plan
  - .2 WHMIS data sheets.

2 Products

2.1 NOT USED

- .1 Not Used.

3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

## 1 General

### 1.1 FIRES

- .1 Fires and burning of rubbish and construction waste materials not permitted on site.

### 1.2 DISPOSAL OF WASTE

- .1 Do not bury rubbish and waste material on site.
- .2 Do not dispose of waste and volatile materials, such as mineral spirits, oil and paint thinner into waterways, storm and sanitary sewers.

### 1.3 PRECAUTIONARY MEASURES

- .1 Prevent discharge of material into environment. Provide necessary procedures, materials, equipment, and labour for prevention of discharges.
- .2 Report to Departmental Representative, spills on site of substances introduced to site by Contractor (e.g. fuel, lubricants). Adhere to spill reporting and remedial requirements as outline in provincial and federal legislation.
- .3 Take necessary measures to remedy effects of spills, whether of hazardous or non-hazardous substances, and to assume full financial liability for remedial measures required.

### 1.4 PERMITS AND APPROVALS

- .1 Obtain copies of permits and approvals issued by approval agencies. Review and comply with conditions contained in permits and approvals.
- .2 Be responsible for obtaining permits and approvals that are required, but not obtained at time of bidding.
- .3 Be responsible to obtain and pay for required permits.
- .4 Ensure staff and subcontractors are aware of terms and conditions of permit and approval issues and ensure compliance.
- .5 Traffic control is considered part of contractor's work.

### 1.5 EQUIPMENT MAINTENANCE

- .1 Contain, handle and dispose of maintenance fluids in accordance with Government of Nunavut Department of Environment legislation. Spillage on ground is prohibited. Report spills to the Nunavut Department of Environment spill response emergency number: 1-867-920-8130.

## 2 Products

### 2.1 NOT USED

- .1 Not Used.

- 3 Execution
- 3.1 NOT USED
  - .1 Not Used.

END OF SECTION

## 1.1 GENERAL

- .1 Due to nature of the Work and client operations on the site, security regulations pertaining to the site and existing operations, access will be in place during the work resulting in need for:
  - .1 Control and limit of movement of construction workers at the site.
  - .2 All workers must undergo a security clearance process prior to engaging in any site work.
  - .3 Specific rules and regulations as specified in this section and as directed by the Departmental Representative to be stringently followed.
- .2 It is the Contractor's responsibility to:
  - .1 Designate a Contractor Security Representative. This representative will coordinate with all subtrades and workers for submissions of necessary security documentation.
  - .2 Ensure all workers that are intended to be onsite obtain RCMP security clearances;
  - .3 Become familiar with and abide by security rules and regulations;
  - .4 Brief all workers and subcontractors in respect of the security regulations and ensure that they abide by all rules and directives.
- .3 The Departmental Representative will coordinate a pre-construction meeting between Contractor and Security Personnel who will provide details and directives on control and movement on site.
- .4 Any infraction of site security regulations on the part of the Contractor, members of work force or any Subcontractor in their employ, will result in immediate removal of offending party from the site.

## 1.2 SECURITY PERSONNEL

- .1 The Departmental Representative will obtain services of security personnel, employed by the Canadian Corps of Commissionaires to provide escort and security supervision of all workers during the work of this contract.
- .2 Departmental Representative will pay costs for security personnel.
- .3 Commissionaires will be provided when required to perform supervision or escort function as may be needed due to Contractor's work operations such that no worker is left unsupervised if work is required to take place inside occupied building(s) on site.
- .4 Escort and supervision of workers by commissionaire, when required by the Work, will be provided at all times when work of the Contract is being performed regardless of whether this is during regular business hours or beyond.
- .5 Commissionaire will report directly to the Departmental Representative and ensure that site security directives are obeyed by all workers.
- .6 Ensure commissionaire(s) under goes contractor site safety orientation. Commissionaire(s) are to comply with contractor's safety policies applicable to this project including all required personnel protective equipment.

## 1.3 SECURITY CLEARANCE REQUIREMENTS

- .1 All persons employed by Contractor or by subcontractors who will be working on site must undergo the following check:

- .1 Apply for RCMP personnel security clearance screening and obtain a clearance ranging from a Facility Access up to Reliability Status. This will vary as the Contractor involvement and access requirements during and after construction.
- .2 For work within unoccupied areas all workers must at minimum obtain a Facility Access 1X clearance.
- .2 Persons who do not have security clearance, as specified above, may not be allowed access to the construction site.
- .3 Departmental Representative will advise when worker security clearance has been received and whether escort and supervision is still needed for any worker.
- .4 Escort and supervision functions specified herein are still required on the project after workers having obtained security clearance.

#### 1.4 SECURITY CLEARANCE APPLICATION

- .1 Within 2 weeks following notification of acceptance of bid, contractor to commence submissions of application forms for all workers who require security clearance.
  - .1 Contractor security representative to prioritize worker's application submissions with the phasing of construction activities.
- .2 To obtain Facility Access (FA) 1X or 2X Security Screening Status clearance, the following information is required for each applicant.
  - .1 "Personnel Screening, Consent and Authorization Form" (Form No. TBS/SCT #330-23E, Rev. 2006/02) completed by each worker.
    - .1 Part A: by RCMP Project Manager.
    - .2 Part B: by applicant. Provide full name, including middle name (not simply an initial). Ensure address listed represent last five (5) years of residence and each address is fully completed including postal code. Print data in clear, legible manner.
    - .3 Part C: only boxes 1, 2, 3 and 5 need be completed, requiring applicant's initials.
  - .2 Proof of applicant's identity consisting of a picture ID such as a valid Canadian Motor Vehicle Driver's License or other similar official ID card. Provide copy of both front and back of Driver's License or Governmental ID. Applicants must sign copy.
- .3 Fingerprinting may be required depending on level of security requirements and if previous criminal conviction exists.
- .4 Departmental Representative will provide details as to what procedures, location and time where workers must go if fingerprints are required.
- .5 Processing Time:
  - .1 The RCMP departmental processing time to obtain basic security clearances is estimated to be 4 weeks from date of receipt of required documentation.
  - .2 To avoid delays, prepare worker documentation as soon as possible. Documentation is to be submitted as one package for all applicant
  - .3 Contractor's Security Representative shall ensure forms are fully completed, signed and that all information and photo identification is clear and legible. Incomplete applications will result in immediate rejection by Departmental Representative.
  - .4 Be aware that processing time for applicants requiring higher level security requirements or those with criminal convictions may take longer and could extend the clearance waiting period significantly.

- .1 An interview with such applicant may also be required as part of the security clearance process.
  - .6 To obtain RCMP Reliability Status additional security forms and screening will be required. For those workers requiring this clearance please see Departmental Representative for additional instructions.
  - .7 The Contractor and/or Contractor Security Representative is to facilitate workers security clearance process as follows:
    - .1 Prepare comprehensive list of workers who will require security clearance throughout project, including those of subcontractors.
    - .2 Provide copy of list to Departmental Representative.
    - .3 Coordinate and expedite submission in preparing and submitting documentation.
    - .4 Brief and assist applicants in preparing and submitting documentation.
    - .5 Review documentation of each applicant for completeness before submission.
    - .6 Have each worker keep a copy of their completed application form in case the initial submission gets lost.
    - .7 Submit documentation in an organized manner with transmittal letter clearly identifying project and company employee is affiliated with.
  - .8 Send submission(s) directly to Departmental Representative or to the approved mailing address as directed by Departmental Representative.
  - .9 Persons who have not been successful in obtaining security clearance, upon documentation review by RCMP, will not be allowed further access on site.
- 1.5 SECURITY PASSES
- .1 All personnel, visitors or workers requiring access to occupied areas require a HRMIS number issued by RCMP. It is the responsibility of the Contractor and all personnel, visitors and workers to know their HRMIS number.
  - .2 Security passes are not required for unoccupied areas.
- 1.6 SECURITY CONTROL LIST
- .1 Provide a list of employee names from work force and from subcontractors who will be present at site during the course of work.
  - .2 List to include each person's name, address and telephone number.
  - .3 Submit copy of list to Departmental Representative and to Security Commissionaire for control of workers.
  - .4 Update list as work progresses.
  - .5 Ensure that each worker can provide proof of identity upon demand, when requested by Security Personnel or Departmental Representative.
- 1.7 BUILDING ACCESS
- .1 Keys and security access cards given to the commissionaire for his sole possession, as determined by Departmental Representative, shall not under any circumstances be given to any worker or subcontractor.
  - .2 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.
  - .3 Immediately report to Departmental Representative any lost, stolen or destroyed keys and door security access cards.

1.8 SITE SECURITY

- .1 When work must be carried out during hours beyond the work hours previously agreed upon at start of work, provide notice within 48 hours beforehand to minimize impact on security and other operations on site.

END OF SECTION

## 1 General

### 1.1 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

### 1.2 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
  - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over two (2) sets of fully documented tests reports to the Departmental Representative.
  - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00 - Closeout Submittals.
- .3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

### 1.3 ACCESS TO WORK

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

### 1.4 REJECTED WORK

- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
- .2 Make good damages to new and existing construction and finishes resulting from removal or replacement of defective work.

- 2 Products
- 2.1 NOT USED
  - .1 Not Used.
- 3 Execution
- 3.1 NOT USED
  - .1 Not Used.

END OF SECTION

## 1 General

### 1.1 REFERENCES

- .1 Canadian Standards Association (CSA).
  - .1 CAN/CSA-Z321-96 (R2006), Signs and Symbols for the Workplace.

### 1.2 SITE ACCESS AND PARKING

- .1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.
- .2 The Contractor is advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.
- .3 Parking facilities at site is limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.
- .4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.

### 1.3 BUILDING ACCESS

- .1 Use only access doors and circulation routes within building as designated by Departmental Representative to access interior work.

### 1.4 CONTRACTOR'S SITE OFFICE

- .1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

### 1.5 MATERIAL STORAGE

- .1 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.
- .2 Make arrangements elsewhere in area as deemed required and pay all costs for storage of materials not ready for incorporation into work.

### 1.6 INTERIOR DUST CONTROL AND DUST BARRIERS

- .1 Control creation and spread of dust and dirt to building interior and in particular to areas within premises still under use by occupants.
- .2 Inform Departmental Representative of the proposed dust control measures to be followed at each work area and for each major dust generating activities. Obtain Departmental Representative's approval before proceeding with work.
- .3 Meager attempts at controlling dust will not be tolerated. Failure to provide effective dust control during work and to perform satisfactory cleaning thereafter will result in Departmental Representative to proceed and obtain a separate cleaning service agency to perform cleaning to tenant's satisfaction with cost for such services being charged against this Contract in the form of financial holdbacks.
- .4 Obtain Departmental Representative's approval before erecting any dust partitions simply to underside of finish ceiling.

- .5 Construction of dust barriers, enclosures and placement of temporary protective devices to be performed during Facility non-operational off-hour periods.

#### 1.7 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Departmental Representative.

#### 1.8 POWER

- .1 Power supply is available and will be provided for construction usage at no cost.
  - .1 Make arrangements for the use of such services through the Departmental Representative.
  - .2 Departmental Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.
  - .3 Connect to existing power supply in accordance with Canadian Electrical Code.

#### 1.9 WATER SUPPLY

- .1 Water supply is available in existing building and will be provided for construction usage at no cost. Make arrangements for the use and transportation of such services to work area through the Departmental Representative.
- .2 Permanent water supply system installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.

#### 1.10 CONSTRUCTION SIGN AND NOTICES

- .1 Safety and Instruction Signs and Notices:
  - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN/CSA-Z321.

#### 1.11 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.

#### 2 Products

##### 2.1 NOT REQUIRED

- .1 Not Required.

#### 3 Execution

##### 3.1 NOT REQUIRED

- .1 Not Required.

END OF SECTION

## 1 General

### 1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within seven (7) days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
  - .1 Name and address of manufacturer.
  - .2 Trade name, model and catalogue number.
  - .3 Performance, descriptive and test data.
  - .4 Compliance to specified standards.
  - .5 Manufacturer's installation or application instructions.
  - .6 Evidence of arrangements to procure.
  - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Permanent labels, trademarks, and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

### 1.2 PRODUCT QUALITY

- .1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
- .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions of the Contract.

### 1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES

- .1 Acceptable Materials: When materials specified include trade names or trade marks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.
- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.
- .3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

### 1.4 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.

## 1.5 AVAILABILITY

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per paragraph 1.1.2 above.

## 1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.
- .3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate placement of openings, sleeves, and accessories.

## 1.7 FASTENINGS - GENERAL

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See section on Health and Safety Requirements in this regard.

## 1.8 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

## 1.9 STORAGE, HANDLING AND PROTECTION

- .1 Deliver, handle and store materials in manner to prevent deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.

- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
  - .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
  - .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
  - .8 Immediately remove damaged or rejected materials from site.
  - .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 2 Products
- 2.1 NOT REQUIRED
    - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
    - .1 Not Required.

END OF SECTION

## 1 General

### 1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

### 1.2 MATERIALS

- .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

### 1.3 CLEANING DURING CONSTRUCTION

- .1 Maintain work areas in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
- .2 Keep building entrances, corridors, stairwells and tenant occupied areas of building in a clean dust free condition at all times. Conduct thorough cleaning of these areas at end of each work shift when used by workers or affected by the Work.
- .3 Provide on-site dump containers for collection of waste materials and debris.
- .4 Use separate collection bins, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified.
- .5 Remove waste materials, and debris from site on a daily basis.
- .6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .7 Provide dust barriers, dividers, seals on doors and employ other dust control measures as required to ensure that dust and dirt, generated by work, are not transmitted to other areas of building. Should dust migrate into tenant occupied or public areas of building, employ such means as may be necessary to immediately clean all contaminated surfaces to the satisfaction of the Departmental Representative.
  - .1 See Section 01 50 00 - Temporary Facilities for requirements on dust control and for erection of dust partitions.
- .8 Immediately clean all dust, dirt, smears, scuffs and soiled surfaces in lobbies, corridors, stairwells, and within tenant occupied areas resulting from the Work.
  - .1 Perform cleaning, dusting and washing operations, carpet vacuuming (including shampooing if deemed required by Departmental Representative) and floor washing as necessary to thoroughly clean all soiled surfaces.
- .9 Remove snow and ice from access doors used by workforce

### 1.4 FINAL CLEANING

- .1 In preparation for acceptance of the completed work perform final cleaning.

- .2 Remove grease, dust, dirt, stains, labels, fingerprints, marks and other foreign materials, from interior and exterior finished surfaces. Clean and polish surfaces including glass, mirrors, hardware, wall tile, stainless steel, chrome, baked enamel, plastic laminate, mechanical and electrical fixtures.
  - .3 Replace items with broken pieces, scratches or disfigured.
  - .4 Clean lighting reflectors, lenses, and other lighting surfaces.
  - .5 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
  - .6 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
  - .7 Remove debris and surplus materials from crawl areas, roof areas and other accessible concealed spaces.
  - .8 Clean equipment, and washroom fixtures to a sanitary condition.
- 2 Products
- 2.1 NOT REQUIRED
    - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
    - .1 Not Required.

END OF SECTION

## 1 General

### 1.1 DEFINITIONS

- .1 Hazardous Material: Product, substance, or organism that is used for its original purpose, and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

### 1.2 WASTE MANAGEMENT

- .1 Incorporate environmental and sustainable practices in managing waste resulting from work.
- .2 Divert as much waste as possible from landfill.
- .3 Coordinate work of subtrades and subcontractors to ensure all possible waste reduction and recycling opportunities are taken. Follow waste management requirements specified in trade sections of the Specifications.
- .4 Reduce waste during installation of new materials. Undertake practices which will optimize full use of materials and minimize waste.
- .5 Develop innovative procedures to reduce quantity of waste generated by construction such as by delivering materials to site with minimal packaging etc.
- .6 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
- .7 During demolition and removal work separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
  - .1 Reinstallation into the work where indicated.
  - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties.
  - .3 Sending as many items as possible to locally available recycling facility.
  - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .8 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .9 Send leftover material resulting from installation work for recycling whenever possible.
- .10 Establish methods whereby hazardous and toxic materials, and their containers used on site are properly handled, stored and disposed in accordance with applicable federal, provincial and municipal laws and regulations.

### 1.3 DISPOSAL REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of volatile materials, mineral spirits, oil, paint, and other hazardous materials into waterways, storm, or sanitary sewers is prohibited.
- .3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.

- .4 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
  - .5 Transport and dispose of waste intended for waste processing plant or landfill facility in separated condition and to Operator's rules and recommendations in support of their effort to recycle, reduce and divert certain waste stream from general landfill.
  - .6 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
  - .7 Sale of salvaged items by Contractor to other parties not permitted on site.
- 2 Products
- 2.1 NOT REQUIRED
    - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
    - .1 Not Required.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.

1.2 RELATED REQUIREMENTS

- .1 Section 01 10 01 - General Requirements.

1.3 INSPECTION AND DECLARATION

- .1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
  - .1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
  - .2 Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.
    - .1 Address defects, faults and outstanding items of work identified by such inspections.
    - .2 Advise Departmental Representative when all deficiencies identified have been rectified.
  - .3 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
    - .1 Project record as-built documents;
    - .2 Final Operations and Maintenance manuals;
    - .3 Maintenance materials, parts and tools;
    - .4 Compliance certificates from applicable authorities;
    - .5 Reports resulting from designated tests;
    - .6 Demonstration and training complete with user manuals;
    - .7 Manufacturer's Guarantee certificates.
    - .8 Testing, adjusting and balancing of equipment and systems complete with submission of test reports.
    - .9 Commissioning of equipment and systems specified.
  - .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

2 Products

2.1 NOT REQUIRED

- .1 Not Required.

3 Execution

3.1 NOT REQUIRED

.1 Not Required.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Project Record Documents.
- .2 Operations and Maintenance data.

1.2 RELATED REQUIREMENTS

- .1 01 79 00 - Demonstration and Training.

1.3 PROJECT RECORD DOCUMENTS

- .1 Departmental Representative will provide 2 white print sets of contract drawings and two (2) copies of Specifications Manual specifically for "as-built" purposes.
- .2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.
- .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative upon request.
- .4 As-Built Drawings:
  - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).
  - .2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.
  - .3 Stamp all drawings with "As-Built Drawings". Label and place Contractor's signature and date.
  - .4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
  - .5 Record following information:
    - .1 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
    - .2 Field changes of dimension and detail;
    - .3 Location of all capped or terminated services and utilities.
    - .4 Chases for mechanical, electrical and other services;
    - .5 Ceiling and floor elevations;
    - .6 Reflected ceiling plan condition showing finished layout of all ceiling-mounted services and devices;
    - .7 Plumbing, heating, air conditioning and ventilation, sprinkler and electrical service installation locations; all to be dimensioned and referenced to building columns or load bearing walls;
    - .8 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
    - .9 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
- .5 As-built Specifications: legibly mark in red each item to record actual construction, including:
  - .1 Changes made by Addenda and Change Orders.

- .2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above paragraph.
  - .6 Maintain As-built documents current as the contract progresses. Departmental Representative may conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.
- 1.4 REVIEWED SHOP DRAWINGS
- .1 Provide a complete set of shop drawings reviewed for project to incorporate into each copy of the Operations & Maintenance manuals.
  - .2 Submit full sets at same time and as part of the contents of the Operation and Maintenance manuals specified.
- 1.5 OPERATIONS & MAINTENANCE MANUAL
- .1 O&M Manual - Definition: an organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual products or systems as specified in individual sections of the specifications.
  - .2 Manual Language: final manuals to be in both English and French languages.
  - .3 Number of copies required:
    - .1 Upon review and acceptance by Departmental Representative, submit three (3) final copies. Interim copies are not to be considered as part of the final copies unless they have been fully revised and are identical to the final approved version.
  - .4 Submission Date: submit complete operation and maintenance manual to Departmental Representative three (3) weeks prior to application for Certificate of Substantial Performance of the work.
  - .5 Binding:
    - .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual.
    - .2 Use vinyl, hard covered, 3 "D" ring binders, loose leaf, sized for 215 x 280 mm paper, with spine pocket.
    - .3 Where multiple binders are needed, correlate data into related consistent groupings.
    - .4 Identify contents of each binder on spine.
    - .5 Organize and divide data following same numerical system as the section numbers of the Specification Manual.
    - .6 Dividers: separate each section by use of cardboard dividers and labels. Provide tabbed fly leaf for each individual product and system and give description of product or component.
    - .7 Type lists and notes. Do not hand write.
    - .8 Drawings, diagrams and manufacturers' literature must be legible. Provide with reinforced, punched binder tab. Bind in with text; fold larger drawings to size of text pages.
  - .6 Manual Contents:
    - .1 Cover sheet containing:
      - .1 Date submitted.

- .2 Project title, location and project number.
- .3 Names and addresses of Contractor, and all Sub-contractors.
- .2 Table of Contents: provide full table of contents in each binder(s), clearly indicate which contents are in each binder.
- .3 List of maintenance materials.
- .4 List of spare parts.
- .5 List of special tools.
- .6 Original or certified copy of warranties and product guarantees.
- .7 Copy of approval documents and certificates issued by Inspection Authorities.
- .8 Copy of reports and test results performed by Contractor as specified.
- .9 Product Information (PI Data) on materials, equipment and systems as specified in various sections of the specifications. Data to include:
  - .1 List of equipment including manufacturer's name, supplier, local source of supplies and service depot(s). Provide full addresses and telephone numbers.
  - .2 Nameplate information including equipment number, make, size, capacity, model number and serial number.
  - .3 Parts list.
  - .4 Installation details.
  - .5 Operating instructions.
  - .6 Maintenance instructions for equipment.
  - .7 Maintenance instructions for finishes.
- .7 Shop drawings:
  - .1 Include complete set of reviewed shop drawings into each copy of the operations and maintenance manual.
  - .2 Fold and bind material professionally in a manner that corresponds with the specification section numbering system.
  - .3 When large quantity of data is submitted, place into separate binders of same size as O&M binders.
- .8 Equipment and Systems Data: the following list indicates the type of data and extent of information required to be included for each item of equipment and for each system:
  - .1 Description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
  - .2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
  - .3 Maintenance Requirements: include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  - .4 Manufacturer's printed operation and maintenance instructions.
  - .5 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
  - .6 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
  - .7 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
  - .8 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

- .9 Include test and balancing reports.
- .10 Additional requirements as specified in individual specification sections.
- .9 Materials and Finishes Maintenance Data:
  - .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  - .3 Additional Requirements: as specified in individual specifications sections.
- 1.6 SPARE PARTS, TOOLS AND MAINTENANCE MATERIALS
  - .1 Provide spare parts, special tools and extra materials for maintenance purposes in quantities specified in individual specification sections.
  - .2 Tag all items with associated function or equipment.
  - .3 Provide items of same manufacture and quality as items in Work.
  - .4 Deliver to site in well packaged condition. Store in location as directed by Departmental Representative.
  - .5 Clearly mark as to contents indicating:
    - .1 Part number.
    - .2 Identification of equipment or system for which parts are applicable.
    - .3 Installation instructions or intended use as applicable.
    - .4 Name, address and telephone number of nearest supplier.
  - .6 Prepare and submit complete inventory list of items supplied. Include list within Maintenance Manual.
- 2 Products
  - 2.1 NOT REQUIRED
    - .1 Not Required.
- 3 Execution
  - 3.1 NOT REQUIRED
    - .1 Not Required.

END OF SECTION

1 General

1.1 RELATED REQUIREMENTS

- .1 Operations and Maintenance Manual: Section 01 78 00 - Closeout Submittals.

1.2 DESCRIPTION

- .1 Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel prior to date of final inspection.
- .2 Departmental Representative will provide a list of Owner's personnel to receive instructions,
- .3 Cooperate with Departmental Representative in coordinating time and attendance of Owner's personnel with manufacturer's training Representative(s).

1.3 QUALITY CONTROL

- .1 Ensure that only personnel from own forces, Subcontractors or Suppliers competent and fully knowledgeable in the particular material component, equipment or system installation are used to provide training and demonstrations.
- .2 When specified in individual Sections, obtain the manufacturers authorized Representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.
- .3 Upon request, provide evidence to Departmental Representative of individual Trainor's knowledge and qualifications.

1.4 SUBMITTALS

- .1 Submit schedule of time, date and complete list of equipment and systems for which demonstration and training sessions will be provided. Submit schedule a minimum of two (2) weeks prior to designated dates, for Departmental Representative's approval.
- .2 Submit report within one (1) week after completion of demonstration, that demonstration and instructions have been satisfactorily completed. Provide time and date of when each demonstration was actually given, with list of persons present.

1.5 CONDITIONS FOR DEMONSTRATIONS

- .1 Prior to carrying out demonstration and training, ensure that equipment has been inspected and tested, is fully operational, has been performance verified and TAB has been carried out.
- .2 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6 PREPARATION

- .1 Verify that conditions for demonstration and instructions comply with requirements.
- .2 Verify that designated personnel are present.

## 1.7 DEMONSTRATION AND INSTRUCTIONS

- .1 Include the following items within the demonstration and training:
  - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each of equipment.
  - .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
  - .3 Review contents of manual in detail to explain all aspects of operation and maintenance.
  - .4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.
  - .5 Provide other specific training and instructions as specified in trade sections.

## 1.8 TIME ALLOCATED FOR INSTRUCTIONS

- .1 Observe the allocated time period specified in trade sections. Provide additional time when required to ensure all personnel fully understand all aspects of the information and instructions being provided. Allow for questions by participants.

## 2 Products

### 2.1 NOT REQUIRED

- .1 Not Required.

## 3 Execution

### 3.1 NOT REQUIRED

- .1 Not Required.

END OF SECTION

## 1 General

- .1 Perform the work in accordance with the latest edition of the National Building Code of Canada and the Canadian Electrical Code adopted by the local Authorities having Jurisdiction and other codes of the territorial or local application including amendments up to project tender closing.
- .2 The Electrical Contractor shall make a thorough examination of the site and review other trades drawings, specifications, and addendums to coordinate associated electrical work prior to submitting tender price. Additional costs will not be considered due to failure to adhere to this requirement.
- .3 Drawings for the electrical work are shown diagrammatically. They are intended to convey the scope of work and to indicate the general arrangement of equipment.
- .4 Submit to inspection departments, necessary number of drawings and specifications for examination and approval prior to commencement of work.
- .5 Work is to be warrantied for one (1) year after the date of substantial completion.
- .6 Comply with the Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut acts and regulations.
- .7 Plan and schedule shutdowns of existing services in consultation with Departmental Representative. Minimize impact and downtime of facility operations. Departmental Representatives directives are to be strictly followed in this regard.
- .8 Altered, cut, patch, and make good to match existing work. This includes sections of existing work affected by the removal of existing services.
- .9 Where unknown services are encountered, immediately advise Departmental Representative. Confirm findings in writing.
- .10 Existing damage to be identified and reported prior to commencement of work.

## 1.2 DESCRIPTION OF WORK

- .1 This work includes, but is not limited to, the supply and installation of supervision, labour, permits, equipment, materials, and consumables necessary to provide this facility with complete and operational systems as listed below, as indicated on drawings, and as described in the specifications:
  - .1 Replace existing fire alarm control panel, initiating devices, and notification devices with new. Existing wiring to remain.
  - .2 Add new fire alarm notification devices as indicated on drawings. Supply and install new wiring.
  - .3 Supply and installation of new Transient Voltage Surge Suppression (TVSS) module on main distribution panel.

## 1.3 FIRESTOPPING

- .1 All electrical penetrations through rated assemblies to be firestopped.
- .2 Electrical contractor is responsible for verifying size, type, and number of locations required for firestopping systems and installing approved firestopping.

## 2 Products

### 2.1 WIRING

- .1 Stranded conductors for #8 AWG and larger. Minimum size #12 AWG.
- .2 Copper conductors size as indicated, with 600V insulation of chemically cross linked thermosetting polyethylene material rated RW90. Coloured green for bond wire.

### 2.2 CONDUIT AND FITTINGS

- .1 Use building wire in EMT conduit where concealed in walls, above suspended ceilings, or surface mounted in service areas. Bend conduit cold. Replace conduit if kinked or flattened.
- .2 Surface EMT in crawl space.
- .3 Run conduits parallel or perpendicular to building lines.

### 2.3 CONDUIT BOXES

- .1 Size boxes in accordance with CSA 22.1 2015 requirements.
- .2 Electro-galvanized steel single and multi-gang flush device boxes, minimum size 75mm x 50mm x 37mm.
- .3 Do not install boxes back to back in walls. A minimum separation of 150mm offset is required.

### 2.4 MOULDED CASE CIRCUIT BREAKERS

- .1 Bolt-on moulded case circuit breaker: quick-make, quick-break type for manual and automatic operation with temperature compensation for 40 deg. C ambient.
- .2 Common-trip breakers: with single handle for multi-pole applications.
- .3 Circuit breakers to have a minimum 10 kA symmetrical RMS interrupting.
- .4 Breaker certificate of origin must be provided from the manufacturer.
- .5 Breaker manufacturer to match existing panel manufacturer. Coordinate on site.
- .6 Update typewritten panel schedules.

### 2.5 TRANSIENT VOLTAGE SURGE SUPPRESSION MODULE

- .1 Module: 120/208V, 3Ph, 4W TVSS module, 200kA rating.
- .2 LED indicating lights, audible alarm c/w silence button.
- .3 CSA 1 enclosure.
- .4 Module mounted adjacent to main distribution panel. Confirm with manufacturer to coordinate wiring distance.
- .5 Submit shop drawings in accordance with Contract General Requirements.
- .6 Acceptable manufacturer or approved equal: Eaton, Schneider, Siemens.

## 3 Installation

- .1 Provide labour, materials, and equipment required for a complete electrical installation.
- .2 Mounting heights of all electrical equipment to be as per Canadian Electrical Code 2015.

- .3 Provide lamacoid labels as instructed by Departmental Representative.

END OF SECTION

## 1 General

### 1.1 REFERENCES

- .1 CAN/ULC-S524-14, Standard for the Installation of Fire Alarm Systems.
- .2 ULC-S525, Audible Signal Devices for Fire Alarm Systems.
- .3 CAN/ULC-S527, Control Units Fire Alarm.
- .4 ULC-S528, Manually Actuated Signaling Boxes, Fire Alarm.
- .5 CAN/ULC-S529, Smoke Detectors for Fire Alarm Systems.
- .6 ULC-S530, Heat Actuated Fire Detectors for Fire Alarm Systems.
- .7 CAN/ULC-S536, Inspection and Testing of Fire Alarm Systems.
- .8 CAN/ULC-S537-13, Verification of Fire Alarm Systems.
- .9 CAN/ULC-S561-03, Standard Installation and Services for Fire Signal Receiving Centres.
- .10 NBC-2015, National Building Code of Canada.
- .11 NFC-2015, National Fire Code of Canada.
- .12 NFPA 72-2013 National Fire Alarm Code.
- .13 Canadian Electrical Code 2015.

### 1.2 DESCRIPTION OF SYSTEM

- .1 Manufacturer shall be responsible to ensure full system is compatible with Owner approved smoke detectors and protective cages.
- .2 Fully supervised, microprocessor-based, addressable, fire alarm system, utilizing digital techniques for data control and digital, and multiplexing techniques for data transmission.
- .3 System to carry out fire alarm and protection functions including receiving alarm signals; initiating general alarm; supervising components and wiring; actuating auxiliary functions; initiating trouble signals and signaling to fire department via dual dialing over phone and cellular networks.
- .4 Zoned, non-coded, single stage.
- .5 Modular in design to allow for future expansion.
- .6 Operation of system shall not require personnel with special computer skills.
- .7 System to include:
  - .1 Central Control Unit in separate enclosure with power supply, stand-by batteries, central processor with microprocessor and logic interface, main system memory, input-output interfaces for alarm receiving, annunciation/display and program control/signaling, integral TVSS. Interface to be bilingual.
  - .2 Addressable zone relay modules.
  - .3 Power supplies.
  - .4 Initiating/input circuits.
  - .5 Output circuits,
  - .6 Auxiliary circuits.
  - .7 Addressable manual and automatic initiating devices.
  - .8 Audible and visual signaling devices.

- .9 Historic event recorder.
- .10 Static graphics to be bilingual.
- .11 Recessed remote annunciator panel.
- .12 Auto-dialer.
- .13 ULC Listed dual channel digital communicator with standard phone line and cellular interfaces, to notify a ULC certified monitoring station. The monitoring station shall be supplied the necessary information in order to relay alarms to the local fire fighters and other responsible persons as approved by the end user.
- .14 All the components of the fire alarm system shall be indicated on a single line drawing including alarm and signaling devices, zones, power connections, sprinkler connections, door holder connections and shut down circuits, etc.

### 1.3 REQUIREMENTS OF REGULATORY AGENCIES

- .1 System:
  - .1 Shall be installed to the satisfaction of the Departmental Representative.
  - .2 System components: listed by ULC and comply with applicable provisions of the 2015 National Building Code, and meet requirements of local authority having jurisdiction.

### 1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with the general requirements of the Contract.
  - .1 Include:
    - .1 Overall system riser wiring diagram, identifying control equipment, initiating zones, signaling circuits; identifying terminations, terminal numbers, and conductors.
    - .2 Detailed assembly and internal wiring diagrams for control unit, auxiliary cabinets.
    - .3 Details for devices.
    - .4 Smoke detector protective cage data and installation details.
    - .5 Details and performance specifications for control, communications, annunciation, and peripherals with item by item cross reference to specification for compliance.
    - .6 Step-by-step operating sequence, cross referenced to logic flow diagram.
    - .7 Graphic annunciator, in English.

### 1.5 OPERATION AND MAINTENANCE DATA

- .1 Provide operation and maintenance data for fire alarm system for incorporation into manual per the general requirements of the Contract.
  - .1 Include:
    - .1 Instructions for complete fire alarm system to permit effective operation and maintenance.
    - .2 Technical data - illustrated parts lists with parts catalogue numbers.
    - .3 Copy of approved shop drawings with corrections completed and marks removed except review stamps.
    - .4 List of recommended spare parts for system.
    - .5 As-built redline drawings.

## 2 Products

### 2.1 MATERIALS

- .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .2 Power supply: to CAN/ULC-S524.
- .3 Audible & visual signal devices: to ULC-S524.
- .4 Control unit: to CAN/ULC-S527.
- .5 Manual fire alarm stations: to ULC-S528.
- .6 Thermal detectors: to ULC-S530.
- .7 Smoke and duct detectors: to CAN/ULC-S529.

### 2.2 SYSTEM OPERATION: SINGLE STAGE - SIGNALS ONLY

- .1 Actuation of any alarm initiating device to:
  - .1 Cause electronic latch to lock-in alarm state at central control unit.
  - .2 Indicate zone of alarm at central control unit.
  - .3 Cause audible and visual signaling devices to sound continuously throughout building and at central control unit.
  - .4 Transmit signal to fire department via central station.
  - .5 Cause air conditioning and ventilation fans to shut down upon activation of the duct smoke alarm or to function to provide required control of smoke movement.
  - .6 Cause fire doors and smoke control doors, if normally held open, to close automatically.
  - .7 Acknowledging alarm: indicated at central control unit.
  - .8 Possible to silence signals by "alarm silence" switch at control unit, after a 60 second period of operation.
  - .9 Subsequent alarm, received after previous alarm has been silenced, to re-activate signals.
- .10 Actuation of supervisory devices to:
  - .1 Cause electronic latch to lock-in supervisory state at central control unit.
  - .2 Indicate respective supervisory zone at central control unit and at remote annunciators.
  - .3 Cause audible signal at central control unit to sound.
  - .4 Activate common supervisory sequence.
  - .5 Resetting alarm and/or supervisory device to return system indications/functions back to normal.
- .11 Trouble on system to:
  - .1 Indicate circuit in trouble at central control unit.
  - .2 Activate "system trouble" indication, buzzer and common trouble sequence. Acknowledging trouble condition to silence audible indication; whereas visual indication to remain until trouble is cleared and system is back to normal.
  - .3 Trouble on system: suppressed during course of alarm.
  - .4 Trouble condition on any circuit in system not to initiate alarm conditions.

## 2.3 CONTROL PANEL

- .1 Central Control Unit (CCU):
  - .1 Features specified are minimum requirements for microprocessor-based system with digital data control and digital multiplexing techniques for data transmission.
  - .2 System to provide for priority reporting levels, with fire alarm points assigned highest priority, supervisory and monitoring lower priority, and third priority for troubles. Possible to assign control priorities to control points in system to guarantee operation or allow emergency override as required.
  - .3 Integral power supply, battery charger and standby batteries.
  - .4 Basic life safety software: retained in non-volatile Erasable Programmable Read-Only-Memory (EPROM). Extra memory chips: easily field-installed. Random-Access-Memory (RAM) chips in panel to facilitate password-protected field editing of simple software functions; e.g., zone labels, priorities and changing of system operation software.
  - .5 Circuitry to continuously monitor communications and data processing cycles of microprocessor. Upon failure, audible and visual trouble indication to activate.
  - .6 Communication between CCU and remote addressable detectors or zone relay modules to be supervised, Class A. Should communications fail between CCU and remote units, audible and visual trouble to be indicated at CCU. Data communication to be binary C, baseband, time-division multiplex, half-duplex. Each data channel: capable of communicating up to distance of 3000 m.
  - .7 Support up to two (2) RS-232-C I/O ports. CCU output: parallel ASCII (with adjustable baud rates to allow interface of any commercially available printer, terminal or PC).
  - .8 Equipped with software routines to provide Event-Initiated-Programs (EIP); change in status of one or more monitor points, may be programmed to operate any or all of system's control points.
  - .9 Software and hardware to maintain time of day, day of week, day of month, month and year.
  - .10 Main control panel to be recessed.
  - .11 Protocol module to comply with ULC561. Module to allow off-site monitoring of the FACP over both standard dial-up phone line and cellular dialer.

## 2.4 POWER SUPPLIES

- .1 120 V, 60 Hz as primary source of power for system.
- .2 Voltage regulated, current limited distributed system power.
- .3 Primary power failure or power loss (less than 102 V) will activate common trouble sequence.
- .4 Interface with battery charger and battery to provide uninterruptible transfer of power failure or loss.
- .5 During normal operating conditions fault in battery charging circuit, short or open in battery leads to activate common trouble sequence and standby power trouble indicator.
- .6 Standby batteries: sealed, maintenance free.

- .7 Continuous supervision of wiring for external initiating and alarm circuits to be maintained during power failure.

## 2.5 INITIATING/INPUT CIRCUITS

- .1 Receiving circuits for alarm initiating devices such as manual pull stations, smoke detectors and heat detectors, using existing wiring configuration to central control unit.
- .2 Alarm receiving circuits (active and spare): compatible with smoke detectors and open contact devices.
- .3 Actuation of alarm initiating device: cause system to operate as specified in "System Operation".
- .4 Receiving circuits for supervisory, N/O devices. Devices: using existing wiring to central control unit.
- .5 Actuation of supervisory initiating device: cause system to operate as specified in "System Operation".

## 2.6 ALARM OUTPUT CIRCUITS

- .1 Alarm output circuits connected to signals, using existing wiring to central control unit.
- .2 Signal circuits' operation to follow system programming; capable of operating horns and strobes. Each signal circuit: rated at 3 A, 24 V DC, fusing for protection protected against overloading / overcurrent.
- .3 Manual alarm silence, automatic alarm silence and alarm silence inhibit to be provided by system's common control.

## 2.7 AUXILIARY CIRCUITS

- .1 Auxiliary contacts for control functions.
- .2 Actual status indication, positive feedback, from controlled device.
- .3 Alarm and / or supervisory trouble on system to cause operation of programmed auxiliary output circuits.
- .4 Upon resetting system, auxiliary contacts to return to normal or to operate as pre-programmed.
- .5 Fans: stagger-started upon system reset, timing circuit to separate starting of each fan or set of fans connected to auxiliary contact on system. Timing circuit: controlled by CCU.
- .6 Auxiliary circuits: rated at 2 A, 24 V DC and 120 V AC, complete with fusing.

## 2.8 WIRING REQUIREMENTS FOR NEW DEVICES

- .1 Twisted copper conductors: rated 120 V.

- .2 To initiating circuits: 18 AWG minimum, and in accordance with manufacturer's requirements.
- .3 To initiating circuits: 16 AWG minimum, and in accordance with manufacturer's requirements.
- .4 To control circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.
- .5 To be run separately in EMT. Coordinate requirements with CEC 2015 and manufacturer's recommendations. To be FT-6 rated and rated for fire alarm use and comply with applicable ULC standards.

## 2.9 MANUAL ALARM STATIONS

- .1 Addressable manual pull station.
- .2 Pull lever, break glass rod, semi-flush, wall-mounted type, single action, single stage, electronics to communicate station status to addressable module and supply power to station. Bilingual markings. Station address to be set on station in field. Backbox to accommodate pull station and relay.
- .3 Dual action devices where indicated to be impact resistant, Lexan construction.

## 2.10 AUTOMATIC ALARM INITIATING DEVICES

- .1 Addressable smoke detector: photoelectric type.
- .2 Addressable duct smoke detectors: air duct type with sampling tubes with protective housing. Complete with two (2) auxiliary contacts.
- .3 Twistlock plug-in type with fixed base.
- .4 Addressable heat detectors as per ULC requirements.
- .5 Wire-in base assembly with integral red alarm LED, and terminals for remote relay alarm LED.
- .6 Electronics to communicate detector's status to addressable module.
- .7 Detector address to be set on detector base in field.

## 2.11 AUDIBLE/VISUAL SIGNAL DEVICES

- .1 Electronic horn/strobe with high intensity horn (90 dB) and low intensity strobe (4.7 candela) with bilingual FIRE/FEU markings on white Lexan strobe lens.
- .2 Overall red Lexan cover with no exposed screws complete with backbox.
- .3 Exterior horns without strobes to be weatherproof complete with recessed weatherproof backbox, suitable for extreme cold environment.

- .4 Horn/strobes installed in cell blocks are to have red wire cage installed c/w tamper resistant hardware.

## 2.12 VISUAL ALARM SIGNAL DEVICES

- .1 Strobe type: flashing, red, 24 V DC.
- .2 Designed for surface mounting on ceiling or wall outlet box.

## 2.13 SMOKE DETECTOR PROTECTIVE SECURITY CAGES

- .1 14-gauge cold rolled steel housing with perforated mesh side walls. Continuously welded seams with tamper resistant screws. Cage base to be made of 14-gauge cold rolled steel mounted to cell ceiling. White powder coat finish.
- .2 Acceptable product: Notifier SMOKE-GIA2; Edwards 6255-004; Vipond KSFDG-002 (notifier FSL-85A devices).
- .3 Install complete with anti-pick security sealant per Owner's standard.

## 2.14 GRAPHIC DISPLAY

- .1 Acrylic graphic display passive type as follows:
  - .1 Passive graphic display(s) on white photo bond paper in metal frame(s) with polycarbonate or Plexiglass glazing. In compliance with NFPA-72 6-2.3, the graphic(s) shall be designed, fabricated, and installed in a manner to render them damage and tamper resistant. The display(s) shall be securely attached to the wall adjacent to the fire alarm main panel. The labeling on the graphic must closely correspond to the displays on the fire alarm annunciator or the labels for each fire panel alarm indication. Wording shall be bilingual. The floor plan drawing is to indicate:
    - .2 Building's outline showing exterior doors.
    - .3 Building's corridors, stairways, and elevators.
    - .4 Location of, and divisions between, the fire alarm zones.
    - .5 Location of the main fire alarm panel and devices.
    - .6 The location of the propane and gas shutoff valves, where relevant.
    - .7 Duct smoke detector locations and/or ventilation equipment rooms, where relevant use of legend and symbols is recommended).
    - .8 Kitchen fire suppression system, where relevant.
    - .9 An accurate "you are here" indicator each graphic display must be oriented to match the direction of the location at which it is to be posted. - i.e., oriented to the direction in which the person viewing the display is facing.
  - .10 Allow for two to be installed at locations as directed by the Departmental Representative.

## 2.15 RECORD RISER DIAGRAM

- .1 Fire alarm system riser diagram: in glazed frame. Plastic mylar on white background.

## 2.16 ANCILLARY DEVICES

- .1 Remote relay unit to initiate fan shut-down.
- .2 Isolation modules.
- .3 Power supplies/signal boosters.
- .4 End of line devices.

- .5 Addressable relay output modules for tying into mechanical equipment and door hold opens.

## 2.17 MANUFACTURERS

- .1 Manufacturer shall be responsible to ensure full system is compatible with Owner approved smoke detectors and protective cages.
- .2 Acceptable Manufacturers – Substitutions are not acceptable:
  - .1 GE Edwards Security Canada (Edwards iO Series)
  - .2 Notifier NFS-320 Series

## 3 Execution

### 3.1 INSTALLATION

- .1 It is intended that all fire alarm equipment, detectors, pull stations, speaker horns, etc. with the exception of the main control panel, will be flush mounted and wire and conduit will be concealed in construction in finished areas.
- .2 Mounting heights shall match existing devices unless otherwise indicated.
- .3 Install systems in accordance with CAN/ULC-S524-06 and CAN/ULC-S561-03.
- .4 Install manual alarm stations and connect to alarm circuit wiring.
- .5 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.
- .6 Detectors shall be mounted both above and below the suspended ceiling tile as indicated.
- .7 Connect alarm circuits to main control panel.
- .8 Install horns and visual signal devices and connect to signaling circuits.
- .9 Provide separate conduits for initiation and signaling circuits.
- .10 Connect signaling circuits to main control panel.
- .11 Connect door holders and releasing devices to alarm loop using relays and addressable relay modules where relevant.
- .12 Install remote relay units to control fan shutdown.
- .13 Splices are not permitted.
- .14 Confirm with manufacturer if supplied addressable relays or intelligent interface devices require separate DC power and if so supply and install DC power feed from main fire alarm panel and sized per manufacturer's recommendations.
- .15 Provide necessary raceways, cable and wiring to make interconnections to terminal boxes, annunciator equipment and CCU, as required by the equipment manufacturer.

- .16 Ensure that wiring is free of opens, shorts or grounds, before system testing and handing over.
- .17 Identify circuits and other related wiring at central control unit and terminal boxes.
- .18 Make all arrangements to have fire alarm remotely annunciated at Central Station. Supply all equipment, connections, etc. required. Departmental Representative to pay fees and connection costs to the telephone company and local Fire Department.
- .19 Connect relay units to control fan shut-down and door releases with relays and intelligent interface devices and as indicated.

### 3.2 FIELD QUALITY CONTROL

- .1 Perform tests and submit field reports in accordance with general conditions of the Contract and CAN/ULC-S537.
  - .1 Fire alarm system:
    - .1 Test such device and alarm circuit to ensure manual stations and smoke detectors, transmit alarm to control panel and actuate general alarm and ancillary devices.
    - .2 Simulate grounds and breaks on alarm and signaling circuits to ensure proper operation of trouble signals.
    - .3 Simulate ground fault at panel.
    - .4 Check annunciator panels to ensure zones are shown correctly.
    - .5 Verify correct door control and general operation.
    - .6 Verify correct fan shut-down and restart.
    - .7 Verify remote dial-out and monitoring.
  - .2 Provide final PROM program return for system incorporating program changes made during construction.

### 3.3 INSPECTION

- .1 The manufacturer shall make an inspection of equipment, including those components necessary for the direct operation of the system such as manual stations, detectors, and controls. The inspection to comprise an examination of such equipment for the following:
  - .1 That the type of equipment installed is that designated by this specification.
  - .2 That the wiring type, installation, and connections to equipment components show that the installer undertook to have observed applicable codes and standards.
  - .3 That equipment supply by the manufacturer was installed in accordance with the manufacturer's recommendation and that devices have been operated or tested to verify their operation.
  - .4 That the supervisory wiring of those items of equipment connected to a supervised circuit is operating and that the governmental regulations, if any, concerning the supervisory wiring, have been met to the satisfaction of inspection officials.
- .2 The manufacturer to supply to the electrical contractor reasonable amounts of technical assistance with respect to any changes necessary to conform to Paragraphs 1, 2, and 4 above. During the period of inspection by manufacturer, the electrical contractor to make available to the manufacturer, electricians as designated by the manufacturer.

- .3 To assist the electrical contractor in preparing his bid, the manufacturer to indicate the number of hours necessary to complete this inspection prior to closing of tenders.
  - .4 On completion of the inspection and when all of the above conditions have been complied with, the manufacturer to issue to the Departmental Representative:
    - .1 A copy of the Inspecting Technician's report showing location of each device and certifying the test results of each device.
    - .2 A certificate of verification confirming that the inspection has been completed in accordance with CAN/ULC-S537 and S561 and showing the conditions upon which such inspection and certification have been rendered.
  - .5 The representative of the manufacturer shall provide evidence of technical training on the type of electronic equipment specified herein and shall have at least five (5) years experience with fire detection and control systems.
  - .6 Service technicians and replacement components for the system specified shall be available from an authorized service representative of the manufacturer who is able to provide evidence of the technical training and authorization by the manufacturer.
  - .7 All costs involved in this inspection, both from the manufacturer and the electrical contractor work, to be included in the tender price.
- 3.4 CLEANING
- .1 Remove protective coverings from sensors and components.
  - .2 Clean sensors and keypads such that they are free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
- 3.5 WARRANTY
- .1 Provide a written guarantee, signed and issued in the name of the Departmental Representative, stating that the fire alarm system is guaranteed against defects in material, workmanship and performance for a period of two (2) years from the date of the Final Certificate of Completion. CAN/ULC-S537.

END OF SECTION