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THIS PACKAGE CONTAINS A SECURITY REQUIREMENT

Specifications | Devis

Project Name | Nom du projet : Fort Frontenac Arc Flash

DND Project File : PF500659505

DCC Project File : KN229976

Drawing Number | Numéro du projet : K-B35-9306/91

Date | Date : 2026-06-05

Location | Emplacement :

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Address | Adresse

Kingston
City | Ville

ON
Province | Province

Project Manager | Chargé de projet :

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END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the furnishing of all labour, materials and equipment required for general construction, renovation located at Fort Frontenac.

1.03 CODES

.1 Perform work in accordance with National Building Code of Canada (NBC), Ministry of Labour guidelines and regulations, applicable codes and standards and any other National Defence standard procedures that may be specified, (all latest editions). In any case of conflict or discrepancy, the more stringent requirement shall apply.

.2 Meet or exceed requirements of:
- .1 contract documents,
- .2 specified standards, codes and referenced documents.
- .3 all of the above documents are latest issue, regardless of data shown in the specification.

1.04 DEFINITIONS

.1 DCC Representative is Defence Construction Canada Ltd. DCC, as referenced in DCC General Conditions. DCC is the tendering agency and the Coordinator for the projects. DCC is the sole project authority representing National Defence and the Designer of Record for the project, during and after tender award.
- .1 DCC Representative is the sole project authority. The Designer of Record is to have the DCC Representative approval for making any changes to the design or specification.
- .2 The Contractor shall cooperate fully with the DCC Representative order that the DCC Representative and the Designer of Record may properly review the progress of the work during its execution.

1.05 SITE CONDITIONS AND INQUIRIES AT TENDER

.1 It is highly recommended that Contractors should attend the site visit where possible to familiarize themselves with existing conditions and project intent during the tender. Bidders site briefing, if conducted, is not comprehensive and is not a substitute for a thorough review of the tender package by the Contractor.

1.06 SETTING OUT OF WORK

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide everything needed to lay out and construct work.

.3 Supply any devices and or templates required to facilitate DCC Representative or authorized testing agencies inspection of work.

.4 Location of non-base controlled services are the responsibility of the contractor to obtain. These are typically natural gas, telephone, cable and local utility controlled electrical. Base will locate services as follows: Base controlled electrical, sewer, steam, water and communications.

.5 Saturday and Sunday work or work on specified Statutory Holidays is NOT permitted unless approved by the DCC Representative.

.6 Contractor is to provide a qualified and competent superintendent and is to be present at the job site when work is being performed.

1.07 WORK SEQUENCE

.1 Construct Work in stages to accommodate Owner's continued use of premises during construction, as applicable.

.2 Coordinate the Progress Schedule and cooperate with the DCC Representative in scheduling operations to minimize conflict and to facilitate tenant usage.

.3 The Contractor is responsible to determine the schedule and sequence of work to meet the Schedule

.4 Maintain fire access/control.

1.08 CONTRACTOR USE OF PREMISES

.1 Use of DND Property:
.1 Contractor, sub-contractor(s) and all personnel of this contract shall not use any tools, equipment, materials, buildings, structures or any other or any other property owned, rented leased by the Department of Nation Defence (DND) unless authorized in writing by the DCC Representative.

.2 Contractor's Use of Site:
.1 Use of site: exclusive and complete for execution of work, within the boundaries of the Project area of work, unless otherwise stated in writing by the DCC Representative.
.2 Zones for exterior storage area are indicated or are as directed by the DCC Representative.

.3 Limit use of premises to allow:
.1 Owner occupancy.
.2 Partial owner occupancy.
.3 Public usage.

.4 Co-ordinate use of premises under direction of DCC Representative.

.5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.6 Repair or replace portions of existing work which have been altered during

construction operations to match existing or adjoining work, as directed by DCC Representative.

.7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.09 OWNER FURNISHED ITEMS

.1 Not used.

1.10 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendation for safety, assess and maintenance. Advise DCC Representative of conflicts and await clarification.

.3 Inform DCC Representative of impending installation and obtain their approval for actual location.

.4 Submit red line drawings to indicate relative position of various services and equipment.

1.11 CONCEALMENT

.1 Conceal pipes, duct and wiring in the floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.12 CUTTING AND PATCHING

.1 Cut and patch as required to make work fit. Refer to appropriate sections and details. Where no detail is given advise DCC Representative and wait for direction.

.2 Make cuts with clean, true, smooth edges.

.3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work or as indicated.

1.13 ADDITIONAL DRAWINGS

.1 DCC Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

1.14 RELICS AND ANTIQUTIES

.1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of work.

.2 Give immediate notice to DCC Representative and await DCC Representative written instructions before proceeding with work in this area.

.3 Relics, antiquities and items of historical or scientific interest remain Crown property.

1.15 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with DCC Representative to facilitate execution of work.

.2 Use of in building for moving workers and material.
- .1 Protect walls of passenger elevators, to approval of DCC Representative prior to use.
- .2 Accept liability for damage, safety of equipment and overloading of existing equipment.
- .3 Where security has been reduced by work of Contractor, provide temporary means to maintain security.
- .4 Provide and maintain temporary dust screens, barriers, hoarding, hazardous abatement enclosures, warning signs, drop cloths etc where work is adjacent to areas used by the public or National Defence personnel.

1.16 EXISTING SERVICES

.1 Notify, DCC Representative of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give DCC Representative 5 working days notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by DCC Representative with minimum disturbance to pedestrian, vehicular traffic and tenant operations.

.3 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.4 Submit schedule to and obtain approval from DCC Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.5 Provide temporary services when directed by DCC Representative to maintain critical building and tenant systems.

.6 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.7 Where unknown services are encountered, immediately advise DCC Representative and confirm findings in writing.

.8 Protect, relocate or maintain existing active services. When inactive services are encountered, notify DCC Representative.

.9 Record locations of maintained, re-routed and abandoned service lines on redline drawings.

.10 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.17 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.
- .12 Utility locate sheets.

1.18 QUALITY ASSURANCE

.1 The review of the work by the DCC Representative is to confirm adherence to the intent of the design. It does not release the Contractor from his responsibility for the proper execution of the work in accordance with the drawings and specifications and all governing regulations and good workmanship and established trade practices.

.2 The sampling inspection of material installations by testing agencies will not release the Contractor from his responsibility for the thorough execution of the work in accordance with the drawings and specifications and all governing regulations, good workmanship and established trade practices.

.3 The intermittent site reviews and subsequent reports by the Designer of Records do not constitute thorough inspection, blanket approval or comprehensive deficiency findings of the installations performed by the Contractor. They are limited to what has been witnessed and to establish adherence to the intent of the design. The Contractor is responsible for the proper execution of the work in accordance with the drawings and specifications and all governing regulations, good workmanship and established trade practices.

.4 The Contractor is responsible for securing timely written clarifications where the intent of the design may not be clear.

1.19 COST BREAKDOWN

.1 Within 10 working days of award submit breakdown of Contract price in detail as directed by DCC Representative and aggregate contract price. Cost breakdown will be used as basis for progress payment.

.2 Itemized separate line cost for each of the following general cost items as applicable.
- .1 Performance and Payment Bonds.
- .2 Field supervision and layout.
- .3 Temporary Facilities and Controls.

.3 Itemize separate line-item cost for work required by each Section of this

Specification.

1.20 PROJECT MEETINGS

.1 Hold construction project meetings at times and locations approved by DCC Representative.
.1 For bidding purposes, assume Project Meetings to be held bi-weekly.

.2 DCC Representative will advise General Contractor of meetings. General shall be responsible for notifying sub-contractors and any other interested parties whose attendance is required.

.3 DCC Representative will assume responsibility for recording and distributing minutes to all interested parties.

2 PRODUCTS

1.21 NOT USED

.1 Not used.

3 EXECUTION

2.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding as required, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.03 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with DCC Representative to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security, in accordance with section 01 35 15 Industrial Security.

.4 DCC Representative may, at their sole discretion assign sanitary facilities for use by Contractor's personnel. Keep facilities clean. For bidding purposes, assume that the Contractor provides sanitary facilities.

.5 Closures: protect work temporarily until permanent enclosures are completed.

1.04 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants, and normal use of premises. Arrange with DCC Representative to facilitate execution of work.

1.06 SPECIAL REQUIREMENTS

.1 Carry out Work Monday to Friday from 07:00 to 17:00 hours, except when other hours are approved by DCC Representative. No work on statutory holidays unless approved by DCC Representative.

.2 Interruptions and connections to the CFB Kingston Steam network will only be allowed during the period of June 1st to September 30th, unless directed otherwise by the DCC Representative.

.3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.4 Keep within limits of work and avenues of ingress and egress.

.5 Ingress and egress of Contractor vehicles at site is limited to 07:00 to 17:00 hours.

1.07 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.2 Particular requirements for inspection and testing to be carried out by testing laboratory designated by DCC Representative are specified under sections as applicable.

1.02 APPOINTMENT AND PAYMENT

.1 DCC Representative will appoint and pay for services of testing laboratory except follows:
- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.
- .5 Tests specified to be carried out by Contractor under supervision of DCC Representative.
- .6 Additional tests specified in paragraph 1.02.2.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by DCC Representative to verify acceptability of corrected work.

1.03 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:
- .1 Provide access to Work for inspection and testing.
- .2 Facilitate inspections and tests.
- .3 Make good Work disturbed by inspection and test.
- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify DCC Representative 3 working days minimum in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and accepted by DCC Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.3 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days.

.4 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.5 Milestone: significant event in project, usually completion of major deliverable.

.6 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.7 Project Planning, Monitoring and Control System: overall system operated by DCC Representative to enable monitoring of project work in relation to established milestones.

1.03 REQUIREMENTS

.1 Ensure Project Schedules are practical and remains within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that Award of Contract, Interim Certificate and Final Certificate dates are identified on the schedule.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal

Procedures.

.2 Submit to DCC Representative within 10 working days of Award of Contract, a detailed Project Schedule, capable of identifying, scheduling, monitoring and reporting activities related to the progress of work. Provide sufficient detail and degree of control in the schedule to the approval of the DCC Representative and such that the needs and objectives of the Contract are met.

1.05 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule. Contractor to identify milestones on project schedule. Contractor to include identified milestones from Tender Documents on Project Schedule.

1.06 PROJECT SCHEDULE

.1 Develop detailed Project Schedule.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- .1 Identification of work periods on a horizontal time scale, from date of award to completion. Indicated weekend or after hours work, if required.
- .2 Submission date, review times for shop drawings, product data and samples.
- .3 Anticipated progress of the work for each major activity by discipline. Duration of each task shall be a maximum of 10 days.
- .4 Identification of the most critical activities throughout the course of the project.
- .5 Major equipment/material deliveries.
- .6 Backfill of any utilities.
- .7 Planned shutdowns of existing systems for work requirements.
- .8 Proposed dates(s) for commissioning, if required.
- .9 Training for personnel on new systems.
- .10 Submission of Redline Drawings, updated Record Drawings and Operations and Maintenance Manuals.
- .11 Mobilization and demobilization.

.3 DCC Representative will review schedule and return review copy with comments or request for clarifications within 10 business days after receipt.

.4 Submit finalized schedule within 10 business days after return of review copy.

1.07 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

1.08 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that

are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Submit progress update of activities against planned progress on a bi-weekly basis as requested by the DCC Representative. Progress update to reflect the next 2 weeks of work.

.3 Weather related delays with their remedial measures will be discussed and negotiated.

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ADMINISTRATIVE

.1 This section specifies general requirements and procedures for contractor submissions of shop drawings, product data, samples, mock-ups and certificates to DCC Representative for review. Additional specific requirements for submissions are specified in individual sections of the specification.

.2 Submit to DCC Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.3 Do not proceed with Work affected by submittal until review and acceptance by the DCC Representative.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not produced in SI Metric units converted values are acceptable.

.6 Review submittals prior to submission to DCC Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not dated and identified as to specific project will be returned without being examined and considered rejected.

.7 Notify DCC Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are co-ordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by DCC Representative's or Designer of Record review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by DCC Representative or Designer of Record review.

.11 Submitted shop drawings that do not consider the time requirement for review and or the time required to order, manufacture and deliver does not constitute justification or grounds for requesting an alternate material that is readily available for the project. Contractor shall bear all costs associated to provide the acceptable product to deliver the project on schedule.

.12 Keep one reviewed copy of each submission on site.

1.03 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 10 working days for DCC Representative's review of each submission.

.4 Make changes in shop drawings as DCC Representative may require, consistent with Contract Documents. When resubmitting, notify DCC Representative in writing of revisions other than those requested.

.5 Accompany submissions with transmittal letter, containing:
- .1 Date.
- .2 Project Title and Building Number.
- .3 DND Drawing Number
- .4 DND Project Number
- .5 DCC Project Number
- .6 Contractor's name and address.
- .7 Identification and quantity of each shop drawing, product data and sample.
- .8 Other pertinent data.

.6 Submissions include:
- .1 Date and revision dates.
- .2 Project Title and Building Number.
- .3 DND Drawing Number
- .4 DND Project Number
- .5 DCC Project Number
- .6 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .7 Signature by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .8 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.7 After DCC Representative's review, distribute copies.

.8 Submit one electronic copy of shop drawings for each requirement requested in specification Sections and as DCC Representative may reasonably request.

.9 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by DCC Representative where shop drawings will not be prepared due to standardized manufacture of product.

.10 Submit electronic copy of test reports for requirements requested in specification Sections and as requested by DCC Representative.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.

.11 Submit electronic copy of certificates for requirements requested in specification Sections and as requested by DCC Representative.
.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
.2 Certificates must be dated after award of project contract complete with project name.

.12 Submit electronic copy of manufacturer’s instructions for requirements requested in specification Sections and as requested by DCC Representative.
.1 Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.

.13 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by DCC Representative.

.14 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.15 Submit electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by DCC Representative.

.16 Delete information not applicable to project.

.17 Supplement standard information to provide details applicable to project.

.18 If upon review by DCC Representative, no errors or omissions are discovered or if only minor corrections are made, electronic acceptance copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.04 SAMPLES

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to DCC Representative.

.3 Notify DCC Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Make changes in samples which DCC Representative may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.05 MOCK-UPS

.1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

.2 Reviewed and accepted mock-ups will become standard of workmanship and materials against which installed work will be verified.

.3 Erect mock-ups at locations acceptable to DCC Representative.

1.06 PHOTOGRAPHIC DOCUMENTATION

.1 When called for inspections submit electronic copy of colour digital photography in .jpg format, standard resolution and as directed by DCC Representative.

.2 Project identification: name and number of project and date of exposure indicated.

1.07 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 **Precedence** - Division 1 sections take precedence over technical specifications in other Divisions of this project manual.

1.2 REFERENCES

.1 Definitions:

.1 Contract Security Program (CSP) - A division of Public Services and Procurement Canada (PSPC), which developed the Contract Security Manual and helps industry to participate in Government of Canada and foreign government contracts. CSP provides security screening services needed for contractors before their employees can work with Protected and Classified information and assets.

.2 Company Security Officer (CSO) - The CSO is the organization's official point of contact with the CSP. The CSO is responsible for monitoring the organization's security profile, addressing security issues, and is accountable to the CSP and to the organization's designated Key Senior Official on all industrial security matters.

.3 Contractor CSO - The employee of the Contractor’s company who is the CSO.

.4 Contract Security Manual (CSM) - The CSM is a ready and simple reference which tells Company Security Officers what they must know about Canadian government security standards and procedures and how to ensure that their organization meets these security requirements.

.5 Positive Control - Measures which guarantee that persons without appropriate clearance will not be left unattended to access the Department of National Defence/Canadian Armed Forces (DND/CAF) information, assets, resources, or locations.

.6 Request for Visit (RFV) - A form to be filled out by an individual who requires access to sensitive DND property, personnel, information, assets and resources because they must be security screened at the appropriate level before commencement of their duties.

.7 Restricted - Refers to a situation where authorized persons only, are allowed access to an area or information.

.8 Security Implementation Plan - A detailed document which outlines the company’s strategy and process to meet contract security requirements.

.9 Security Requirements Check List (SRCL) - The SRCL is a Treasury Board Secretariat (TBS) form used to define the security requirements for a contract. The SRCL represents an evaluation of security threats and risks that may arise through the contracting process.

.10 Sensitive - Records that are sensitive contain information that can cause different degrees of injury to an individual, a company, or the country if the information were disclosed in an unauthorized manner.

.2 Reference Sites:

.1 Defence Construction Canada (DCC)

.1 https://www.dcc-cdc.gc.ca/industry/security-requirements

.2 PSPC Contract Security Manual

.1 https://www.tpsgc-pwgsc.gc.ca/esc-src/msc-csm/index-eng.html

1.3 GENERAL

.1 Security requirements must form part of the contract between DCC and industry when defined by a SRCL.

.2 These security requirements apply but are not limited to:

.1 construction and material objects;

.2 contractual arrangements;

.3 professional service contracts;

.4 facility maintenance contracts; and

.5 environmental and UXO contracts.

.3 A SRCL is a form that is used to define the security requirements associated with each contract. The SRCL ensures that that the appropriate security clauses are identified so they may be incorporated into the contract, thereby legally binding the parties to meet the contract's security requirements. **The SRCL must accompany all contract documents including subcontracts that contain security requirements**.

.4 If multiple levels of screening are required, a Security Classification Guide may have been provided along with the SRCL as a contractual document. This document will provide further information related to security requirements when dealing with multiple levels of clearances within the contract.

1.4 PRIVATE SECTOR ORGANIZATION SCREENING AND CLEARANCES

.1 Companies who will need access to or who will retain controlled goods, protected or classified property, information, assets or resources must be cleared as follows:

.1 Companies must be cleared to safeguard the highest level of information and asset to be retained/accessed, meaning:

.1 Designated Organization Screening (DOS) is required for contracts involving access to information at the protected level and/or secure worksites (Reliability status);

.2 Facility Security Clearance (FSC) is required for contracts involving access to information at the protected and/or classified levels and/or secure worksites (Secret status);

.3 Document Safeguarding Capability (DSC) is required to work on protected and/or classified information at their own worksite; and

.4 Companies who will electronically process protected or classified information must have IT media clearance and processing capability commensurate with the security classification level of the information to be processed and must be cleared to the level commensurate with the information or asset to be accessed.

1.5 PERSONNEL SECURITY SCREENING

.1 Individuals requiring access to information and/or site must have their personnel security screening completed prior to submitting an RFV. As a part of the screening process, it is now a requirement for individuals to undergo a law enforcement inquiry through the RCMP, for electronic finger printing. Please refer to PSPC website for more information.

.2 Prior to Contract Award, personnel security screenings may not be initiated due to CSP requirements. Therefore, contractors must allow time in their schedules to seek personnel security screenings as required by the contract.

.1 Reliability status processing is anticipated to take seven (7) business days per employee after a request has been properly submitted to CSP; and

.2 Secret clearance processing is anticipated to take seventy-five (75) business days per employee after a request has been properly submitted to CSP.

1.6 VISIT CLEARANCE REQUESTS (VCR) APPROVAL

.1 All individuals (including subcontractors) who will have access to sensitive DND or CAF property, personnel, information, assets, and resources, must be security screened at the appropriate level before the commencement of their duties in relation to the contract.

.2 Access to Operations Zones: security screening is not required for certain personnel if positive control of those individuals is maintained throughout their visit. Positive control measures must be outlined in the Security Implementation Plan. Positive control can be used for the following personnel:

.1 Logistics activities – material drop-off, waste removal, snow removal;

.2 Transit through an operations zone (no work); and

.3 Authorities having jurisdiction.

.3 The VCR process verifies that those who are permitted access onto DND property have the required clearance level as outlined within the SRCL for the contract.

1.7 POST AWARD PROCESS OVERVIEW

.1 The Contractor’s CSO is provided a blank RFV form by the DCC Representative in order to obtain an approved VCR.

.2 All employees of the successful bidder who will be accessing restricted sites or sensitive information during the execution of the contract require a VCR. The Contractor’s CSO must forward the completed form to the DCC Representative for processing.

.1 The CSO of each company completing an RFV form must submit a picklist from the Online Industrial Security Services (OLISS) portal instead of filling in the details of each visitor on the form. Only the employees of the company who require access to the restricted site or sensitive information for that contract shall be listed on the picklist.

.2 If the Contractor intends to use Union Hall members, the CSO will request the Union Hall to provide the CSO with a separate picklist for all members to be used on the contract. Only the individuals of the Union Hall who require access to the site for that contract shall be listed on the picklist.

.3 The CSO of the company will input "SEE ATTACHED PICKLIST" when completing Particulars of Visitors.

.3 It is the responsibility of the Prime Contractor to submit and receive an approved SRCL for each subcontract containing security requirements. This responsibility extends to all subcontracts held by subcontractors.

.1 Instructions on this process are in the CSM located at https://www.tpsgc-pwgsc.gc.ca/esc-src/msc-csm/index-eng.html

.2 Prior to Contract Award, subcontract SRCL security screenings may not be initiated due to CSP requirements. Therefore, contractors must allow time in their schedules for subcontract SRCL approvals as required by the contract.

.1 When a Private Sector Organization Screening (PSOS) is **not** required, contractors shall allow 45 business days (from the date on which a complete and correct subcontract SRCL is received by CSP) for approval of a subcontract SRCL by CSP.

.2 When a PSOS **is** required:

.1 For sub-contractors to be sponsored to the level of DOS, contractors shall allow for 50 business days (from the date on which a complete and correct PSOS is submitted to CSP) for approval of a subcontract SRCL by CSP; and

.2 For sub-contractors to be sponsored to the level of FSC (Secret), contractors shall allow 124 business days (from the date on which a complete and correct PSOS is submitted to CSP) for approval of a subcontract SRCL by CSP.

.3 All security related pre-construction activities shall proceed immediately after award.

.4 For subcontracts, the RFV shall not be submitted until after the subcontract SRCL has been approved and permission to award the contract is granted by CSP.

.1 Contractor to allow a minimum of 15 business days for VCR processing.

.5 Personnel not meeting the required security clearances will not be allowed access to restricted sites or any sensitive information pertaining to the contract, except as permitted in 1.6.2.

.6 Approved VCRs are valid for the duration of the contract **or** one year less one day, whichever is less. Extension to VCRs will need to be requested as required, again allowing a minimum of 15 business days for processing.

1.8 SUBMITTALS

.1 Submit to the DCC Representative copies of the following documents, including updates issued:

.1 Security Implementation Plan

.2 Approved subcontract SRCLs

.3 Completed Request for Visit forms for all personnel working under the contract

.4 Incident reports within (1) working day

.5 Submit other data, information and documentation upon request by the DCC Representative.

1.9 RESPONSIBILITY

.1 It is the responsibility of the Contractor to have no security breaches while undertaking the work for this contract.

1.10 MEETINGS

.1 Prior to commencement of work, the Contractor will attend a pre-commencement meeting conducted by the DCC Representative. Ensure, as minimum, attendance by Contractor's site superintendent.

.1 The DCC Representative will advise of time, date and location of the meeting and will be responsible for recording and distributing the minutes.

.2 If requested by the DCC Representative, the Contractor's CSO will be required to participate in the pre-commencement meeting.

.2 Conduct site specific security meetings as required to ensure the management of security is in accordance with the contract.

.1 Record and post minutes of all meetings as allowed by the security requirements of the contract.

1.11 SECURITY IMPLEMENTATION PLAN

.1 Contractors are required to have in place a contract specific Security Implementation Plan that addresses the security requirements outlined in the contract.

.2 Provide one copy of the Security Implementation Plan to the DCC Representative prior to the commencement of work.

.3 At a minimum, the plan shall contain details addressing:

.1 CSO name and contact information;

.2 Schedule for subcontract SRCLs and RFVs;

.3 Site Access and Control Monitoring including verification that all people entering secure areas on site have approved VCRs in accordance with contractual security requirements, or any planned positive control measures;

.4 Security Education (i.e. Restrictions on photographs); and

.5 Security Incident Reporting.

.4 The DCC Representative will coordinate review of the Security Implementation Plan by the DND Project Security Authority to be completed within 10 business days of receipt following which the DCC Representative shall confirm DND's acceptance or rejection with comments.

1.12 INCIDENT REPORTING

.1 Investigate and report any security incidents immediately to the DCC Representative.

.1 Immediately provide a copy of the incident/investigation reports to the DCC Representative.

.2 Refer to Chapter 5 of the CSM https://www.tpsgc-pwgsc.gc.ca/esc-src/msc-csm/index-eng.html for more information.

.2 For the purpose of this contract, immediately notify the DCC Representative of incidents that involve a security breach from the identified clauses on the SRCL or an interruption to adjacent and/or integral infrastructure operations with potential loss implications.

.3 In the investigation and reporting of incidents, the Contractor is required to respond in a timely fashion (within 5 working days) to correct the action that was deemed to have caused the incident and advise in writing on the action taken to prevent a re-occurrence of the incident.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 CONSTRUCTION FIRE SAFETY

.1 The Contractor shall provide construction fire safety in accordance with the National Fire Code of Canada.

1.02 FIRE DEPARTMENT BRIEFING

.1 DCC Representative will co-ordinate arrangements for Pre-Commencement Meeting following contract award. Contractors will be briefed on Fire Safety by the Chief Fire Prevention Officer (CFPO) or his designated representative before work starts.

1.03 REPORTING FIRES

.1 The Contractor shall inform the DCC Representative and CFPO of all fire incidents at the construction site, regardless of size.

.2 Know location of nearest fire alarm pull station and telephone, including emergency phone number.

.3 Report immediately fire incidents to Fire Department as follows:
.1 Activate nearest fire alarm pull station.
.2 Call 911.
.3 Call DCC Representative & Chief Fire Inspector by contacting 613-541-5010 x 5795 / Cell: 613-484-8166

.4 Person activating fire alarm pull station will remain at the front entrance to direct Fire Department to scene of fire.

.5 When reporting fire by telephone, give location of fire, name or number of building and (must give municipal address) be prepared to verify location.

1.04 FIRE SAFETY PLAN

.1 Submit fire safety for the construction site prior to commencement of construction work. The fire safety plan shall conform to the National Fire Code of Canada.

.2 The fire safety plan shall be limited to the area of construction only. Fire safety plan shall contain building-specific details for planned system impairments. Contractor is not responsible for amending fire safety plans in existing buildings.

.3 The fire safety plan shall be submitted to the DCC Representative for review by Chief Fire Inspector. Allow 10 working days for DND review. Any comments by CFB Kingston Chief Fire Inspector shall be implemented by the Contractor.

.4 Post the fire safety plan at entrance to the construction site or near construction site's health and safety board.

.5 The fire safety plan shall conform to the National Fire Code of Canada and

shall contain, at minimum:

.1 Emergency procedures to be used in case of fire, including:
  .a Sounding the fire alarm;
  .b Notifying the fire department;
  .c Instructing occupants on procedures to be followed when fire alarm sounds;
  .d Evacuating occupants, including special provisions for persons requiring assistance; and
  .e Confining, controlling and extinguishing fires.

.2 The appointment and organization of designated supervisory staff to carry out fire safety duties.

.3 The training of supervisory staff and other occupants in their responsibilities for fire safety.

.4 Documents including diagrams, showing type, location and operation of building fire emergency systems.

.5 Holding of fire drills (where applicable).

.6 The control of fire hazards in the building.

.7 The inspection and maintenance of building facilities provided for the safety of occupants.

1.05 FIRE WARNING SYSTEM

.1 A fire warning shall be provided to notify construction personnel of a fire emergency in the construction area.

.2 The system used shall be capable of being heard throughout building.

1.06 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

.1 Unless authorized by the DCC Representative and the CFPO, Fire protection and alarm system will not be:
  .1 Obstructed.
  .2 Shut-off.
  .3 Left inactive at the end of working day or shift without prior written authorization from the CFPO

.2 Do not use Fire hydrants, standpipes or hose systems for other than fire-fighting purposes unless authorized by the CFPO.

1.07 FIRE PROTECTION SYSTEM IMPAIRMENT

.1 Notify the DCC Representative and the CFPO 48 hours prior to shutting down any active fire protection system, including water supply, fire suppression, fire detection and life safety systems.

.2 Where a fire protection system that provides fire alarm monitoring is impaired in an existing building, per the Contractor’s fire safety plan a fire watch shall be required and provided by the Contractor.

.3 The quantity of personnel involved in the fire watch is to be adequate such that the Contractor’s entire area of construction work is patrolled during the fire watch.

.4 The building shall be patrolled at least once per hour on a 24-hour basis until the fire alarm and or fire protection system has been restored to normal operation condition.

.5 Fire watch personnel are to be familiar with facilities and procedures for sounding an alarm in the event of a fire and have a means of notifying the Emergency Services. The person(s) performing fire watch are not permitted to perform any other duties at the same time.

.6 Fire watch personnel are to have fire-extinguishing equipment readily available and be trained in its use.

.7 Implement all fire protection system impairments in accordance with the National Fire Code of Canada and Base Fire Orders.

1.08 FIRE EXTINGUISHERS

.1 In addition to other requirements of this specification, supply fire extinguishers, as scaled by the CFPO, necessary to protect work in progress and contractor's physical plant on site.

.2 Fire extinguishers may be required in the following areas as directed by the CFPO.
- .1 Adjacent to hot works;
- .2 In areas where combustibles are stored;
- .3 Near or on any internal combustion engines;
- .4 Adjacent to areas where flammable liquids or gases are stored or handled;
- .5 Adjacent to temporary oil fired or gas fired equipment; and
- .6 Adjacent to bitumen heating equipment.

.3 Extinguishers shall be sized as 4-A: 40-B: C (20 lbs) unless otherwise directed by the CFPO.

.4 Extinguishers shall be of the dry chemical type unless otherwise required by the hazard being protected.

.5 The Contractor may assume the quantity of extinguishers based on a maximum travel distance between extinguishers of 75 feet.

1.09 INSTALLATION OR REPAIR OF ROOFS

.1 Notify the CFPO of location of asphalt kettles and dates that kettles will be in use. Ensure personnel use and take precautions as follows:
- .1 Use kettles equipped with thermometers or gauges in good working order.
- .2 Locate kettles in safe place outside of building or, if approved by CFPO, on non-combustible roof. Locate to avoid danger of igniting combustible material below.
- .3 Maintain continuous supervision while kettles are in operation and provide metal covers for kettles to smother flames in case of fire. Provide fire extinguishers as required in 1.08.
- .4 Prior to start of work, demonstrate container capacities to CFPO.
- .5 Use only glass fibre roofing mops.
- .6 Do not leave used roofing mops unattended on roof. Store mops away from building and combustible materials.
- .7 Store roofing materials no closer than 3.0 metres from structures.
- .8 Any flammable cylinder shall be secure to prevent accidental tip over.

1.10 ACCESS FOR FIRE FIGHTING

.1 Access for firefighting shall be provide in accordance with National Fire Code of Canada.

.2 Advise the CFPO of work that would impede fire apparatus response. This includes violation of minimum horizontal and overhead clearances, as prescribed by the CFPO, erecting of barricades and digging of trenches.

.3 Minimum horizontal clearance: clear width of not less than 5.0 meters or as defined by the CFPO.

.4 Minimum vertical clearance: overhead height of not less then 6.0 meters, or as defined by the CFPO.

1.11 SMOKING PRECAUTIONS

.1 Smoking is prohibited in all buildings. Observe posted smoking restrictions near existing buildings. Smoking areas will be IAW Base Fire Orders and will not be within 10 meters of any building entrance.

1.12 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials at minimum quantities.

.2 Burning of rubbish is prohibited.

.3 Remove rubbish from work site at end of work day or shift as directed.

.4 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.

.5 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove specified.

1.13 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 Handle, store and use flammable and combustible liquids in accordance with National Fire Code of Canada.

.2 Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Obtain written authorization from CFPO for storage of quantities of flammable and combustible liquids exceeding 45 litres on site.

.3 Do not transfer flammable or combustible liquids inside buildings or on jetties.

.4 Do not transfer flammable or combustible liquids in vicinity of open flames or any type of heat-producing devices.

.5 Do not use flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents.

.6 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities to a minimum and notify CFPO when disposal is required.

1.14 HAZARDOUS SUBSTANCES

.1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, shall be in accordance with National Fire Code of Canada.

.2 Provide ventilation where flammable liquids, such as lacquers or urethanes are used. Eliminate all sources of ignition. Inform the CFPO prior to and at completion of such work.

1.15 HOT WORKS

.1 The Contractor shall implement a hot works program in accordance with the National Fire Code of Canada and NFPA 51 Standard for Fire Prevention during Welding, Cutting and Other Hot Work.

.2 The Contractor shall obtain through their DCC Representative from the CFPO a "Hot Work" permit for all hot works in the construction area. Frequency of renewal for hot works permits is at the discretion of the CFPO. Request to be submitted 48 hours in advance of any hot work.

.3 When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of the CFPO.

.4 Provide fire watch service for work on scale established and in conjunction with the CFPO as defined in the Fire Department Briefing. Fire watchers shall be trained in the use of fire extinguishing equipment. The person(s) performing fire watch are not permitted to perform any other duties at the same time.

.5 Area of hot works
- .1 Hot works shall be carried out in an area free of combustible and flammable content.
- .2 Where not possible,
  - .1 All flammable and combustible materials within 15m of the hot works shall be protected in accordance with the National Fire Code of Canada.
  - .2 A fire watch shall be provided during the hot work and for a period of not less than 60 minutes unless otherwise directed by the CFPO.
  - .3 A final inspection of the hot work area shall be conducted 1 hour after the completion of hot works unless otherwise directed by the CFPO.
- .3 Where there is a possibility of sparks leaking onto combustible materials in areas adjacent to the areas where the hot work is carried out:
  - .1 Openings in walls, floors or ceilings shall be covered or closed to prevent the passage of sparks to such adjacent areas.

.6 Protection of flammable and combustible materials.
.1 Any combustible or flammable material, dust or residue shall be:
.1 Removed from the area where hot works is carried out; or
.2 Protected from ignition by non-combustible materials.

.7 Fire extinguisher
.1 A fire extinguisher shall be provided within 3 m of all hot works. Minimum size shall be 20lbs ABC unless otherwise directed by CFPO.

.8 Temporary heating
.1 No open flame heaters can be used on construction site.
.2 Only forced air heaters ULC or CSA approved and rated for industrial or construction use shall be used.
.3 All electric heaters shall be connected on a proper and individual circuit.

1.16 PARTIAL OCCUPANCY

.1 Implement partial occupancy procedures as defined in the drawings and specifications. Partial occupancy is where construction occurs adjacent to work areas occupied by the Departmental or Canadian Forces personal. This includes:
.1 Phased new construction.
.2 Early or partial occupancy of new construction.
.3 New construction being added onto an existing building.
.4 Renovation or recapitalization of an existing building.
.5 Phased renovation or recapitalization of an existing building.

.2 Where partial occupancy occurs, Contractor shall implement requirements as found in the drawings and specifications. This may include construction of a rated fire separation between occupied and construction areas as required by National Fire Code.

.3 A watch, with tours at intervals of not more than one hour, shall be provided throughout demolition sites when there are occupants in the portion of the building not being demolished.

.4 Except where a building is provided with a fire alarm system equipment, a watch, with tours at intervals of not more than one hour, shall be provided when a portion of the building is occupied while construction operations are taking place.

1.17 FALSE ALARM FEES

.1 “False Alarm” is the activation of a Fire Alarm System or emergency system through a mechanical failure, equipment malfunction, improper installation of the system or failure to maintain the system as described by the Ontario Fire Code being O.Reg.388/97, under the Fire Protection and Prevention Act, 1997, S.O. 1997, c.4, as amended.

.2 The Contractor shall not undertake work on any Fire Alarm System that sends an alarm directly to the Kingston Fire & Rescue or a Fire Alarm Monitoring Service without the DCC Representative being notified 48 hours in advance first.

1.18 QUESTIONS OR CLARIFICATION

.1 Direct questions or clarification on Fire Safety in addition to above requirements to the DCC Representative.

.2 DCC Representative is responsible to obtain clarification from the CFPO. The Contractor is not to liaise directly with the CFPO for notification, authorization or any requests unless the situation constitutes an immediate emergency.

1.19 FIRE INSPECTION

.1 Co-ordinate site inspections by CFPO through DCC Representative.

.2 Allow CFPO unrestricted access to work site.

.3 Co-operate with CFPO during routine fire safety inspection of work site.

.4 Immediately remedy unsafe fire situations observed by CFPO.

END OF SECTION

1 References

FEDERAL

.1 Applicable Base Standing Orders (BSOs) will be provided to the Contractor after award.

.1 Directorate Architecture and Engineering Services (DAES) Standard on the Management of Asbestos Containing Material (ACM) in DND Immovables. 01 October 2024.

.2 BSO 16.00 – Environmental Protection.

.3 BSO 16.01 – Emergency Environmental Response.

.4 BSO 16.02 – Environmental Impact Assessments.

.5 BSO 16.06 – Hazardous Materials General Requirements.

.6 BSO 16.07 – Disposal of Hazardous Materials Waste.

.2 *Canadian Environmental Protection Act 1999*. Statutes of Canada 1999 Chapter 33.

.1 Federal Halocarbon Regulations, 2022. SOR/2022-110.

.2 PCB Regulations. SOR/2008-273.

.3 *Canada Occupational Health and Safety Regulations* (SOR/86-304). Canada Labour Code.

.4 *Code of Practice for the Environmental Sound Management of End-of-Life Lamps Containing Mercury*. Environment and Climate Change Canada. 2017.

.5 *Transportation of Dangerous Goods Act* and pursuant regulations.

PROVINCIAL

.6 *Technical Standards and Safety Act, 2000* and pursuant regulations, codes, and standards. Statutes of Ontario 2000, Chapter 16.

.7 *Environmental Protection Act*. Revised Statutes of Ontario 1990, Chapter E.19.

.3 Ontario Regulation 347 as amended. *General—Waste Management.* Revised Regulations of Ontario 1990

.4 Ontario Regulation 362. *Waste Management – PCB's*.

.8 *Occupational Health and Safety Act*. Revised Statutes of Ontario 1990, Chapter O.1.

.1 Ontario Regulation 490/09. *Designated Substances.*

.2 Ontario Regulation 278/05. *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations*.

.9 Environmental Abatement Council of Canada (EACC). (2025). *Lead Guideline* (March 2025 Edition). Toronto, ON: EACC.

.10 Ontario Ministry of Labour. 2011. *Silica on Construction Projects.*

MUNICIPAL

.11 Corporation of the City of Kingston By-Law No. 2008-192 "*A By-Law to Provide for the Regulation of Waste Water Services and Discharges to Municipal Sewers for the City of Kingston*".

.12 City of Kingston By-Law No. 2004-52 "*A By-Law to Regulate Noise*".

2 Submittals

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities submit an Environmental Protection Plan (EPP). The EPP must meet the intent of the contract and must be acknowledged as reviewed by the DCC Representative prior to work commencement.

.3 The Environmental Protection Plan to include the following sub-Plans:

.1 Spill Prevention Response Plan (SPRP).

.2 Hazardous Materials Abatement and Management Plan (HMAMP).

.3 Waste Management and Disposal Plan (WMDP).

.4 Submit other data, information and documentation upon request by the DCC Representative and as stipulated elsewhere in this section.

3 Designated Substances

.1 Designated Substances and Hazardous Materials are outlined below:

.2 In accordance with Section 30 of Ontario's *Occupational Health and Safety Act*, following is a list of designated substances present at the project site:

.1 Asbestos-containing materials are present, in varying quantities, throughout buildings in Fort Frontenac. Asbestos database summaries and building Designated Substances and Hazardous Materials Reports will be available for review. Contractor is required to review all asbestos documents before disturbing any building materials during the course of this project.

.2 It is assumed that plaster will be disturbed (following type 2 procedures) in buildings FF02, FF03, FF04 and FF05. Assume a total of 10 separate type 2 abatement enclosures.

.3 Disturbance to asbestos-containing materials shall be conducted in accordance with Ontario Regulation 278/05 and Canada Labour Code – Canada Occupational Health and Safety Regulations SOR/86-304 (COHSR). Contractor to provide written abatement plan prior to completing any asbestos abatement activities.

.4 If any work is to disturb Asbestos Containing Materials (ACMs), and the disturbance qualifies as a type 2 or type 3 abatement, contractor is then required to hire a qualified third-party consultant to perform abatement monitoring services. Services, at a minimum, to require:

.1 Review of asbestos abatement plan;

.2 Pre-abatement visual inspection of abatement enclosures;

.3 Ambient air sampling, outside of enclosure, daily during active abatement work;

.4 Post abatement air clearance sampling (for both type 2 and 3 abatements).

.5 Lead is present in all painted surfaces throughout the building.

.1 Disturbances to lead and lead painted surfaces shall be conducted in accordance with the Ministry of Labour, Immigration, Training and Skills Development (2022). *Lead on Construction Projects*. Government of Ontario.

.2 Contractor is required to have painted surfaces sampled and analyzed for toxicity characteristic leaching procedure (TCLP) metals analysis in accordance with O. Reg. 347 to define the appropriate waste classification.

.1 For bidding purposes, lead-containing wastes are to be assumed to be non-leachate toxic, non-hazardous waste and will be transported and disposed of as regular waste.

.6 Silica is present in all concrete materials throughout the project site.

.1 Disturbance of materials containing silica shall be conducted in accordance with the Ministry of Labour Guidelines "Silica on Construction Projects" (2011).

.7 PCBs may be present in transformer oil. For bidding purposes, contractor is to assume transformer oil is non-PCB containing.

.1 Contractor is to have PCB oil sampled for presence of PCBs prior to disposal.

.8 Mercury Containing Lamps and Thermostats:

.1 Mercury is present within lighting lamps and bulbs, thermostats, thermometers, manometers and mechanical controls throughout the building.

.1 Disturbance of mercury-containing lamps shall be conducted in accordance with Environment and Climate Change Canada's "*Code of Practice for the Environmentally Sound Management of End-of-Life Lamps Containing Mercury"* (2017).

.2 Lighting tubes contain mercury, must not be released to the environment. Therefore, the tubes must not be broken.

.3 Recycle all surplus mercury containing thermostats, lighting lamps and bulbs at a facility equipped to recover mercury.

.1 Contractor is to identify the facility and provide a receiver receipt of materials.

.2 Record the number and type of broken and whole tubes/bulbs sent for recycling. Broken tubes/bulbs must be counted separately.

.9 Inform all workers and sub trades of the presence of designated substances and hazardous materials identified in the contract documents.

.10 Immediately notify the DCC Representative of potential asbestos containing material (ACM) discovered during the work and not apparent from the drawings, specifications, or reports pertaining to the Work. Do not disturb such material.

.11 For additional reference information, refer to DSS reports and Database entries for each building.

4 General

.1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation, including in section 1.0 References, noted above.

.2 The Work site is subject to inspection by the Base Environment Officer, or designate, as well as, the DCC Representative, without prior notice.

.3 Failure to comply with environmental requirements may result in a stop work order or assessment of damages commensurate with repair of damage.

.4 All references to payment referred to in OPSS references are to be disregarded and do not apply to this contract.

.5 The Contractor will be unable to request extra funding to meet environmental requirements that are within the contract.

.6 It is the Contractor’s responsibility to be aware of environmental requirements and the best management practices and pollution control measures necessary to meet them.

.7 Blasting is not permitted on DND property.

.8 Fires and burning of rubbish are not permitted on DND property.

.9 No fixed or temporary fuel storage tanks are permitted.

.10 In accordance with the City of Kingston Noise By-law, noise due to construction is not permitted from 7 p.m. through 7 a.m., and all day on Sundays and statutory holidays.

5 Spill Prevention and Response Plan

.1 A spill or release is an accidental discharge of a pollutant (solid, liquid or gas) into the environment. After a spill or release, always ensure human health and safety is protected above all else.

.2 Submit to the DCC Representative a project-specific Spill Prevention and Response Plan (SPRP) prior to work on-site.

.1 The SPRP shall include environmental response measures necessary to prevent and to mitigate a pollutant release on National Defence property.

.2 The SPRP is to include:

.1 Contact information for the designated qualified individual to be the Environmental Protection Coordinator (EPC).

.2 Roles and responsibilities including names of those responsible for managing the SPRP.

.3 List of all subcontractors including contact information to support the SPRP.

.4 Notification to the DCC Representative for any spill.

.5 Emergency spill response measures, see 5.6 below.

.6 Project and site-specific clean up measures for spills,

.7 Waste disposal, including disposal procedures for materials used to contain the spill and storage location for these materials.

.8 Procedure to escalate for spills beyond Contractor’s ability to manage the spill.

.9 Refueling operations shall be conducted within a secondary containment area. Refuel equipment no closer than 30 metres from water bodies. SPRP shall identify equipment fueling location, the machinery to be refueled, location of transfer area, methodology and control measures during refueling.

.3 Identify storage locations of materials or wastes that may require emergency spill response. Identify spill control kit inventory and location(s).

.3 The SPRP is to be modified and updated as necessary. On-going assessments shall be performed during the progress of work identifying and documenting new or potential spill hazards and measures not previously known and identified.

.4 Prior to starting work, provide to the DCC Representative an inventory of hazardous material to be brought to the site, including volume or mass, and Safety Data Sheets (SDS).

.5 A CFB Kingston Pollution Incident Report Template (provided after award) shall be completed by the Contractor for all spill or release incidents and submitted to the DCC Representative.

.6 Emergency Response:

.1 With respect to liquid spills, contractor shall have on-site equipment to control a liquid spill of 110% of any material brought on to—or handled at—the site for one (1) hour.

.2 The on-site spill control kit required to include absorbent pads, absorbent granular, nitrile gloves, garbage bags and/or pails with lids, and shovels, and applicable to the chemical used.

.1 A spill control kit shall be located wherever quantities of materials or wastes that may require emergency spill response are used or stored.

.3 In the event of a spill, invoke Contractor’s SPRP Plan and make immediate notifications to the DCC Representative.

.4 In the event of a spill into the natural environment, do everything practicable to prevent, eliminate, and ameliorate adverse effects, and to restore the natural environment.

.5 Emergency response planning is to include measures to escalate the response in the event of an emergency that exceeds on-site equipment capabilities.

.7 Display an information placard on all such material and equipment containing liquid products that will be located overnight or longer on DND property.

.1 Information placards to include: Contractor's name and address, contact person, emergency telephone numbers, and liquid contents.

.2 Post the information placard either on the exterior of the container, or on the dashboard of the vehicle, where applicable.

.8 The contractor will be provided a Contractor Environmental Hazard & Spill Response Guide by DCC which shall be posted at the Work Site.

6 Hazardous Materials Abatement and Management Plan

.1 Prior to work onsite contractor to create and submit to the DCC Representative a Hazardous Materials Abatement and Management Plan (HMAMP).

.2 The HMAMP will address the details of how designated substance(s) and hazardous material(s) will be abated and managed. HMAMP to include:

.1 Name and contact information of:

.1 The designated qualified individual to be the Environmental Protection Coordinator (EPC).

.2 All subcontractors who will support the HMAMP.

.2 A list of all municipal, provincial and federal permits and notifications required to complete the Work.

.3 A list of all hazardous materials to be brought to site.

.1 Include volumes and SDS, copy of placards and signage.

.4 Detail the approach to the execution of abatement work, including the equipment, tools, materials and actions to be employed for each type of designated substance or hazardous material.

.5 A drawing identifying existing conditions with the location of proposed enclosure(s), barricades and/or warning signs to restrict access, waste and personal decontamination facilities, and proposed location of waste bins.

.6 Proposed schedule accounting for calendar day(s) projected for enclosure set up, abatement work, cleaning and lockdown, and enclosure tear down.

.7 Identify number of calendar days for the shutdown of any building systems (e.g. HVAC, fire alarms, etc.).

.8 Detailed emergency procedures to be followed in the event of: fire, breach of the enclosure, injury or accident within the enclosure, detection of airborne asbestos fibers or other designated substances outside the enclosure, spilling asbestos debris on route to the waste bin.

.9 If not defined in other Plans, provide details of waste disposal procedures for materials stored, used or abated including locations on the work site.

.3 Contractor shall provide DCC Representative a minimum of 48-hours notice prior to request for pre-contamination inspections, post abatement visual inspections and inspections prior to lockdown application (including both Moderate and High-Risk Abatement activities as defined of COHSR).

.1 Scheduling with the environmental consultant to be coordinated through the DCC Representative.

.4 Contractor shall allow a minimum of 48-hours to receive results from DCC Representative for all visual inspections and clearance air testing results prior to enclosure tear-down (including both Moderate and High-Risk Abatement activities as defined of COHSR).

.1 Inform all workers and sub trades of the presence of designated substances and hazardous materials identified in the contract documents.

.2 Immediately notify the DCC Representative of potentially containing asbestos material discovered during the work and not apparent from the drawings, specifications, or reports pertaining to the Work. Do not disturb such material.

.3 Fire alarm suspension can be coordinated on weekdays between 7:30am and 3:30pm daily.

.1 Notification to DCC Representative, via submission of completed Request for Fire Alarm Shut Down form, is required a minimum of 5 days in advance of temporary fire alarm shut down.

.4 Written notification to DCC Representative required a minimum of 5 days prior to request to disable the mechanical ventilation system servicing the work area.

7 Waste Management and Disposal Plan

.1 Submit a Waste Management and Disposal Plan (WMDP) to the DCC Representative before construction work begins at the site. The WMDP is to comply with legislation, best practices, and with the requirements of the specifications.

.2 The WMDP is to encompass:

.1 Regular waste,

.2 Construction waste,

.3 Hazardous materials used in the course of the work, and

.4 Hazardous materials and designated substance waste.

.5 The WMPD shall include items below in addition to 10.3 through 10.10.

.1 Name and contact information for the designated qualified individual to be the Environmental Protection Coordinator (EPC).

.2 A list of all contractors and Receiver Facilities for all waste types.

.1 Waste carriers' business name, address, telephone, email address, and MECP Certificate(s) of Approval listing the hazardous materials approved for transportation.

.3 The anticipated waste shipment frequency for all waste.

.4 Detailed procedures to be used to manage all waste products stored on site (petroleum, oil, lubricants and other hazardous waste to be detailed specifically). Include types of containers, labeling and segregation)

.5 A description of the types of waste materials and expected quantities for storage, transport and disposal. For leachate toxic waste include detailed compliance with O. Reg. 347 and Transportation of Dangerous Goods Act (TDGA).

.1 Include procedure for notifying DCC Representative of the transport of hazardous materials and/or designated substances (including asbestos) offsite.

.6 Procedures for storing and release of hazardous materials to be removed from site including manifest procedures.

.7 Procedures that detail requirements for the below Special Substances that detail what is contained in the specification.

.1 Mechanical Flushing Liquids to Sanitary Sewers including lab analysis report, notifications and contacts.

.2 Smoke detectors,

.3 Polychlorinated Biphenyls (PCBs),

.3 Waste Handling:

.1 Ensure that staff are properly trained and equipped, in accordance with regulatory requirements.

.2 Minimize handling and exposure to hazardous materials. Use control measures such as PPE and best practice procedures to address potential risks.

.3 All waste products will be placed in suitable containers and labeled clearly.

.1 Waste products are to be segregated by commodity and placed in separate containers based on class.

.2 Similar waste products are not to be mixed together without prior approval from the DCC Representative.

.4 Storage:

.1 Identify location(s) on site where wastes and hazardous materials wastes will be stored.

.2 Store all petroleum, oil, lubricants, and other hazardous materials within secondary containment, or in an appropriate metal clad storage building with containment.

.3 Store incompatible materials separated to prevent reaction.

.4 Access to hazardous waste storage areas must be controlled through appropriate physical barriers and limited to authorized personnel.

.5 Site is to be kept neat and orderly at all times.

.5 Transportation:

.1 Transportation of hazardous material must be in accordance with the *Transportation of Dangerous Goods Act*, by a licensed hauler, and in approved containers.

.2 Hazardous Materials Waste shall **not** be released from a work site to a carrier that is not registered as a carrier for the specific Hazardous Materials Waste, nor shall it be released for delivery to a consignee that is not registered as a receiver for the specific Hazardous Materials Waste.

.6 Disposal:

.1 Identify the proposed waste receiver facilities and the anticipated waste shipment frequency for all wastes.

.2 Contractor is required to have painted waste sampled and analyzed for toxicity characteristic leaching procedure (TCLP) metals analysis in accordance with O. Reg. 347.

.1 Sample(s) are to be taken by a Qualified Person (QP) (as defined in O. Reg. 153).

.2 Results are to be provided to DCC Representative for review prior to disposal off-site.

.3 Disposal of leachate toxic lead-based paint as hazardous materials must comply with legislation on transport and disposal.

.1 Record the weight of leachate toxic material sent for disposal.

.4 Dispose of all materials that are removed as asbestos-containing materials as asbestos waste.

.7 Transport and Disposal of Hazardous Waste and Designated Substances:

.1 Provide DCC Representative written notification of intent to transport of hazardous materials or designated substances off site, including but not limited to hazardous and liquid industrial waste (i.e. oils, solvents, waste fuels, used spill clean-up materials) or designated substance waste (i.e. asbestos, leachate toxic lead paint, mercury vapour in fluorescent light tubes).

.2 For shipments that require a waste generator number pursuant to O. Reg. 347, the Base waste generator number is required prior to removal offsite and will be provided by the DCC Representative.

.3 Submit the following to the DCC Representative for review 5 business days prior to transport:

.1 Description and approximate quantity of waste material, including substrate if applicable.

.2 Contractor proposed date and time for hazardous waste material shipment.

.3 Correspondence from the approved hazardous waste receiver, indicating agreement and intent to accept the specified hazardous materials waste on specified date.

.4 Contractor will complete a “Certificate of Content for Waste Disposal” provided in subsection 9 of this specification.

.4 Coordinate with the DCC Representative so that the Base Hazardous Materials Officer or designate is present at the time of shipment to review, sign and document hazardous waste transport from the Base.

.5 Submit the following to the DCC Representative for review within 48 hours following transport from the Base:

.1 Landfill weigh scale receipt/ticket for the disposal of waste.

.8 Disposal of Mechanical Flushing Liquids:

.1 Mechanical flushing liquids and mechanical liquids include any mechanical systems (piping, units, etc.) such as HVAC, glycol and includes residual liquid in current systems, cleaning with chemical inhibitors or cleaners, and flushing of new piping.

.2 Mechanical flushing liquids are to be assumed for bidding purposes to be hazardous waste and shall be transported and disposed of at a licensed facility in accordance with O. Reg. 347, and as described in this specification for Shipment and Disposal of Hazardous Waste and Designated Substances.

.3 In the event the contractor wants to discharge to a sanitary sewer the contractor must undertake the following items:

.1 Provide DCC Representative written notification of intent to discharge mechanical flushing liquids to sanitary sewer.

.2 Submit a sample of the liquid for laboratory analysis of all parameters in the City of Kingston Sewer Bylaw Schedule A including pH to a licensed laboratory.

.3 Submit a report to DCC Representative confirming that all materials proposed to be disposed to sewers comply with all legislative requirements, including the City of Kingston Sewer Use Bylaw.

.4 Coordinate with the DCC Representative to involve the Hazardous Materials Officer to authorize results from testing and sanitary discharge. Allow a minimum of 48 hours for review and authorization.

.5 Mechanical flushing liquids and mechanical liquids that are not authorized to be discharged to sanitary sewer shall be transported and disposed of at a licensed facility in accordance with O. Reg. 347, and as described in this specification for Shipment and Disposal of Hazardous Waste and Designated Substances.

.9 Special Wastes:

.1 <u>Smoke Detectors:</u>

.1 Undamaged and intact commercial Canadian Standards Association (CSA) and Underwriters Laboratories (UL) approved smoke detectors containing less than 185 kilo-Becquerel's of Americium-241 may be disposed of using local waste collection systems.

.2 *Photoelectric* smoke detectors are **not** subject to this special procedure.

.3 *Ionization chamber smoke detectors* (ICSDs) contain radioactive sources, and **are** subject to this special procedure.

.4 If surplus ICSDs are not to be re-used, remove the ICSDs from walls, ceilings, etc., without breakage, and, dispose of ICSDs at an approved landfill.

.2 Polychlorinated Biphenyls (PCBs):

.1 For bidding purposes assume transformer oil is not PCB containing.

.2 Contractor to sample transformer oil to confirm the absence or presence of PCB containing oil.

.3 Label containers with black and white serialized, "ATTENTION PCB" labels, in accordance with Environment and Climate Change Canada Manual for Spills of Hazardous Materials.

.4 Contact DCC prior to transporting PCB waste off-site to arrange manifest sign-off with DND.

.10 Do not bury rubbish or waste materials on DND Property.

.11 Do not dispose of waste into any waterways, storm or sanitary sewers, drainage system, or onto land.

.12 Divert unused asphalt material from landfill to be reused offsite or recycled.

.13 All solid and liquid hazardous waste material generated by work are to be taken off Base and disposed of in a lawful manner and at appropriately accredited facilities.

.14 All expenses incurred for the handling, storage, analysis, transport and disposal/recycling of all wastes will be incurred by the Contractor.

8 Pollution Prevention - Air

.1 Prevent material from sandblasting, saw-cutting, and other operations from contaminating air beyond application area, by providing temporary enclosures.

.2 Use new or well-maintained heavy equipment and machinery, preferably fitted with muffler/exhaust system baffles, engine covers.

.3 Comply with operating specifications for heavy equipment and machinery.

.4 Minimize the operation and idling of vehicles and avoid operating and idling vehicles and gas-powered equipment during smog advisories.

.5 Control emissions from equipment and plant to conform with federal, provincial, and municipal requirements.

.6 Products and Materials:

.1 Use products and materials that are as free as possible of noxious or toxic volatile emissions or emissions of irritating or toxic particles, so that the interior air of the completed building is as pollution-free as possible. For example, products emitting benzene, mercury, lead, or other known toxic compounds are not acceptable.

.2 Where odourless products are not available, choose products where possible so that odours are minimized. Set ventilation levels during the construction period sufficiently high to encourage the off-gassing of materials to their minimum levels prior to occupancy of the building, where possible.

.3 Choose products for installation within the air-handling and distribution systems to minimize the introduction of pollutants into the fresh air supply to the building.

.4 Remove oily rags and other combustible debris from Site daily. Take every precaution necessary to prevent spontaneous combustion.

9 Certificate of Content for Waste

Date: _____

DCC/CE Project Number: _____

Site Location: _____

Contractor Name: _____

Address: _____

Contact Name: _____

Phone Number: _____

Brief Description of Materials Being Shipped (including quantity):

_____

_____

_____

This document is to certify that the materials being shipped are as described above.

Only materials indicated on this Certificate as described above will be shipped.
For materials requiring manifests a minimum of 48 hours notice is required to coordinate Base Environment sign-off prior to material transport from site.

If applicable indicate,

Manifest #: _____

Waste Classification#: _____

Contractor Signature (print and sign): _____

DCC/CE Contract Authority (print and sign):_____
Ref.
Ontario Regulation 347/558
Transportation of Dangerous Goods Act

Submit form to DCC Representative

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.02 RELATED REQUIREMENTS

.1 Perform Work in accordance with the latest National Building Code of Canada (NBC) including amendments up to tender closing date provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code

.1 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

1.04 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

1.05 QUALITY ASSURANCE

.1 Regulatory Requirements: Except as otherwise specified, Contractor shall apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:

.1 Regulatory requirements and fees in force on date of Bid submission; and

.2 A change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

2.02 EASEMENTS AND NOTICES

.1 Contractor to confirm with DCC Representative that surrounding infrastructure is owned and operated by DND.
  .1 If true, DCC Representative to notify DND PM to contact Property Officer for their comments.

.2 Contractor is not permitted to work on any infrastructure owned by municipality, other government departments, or a third-party owner (for example, utility companies).

.3 Contractor is to get written permission from DCC Representative through DND PM and Base Property Officer if work is required on DND owned utilities that cross an easement.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 GENERAL

.1 Quality control remains the responsibility of the contractor. DCC Representative provides Quality Assurance.

.2 Contractor shall provide a contract specific Quality Control Plan to the DCC Representative for review and acceptance prior to first progress payment. The contract specific Quality Control Plan shall include specific and detailed responsibilities of the Contractor's staff to demonstrate how they will ensure that the Work meets the specifications and drawings of the Contract.

1.03 INSPECTION

.1 Allow DCC Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by DCC Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 DCC Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, DCC Representative will pay cost of examination and replacement.

1.04 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by DCC Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by DCC Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree

of defect. Correct defect and irregularities as advised by DCC Representative at no cost to DCC Representative. Pay costs for retesting and reinspection.

1.05 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.06 PROCEDURES

.1 Notify appropriate agency and DCC Representative 3 business days in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.07 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by DCC Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.08 REPORTS

.1 Submit 1 electronic copy of inspection and test reports to DCC Representative.

.2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.09 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.10 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to DCC Representative.

.3 Prepare mock-ups for DCC Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason

for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, DCC Representative will assist in preparing schedule fixing dates for preparation.

.1.11 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.12 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical, and building equipment systems.

.2 Refer to Sections for definitive requirements.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 REFERENCES

.1 Occupational Health and Safety Act (OHSA)
  .1 Ontario Regulation 213/91 for Construction Projects.

1.02 INSTALLATION REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Coordinate with governing authorities and obtain required permits.

.3 Remove from site all such work after use.

1.03 FUNCTIONAL REQUIREMENTS

.1 Provide all necessary hoists for work.

.2 Locate hoists where directed by DCC Representative.

1.04 DESIGN CRITERIA

.1 When required by code, scaffolding and scaffold enclosures shall be designed and certified by a Professional engineer, retained by contractor and licensed in the Province of Ontario. The same Professional engineer must approve, in writing, additions or modifications to scaffolding.
  .1 Scaffold and enclosure must be built to withstand, and all wind, rain and snow loads applicable to construction site in accordance with NBC and OBC.
  .2 Scaffold may be loaded up to 2.40 kPa. No more than 5 (five) working levels shall be loaded at one time.

.2 Where scaffolding must be supported by existing structures, DCC Representative shall provide on request, information from the Owner on the condition and capacity of the existing structure in sufficient detail to allow the Contractor to complete scaffolding design.

1.05 GENERAL REQUIREMENTS FOR SCAFFOLDING

.1 Power elevated platforms may be used as part of the access system for the work if suitable to complete the work and provide access for inspection. Use of elevated work platforms shall be subject to remaining within the load lifting limits of such machines, accommodating traffic required for operations (delivery, garbage, recycling trucks etc.) and providing ready access to both the DCC Representative and designated inspectors such that the work can be inspected while in progress and once complete. Design scaffolds as follows:
  .1 Platforms shall be prefabricated clip platforms, planks are not permitted.
  .2 Scaffolds shall have proper stairs; ladders and trap doors are not permitted.

.3 Scaffolds shall be built of modular parts whenever possible.
.4 Scaffold accessories including braces and jackscrews shall be compatible with the capacity of frames.
.5 Provide internal horizontal x-bracing at all planking levels.
.6 Platforms shall be wide enough to circulate and temporarily store materials.
.7 Platforms shall be designed to support extra loads of removed materials.
.8 Provide steel guardrails, including toe boards, intermediate rails and handrails, at perimeter and around openings of all work platforms.
.9 Scaffold design and erection shall be in accordance with the "Occupational Health And Safety Act" and "Regulations For Construction Projects", and relevant municipal, provincial and federal regulations.

.2 Scaffolding shall be tied back to the masonry using push-pull ties. Scaffolding shall be isolated from walls or surfaces with 12 mm thick rubber or neoprene pads. Show all anchor locations and ties on shop drawings. DCC Representative shall review anchor locations prior to installation.

.3 Scaffold roofs shall be waterproof and meet Design Criteria.

1.06 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Submit for review shop drawings of scaffold and weather enclosure system including:
.1 Scaffold assembly drawings.
.2 Scaffold anchoring.
.3 Enclosure fabric with fastening and support system if applicable.
.4 Waterproofing details for scaffold roof.
.5 Indicate on drawings distance from platforms to wall surface to be worked on.

2.0 PRODUCTS

2.01 TUBULAR SCAFFOLD

.1 Tubular scaffold, scaffold bridge, stair, side brackets, work platforms, guardrails, barricades, and other accessories shall be an engineered type modular tubular scaffold system.

.2 Complementary 50 mm diameter tube and clamp assemblies may be used where structural reinforcement is required and/or irregular geometry prevents use of modular parts.

.3 All components shall be hot dip galvanized steel.

.4 Platforms shall be clip type prefabricated platforms; wood planks are not permitted.

2.02 ACCESSORIES

.1 Spacers and protection pads: rubber or neoprene spacers: 12 mm thick min.

.2 Pipe fasteners: 3 mm thick min. galvanized steel fasteners designed for 25 mm and for 50 mm exterior diameter tubing.

3.0
EXECUTION

3.01 INSTALLATION

.1 The erection of the scaffold cannot commence prior to review of the shop drawings.

.2 A competent worker shall supervise erection of the scaffold.

.3 Professional engineer that prepared shop drawings shall inspect the scaffold before it is used to ensure that it is erected in accordance with design drawings.

.4 Scaffolds:
.1 Install engineered scaffold, stairs and aluminum track system in accordance with approved shop drawings and mock-ups.

.5 Enclosure and netting:
.1 Use plastic wrap ties to fasten netting securely to scaffolding where applicable.

3.02 REMOVAL

.1 Remove temporary scaffolding and enclosures when directed by DCC Representative.

.2 Coordinate removal work DCC Representative.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.03 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.04 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.05 WATER SUPPLY

.1 Existing water supply may be used free of charge, for construction requirements with prior approval of DCC Representative. Make good any damage.

.2 DCC Representative will determine delivery points and quantitative limits. Written permission is required before any connection is made. All connections to be completed by licensed trade as required by regulatory and approval authorities.

.3 Provide at no cost to DND, all equipment and temporary lines to bring these services to project site.

.4 Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay, caused by such withdrawal of temporary services.

1.06 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 All equipment shall be in good working order and approved by a recognized certification agency.

.3 Prior to the use of any heating equipment the Chief Fire Inspector of the Base shall be notified and the equipment and installation inspected before

any use.

.4 No temporary heating equipment utilizing an open flame will be allowed.

.5 Unless explicitly stated elsewhere in the specifications, the contractor is responsible for all heating cost, including equipment, fuel, electricity and maintenance personnel as required for the duration of the project.

.6 Construction heaters used inside building must be vented to outside or be flameless (vent free) type. Solid fuel salamanders are not permitted.

.7 Provide temporary heat and ventilation in enclosed areas as required to:
- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.8 Maintain temperatures of minimum 10 degrees Celsius in areas where construction is in progress.

.9 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.10 Permanent heating system of building, be used when available. Be responsible for damage to heating system if use is permitted.

.11 When authorized by the DCC Representative, Contractor may use existing building equipment for temporary heat source.

.12 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.

.13 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.07 TEMPORARY POWER AND LIGHT

.1 Arrange and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.2 DND may provide, free of charge, temporary electrical power for construction purposes. Electrical power provided by DND is not to be utilized for temporary heating.

.3 DCC Representative will determine delivery points and quantitative limits. Written permission is required by DCC Representative before any connection is made. Connect to existing power supply in accordance with the Canadian Electrical Code. All connections to be completed by licenced trade as required by regulatory and approval authorities.

.4 Provide, at no cost to DND, all equipment and temporary lines to bring these services to project site.

.5 Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay, caused by such withdrawal of temporary services.

.6 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor based on General Conditions of Contract.

.7 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

.8 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of DCC Representative provided that guarantees are not affected.

.1 Repair damage to electrical system caused by use under this Contract.

.2 Replace lamps which have been used for more than 3 months.

1.08 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines necessary for own use and use of DCC Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.03 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.04 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.05 WATER SUPPLY

.1 Existing water supply may be used free of charge, for construction requirements with prior approval of DCC Representative. Make good any damage.

.2 DCC Representative will determine delivery points and quantitative limits. Written permission is required before any connection is made. All connections to be completed by licensed trade as required by regulatory and approval authorities.

.3 Provide at no cost to DND, all equipment and temporary lines to bring these services to project site.

.4 Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay, caused by such withdrawal of temporary services.

1.06 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 All equipment shall be in good working order and approved by a recognized certification agency.

.3 Prior to the use of any heating equipment the Chief Fire Inspector of the Base shall be notified and the equipment and installation inspected before

any use.

.4 No temporary heating equipment utilizing an open flame will be allowed.

.5 Unless explicitly stated elsewhere in the specifications, the contractor is responsible for all heating cost, including equipment, fuel, electricity and maintenance personnel as required for the duration of the project.

.6 Construction heaters used inside building must be vented to outside or be flameless (vent free) type. Solid fuel salamanders are not permitted.

.7 Provide temporary heat and ventilation in enclosed areas as required to:
- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.8 Maintain temperatures of minimum 10 degrees Celsius in areas where construction is in progress.

.9 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.10 Permanent heating system of building, be used when available. Be responsible for damage to heating system if use is permitted.

.11 When authorized by the DCC Representative, Contractor may use existing building equipment for temporary heat source.

.12 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.

.13 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.07 TEMPORARY POWER AND LIGHT

.1 Arrange and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.2 DND may provide, free of charge, temporary electrical power for construction purposes. Electrical power provided by DND is not to be utilized for temporary heating.

.3 DCC Representative will determine delivery points and quantitative limits. Written permission is required by DCC Representative before any connection is made. Connect to existing power supply in accordance with the Canadian Electrical Code. All connections to be completed by licenced trade as required by regulatory and approval authorities.

.4 Provide, at no cost to DND, all equipment and temporary lines to bring these services to project site.

.5 Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay, caused by such withdrawal of temporary services.

.6 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor based on General Conditions of Contract.

.7 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

.8 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of DCC Representative provided that guarantees are not affected.

.1 Repair damage to electrical system caused by use under this Contract.

.2 Replace lamps which have been used for more than 3 months.

1.08 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines necessary for own use and use of DCC Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 REFERENCE STANDARDS

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.
- .2 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.

.3 CSA Group (CSA)
- .1 CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-0121-[M1978(R2003)], Douglas Fir Plywood.
- .3 CAN/CSA-S269.2-[M1987(R2003)], Access Scaffolding for Construction Purposes.
- .4 CAN/CSA-Z321-[96(R2001)], Signs and Symbols for the Occupational Environment.

.4 U.S. Environmental Protection Agency (EPA) / Office of Water
- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.04 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.05 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2 and or Section 01 50 01.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs.

1.06 HOISTING

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists and cranes to be operated by qualified operator.

1.07 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.08 CONSTRUCTION PARKING

.1 DCC Representative will determine where Parking may be permitted on site. When permitted, maintain and administer these spaces as directed.

1.09 OFFICES

.1 Provide marked and fully stocked first-aid kit in a readily available location.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds when required by contractor for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

.3 Storage location to be approved by DCC Representative.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances, if required.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Permanent facilities may be used on approval of DCC Representative.

1.12 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, upon Contractor's mobilization to site, in a location designated by DCC Representative.

.2 No other signs or advertisements, other than warning signs, are permitted

on site.

.3 Direct requests for approval to erect Contractor signboard to DCC Representative. For consideration general appearance of Contractor signboard must conform to project identification site sign. Wording in both official languages.

.4 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by DCC Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by DCC Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by DCC Representative.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work for Contractor's Roads.

.14 Remove, upon completion of work, haul roads designated by DCC Representative.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on travelled way:
- .1 Place equipment in position to minimize interference and hazard to travelling public.
- .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
- .3 Do not leave equipment on travelled way overnight.

.3 Close lanes of road only after receipt of written approval from DCC Representative.
- .1 Before re-routing traffic erect suitable signs and devices to Ontario Traffic Manual, Book 7: Temporary Conditions.

.4 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.
- .1 Provide 7 m wide minimum temporary roadway for traffic in two-way sections through Work and on detours.
- .2 Provide 5 m wide minimum temporary roadway for traffic in one-way sections through Work and on detours.

.5 Provide detours or temporary roads as indicated, and as approved by DCC Representative to facilitate passage of traffic around restricted construction area:

.6 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, except where other means of road access exist that meet approval of DCC Representative.

1.03 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response, as approved on traffic control plan by DCC Representative.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Ontario Traffic Manual, Book 7: Temporary Conditions.

.3 Place signs and other devices in locations recommended in Ontario Traffic Manual, Book 7: Temporary Conditions.

.4 Meet with DCC Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site

changes, revise list to approval of DCC Representative.

.5 Continually maintain traffic control devices in use:
.1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
.2 Remove or cover signs which do not apply to conditions existing from day to day.

1.04 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag personnel, trained in accordance with, and properly equipped to Ontario Traffic Manual, Book 7: Temporary Conditions for situations as follows:
.1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
.4 Where temporary protection is required while other traffic control devices are being erected or taken down.
.5 For emergency protection when other traffic control devices are not readily available.
.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
.7 At each end of restricted sections where pilot cars are required.
.8 Delays to public traffic due to contractor's operators:[15] minutes maximum.

.2 Where roadway, carrying two-way traffic, is restricted to one lane, for 24 hours each day, provide portable traffic signal system.
.1 Adjust, as necessary, and regularly maintain system during period of restriction.
.2 Ensure signal system meets requirements of Ontario Traffic Manual, Book 7: Temporary Conditions.

1.05 OPERATIONAL REQUIREMENTS

.1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by DCC Representative to protect and control public traffic.

.2 Maintain existing conditions for traffic crossing right-of-way.

.3 Maintain existing conditions for traffic crossing right-of-way except when required for construction.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 REFERENCE STANDARDS

.1 Not used.

1.03 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.04 HOARDING

.1 Erect temporary site enclosures using 38x89mm construction grade lumber framing at 610mm centers and 19mm exterior grade fir plywood to CSA O121.

.2 Apply plywood panels vertically

.3 Provide lockable truck entrance and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

.5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.

.6 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.05 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, and open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.06 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

1.07 DUST TIGHT SCREENS

.1 Provide dust control measures to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.08 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.09 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.10 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred by Work, to previous or better condition.

1.12 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with DCC Representative locations and installation schedule at least 10 working days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.13 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for [reuse] [and] [recycling] in accordance with Section 01 35 43 - Environmental Protection.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 REFERENCE STANDARDS

.1 Within text of each specifications section, reference may be made to reference standards

.2 Conform to latest date of issue of referenced standards in effect on date of submission of Tender, except where specific date or issue is specifically noted.

.3 If there is question as to whether products or systems are in conformance with applicable standards, DCC Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be borne by DCC Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.03 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Within 7 Calendar days of written request by DCC Representative, submit following information for materials and equipment proposed for supply:
.1 Name and address of manufacturer.
.2 Trade name, model catalogue number.
.3 Performance and test data.
.4 Manufacturers installation instructions.
.5 Evidence of arrangement to procure.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with DCC Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 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.

1.04 CONTRACTOR'S OPTIONS FOR SELECTING MATERIALS FOR TENDERING

.1 Products specified by naming three or more, select any product named. Materials listed as "Acceptable Products" within the contents of this specification identify products known to meet the specified criteria. Other products may exist which meet the requirements specified but have not been listed as "Acceptable Products".

.2 Where 3 products are listed, the Contractor will choose one of the listed products. If Contractor desires to use alternate products in lieu of the listed acceptable products, the Contractor will follow specified procedures for requesting the use of alternate products - DCL242. The term "Acceptable Product" is deemed to be a complete and working commodity as described by a manufacturer's name, catalogue number, trade name or any combination thereof.

1.05 SUBSTITUTION

.1 No substitutions will be permitted after tender award except under special circumstances described herein.

.2 A substitution request must include statements of respective costs of items originally specified and the proposed substitution and itemize any differences in quality, performance and warranty.

.3 A substitution request may be considered by the DCC Representative if:
- .1 materials selected from those specified are not available, discontinued; or
- .2 delivery date of materials selected from those specified would unduly delay completion of contract; and
- .3 alternative material to those specified is equivalent in quality, performance and warranty to the material specified and will result in a credit to the Contract amount.

.4 Should substitution be accepted either in part or in whole, assume full responsibility and cost when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.5 Amounts of all credits arising from approval of substitution will be determined by DCC Representative and Contract Price will be reduced accordingly.

1.06 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.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, lumber and electrical equipment 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 Remove and replace damaged products at own expense and to satisfaction of DCC Representative.

.9 Touch-up damaged factory finished surfaces to DCC Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.07 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

.2 Products supplied by Owner will coordinated by DCC Representative, unless otherwise noted in Contract Documents.

1.08 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify DCC Representative in writing, of conflicts between specifications and manufacturer's instructions, so that DCC Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes DCC Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify DCC Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. DCC Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with DCC Representative, whose decision is final.

1.10 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform DCC Representative if there is interference. Install as directed by DCC Representative.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform DCC Representative of conflicting installation. Install as directed.

1.14 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.15 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. Use No. 304 stainless steel for exterior areas.

.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. Use resilient washers with stainless steel.

1.16 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of DCC Representative.

1.17 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by DCC Representative, with minimum of disturbance to Work, building occupants, pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered notify DCC Representative, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 SUBMITTALS

.1 Submit to the DCC representative copies of the following documents, including updates issued:

- .1 Health and Safety Policy & Program as indicated in paragraph 1.9, prior to commencement of work on the work site.
- .2 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
- .3 Accident or Incident Reports, within 24 hrs of occurrence.

.2 Submit other data, information and documentation upon request by the DCC representative as stipulated elsewhere in this section.

1.2 COMPLIANCE REQUIREMENTS

.1 Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

.2 Observe and enforce construction safety measures required by:

- .1 National Building Code of Canada (latest edition).
- .2 The Ontario Workplace Safety & Insurance Board (WSIB).
- .3 Municipal statutes and ordinances.

.3 In event of conflict between any provisions of above authorities the most stringent provision shall apply.

.4 Provide and maintain WSIB worker's compensation coverage for all employees for the duration of the contract. Prior to commencement of the work, at the time of Interim Completion and prior to final payment, provide to the DCC representative a clearance certificate from the WSIB indicating that the Contractor's account is in good standing.

1.3 RESPONSIBILITY

.1 The Contractor is responsible for safety of persons and property on the work site and for protection of federal employees and the general public circulating adjacent to work site operations to extent that they may be affected by conduct of work.

.2 The Contractor is to enforce compliance by workers and other persons granted access to work site with safety requirements of Contract Documents, applicable federal, provincial, and local statues, regulations, and ordinances, and with the Contractor's Health and Safety Program.

.3 Should an unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and

prevent damage or harm. Advise the DCC representative verbally and in writing of the hazard or condition.

1.4 SITE CONTROL AND ACCESS

.1 Delineate and isolate the work areas from adjacent and surrounding areas with floor to ceiling hoarding to maintain control of all work area access points so that access to the project site work areas is restricted to authorized (construction) personnel only. The public way site delineation requirements shall meet or exceed the prescribed requirements specified in the Ontario Occupational Health and Safety Act & Regulations, specifically Section 64-65 (O. Reg. 213/91).

.2 Make provisions for granting permission to access onto work site to all persons who require access. Procedures for granting permission to access are to be in accordance with the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act and the Contractor's Health and Safety Program.

.3 Ensure persons granted access to the work site are in possession of and wear the minimum personal protective equipment (PPE) designated by the Contractor's Health and Safety Program. Ensure persons granted access to the work site are provided with, trained in the use of, and wear, appropriate PPE that are required above and beyond the designated minimums previously noted and as specifically related to the work site activity that they are involved in. Be responsible for the efficacy of the PPE that is provided above and beyond the designated minimums.

.4 For the purpose of this contract, the following are activities that will be required to be performed on the work site by DND forces and other Contractor(s). Control of the work site access and activities remain the responsibility of the Contractor as detailed within this specification section.

.1 Real Property Operations Detachment Kingston, throughout the project where required (for example, base issued permits, service shut-downs, locates, etc.)

.5 Erect signage at access points and at other strategic locations around the work site clearly identifying the work site area(s) as being "off-limits" to non-authorized persons. Signage must be professionally made with well understood graphic symbols and is not to be used as advertising but for the specific use as related to site safety and key contact information.

.1 Information to be provided on the signage is as follows:

Project Name/Description:

Contractor Company Name:

Project Superintendent's Name/Phone No.:

DCC Point of Contact Name/Phone No.:

.6 Secure the work site at all times to protect against un-authorized access.

1.5 FILING OF NOTICE

.1 File Notice of Project and any other required Notices with the Ontario Ministry of Labour prior to commencement of the work. Provide the DCC representative with a copy of the filed Notice(s) prior to commencement of the work.

1.6 PERMITS

.1 Obtain permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction, for example CFB Kingston Hot Work Permit.

.2 Post all permits, licenses and compliance certificates on work site and provide copies to the DCC representative.

1.7 PROJECT/SITE CONDITIONS

.1 DND has provided the following list of known hazardous substances and/or hazardous conditions at the work site which should be considered for inclusion on the Constructor's hazard assessment, as health or environmental hazards and shall be properly managed should they be encountered as part of the work:

- .1 General construction type hazards;
- .2 Designated substances and hazardous materials, as detailed in the designated substance / hazardous materials survey;
- .3 Working at heights;
- .4 Public safety hazards;
- .5 Electrical hazards;
- .6 Mechanical hazards;
- .7 Energy isolation (lockout / tagout) hazards;
- .8 Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include in their tender price all work associated in working with, in and around the hazards.

.2 The above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.

1.8 MEETINGS

.1 Prior to commencement of work attend a pre-commencement meeting conducted by the DCC representative. Ensure minimum attendance by contractor's site superintendent. The DCC representative will advise of time, date and location of the meeting and will be responsible for recording and distributing the minutes.

.2 Conduct site specific occupational health and safety meetings as required by the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

.3 Record and post minutes of all meetings in plain view on the work site. Make copies available to the DCC representative upon request.

1.9 HEALTH AND SAFETY POLICY & PROGRAM

.1 Contractors are required under the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act to have in place a Health and Safety policy and program to support the policy. Compliance requirements for the content, detail and implementation of the policy and program resides with the Ontario Ministry of Labour. For the purpose of this contract the Health and Safety policy & program shall include, a signed / dated (current) safety policy statement and a program to support the policy (safe work procedures & practices, etc.) a site-specific hazard assessment that acknowledges, assesses and addresses the hazardous substances and/or hazardous conditions known and identified in paragraph 1.7 above, and on-going hazard assessment(s) shall be performed during the progress of work identifying and documenting new or known & potential health risks and safety hazards not previously known and identified.

.2 Provide a copy of the Health and Safety Policy & Program to the DCC representative prior to commencement of work on the work site. The copy provided to the DCC representative is for the purpose of review against the contract requirements related to the known hazardous substances and/or hazardous conditions. The review is not to be construed to imply approval by the DCC representative that the program is complete, accurate and legislatively compliant with the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act, and shall not relieve the Contractor of their legal obligations under such legislation.

1.10 ACCIDENT REPORTING

.1 Investigate and report incidents and accidents as required by the Ontario Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

.2 For the purpose of this contract immediately notify DCC representative, investigate and provide a report within 24 hours to the DCC representative on incidents and accidents that involve:

- .1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
- .2 Exposure to toxic chemicals or substances.
- .3 Property damage.
- .4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.

.3 In the investigation and reporting of incidents and accidents, the Contractor is required to respond in a timely fashion to correct the action that was deemed to have caused the incident and/or accident and advise in writing on the action taken to prevent a re-occurrence of the incident and/or accident.

1.11 RECORDS ON SITE

.1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.

.2 Upon request, make copies available to the DCC representative.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 REFERENCE STANDARDS

.1 Owner's identification of existing survey control points and property limits.

1.03 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work.

1.04 SURVEY REFERENCE POINTS

.1 Use when applicable.

.2 Existing base horizontal and vertical control points are designated on drawings.

.3 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.4 Make no changes or relocations without prior written notice to DCC Representative.

.5 Report to DCC Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.6 Require surveyor to replace control points in accordance with original survey control.

1.05 SURVEY REQUIREMENTS

.1 Use when applicable.

.2 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.3 Establish lines and levels, locate and lay out, by instrumentation.

.4 Stake for grading, fill and landscaping features.

.5 Stake slopes and berms.

.6 Establish pipe invert elevations.

.7 Stake batter boards for foundations.

.8 Establish foundation column locations and floor elevations.

.9 Establish lines and levels for mechanical and electrical work.

1.06 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work, all Base and Provincial Locate must be in hand before work may commence.

.2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by DCC Representative.

.3 Notify DCC Representative 1 week prior to backfill or capping of any utilities below grade.

1.07 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform DCC Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate the relative position of various services and equipment to DCC Representative.

1.08 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On request of DCC representative, submit documentation to verify accuracy of field engineering work.

1.09 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to DCC Representative.

.2 On request of DCC Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying [and noting] those elevations and locations of completed Work that conform [and do not conform] with Contract Documents.

1.10 SUBSURFACE CONDITIONS

.1 Investigate and promptly notify DCC Representative in writing if subsurface conditions at Place of Work differ materially from those

indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 Should the DND utility locates provided by the DCC Representative, during excavation appear not to be in the location/assumed (typical) depth as indicated, stop excavation and contact the DCC Representative for further DND/OneCall review/investigation etc.

1.11 EXISTING UTILITIES

.1 In General: If damage to any existing infrastructure/utility line occurs during excavation or is found to be damaged, including damage to any coating on the line itself, the excavator shall immediately stop work, leave the utility line exposed, barricade the area and contact the appropriate utility provider immediately and notify DCC Representative. When a utility line strike occurs after working hours in addition, notify the Central Heating Plant (613 541 5010 ext.4582).

.2 Damaged Electrical Line: If there are any flames or sparks originating from an exposed electric distribution line or other works, the excavator shall barricade the area off and keep the public and workers away. Call 911 and the local electric distribution utility immediately.

.3 Damaged Gas Line: If **ANY** gas line strike occurs, be it by mechanical equipment or by manual methods, , the following actions must be taken immediately. If required, emergency responders will coordinate the evacuation of affected buildings.

a. Stop Work and shut off all tools, machinery or equipment.
b. Clear everyone from the area.
c. Call 911.
d. Contact the appropriate utility provider immediately; and
e. **DO NOT** attempt to control or stop the gas from escaping.

1.12 Utility Provider Points of Contact

Enbridge Gas: 1-866-763-5427

Utilities Kingston: 613-546-1181 ext.2151

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor (if applicable).
- .8 Date and time work will be executed.

1.03 MATERIALS

.1 Required for original installation.

1.04 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work.

1.05 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Restore work with new products in accordance with requirements of Contract Documents.

.8 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.9 Provide firestopping in to maintain the integrity of fire separations, including:
- .1 Protecting penetrations at fire-resistance rated wall, ceiling or floor construction.
- .2 Using construction joint fire stops and building perimeter fire stops to protect gaps at fire separations and between fire separations and other construction assemblies.

.10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection or as indicated in contract documents. Refinish assemblies by refinishing entire unit.

.11 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.06 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Cleaning and Waste Management.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 REFERENCE STANDARDS

.1 Conduct cleaning and disposal operations in accordance with all Federal, Provincial or Municipal regulatory requirements and guidelines for environmental protection.

.2 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation system is not permitted for this purpose.

.3 This section does not apply to cleaning associated with hazardous material removal and disposal operations. Cleaning of these areas is covered in other sections. Once certified as safe by DCC Representative cleaning methods specified herein are applicable.

1.03 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris at regulated waste facility off site.

.6 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

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

.10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.04 FINAL CLEANING

.1 When Work is Substantially Completed remove surplus products, tools,

construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Do not burn waste materials on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.6 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass if damaged by the Work.

.7 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors, if caused by the Work.

.8 Clean lighting reflectors, lenses, and other lighting surfaces.

.9 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.10 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.13 Remove dirt and other disfiguration from exterior surfaces.

.14 Clean and sweep roofs, gutters, areaways, and sunken wells.

.15 Sweep and wash clean paved areas.

.16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.17 Clean roofs, downspouts, and drainage systems.

.18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.19 Remove snow and ice from access to building.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Complete in accordance with 01 35 43 - ENVIRONMENTAL PROTECTION section.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 DEFINITIONS

.1 Redline Drawings are those prepared by the Contractor as it constructs the project and upon which it documents the actual locations of the building components and site components and changes to the original contract.

.2 Record Drawings are prepared by the Consultant or Designer of Work based on information taken from the Contractors Redline Drawings, are not included in the scope of work unless stated in the contract documents.

1.02 GENERAL

.1 The following shall be submitted in the close out package for approval in folders described in this divisional section.
- .1 Scanned Redline Drawings
- .2 Field Survey Data
- .3 O&M Manual
- .4 Approved Shop Drawings
- .5 Warranty Information and if available;
- .6 Reports
- .7 Photos
- .8 Spare parts, special tools and maintenance materials, as indicated in contract documents.

1.03 FORMAT

.1 The main folder structure for the closeout package submittal is to be organized as follows;
- .1 910 - Redline Drawings
- .2 920 - Record Drawings
  - .1 921 - Field Survey Data
- .3 930 - O&M Manual
- .4 940 - Approved Shop Drawings
- .5 950 - Warranty Information
- .6 960 - Reports
- .7 970 - Photos
- .8 980 - Spare parts, special tools and maintenance materials, as indicated in contract documents.

.2 Only electronic format is to be submitted.

.3 Allow 10 working days for closeout package to be reviewed by DCC Representative and DND Project Manager.

.4 All Cover Sheets: Project Title, Building Number, Drawing Number, Project Number, DCC KN Number and identify subject matter of contents.

.5 Arrange content by Specification Section numbers and sequence of Table of

Contents.

.6 Provide separate sections for each separate product and system, with typed description of product and major component parts of equipment.

.7 Submission is to be provided using DCC's electronic file transfer platform.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Two weeks prior to Substantial Completion of the Work, submit to the DCC Representative, a DRAFT electronic copy of operating and maintenance manuals in English.

.3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

1.05 REDLINE DRAWINGS

.1 As-Builts, Field Record Drawings and Redlines are interchangeable terms meaning Redlines.

.2 Contractor is to provide a printed copy of the drawing set for the intended purpose of creating redline drawings with the words "Redlines" in red written on each page.

.3 Contractor to record changes in red as made and authorized on one set of prints referred to as "Redline Drawings" and at substantial completion of project and prior to final inspection scan and submit drawings to DCC Representative. DCC Representative will review and initial to concur with the content of the final markups.

.4 All Site Instruction Numbers and Change Order Numbers are to be annotated on the Redline Drawing set.

.5 Contractor to maintain information on project site drawings and record accurately, deviations of newly installed or existing plant works from Contract documents during construction.

.6 Contractor will submit for record drawings purposes the original set of redline drawings from construction site used for keeping track of contract design and site condition changes.

.7 The Contractor shall ensure but not limit to the recording of the following information on the original Redline drawings:

.1 Depths of various elements of foundation in relation to first floor level or finished grade elevation.

.2 Horizontal and vertical locations of existing and new underground utilities and appurtenances as well as the alignment, bend and curves

of buried utilities such as communication, power, water, sewer, storm and natural gas ducts, pipes and lines shall be surveyed and be geographically referenced to the coordinate system of the drawing or accurately dimensioned to surfaces features shown in the drawing.

.3 Locations of internal utilities and appurtenance concealed in construction, referenced to visible and accessible features of structure.

.4 Field changes of dimension and detail, such as but not limited to:

.1 For Buildings: Door locations, duct sizes, piping valve, and equipment layout, cable tray alignment.

.2 For Civil/Utilities: road widths, curve radii, alignment, curb radii, sidewalk extents, conduit/pipe sizes.

.5 Changes made by Change Order.

.6 Utilities shall be identified as abandoned, existing or new.

1.07 FIELD SURVEYING & DATA FILE

.1 Contractor to notify the DCC Representative with 2 working days' notice if any buried utility or infrastructure is being exposed to allow DND Surveyor to survey.

.2 DND surveyor is allowed access to site to survey.

.3 Should DND surveyor require special site safety training, the Contractor will notify DCC Representative prior to allow time to be trained.

.4 Should the Contractor have their own Surveyor, and data is collected, it will be submitted with the closeout package.

.5 Field survey data file for service structures, manholes, catch basins, vaults, valves, hydrants etc shall be submitted in excel sheet file format. DCC Representative will get an excel template to be populated from DND. File will contain preset fields to be populated.

.6 Field survey performed for Municipal/Civil/Marine Works forming Part of Project shall:

.1 Be collected in ASCii format and shape file.

.2 ASCii file (Test File) shall contain point ID, Northing, Easting, Elevation and Descriptor.

.3 Shape files (.shp, ESR1 format) shall include point ID, Northing, Easting, Elevation and Descriptor.

1.08 O&M MANUALS

.1 Electronic files are to be arranged and indexes into the same numerical order as the contract Specification Section. A maximum of 300 pages per file.

.2 The use of Bookmarks within PDF is an acceptable practice.

.3 Warranties are to remain in the Manual under each section.

.4 Table of Contents for Each Volume: provide Project Title, Building Number, Drawing Number, DND Project Number, DCC KN Number;

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Contractor with name of responsible parties.
.3 List of products and systems, indexed to content of volume.

.5 For each product or system:
.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.6 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.7 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.8 Text: as required to supplement product data.
.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.9 Training: refer to Section 01 79 00 - Demonstration and Training.

1.09 APPROVED SHOP DRAWINGS

.1 Only copies of approved shop drawings and product data are to be submitted. Rejected and non-approved shop drawings and product data are not to be included.

.2 Approved shop drawings for temporary works required to facilitate construction and that will be removed during or at the completion of construction are not required to be submitted in the closeout package.

1.10 WARRANTY

.1 A Cover Sheet and Table of Contents containing all project related warranties with each item’s expiry date is to be created.

.2 All project related warranties are to be copied into this folder listed by specification section.

.3 Submit a summary of warranty information to DCC Representative for any warranties.
.1 Name of item.
.2 Model and serial numbers.
.3 Location where installed.
.4 Name and phone numbers of manufacturers or suppliers.
.5 Names, addresses and telephone numbers of sources of spare parts.
.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
.7 Cross-reference to warranty certificates as applicable.
.8 Duration of warranty period.
.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
.11 Organization, names and phone numbers of persons to call for warranty service.

.4 Respond in timely manner to oral or written notification of required construction warranty in the closeout package.

1.11 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts.
.1 Give function, normal operation characteristics and limiting conditions.
.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
.1 Include regulation, control, stopping, shut-down, and emergency instructions.
.2 Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning Requirements.

1.12 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  .1 Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections.

1.13 MAINTENANCE MATERIALS

.1 Spare Parts:
  .1 Provide spare parts, in quantities specified in individual specification sections to DCC Representative.
  .2 Provide items of same manufacture and quality as items in Work.
  .3 Deliver to location as directed by DCC Representative; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to DCC Representative.
    .2 Include approved listings in Maintenance Manual.

.2 Extra Stock Materials:
  .1 Provide maintenance and extra materials, in quantities specified in individual specification sections to DCC Representative.
  .2 Provide items of same manufacture and quality as items in Work.
  .3 Deliver to location as directed by DCC Representative; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to DCC Representative.
    .2 Include approved listings in Maintenance Manual.

.3 Special Tools:
  .1 Provide special tools, in quantities specified in individual specification section to DCC Representative.
  .2 Provide items with tags identifying their associated function and equipment.
  .3 Deliver to location as directed by DCC Representative; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to DCC Representative.
    .2 Include approved listings in Maintenance Manual.

1.14 DELIVERY, STORAGE AND HANDLING

.1 Store spare parts, maintenance materials, and special tools in manner to

prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and for review by DCC Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Not used.

1.02 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel as scheduled with the DCC Representative .

.2 Preparation:
- .1 Verify conditions for demonstration and instructions comply with requirements.
- .2 Verify designated personnel are present.
- .3 Ensure equipment has been inspected and put into operation
- .4 Ensure testing, adjusting, and balancing has been performed in accordance with Section 01 91 00 General Commissioning Requirements and equipment and systems are fully operational.

.3 Demonstration and Instructions:
- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment.
- .2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
- .3 Review contents of manual in detail to explain aspects of operation and maintenance.
- .4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for DCC Representative's approval.

.3 Provide electronic copy of completed operation and maintenance manuals for use in demonstrations and instructions.

1.04 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:
- .1 Instruct personnel as designated by the DCC Representative.
- .2 Provide written report that demonstration and instructions have been completed.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 Section Includes:
  .1 This Section specifies roles and responsibilities of Commissioning Training.

.2 Related Requirements

  .1 Not used.

1.02 TRAINEES

.1 Trainees: personnel selected for operating and maintaining this facility. Includes Property, Facility Manager, building operators, maintenance staff, security staff, and technical specialists as required.

.2 Trainees will be available for training during later stages of construction for purposes of familiarization with systems.

1.03 INSTRUCTORS

.1 Contractor and certified factory-trained manufacturers' personnel to provide instruction on the following:
  .1 Start-Up, operation, shut-down of equipment, components and systems.
  .2 Control features, reasons for, results of, implications on associated systems of, adjustment of set points of control and safety devices.
  .3 Instructions on servicing, maintenance and adjustment of systems, equipment and components.

.2 Contractor and equipment manufacturer to provide instruction on:
  .1 Start-up, operation, maintenance and shut-down of equipment they have certified installation, started up and carried out PV tests.

1.04 TRAINING OBJECTIVES

.1 Training to be detailed and sufficient in duration to ensure:
  .1 Safe, reliable, cost-effective, energy-efficient operation of systems in normal and emergency modes under all conditions.
  .2 Effective on-going inspection, measurements of system performance.
  .3 Proper preventive maintenance, diagnosis and trouble-shooting.
  .4 Ability to update documentation.
  .5 Ability to operate equipment and systems under emergency conditions until appropriate qualified assistance arrives.

1.05 TRAINING MATERIALS

.1 Instructors to be responsible for content and quality.

.2 Training to consist of demonstration of use and maintenance of equipment and systems.

.3 DCC Representative and DND Project Manager will review training manuals.

.4 Training materials to be in a format that permits future training procedures to same degree of detail.

1.06 SCHEDULING

.1 Include in Commissioning Schedule time for training.

.2 Deliver training during regular working hours, training sessions to be [3] hours in length.

.3 Training to be completed prior to acceptance of facility.

1.07 RESPONSIBILITIES

.1 Contractor will be responsible for:
- .1 Implementation of training activities,
- .2 Coordination among instructors,
- .3 Quality of training, training materials,
- .4 Handouts including all necessary information (ie. flow charts, schematics, function / operations / interconnection information)

.

1.08 TRAINING CONTENT

.1 Training to include demonstrations by Instructors using the installed equipment and systems.

.2 Content includes:
- .1 Equipment and system start-up, operation, monitoring, servicing, maintenance and shut-down procedures.
- .2 System operating sequences, including step-by-step directions for starting up, shut-down, operation of valves, dampers, switches, adjustment of control settings and emergency procedures.
- .3 Maintenance and servicing, including spare parts recommended to be stored as site.
- .4 Trouble-shooting diagnosis.
- .5 Inter-Action among systems during integrated operation.

.3 Provide specialized training as specified in relevant Technical Sections of the construction specifications.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 General requirements for Commissioning facilities and facility systems.

1.2 QUALITY ASSURANCE

.1 Provide all related Commissioning and testing services.

.2 Comply with applicable procedures and standards.

.3 Perform services to support quality management and verifying contract performance.

1.3 REFERENCES

.1 CSA Z320 – Building Commissioning Standard

.2 ASHRAE Guideline 0-2013 – The Commissioning Process

.3 ASHRAE Standard 202-2013 – Commissioning Process for Building and Systems

1.4 METHODOLOGY

.1 Verification of performance of building systems and components will be performed by means of a Commissioning process.

.2 Commissioning plan & testing activities shall be performed by the Contractor and witnessed by the Commissioning Agent.

.3 Commissioning Agent for this facility will be the DCC Representative.

1.5 COMMISSIONING OBJECTIVES

.1 To bring mechanical, electrical & building architectural systems and components from a state of static completion to a state of dynamic operation.

.2 To verify conformance to contract requirements.

.3 To confirm installations, meet requirements of performance specification & design intent of contract drawings and specifications.

.4 To provide all testing documentation and records.

.5 To ensure completed facility meets user stated requirements.

.6 To provide a documented operator training program.

.7 To verify accuracy of project record drawings and operating & maintenance manuals.

1.6 CONTRACTORS - COMMISSIONING PLAN

.1 Provide a commissioning plan consisting of:

.1 Details regarding roles and responsibilities during all phases of Commissioning.

.2 Documentation defining design assumptions and performance standards of proposed systems.

.3 Description of mechanical, electrical and building architectural systems, intended operation and performance details.

.4 Static testing and verification procedures.

.5 Functional performance verification procedures.

.6 Contractors and manufacturers start-up reports.

.7 Check sheet documentation for recording testing procedures and recording test results prepared by the Contractor for mechanical, electrical and building architectural systems and components.

.8 Test procedures and documentation for seasonal or deferred commissioning.

.9 Training plan for building operators.

.10 Final commissioning report.

1.7 COMMISSIONING AGENT'S - RESPONSIBILITIES

.1 For ensuring that commissioning activities are carried out in accordance with the Contractors Commissioning plan.

.2 Commissioning Agent will:

.1 Chair and arrange commissioning meetings.

.2 Witness all equipment start-up and collect all manufacturer's start-up reports.

.3 Witness testing and balancing measurements and procedures.

.4 Witness all tests and initial all test documents at time of test.

.5 Co-sign off, as witness, all systems verification and test forms.

.6 Coordinate building operators training.

.7 Arrange for provision of additional training where required.

.8 Turn over completed Interim and Final Commissioning reports to the DCC Representative.

1.8 CONTRACTORS - SUBMITTALS

.1 Prior to start of Work, submit name of Contractor personnel proposed to perform services to organize, coordinate, and schedule the applicable personnel to complete the Commissioning process.

.2 Submit documentation to confirm Contractor personnel compliance to perform services.

.3 Contractor shall prepare & submit a completed Commissioning Plan and Commissioning Schedule for review by the Commissioning Agent eight (8) weeks after award.

.4 Submit an updated Commissioning Schedule as directed by the Commissioning Agent.

.5 Prior to the Issuance of the Final Certificate of Completion, and within ten (10) working days after the issuance of the Interim Certificate of Completion, submit three (3) copies of the Interim Commissioning report in D-ring binders, complete with index tabs.

.6 Submit reports of Commissioning activities that are deferred or seasonal after completion and witnessing by the Commissioning Agent.

1.9 PROCEDURES - GENERAL

.1 Comply with referenced standards and the contract documents.

.2 Notify DCC Representative fourteen (14) days prior to beginning Commissioning activities.

.3 Accurately record data for each step on check sheets prepared by the Contractor.

.4 Report to Commissioning Agent / DCC Representative any deficiencies or defects found during start-up and the solution to resolve.

1.10 CONTRACTORS - RESPONSIBILITIES

.1 Prepare each system for testing and functional performance verification.

.2 Cooperate fully with the Commissioning Agent in the execution of the Contractors Commissioning plan. At completion of Commissioning, provide a written statement affirming that building systems are operating properly in accordance with requirements of performance specification and design intent of contract drawings and specifications.

.3 Provide personnel, equipment, instruments & operate systems as required to perform and record Commissioning activities as directed by the Commissioning Agent.

1.11 CONTRACTORS - PREPARATION

.1 Contractors personnel and equipment are on-site to complete the scheduled activities.

.2 All testing procedures & data recording check sheets are updated and on-site.

.3 Contractors & Manufacturers Start-up reports are updated and on-site.

.4 Updated Shop Drawings are on-site.

.5 Equipment Installation, Operation & Maintenance Manuals are on-site.

1.12 BUILDING SYSTEMS TO BE COMMISSIONED

.1 The Contractor shall provide Commissioning services for all mechanical, electrical & building architectural systems and components.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.2 Underwriter's Laboratories of Canada (ULC)
- .1 ULC-S115-1995, Fire Tests of Fire stop Systems.

1.2 DEFINITIONS

.1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

.4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
- .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.3 Shop Drawings:
- .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
- .2 Construction details should accurately reflect actual job conditions.
- .3 Submit manufacturer’s specifications and technical data for each material including the composition and limitations, documentation of ULC or cUL fire-stop system to be used and manufacturers installation instructions

.4 For those fire-stop applications that exist for which no ULC or cUL testing system is available through a manufacturer, a manufacturer’s engineering judgement derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the international Fire stop Council (September 7, 1994, as may be amended from time to time.).

.5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control
- .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
  - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
- .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .4 Manufacturer's Field Reports: submit to manufacturer's written reports within [3] days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 DESIGN

.1 Fire Stopping shall be designed and installed to meet the fire resistance ratings as required on the contract documents. This section shall review the contract documents and provide designs for all locations and areas to receive fire stopping in compliance with the applicable codes and regulations.
- .1 Review drawings and submit specific, fire stopping details engineered solutions test reports for all locations required, including, but not limited to
  - .1 Wall penetrations.
  - .2 Floor penetrations

.2 Prior to beginning work of this Section submit to the Contractor and the Authorities having Jurisdiction, copies of any and all ULC Designs, or written ULC confirmation or ULC engineering studies attesting that the required fire resistance ratings required for various assemblies and components will be achieved.

1.5 QUALITY ASSURANCE

.1 A manufacturer’s direct representative (not distributor or agent) to be on-site during initial installation of fire-stop system to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer’s written recommendations published in their literature and drawing details

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer and ULC markings.

.2 Storage and Protection:
- .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

.3 Waste Management and Disposal:
- .1 Separate waste materials for recycling in accordance with Section 01 74 00 – Cleaning & Waste Management.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
  .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN- ULC-S115 and not to exceed opening sizes for which they are intended

.2 Service penetration assemblies: systems tested to CAN-ULC-S115 and listed in ULC Guide No. 40 U19, or, certified by UL for use in Canada in accordance with CAN4-S115-M under service label cUL.

.3 Service penetration fire-stop components: certified by ULC in accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC, or, certified by UL for use in Canada in accordance with CAN4-S115-M under service label cUL.

.4 Fire-resistance rating (F-rating) of installed fire stopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly. Provide FT-rating for penetrations of fire walls of horizontal fire separation as determined by ULC or cUL.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal. Do not use cementitious or rigid seal at such locations

.6 Fire stopping and smoke seals at openings around penetrations for conduits and other electrical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
  .1 Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 APPLICATION

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

.4 Apply fireproofing directly to open web joists without use of expanded lath.

.5 Tamp smooth, surfaces visible in finished work.

.6 Apply curing compound to surface of cementations fireproofing as required by manufacturer.

.7 Apply sealer to surface of mineral fiber fireproofing as required by manufacturer where fireproofing is to be painted and as indicated

3.4 SEQUENCES OF OPERATION

.1 Proceed with installation only when submittals have been reviewed by DCC Representative.

.2 Install floor fire stopping before interior partition erections.

.3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.

.4 Mechanical pipe insulation: certified fire stop system component.
.1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

.1 Inspections: notify DCC Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Manufacturer's Field Services:
.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

.1 Proceed in accordance with Section 01 74 00 – Cleaning & Waste Management.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

.1 Fire stop and smoke seal at:
- .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
- .2 Edge of floor slabs at curtain wall and precast concrete panels.
- .3 Top of fire-resistance rated masonry and gypsum board partitions.
- .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
- .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
- .6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .7 Openings and sleeves installed for future use through fire separations.
- .8 Around mechanical and electrical assemblies penetrating fire separations.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA C22.1-24, Canadian Electrical Code, Part 1 (26th edition) Safety Standard for Electrical Installations.
- .2 OESC 29th Edition, Ontario Amendments to the Ontario Electrical Safety Code.
- .3 CAN3-C235-19 Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .4 CAN/CSA-B72-20, Installation Code for Lightning Protection Systems

.2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
- .1 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.3 CAN/ULC-S524-24 – Standard for the Installation of Fire Alarm Systems

.4 CAN/ULC-S139-12 Standard Method of Fire Test for Evaluation of Integrity of Electrical Cables

.5 CSA B651-23 – Accessible Design for the Built Environment

.6 National Building Code of Canada

.7 All governing municipal requirements

1.2 DEFINITIONS

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by the IEEE Standard Dictionary of Electrical and Electronics Terms.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: submit WHMIS MSDS in accordance with Section 02 81 00 - Hazardous Materials.

.3 Submit for review single line electrical diagrams in glazed frames and locate on-site with DCC Representative.

.4 Shop drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada, only for systems where required by Provincial or Federal Law.
- .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
- .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
- .4 Indicate on drawings clearances for operation, maintenance, and replacement of operating equipment devices.
- .5 Submit copies of drawings and product data to authority having jurisdiction and inspection authorities as required.
- .6 If changes are required, notify DCC Representative of these changes before they are made.

.5 Quality Control: in accordance with Section 01 45 00 - Quality Control.
- .1 Provide CSA certified equipment and material.
- .2 Where CSA certified equipment and material is not available, submit such equipment and material to inspection authorities for special approval before delivery to site.
- .3 Submit test results of installed electrical systems and instrumentation.
- .4 Permits and fees: in accordance with General Conditions of contract.
- .5 Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.
- .6 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to DCC Representative.
- .7 Manufacturer's Field Reports: submit to DCC Representative manufacturer's written report, within 7 days of review, verifying compliance of Work as described in PART 3 - FIELD QUALITY CONTROL.

.6 Arc Flash Hazard Analysis:
- .1 To be performed by consultant. Provide make and models of electrical protection equipment and revised conductors sizes and lengths to consultant for update of existing Arc Flash Hazard Analysis.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
- .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
- .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
- .3 Safety precautions.
- .4 Procedures to be followed in event of equipment failure.
- .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.

.4 Post instructions where directed.

.5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.

.6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license as per the conditions of Provincial Act respecting manpower vocational training and qualification.

.3 Site Meetings:
- .1 Site Meetings: as part of Manufacturer's Field Services, schedule site visits, to review Work, at stages listed.
  - .1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete.
.3 Upon completion of Work, after cleaning is carried out.
.4 Health and Safety Requirements: do construction occupational health and safety in accordance with General Contractor Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Material Delivery Schedule: coordinate delivery of material to suit proposed construction schedule.

.2 Waste Management and Disposal: separate waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

1.7 SYSTEM STARTUP

.1 Instruct DCC Representative and operating personnel in operation, care and maintenance of systems, system equipment and components.

.2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

.3 Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant will aspects of its care and operation.

1.8 OPERATING INSTRUCTIONS AND MAINTENANCE DATA

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

.2 Operating instructions to include following:
.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
.2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
.3 Safety precautions.
.4 Procedures to be followed in event of equipment failure.
.5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Names and addresses of nearest suppliers for all items included in maintenance manuals.

.4 Print or engrave operating instructions and frame under glass or in approved laminated plastic.

.5 Post instructions where directed.

.6 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.

.7 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.9 WARRANTY

.1 All manufacturer product and contractor labour warranties **NOT** to commence until the issuance of a certificate of substantial performance once equipment is being utilized for its intended operational purpose.

1.10 ESA INSPECTIONS

.1 Contractor to pay for and arrange for ESA permit and both rough-in and final inspections. DCC representatives to be present for all inspections.

PART 2 PRODUCTS

2.1 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: Provide identification nameplates and labels for control items in English.

2.2 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 61 00 - Product Requirements.

.2 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.

.3 Factory assembled control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

.1 Verify installation and co-ordination responsibilities related to motors, equipment and controls between Divisions, as indicated.

2.4 WARNING SIGNS

.1 Warning Signs: in accordance with requirements of authority having jurisdiction, inspection authorities and DCC Representative.

.2 Porcelain enamel signs, minimum size 175 x 250 mm.

2.5 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are 90 degrees Celsius rated suitable for either copper or aluminum conductors.

2.6 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates and labels as follows:

NAMEPLATE SIZES

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters

NAMEPLATE SIZES

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

.2 Identify electrical equipment with nameplates and labels as follows:
- .1 Nameplates: Lamacoid 3mm (1/8”) thick engraving sheet, BLACK face for normal/backup power equipment and RED face for life safety power equipment, white core, lettering accurately aligned and engraved into core mechanically attached with self tapping screws or rivets.
- .2 Printed adhesive backed labels in lieu of Lamacoid will NOT be considered as an acceptable alternate means of labeling.

.3 Labels: embossed plastic labels sized to suit mounting location and tag details, with 6mm high letters unless specified otherwise. Printed adhesive backed labels will NOT be acceptable.

.4 Wording on nameplates and labels to match equipment identifiers on plans and to be approved to suit Owner’s preference if not indicated in labeling standard prior to manufacture.

.5 Allow for minimum of twenty-five 25 letters per nameplate and label.

.6 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

.7 Distribution switchboard(s), motor control centres, power panels, lighting panels, lighting control panels, indicate system and/or voltage characteristics and if for relay panel if fed from more than one power source indicating the source locations. All power panels have source included on label.

.8 Disconnects, starters, contactors and push-button control stations: indicate equipment being controlled and voltage.

.9 Terminal cabinets and pull boxes: indicate system and voltage.

.10 Transformers: indicate capacity, primary and secondary voltages.

.11 Motorized equipment and operable wall controls: indicate equipment being controlled and voltage.

.12 All power device components (new and existing) including switches, receptacles and junction boxes are to be labelled as indicated below:
- .1 Provide clear printed adhesive label tags affixed to bottom front of faceplate in BLACK.
- .2 Provide white printed adhesive label tags affixed to wall on inside of faceplate to indicate circuit feeding location to allow faceplates to be put back in the correct location if removed in the future.

2.7 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour coding: to CSA C22.1.

.4 Use colour coded wires in communication cables, matched throughout system.

2.8 CONDUIT AND CABLE IDENTIFICATION

.1 Colour code conduits, boxes and metallic sheathed cables.

.2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.

.3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Type	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow
HVAC Controls	White	

2.9 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

.1 Paint indoor normal/backup power switchgear and distribution enclosures light gray to ASA49.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

.2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.3 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 CONDUIT AND CABLE INSTALLATION

.1 Install conduit and sleeves prior to pouring of concrete.

.2 Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm.

.3 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.

.4 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

.5 Arrange with Division 7 for flashing and weatherproofing of holes through exterior walls.

.6 Provide wire with flame spread rating suitable for application. (ie FT1, FT4, FT6 or MI cable as required to suit 1 HR FRR ULC S139) where indicated on the drawings.

.7 Coordinate with all other Divisions through General Contractor for associated conduit rough-ins to avoid coordination issues and enable installation of products supplied by other Divisions to suit final approved systems shop drawings.

3.5 LOCATION OF OUTLETS

.1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.

.2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.

.3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

.4 Locate light switches on latch side of doors.

.1 Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

3.6 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centre-line of equipment unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install electrical equipment at following heights unless indicated otherwise.
- .1 Local switches: 1100 mm.to centre-line of device box
- .2 Thermostats: 1200mm. to centerline of device box
- .3 Wall receptacles:
  - .1 General: 400 mm to centre or as indicated.
  - .2 Systems Furniture locations: confirm rough-in location with DCC Representative.
  - .3 Above top of counters or counter splash backs: 200 mm.
  - .4 In mechanical/electrical rooms: 1000 mm.
  - .5 Wall receptacles mounted on building exterior: 600mm above finished grade
- .4 Panelboards: as required by Code or as indicated.
- .5 Communications outlets:
  - .1 General: 400 mm to centre or as indicated.
  - .2 Systems Furniture locations: confirm rough-in location with DCC Representative.
  - .3 Above top of counters or counter splash backs: 200 mm.
- .6 Fire alarm manual stations: 1200mm to the centre-line of the device box.
- .7 Fire alarm wall mounted speakers/strobes: as required by CAN/ULC-S524 Standard for the Installation of Fire Alarm Systems or as indicated on drawings.
- .8 Television communication outlets: as indicated, confirm rough-in location with DCC Representative.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 THERMAL SCANING

.1 Provide an Infrared Thermographic Analysis for all electrical distribution equipment noted within the contract documents. Equipment covers and panels shall be removed by the licensed Electrical contractor to expose current carrying connections and terminations.

.2 All infrared scanning and other site inspections will be done with all electrical equipment energized and under load.

.3 Per CSA Z462, all representatives performing live work shall be qualified and competent personnel, wear the appropriate Personal Protective Equipment (PPE) including approved safety boots, side impact hard hats, safety glasses and/or safety shields, arc flash coveralls, and rubber gloves with protectors during inspections operations. All PPE shall be rated for the appropriate voltage class and switchgear style per CSA Z462 Table 6A/B/C as no arc flash labels may be present. At least two personnel will be working together doing any live work.

.4 Utilize state-of-the-art instrumentation to identify and document temperatures that exceed NFPA Standard 70B recommendations, ie. High resistance electric connections, current overload, defective circuit breakers and insulator conditions. Use the most advanced scientific grade infrared imager to enable more in-depth results and avoid missing defects. Use same imagers for all work to

ensure consistency for comparison. Perform daily calibrations. Run equipment at maximum possible load for at least 15 minutes for tests.

.5 For larger main breakers remove either top front cover strip or rear panel to give an unobstructed view especially of the rear breaker stabs.

.6 Measure current on all phases of any piece of equipment found to be anomalous.

.7 Propose actions based on temperature rise as found in NETA Table 100.18

.8 Personnel doing scanning and report to have Level I Infrared Certification from an infrared manufacturer or training group in accordance with the American Society for Non-Destructive Testing Inc. standard SNT-TC-1A ' Personnel Qualification and Certification in Non-destructive Testing' and the ASTM E1934-99a ' Standard Guide for Examining Mechanical, Building Envelopes, and Electrical Equipment with Infrared Thermography'.

.9 Note any identifiable operational or code deficiencies.

.10 Inspect distribution equipment with imaging equipment capable of detecting a minimum temperature difference of 1°C at 30°C.

.11 Provide pictures and thermograms for each significant device, and the following information for each device with identified deficiencies.

.12 Provide photographs and thermograms showing temperature difference between any areas or items of concern and the reference area.

.13 Measure and document the current through the device and confirm whether the loading is within the device rating.

.14 Note the probable cause of temperature differences.

3.9 FIELD QUALITY CONTROL

.1 Load Balance:
- .1 Measure phase current to panel boards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
- .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
- .3 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.

.2 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
- .1 Power generation and distribution system including phasing, voltage, grounding and load balancing.
- .2 Circuits originating from branch distribution panels.
- .3 Lighting and its control.
- .4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
- .5 Systems: fire alarm system and communications.
- .6 Insulation resistance testing:
  - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
  - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.

.3 Check resistance to ground before energizing.
.4 Megger existing feeders being re-used for new distribution equipment and replace all feeders with failed test results.

.3 Carry out tests in presence of DCC Representative.

.4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.5 Manufacturer's Field Services:
.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.10 PROTECTION

.1 Protect exposed live equipment during construction for personnel safety.

.2 Shield and mark live parts 'LIVE 120 VOLTS' or with appropriate voltage.

.3 Arrange for installation of temporary doors for rooms containing electrical distribution equipment. Keep these doors locked except when under direct supervision.

3.11 ACCESS DOORS

.1 Supply access doors for furred ceilings or spaces for access to electrical fitments for installation under section erecting the walls or ceilings.

.2 Access doors, unless otherwise specified or shown, shall be flush mounted 600 × 600 mm (24" × 24") for body entry, at least 12 gauge steel, finished prime coat only, with concealed hinges, screwdriver latches, anchor straps, rounded safety corners and shall open 180 degrees. Doors shall be of approved manufacturer with published literature.

3.12 FIREPROOFING

.1 Provision of all firestopping required for electrical service penetration of rated walls, floors and partitions shall be the responsibility of this contractor as per the Division 7 specifications.

3.13 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning & Waste Management.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning & Waste Management

.3 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.4 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 This Section includes requirements for selective demolition and removal of electrical components including removal of conduit, junction boxes and incidentals required to complete work described in this Section ready for new construction.

1.2 RELATED REQUIREMENTS

.1 Section 02 41 19.16 – Selective Interior Demolition.

.2 Section 02 81 00 – Hazardous Materials

.3 Section 02 82 00.01 – Asbestos Abatement Minimum Precautions

.4 Section 02 82 00.02 – Asbestos Abatement Intermediate Precautions

1.3 DEFINITIONS

.1 Demolish: Detach items from existing construction and legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

.2 Remove: Planned deconstruction and disassembly of electrical items from existing construction including removal of conduit, junction boxes, cabling and wiring from electrical component to panel taking care not to damage adjacent assemblies designated to remain; legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

.3 Remove and Salvage: Detach items from existing construction and deliver them to DCC Representative ready for reuse.

.4 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.5 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed and salvaged, or removed and reinstalled.

.6 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by Federal Hazardous Products Act (RSC 1985) including latest amendments.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Action Submittals: Provide in accordance with Section 01 33 00 – Submittal Procedures before starting work of this Section:

.2 Construction Waste Management Plan (CWM Plan): Submit plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 00 – Cleaning & Waste Management.

.3 Landfill Records: Indicate receipt and acceptance of selective demolition waste and hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate work of this Section to avoid interference with work by other Sections.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: Perform work of this Section in accordance with:
- .1 WSIB Ontario
- .2 Ministry of Labour, Training and Skills Development

1.7 SITE CONDITIONS

.1 Existing Conditions: Condition of materials identified as being salvaged or demolished are based on their observed condition at time of site examination before tendering.

.2 Existing Hazardous Substances: DCC Representative has performed a hazardous substances assessment and identified materials requiring abatement as follows:
- .1 Asbestos, Lead and Mercury are expected to be present.
- .2 Hazardous substances are as defined in Hazardous Products Act.
- .3 Hazardous substances will be removed by the General Contractor as a part of Contract before starting Work in accordance with work results described in Related Requirements listed above.

1.8 SALVAGE AND DEBRIS MATERIALS

.1 Demolished items become Contractor's property and will be removed from Project site; except for items indicated as being reused, salvaged, or otherwise indicated to remain Owner 's property.

.2 Carefully remove materials and items designated for salvage and store in a manner to prevent damage or devaluation of materials

PART 2 PRODUCTS

2.1 MATERIALS

.1 General Patching and Repair Materials: Refer to Section 02 41 19.16 – Selective Interior Demolition for listing of patching and repair materials incidental to removal or demolition of components associated with work of this Section.

.2 Electrical Repair Materials: Use only new materials, CSA or ULC labelled as appropriate and matching components remaining after work associated with components identified for removal or demolition are completed

.3 Fire stopping Repair Materials: Use fire stopping materials compatible with existing fire stopping systems where removal or demolition work affects rated assemblies, restore to match existing fire rated performance.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Reserved.

3.2 PREPARATION

.1 Protection of Existing Systems to Remain: Protect systems and components indicated to remain in place during selective demolition operations and as follows:
- .1 Prevent movement and install bracing to prevent settlement or damage of adjacent services and parts of existing buildings scheduled to remain.
- .2 Notify DCC Representative and cease operations where safety of buildings being demolished, adjacent structures or services appears to be endangered and await additional instructions before resuming demolition work specified in this Section.
- .3 Prevent debris from blocking drainage inlets.
- .4 Protect mechanical systems that will remain in operation.

.2 Protection of Building Occupants: Sequence demolition work so that interference with the use of the building by the Owner and users is minimized and as follows:
- .1 Prevent debris from endangering safe access to and egress from occupied buildings.
- .2 Notify DCC Representative and cease operations where safety of occupants appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

3.3 EXECUTION

.1 Demolition and Removal:
- .1 Disconnect electrical circuits; maintain electrical service and main distribution panel as is, ready for subsequent Work.
- .2 Remove existing luminaires, electrical devices and equipment including associated conduits, boxes, wiring, and similar items unless specifically noted otherwise.
- .3 Disconnect and remove existing fire alarm system including associated conduits, boxes, wiring, and similar items unless specifically noted otherwise.
- .4 Disconnect and remove communication systems including associated conduits, boxes, cabling, and similar items unless specifically noted otherwise.
- .5 Disconnect and remove telephone outlets, associated conduit, cabling and sub terminal backboards and related accessories; maintain telephone service and main terminal backboard as is.
- .6 Perform demolition work in a neat and workmanlike manner:
  - .1 Remove tools or equipment after completion of work, and leave site clean and ready for subsequent renovation work.
  - .2 Repair and restore damages caused as a result of work of this Section to match existing materials and finishes.
- .7 Disconnect circuits back to distribution panel and re label respective circuit breaker as "SPARE".
- .8 Place weatherproof blank cover plates on exterior outlet boxes remaining after demolition and removal activities.
- .9 Remove existing conduits, boxes, cabling and wiring associated with removed luminaires, electrical devices and equipment.
- .10 Grind off conduits and make flush with surface of concrete where conduits are cast into concrete; seal open ends of conduit with silicone sealant and leave in place.
- .11 Seal open ends of conduit with silicone sealant and leave in place where they are inaccessible or cannot be removed without damaging adjacent construction.

3.4 CLOSEOUT ACTIVITIES

.1 Demolition Waste Disposal: Arrange for legal disposal and remove demolished materials to accredited provincial landfill site or alternative disposal site (recycle centre) except where explicitly noted otherwise for materials being salvaged for re use in new construction.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Reserved.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM A 82/A 82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- .2 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 ASTM D 1056-20, Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

.2 Canadian Standards Association (CSA International)
- .1 CAN/CSA-A3000-23, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 CSA-A3001-23, Cementitious Materials for Use in Concrete.
- .3 CSA A23.1/A23.2-24, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 CAN/CSA-G30.18-21, Billet-Steel Bars for Concrete Reinforcement.
- .5 CSA C22.2 No. 211.1-06 (2021), Rigid Types EBI and DB2/ES2 PVC Conduit.
- .6 CAN/CSA C22.2 No. 327-16 HDPE Conduit and fittings.

1.3 SUBMITTALS

.1 Provide submittals for pre-case concrete products in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
- .1 Submit shop drawings for precast transformer vaults.

.4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
- .1 Test reports: submit certified test reports for specified materials from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

PART 2 PRODUCTS

2.1 DIRECT BURIAL PVC DUCTS AND FITTINGS

.1 Provide Schedule 40 rigid heavy wall installed to suit manufacturers requirements.

.2 Provide PVC bends, couplings, reducers, bell end fittings, plugs, caps, adaptors same product material as duct, to make complete installation and include for any transitions between PVC and HDPE.

.3 Rigid PVC 90 degrees and 45 degrees bends.

.4 Rigid PVC 5 degrees angle couplings.

.5 Expansion joints as required.

.6 Rigid PVC split ducts.

2.2 CABLE PULLING EQUIPMENT

.1 Pull rope: 6 mm stranded nylon or polypropylene, tensile strength 5 kN, continuous throughout each duct run with 3m spare rope at each end.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PVC INSTALLATION GENERAL

.1 Build on undisturbed soil or on well compacted granular fill not less than 150 mm thick, compacted to 95% of maximum proctor dry density. Granular fill to be Granular A as per OPSS1010.

.2 Open trench completely between manholes before ducts are laid and ensure that no obstructions will necessitate change in grade of ducts.

.3 Install ducts at elevations and with slope as indicated and minimum slope of 1 to 400.

.4 Install base spacers at maximum intervals of 1.5 m levelled to grades indicated for bottom layer of ducts.

.5 Lay PVC ducts with configuration and reinforcing as indicated with rigid plastic intermediate spacers to maintain spacing between ducts at not less than 75 mm horizontally and 50mm vertically.
- .1 Stagger joints in adjacent layers at least 150 mm and make joints watertight.
- .2 Transition above grade to galvanized steel or electric metallic tubing above finished grade level as indicated on the drawings.

.6 In areas of congestion, hand dig trenches to avoid damage to existing utilities.

.7 Duct banks shall follow general route shown on the drawings and shall terminate at specified locations. Exact location of duct banks and terminating points shall be verified on site prior to commencement of work.

.8 Make transpositions, offsets and changes in direction using 5 degree bend sections, do not exceed a total of 20 degree with duct offset.

.9 Use bell ends at duct terminations in manholes or buildings.

.10 Use conduit to duct adapters when connecting to conduits.

.11 Cut, ream and taper end of ducts in field in accordance with manufacturer's recommendations, so that duct ends are fully equal to factory-made ends.

.12 Clean ducts before laying:
- .1 Cap ends of ducts during construction and after installation to prevent entrance of foreign materials.

.13 Duct cleaning:
- .1 Pull 300mm long x diameter 6 mm less than internal diameter of duct steel or wooden mandrel through each duct, immediately after placing of concrete.
- .2 Then pull stiff bristle brush through duct; avoid disturbing or damaging ducts where concrete has not set completely.
- .3 Pull stiff bristle brush through each duct immediately before pulling-in cables.

.14 Install pull rope continuous throughout each duct run with 3m spare rope at each end.

.15 Provide electrical warning tape 300 mm (12") below finished grade spanning the width of the duct bank.

3.3 FIELD QUALITY CONTROL

.1 Site Tests/Inspections:
- .1 Advise Engineer so that he/she may inspect ducts prior to placing and be present during the placement of concrete and clean out.
- .2 Coordinate all approvals and inspection with the local ESA field inspector (AHJ) prior to pouring concrete and backfilling trench.

3.4 RECORD SURVEY

.1 Survey all duct banks and pull pits prior to backfilling.

.2 Include on the survey the following information with co-ordinates tie into the UTM:
- .1 Centre line of each duct bank run.
- .2 Width of duct bank.
- .3 Top elevation of duct bank.
- .4 Location and elevation of each junction box.

3.5 CLEANING

.1 Proceed in accordance with Section 01 74 00 – Cleaning & Wate Management.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 21 Wires and Cables (0-1000V).

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)
- .1 CSA C22.2 No. 18.5:22, Metallic Outlet Boxes (Trinational standard with NMX-J-023/1-ANCE-2024 and UL 514A).
- .2 CAN/CSA-C22.2 No.65:25 Wire Connectors

.2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
- .1 EEMAC 1Y-2, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for wire and box connectors and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Sustainable Design Submittals:
- .1 Construction Waste Management:
  - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
  - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for wire and box connectors for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect wire and box connectors from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.

.2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

.3 Bushing stud connectors: to NEMA to consist of:
- .1 Connector body and stud clamp for stranded copper conductors.
- .2 Clamp for stranded copper conductors.
- .3 Clamp for stranded aluminum conductors.
- .4 Stud clamp bolts.
- .5 Bolts for copper conductors.
- .6 Bolts for aluminum conductors.
- .7 Sized for conductors as indicated.

.4 Clamps or connectors for armoured cable, TECK cable, aluminum sheathed cable, mineral insulated cable, flexible conduit, non-metallic sheathed cable as required to: CAN/CSA-C22.2 No.18.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Remove insulation carefully from ends of conductors and cables and:
- .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
- .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65
- .3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.
- .4 Install bushing stud connectors in accordance with NEMA.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning & Waste Management.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results Electrical

.2 Section 26 05 32 – Conduits and Fittings

1.2 PRODUCT DATA

.1 Provide product data in accordance with Section 01 33 00 - Submittal Procedures

PART 2 PRODUCTS

2.1 BUILDING WIRES

.1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.

.2 120V Control circuits are permitted to be #14AWG Copper.

.3 Copper conductors: size as indicated, with 600V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE where used underground or in floor slabs, both Jacketted.

.4 Type TWU, TWH, T90 Nylon not permitted.

2.2 ARMOURED CABLES

.1 Conductors: insulated, copper, size as indicated.

.2 Type: AC90

.3 Armour: interlocking type fabricated from galvanized steel strip.

.4 Connectors: anti short connectors.

2.3 CONTROL CABLES

.1 Type: LVT: 2, 4, 6 or 8 soft annealed copper conductors, sized as indicated:
- .1 Insulation: thermoplastic.
- .2 Sheath : cotton braid

2.4 NON-METALLIC SHEATHED CABLE

.1 Shall not be used on this project.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform insulation tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

.1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).

.2 Cable Colour Coding: to Section 26 05 00 Common Work Results for Electrical.

.3 Conductor length for parallel feeders to be identical.

.4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.

.5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.

.6 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.

.7 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF BUILDING WIRES

.1 Install wiring as follows:
  .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

3.4 INSTALLATION OF ARMOURED CABLES

.1 Group cables wherever possible on channels.

.2 Type AC90 is only to be used in extremely short lengths (of 1.5m or less) and are only to be used for fixture drops from conduit boxes.

.3 AC90 is never to be used for home runs for lighting or power devices and will be ordered to be removed if so installed.

.4 Use AC90 for this purpose only and only where specifically called out on the drawings.

3.5 INSTALLATION OF CONTROL CABLES

.1 Install control cables in conduit from cable tray to devices

.2 Install control cables in cable tray

.3 Ground control cable shield.

3.6 INSTALLATION OF NON-METALLIC SHEATHED CABLE

.1 Never use Non Metallic Sheathed Cable.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 26 05 00 - Common Work Results - Electrical.

1.2 REFERENCES

.1 Canadian Standards Association, (CSA International)

PART 2 PRODUCTS

2.1 EQUIPMENT

.1 Copper conductor: bare, soft annealed, stranded, untinned copper ground conductor for system and equipment ground, size as indicated, minimum as dictated by code.

.2 Grounding conductors: bare stranded copper, untinned, soft annealed, minimum 3/0 AWG copper conductor to each ground electrode.

.3 Insulated grounding conductors: green, type RW90 XLPE, where indicated.

.4 Ground bus: copper, size as indicated, complete with 600V insulated supports, fastenings, connectors.

.5 Supply non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
- .1 Grounding and bonding bushings.
- .2 Protective type clamps.
- .3 Bolted type conductor connectors.
- .4 Thermit welded type conductor connectors.
- .5 Bonding jumpers, straps.
- .6 Pressure wire connectors
- .7 Compression ground connectors.

.6 Compression grounding connectors used to make permanent grounding connections must be rated for direct burial, embedding in concrete and for above grade applications
- .1 Compression connectors shall be made of pure, wrought copper, meeting ASTM B187, essentially the same as the conductors being connected.
- .2 Cast connectors shall be made of copper base alloy according to ASTM B30 (latest revision).
- .3 All connectors must be of heavy duty design and must be equivalent in current carrying capacity to the maximum size copper conductors being joined while maintaining high mechanical strength and electrical integrity.
- .4 Terminals and splices may accommodate only one conductor size. All other connectors must be range taking.
- .5 All connectors must be designed to provide high integrity connections.
- .6 Connectors must be pre-filled or filled at time of connection with a corrosion inhibiting compound which is compatible with the conductors being joined.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL

.1 Install complete permanent, continuous system and equipment grounding systems including, electrodes, conductors, connectors, accessories, as indicated.

.2 Install connectors in accordance with manufacturer's instructions.

.3 Protect exposed grounding conductors from mechanical injury.

.4 Make buried connections, and connections to conductive water main, electrodes, using permanent mechanical connectors or inspectable wrought copper compression connectors to ANSI/IEEE 837.

.5 Use mechanical connectors for grounding connections to equipment provided with lugs.

.6 Soldered joints not permitted.

.7 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solder-less lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.

.8 Install flexible ground straps for bus duct enclosure joints, where such bonding is not inherently provided with equipment.

.9 Bond single conductor, metallic armoured cables to cabinet at supply end, provide non-metallic entry plate at load end.

.10 Ground secondary service pedestals.

.11 Ensure uniformity of grounding practices throughout installation.

3.2 SYSTEM AND CIRCUIT GROUNDING

.1 Install system and circuit grounding connections to the neutrals of the electrical distribution system, as indicated.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, cable trays, frames of motors, motor control centres, starters, control panels, building steel work, generators, elevators and escalators, distribution panels, outdoor lighting.

3.4 GROUNDING BUS

.1 Install copper grounding bus mounted on insulated supports on wall in Incoming Electrical, Incoming Comm and Shared Building Network and a total of three separate IT/LAN rooms, scope of work as indicated on the drawings.

.2 Ground items of electrical equipment in electrical room to ground bus with individual bare stranded copper connections size 2/0AWG.

3.5 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical.

.2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of DCC Representative and local authority having jurisdiction over installation.

.3 Perform tests before energizing electrical system.

.4 Disconnect ground fault indicator during tests.

END OF SECTION

PART 1 GENERAL

1.1 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning & Waste Management.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 SUPPORT CHANNELS

.1 U shape, size 41 x 41mm, 2.5 mm thick, surface mounted, suspended by 12mm Threaded Rod.

.2 Galvanized Steel used indoors.

.3 Stainless Steel where required outdoors.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Secure equipment to hollow or solid masonry, tile and plaster surfaces with lead anchors or nylon shields.

.2 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.

.3 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.

.4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.

.5 Fasten exposed conduit or cables to building construction or support system using straps.
- .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
- .2 Two-hole steel straps for conduits and cables larger than 50 mm.
- .3 Beam clamps to secure conduit to exposed steel work.

.6 Suspended support systems.
- .1 Support individual cable or conduit runs with 12 mm dia threaded rods and spring clips.
- .2 Support 2 or more cables or conduits on channels supported by 12 mm dia threaded rod hangers where direct fastening to building construction is impractical.

.7 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.

.8 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.

.9 Do not use wire lashing or perforated strap to support or secure raceways or cables.

.10 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of DCC Representative.

.11 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

.12 Where cutting of galvanized strut is required, touch up the cut ends with galvanizing paint.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures

.2 Product Data:
.1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.

PART 2 PRODUCTS

2.1 SPLITTERS

.1 Construction: sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.

.2 Terminations: main and branch lugs or connection blocks to match required size and number of incoming and outgoing conductors as indicated.

.3 Spare Terminals: minimum three spare terminals or lugs on each connection or lug block sized less than 400 A.

2.2 JUNCTION AND PULL BOXES

.1 Construction: welded steel enclosure.

.2 Covers Flush Mounted: 25 mm minimum extension all around.

.3 Covers Surface Mounted: screw-on flat turned edge covers.

2.3 CABINETS

.1 Construction: welded sheet steel, hinged door, handle, latch and catch

.2 Type E Empty: flush overlapping sides mounting as required.

PART 3 EXECUTION

3.1 SPLITTER INSTALLATION

.1 Mount plumb, true and square to building lines.

.2 Extend splitters full length of equipment arrangement except where indicated otherwise.

3.2 JUNCTION, PULL BOXES AND CABINETS INSTALLATION

.1 Install pull boxes in inconspicuous but accessible locations.

.2 Mount cabinets with top not higher than 2 m above finished floor except where indicated otherwise.

.3 Coordinate all main junction and pull boxes to suit conduit runs and wire sizes are indicated. Install additional pull boxes as required by CSA C22.1.

3.3 IDENTIFICATION

.1 Equipment Identification: to Section 26 05 00- Common Work Results for Electrical.

.2 Identification Labels: size 2 indicating system name voltage and phase.

END OF SECTION

PART 1 GENERAL

1.1 LOCATION OF CONDUITS

.1 Drawings do not show all conduits. Those shown are in diagrammatic form only

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)
.1 CSA C22.1-24, Canadian Electrical Safety Code, Part 1 (26th edition)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

PART 2 PRODUCTS

2.1 CONDUIT

.1 Rigid PVC Conduit (RPVC)

.2 Rigid Galvanized Steel Conduit (RGSC)

.3 Electrical Metallic Tubing (EMT)

.4 Electrical Non-Metallic Tubing (ENMT)

.5 Flexible Metal Conduit and Liquidtight Flexible Metal Conduit

2.2 OUTLET AND CONDUIT BOXES GENERAL

.1 Size boxes in accordance with CSA C22.1.

.2 102 mm square or larger outlet boxes as required.

.3 Gang boxes where wiring devices are grouped.

.4 Blank cover plates for boxes without wiring devices.

.5 347 V outlet boxes for all 347 V line voltage switching devices.

.6 Combination boxes with barriers where outlets for more than one system are grouped.

2.3 GALVANIZED STEEL OUTLET BOXES

.1 One-piece electro-galvanized construction.

.2 Single and multi-gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.

.3 Utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.

.4 102 mm square or octagonal outlet boxes for lighting fixture outlets.

.5 Extension and plaster rings for flush mounting devices in finished plaster and tile walls.

2.4 CONDUIT BOXES

.1 Cast FS aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of devices.

.2 Standard of Acceptance: Iberville, Hubbell or equal Canadian manufactured and CSA certified product.

2.5 PULSTRINGS

.1 Polypropylene nylon, 6mm for conduits to 27mm

.2 Braided Nylon, 12mm for conduits to 103mm.

2.6 FITTINGS - GENERAL

.1 Bushing and connectors with nylon insulated throats.

.2 Knock-out fillers to prevent entry of debris.

.3 Conduit outlet bodies for conduit up to 35mm and pull boxes for larger conduits.

.4 Double locknuts and insulated bushings on sheet metal boxes.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Support boxes independently of connecting conduits.

.2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

.3 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.

.4 Vacuum clean interior of outlet boxes before installation of wiring devices.

.5 Identify systems for outlet boxes as required.

.6 Conceal conduit in walls, partitions and ceilings. Provide access panels in areas where access is required to junction boxes.

.7 Install EMT surface mounted in mechanical, electrical telecommunications rooms and the overhead link.

.8 Install Rigid Galvanized Conduit where subject to mechanical injury

.9 Provide Expansion Fittings where conduits pass over expansion joints.

.10 Seal conduits passing through an outside wall with duct seal a the closest outlet box on the outside wall. If the distance from the nearest outlet box to point where conduit passes through wall exceeds 1524mm (5',) install and outlet box just inside the wall and seal conduit at that location. Install duct seal after all wiring has been completed.

.11 Install rigid galvanized steel conduit 762mm (30") below finished grade and extend 75mm (3") beyond the outside wall surface where conduit runs pass through the foundation walls. Couple to rigid PVC conduit for continuation of underground electrical or telecommunication service to outdoor locations.

.12 Do not use perforated steel supports (all round)

.13 Make exposed conduit parallel to the building lines to present a neat and tidy appearance. Make offsets at similar locations and parallel in areas where two or more runs are together. Failure to coordinate conduit runs with each other will result in the DCC Representative rejecting the installation.

.14 Use liquidtight flexible conduit for final connections to motors and loads subject to vibration.

.15 Run conduit to avoid proximity to water or heating pipes. Do not run within 75mm of pipes, and where unavoidable, contact DCC Representative for direction. Proceed with direction from DCC Representative.

.16 Lengths of Flexible Metallic Conduit are not permitted to be longer than 6' unless prior permission has been obtained from the DCC Representative, under documented writing.

.17 Type AC90 has very limited use, refer to Section 26 05 21.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 21 – Wires and Cables

.2 Section 26 05 29 – Hangars and Supports

.3 Section 26 05 32 – Outlet Boxes, Conduits and Fittings

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA C22.2 No. 18.5:22, Metallic Outlet Boxes (Trinational standard with NMX-J-023/1-ANCE-2024 and UL 514A).
- .2 CSA C22.2 No. 45.1:22, Electrical Rigid Metal Conduit – Steel (Trinational standard with UL 6 and NMX-J-534-ANCE-2022).
- .3 CSA C22.2 No. 56:17 (R2022), Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
- .4 CSA C22.2 No. 83:M85(R2022), Electrical Metallic Tubing.
- .5 CSA C22.2 No. 211.2:06(R2021), Rigid PVC (Unplasticized) Conduit.
- .6 CAN/CSA C22.2 No. 227.1:19 (R2023), Electrical Nonmetallic Tubing.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product data: submit manufacturer's printed product literature, specifications and datasheets.
- .1 Submit cable manufacturing data.

.3 Quality assurance submittals:
- .1 Test reports: submit certified test reports.
- .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .3 Instructions: submit manufacturer's installation instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 00 -Cleaning & Waste Management.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

PART 2 PRODUCTS

2.1 CABLES AND REELS

.1 Provide cables on reels or coils.
- .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.

.2 Each coil or reel of cable to contain only one continuous cable without splices.

.3 Identify cables for exclusively dc applications.

.4 Reel and mark shielded cables rated 2,001 volts and above.

2.2 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.

.2 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.

.3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.

.4 Rigid PVC conduit: to CSA C22.2 No. 211.2.

.5 Flexible metal conduit: to CSA C22.2 No. 56, steel, liquid-tight flexible metal.

.6 Flexible PVC conduit: to CAN/CSA-C22.2 No. 227.1.

2.3 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits NPS 2” (50 mm) and smaller.
.1 Two hole steel straps for conduits larger than NPS 2” 50 mm.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits at maximum length permitted for smallest conduit on rack by code.

.4 Threaded rods, 12 mm diameter, to support suspended channels.

2.4 CONDUIT FITTINGS

.1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.

.2 Ensure factory "ells" where 180 degrees bends for NPS 1” (25 mm) and larger conduits.

.3 EMT Connectors:
.1 Watertight connectors and couplings for EMT where routed below sprinkler heads, installed in location exposed to the weather or at exposed penetrations into the top of electrical equipment.
.2 Set screw type steel connectors are acceptable where EMT conduit is routed in walls, above ceiling and/or sprinkler heads where there is no possibility of direct water stream or ingress of moisture.

2.5 EXPANSION FITTINGS FOR RIGID CONDUIT

.1 Weatherproof expansion fittings with internal bonding assembly suitable for 100mm linear expansion.

.2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.

.3 Weatherproof expansion fittings for linear expansion at entry to panel.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

.2 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.

.3 Use epoxy coated conduit underground and in corrosive areas.

.4 Use electrical metallic tubing (EMT) except in cast concrete, above 2.4 m not subject to mechanical injury.

.5 Use rigid PVC conduit underground and in corrosive areas.

.6 Use flexible metal conduit for connection to motors in dry areas, connection to recessed LED fixtures without prewired outlet box, connection to surface or recessed LED fixtures, work in movable metal partitions.

.7 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.

.8 Install conduit sealing fittings in hazardous areas.
.1 Fill with compound.

.9 Minimum size for all conduit: 21 mm

.10 Bend conduit cold:
.1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.11 Mechanically bend steel conduit over 35 mm diameter.

.12 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.13 No Running of Threads Permitted

.14 Install fish cord in empty conduits.

.15 Run 2-NPS 1 (25 mm) spare conduits up to ceiling space and 2-NPS 1 (25 mm) spare conduits down to ceiling space from each flush panel.
.1 Terminate these conduits in 152 x 152 x 102 mm junction boxes in ceiling space or in case of an exposed concrete slab, terminate each conduit in surface type box.

.16 Remove and replace blocked conduit sections.
.1 Do not use liquids to clean out conduits.

.17 Dry conduits out before installing wire.

.18 Use flexible metal conduit exposed only where specifically indicated on drawings or with approval of DCC Representative, or for final fixture tails, not longer than 10’ and as above in .6.

3.3 SURFACE CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.

.3 Run conduits in flanged portion of structural steel.

.4 Group conduits wherever possible on suspended or surface channels, where applicable

.5 Do not pass conduits through structural members except as indicated or with permission of DCC Representative.

.6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.4 CONCEALED CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Do not install horizontal runs in masonry walls.

.3 Do not install conduits in terrazzo or concrete toppings.

3.5 CONDUITS IN CAST-IN-PLACE CONCRETE

.1 Locate to suit reinforcing steel.

.2 Install in centre one third of slab.

.3 Protect conduits from damage where they stub out of concrete.

.4 Install sleeves where conduits pass through slab or wall.

.5 Provide oversized sleeve for conduits passing through waterproof membrane, before membrane is installed.
.1 Use cold mastic between sleeve and conduit.

.6 Conduits in slabs: minimum slab thickness 4 times conduit diameter.

.7 Encase conduits completely in concrete with minimum 25 mm concrete cover.

.8 Organize conduits in slab to minimize cross-overs.

3.6 CONDUITS IN CAST-IN-PLACE SLABS ON GRADE

.1 Run conduits NPS 1 (25 mm) and larger below slab and encase in 75 mm concrete envelope.
.1 Provide 50 mm of sand over concrete envelope below floor slab.

3.7 CONDUITS UNDERGROUND

.1 Slope conduits to provide drainage.

.2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 00 – Cleaning & Waste Managenemt.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 26 05 00 - Common Work Results - Electrical.

.2 Section 26 05 11 – Direct Buried and Concrete Encased Ductbanks

.3 Section 26 05 21 – Wires and Cables (0-1000V)

1.2 REFERENCES

.1 Canadian Standards Association, (CSA International)

.2 Insulated Cable Engineers Association, Inc. (ICEA)

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

PART 2 PRODUCTS

2.1 RESERVED.

PART 3 EXECUTION

3.1 CABLES IN UNDERGROUND DUCTS

.1 Underground cable splices not acceptable, unless prior permission has been obtained in writing from the DCC REPRESENTATIVE, or if shown on the drawings specifically.

.2 Minimum permitted radius at cable bends for rubber, plastic or lead covered cables, 8 times diameter of cable; for metallic armoured cables, 12 times diameter of cables or in accordance with manufacturer’s instructions.

.3 Maintain 75 mm (3”) minimum separation between cables of different circuits. Maintain 300 mm (12”) horizontal separation between low and high voltage cables. When low voltage cables cross high voltage cables maintain 300 mm (12”) vertical separation with low voltage cables in upper position. At crossover, maintain 75 mm (3”) minimum vertical separation between low voltage cables and 150 mm (6”) between high voltage cables. Maintain 300 mm (12”) minimum lateral and vertical separation for fire alarm and control cables when crossing other cables, with fire alarm and control cables in upper position.

3.2 CABLE INSTALLATION IN DUCTS

.1 Install cables as indicated in ducts.

.2 Do not pull spliced cables inside ducts.

.3 Install multiple cables in duct simultaneously.

.4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.5 To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

.6 Before pulling cable into ducts and until cables are properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

.7 After installation of cables, seal duct ends with duct sealing compound.

3.3 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical.

.2 Perform tests using qualified personnel. Provide necessary instruments and equipment.

.3 Check phase rotation and identify each phase conductor of each feeder.

.4 Check each feeder for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 megohms(MΩ)

.5 Acceptance tests for LV cables (less than 600VAC):
- .1 After installing cable but before splicing and terminating, perform insulation resistance test with 1000 V megger on each phase conductor.
- .2 Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.

.6 Provide DCC REPRESENTATIVE with list of test results showing location at which each test was made, circuit tested and result of each test.

.7 Remove and replace entire length of cable if cable fails to meet any of test criteria.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results for Electrical

1.02 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers, Inc. (IEEE)

.1 ANSI/IEEE 386-2016, IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Rated 2.5 kV through 35 k

.2 CSA Group (CSA)

.1 CAN/CSA-C2-M91, Single-Phase and Three Phase Distribution Transformers, Types ONAN and LNAN

1.03 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, and limitations.

.3 Submit shop drawings and indicate:

.1 Anchoring method and dimensioned foundation template.

.2 Dimensioned cable entry locations.

.3 Dimensioned cable termination and pothead height.

.4 Identified internal and external component layout on assembly drawing.

.5 Insulating liquid capacity.

.6 Submit primary fuse and secondary breaker time-current characteristics.

.7 Quality Assurance Submittals: Submit following in accordance with Section 01 45 00 – Quality Control.

.1 Certificates: Submit production certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.2 Instructions: Submit manufacturer's installation instructions.

.1 DCC Representative will make available 1 copy of systems supplier's installation instructions.

.8 Closeout Submittals:

.1 Provide operation and maintenance data for pad-mounted distribution transformers for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

.2 Include insulating liquid maintenance data.

1.04 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Cleaning & Waste Management.

1.05 MAINTENANCE

.1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.

.2 Include: full set of spare bayonet fuses.

2 PRODUCTS

2.01 EQUIPMENT

.1 Three phase pad-mounted transformers: To CAN/CSA C2.1.

.2 Separable insulated connectors for power distribution systems above 600 V: To ANSI/IEEE 386

.3 Oil-filled pad-mounted distribution transformer complete with primary and secondary cable compartments, primary fused and accessories to form complete factory assembled, self contained, steel fabricated unit for mounting on concrete pad.

.4 High voltage bushings or high voltage bushing wells for connection to distribution system through separable insulated connectors for dead front operation.

.5 Separable insulated connectors.

.6 Primary cable terminals with hole for 9.5 mm diameter, 16 thread bolt for attachment of solder lug or clamp connector in vertical plane.

.7 Spade type low voltage terminals.

.8 Connectors for primary and secondary cables.

.9 Primary protection oil immersed fuse primary protective link.

2.02 TRANSFORMER CHARACTERISTICS

.1 Primary Voltage: 4160V, 60 Hz, delta connected, 3 phase.

.2 Secondary Voltage: 600 V, wye connected, 3 phase, 4 wire, neutral grounded.

.3 Capacity: 500 kVA

.4 Basic Impulse Level: 110 kV

.5 Impedance: 5.8% to match existing.

2.03 VOLTAGE TAPS

.1 Four-2.5% taps.

2.04 TAP CHANGER

.1 Internally operated tap changer with provision for padlocking on 3 phase units.

2.05 ACCESSORIES

.1 Liquid temperature thermometer with two sets of contacts.

.2 Liquid level gauge with two sets of contacts.

.3 Pressure relief device.

.4 Drain and sample valve.

2.06 GROUNDING

.1 Copper grounding bus size minimum 4mm x 6mm.

.2 Connectors for grounding conductor to suit CEC.

2.07 FINISH

.1 Finish exterior of unit in accordance with Section 26 05 00 – Common Work Results for Electrical.

2.08 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section26 05 00 – Common Work Results for Electrical.

.2 Nameplate showing information in accordance with CSA C2

2.09 WARNING SIGNS

.1 Provide warning signs in accordance with Section 26 05 00 – Common Work Results for Electrical.

2.10 SOURCE QUALITY CONTROL

.1 Submit to DCC Representative standard factory test certificates of each transformer and type test of each transformer with high voltage accessories in accordance with CSA C2

3 EXECUTION

3.01 INSPECTION

.1 Check factory made connections of transformer unit for mechanical security and electrical continuity.

.2 Check transformer insulating liquid for correct quantity and specification according to manufacturer's instructions.

3.02 INSTALLATION

.1 Ensure concrete vault is fully cured before transformer is installed.

.2 Set and secure transformer unit in place, rigid, plumb, and square.

.3 Make connections.

.4 Connect transformer unit ground bus to system ground.

.5 Wire one set of contacts on liquid temperature thermometer, liquid level gauge, to sound alarm when unsafe condition reached, wire second set of contacts to trip transformer circuit interrupter.

.6 Ensure care is taken to prevent contamination of liquid and components when filling transformer on site.

.7 Use only metal hose when site-filling transformer with oil: do not use rubber hose.

.8 Set taps to produce rated secondary voltage at no-load.

3.03 SITE QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 – Common Work Results for Electrical.

.2 Carry out following insulation tests using megohmeter with 20 000 megohm scale and resulting insulation resistance corrected to base of 20 degrees C.

.1 High voltage to ground with secondary grounded for duration of test.

.2 Low voltage to ground with primary grounded for duration of test.

.3 High to low voltage.

.3 Inspect primary and secondary connections for tightness and for signs of overheating.

.4 Inspect and clean bushings and insulators.

.5 Check oil level and temperature indicators.

.6 Set transformer taps to rated voltage as specified.

.7 Inspect for oil leaks and excessive rusting.

.8 Inspect oil level.

.9 Check fuses for correctness of type and size.

.10 Check for grounding and neutral continuity between primary and secondary circuits of transformer.

3.04 CLEANING

.1 Proceed in accordance with Section 01 74 00 – Cleaning & Waste Management.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results - Electrical

1.02 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 Load Interrupter Switch: to CSA C22.2 No.193.

.2 Switchgear Assemblies: to CSA 22.2 No. 31, EEMAC G8-2, ANSI C37.20.3

1.03 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for interrupter switches and include product characteristics, performance criteria, physical size, finish and limitations.

1.04 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for interrupter switches for incorporation into manual.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect interrupter switches from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

2 PRODUCTS

2.01 SWITCH GEAR RATINGS

.1 Load Interrupter Switch: to CSA C22.2 No.193.

.2 Switchgear Assemblies: to CSA 22.2 No. 31, EEMAC G8-2, ANSI C37.20.3

.3 3 pole, quick-make, quick-break assembly, stored energy operating mechanism manual operated, assembled on welded steel base.

.4 Continuous full load rating: 600A, interrupting rating: 25,000 A, symmetrical, 180MVA.

.5 Voltage rating: 4.76 kV Maximum, 4.16kV Nominal.

.6 110 kV BIL.

.7 Fault Closing: 40 kA (asymmetrical).

.8 Corona Extinction Voltage to Ground: 3.5kV RMS

.9 High Potential Test (one minute at 60Hz): 19kV

.10 Interphase barriers.

.11 Non-removable operating handle c/w provision for pad locking.

.12 Power fuses: 400 A maximum.

.13 Enclosure: CSA Enclosure CSA 22.2 No. 31, EEMAC G8-2, ANSI C37.20.3.

.14 Include viewing windows that permits full view of the position of all three switch blades.

.15 Include metering section in coordination with Utilities Kingston Requirements.

.16 Interlocks with features as follow:

.1 Fuse is only accessible after switch is opened.

.2 Switch can be closed only after fuse access door is closed.

2.02 ENCLOSURE

.1 The enclosure shall be outdoor construction with front access only. The construction shall be welded 11-gauge flat rolled steel complete with a four-inch steel channel welded along the bottom.

.2 The finish shall consist EEMAC Y1-2 Equipment Green or ANSI #70 Gray for outdoor switchgear. A mimic bus and identification nameplate may also be included.

2.03 600 AMPERE MINI-RUPTER SWITCHES

.1 Voltage rating: 4.76 kV Maximum, 4.16kV Nominal.

.2 60 kV BIL.

.3 Continuous full load rating: 400A, interrupting rating: 600 A

.4 Momentary: 40 kA (asymmetrical)

.5 Short Time (one second): 25kA (symmetrical)

.6 Fault Closing (two time duty cycle): 40kA (asymmetrical)

.7 The interrupter switches shall be factory aligned and tested on a frame before being installed in the switchgear.

.8 Interrupter units shall not rely on separate blades.

.9 Potential indicating light.

2.04 VOLTAGE SENSING DEVICES

.1 Voltage sensing devices for use with open-phase detectors and source transfer control shall be capacitively coupled voltage sensors connected phase to ground for all three phases. Alternatively if local control power is required, two voltage sensors and one fused potential transformer connected phase to ground.

.2 To maximize usable cable-training space within the switchgear assembly, the voltage sensors can directly replace apparatus insulators at the hinge end of the power fuses or the lower terminal of interrupter switches. Furthermore, voltage sensors shall be constant-current-output devices that do not require primary fuses or secondary shorting terminal blocks.

2.05 POWER FUSE

.1 The fuses shall be power fuse assemblies. A fuse assembly shall consist of a renewable fuse unit complete with exhaust filter and blown fuse indicator.

.2 The fuse units shall be full range, non-aging and non-damageable. The time current characteristics shall be NEMA "E" type. A standard and slow speed shall be available for each rating up to 400E amperes.

.3 Each fuse shall contain a silver arcing rod surrounded by epoxy cemented boric acid.

.4 The fuse units shall be able to withstand voltage upon interrupting, thereby not requiring trip-pin operation of the switch.

.5 The fuses shall not have an MBC (minimum breaking current) nor shall they limit current such that over-voltages occur upon interruption.

.6 The fuses shall be constructed with a hinge on one end and a disconnecting latch on the other. It must be possible to remove the holder from the bay with only a grappler equipped hook stick.

2.06 LIGHTNING ARRESTERS

.1 Arrester component parts: to ANSI/IEEE-C62.11.

.2 Arrester characteristics:

.1 Station arrester.

.2 System highest voltage line to line: 4.16kV.

.3 MCOV (maximum continuous operating voltage): 5.10 kV.

.4 Indoor type.

.5 Housing: polymer.

2.07 INSULATOR AND ISOLATING BUSHINGS

.1 The stand-off insulators shall be skirted and have a minimum of 4.8 inches of creepage distance to maintain the 60 kV BIL and 19 kV, 60 Hz one minute High Potential Test.

.2 Where required each bay shall be isolated from adjacent bays by epoxy through bushings.

2.08 FABRICATION

.1 Factory assemble and adjust 3 pole gang operated switch, operating assembly, interphase barriers and interlocks.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for interrupter switches installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of DCC.

.2 Inform DCC Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DCC Representative.

3.02 INSTALLATION

.1 Install load interrupter switches.

.2 Install lightning arrester ground.

.3 Check switch contact resistance with low resistance meter.

.4 Megger switch across each pole, from pole to pole, and from pole to ground.

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning & Waste Management.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning & Waste Management.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 28 16.02 – Moulded Case Circuit Breakers

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA C22.2 No.29-24, Panelboards and enclosed Panelboards.
- .2 CSA C22.2 No.5:25-25, Moulded Case Circuit Breakers

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

PART 2 PRODUCTS

2.1 PANELBOARDS

.1 Panelboards: to CSA C22.2 No.29 and product of one manufacturer.
- .1 Install circuit breakers in panelboards before shipment as applicable.
- .2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.2 Panelboards interrupt rating: to suit provided Short circuit and coordination study.

.3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.4 Provide drip shields for all existing surface mounted panels.

.5 Panelboards:
- .1 Refer to drawing for ratings.

.6 Two keys for each panelboard and key panelboards alike.

.7 Copper main bus with copper neutral of same ampere rating as mains.

.8 Mains: suitable for bolt-on breakers.

.9 Trim with concealed front bolts and hinges.

.10 Trim and door finish: baked grey enamel.

2.2 BREAKERS

.1 Breakers: to Section 26 28 16.02 - Moulded Case Circuit Breakers.

.2 Breakers with thermal and magnetic tripping in panel boards except as indicated otherwise.

.3 Main breaker: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.4 Lock-on devices for 15 to 30 A breakers installed as indicated.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results - Electrical

.2 Nameplate for each panelboard size 4 engraved as indicated.

.3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit.

2.4 STANDARD OF ACCEPTANCE

.1 All equipment supplied by this section shall include the same make/manufacturer of circuit breakers for a complete distribution system by one manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on plywood backboards sealed with grey paint. Ply wood to be 3/4" fire rated and sized to suit panel dimensions. Where practical, group panelboards on common backboard.

.3 Mount panelboards to height specified in Section 26 05 00 - Common Work Results - Electrical or as indicated.

.4 Connect loads to circuits, connect bonding and ground conductors.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

.6 Install circuit breakers as indicated.

.7 Provide breaker space fillers as required.

3.2 ADJUSTING AND CLEANING

.1 Clean all panelboards on completion of work. Adjust panel trims to properly fit. Adjust all breaker trips.

3.3 SPARES

.1 Provide spares as indicated on panel schedules.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results for Electrical

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)
- .1 CSA C22.2 No.42-10 (R2020), General Use Receptacles, Attachment Plugs and Similar Devices.
- .2 CAN/CSA C22.2 No.42.1-13(R2022), Cover Plates for Flush-Mounted Wiring Devices (Bi-national standard, with UL 514D).
- .3 CSA C22.2 No.55-15(R2020), Special Use Switches.
- .4 CSA C22.2 No.111-10-25, General-Use Snap Switches (Bi-national standard, with UL 20).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for wiring devices and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for wiring devices for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect wiring devices from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 SWITCHES

.1 15A, 120 V, single pole switches to: CSA C22.2 No.55 and CSA C22.2 No.111.

.2 Manually-operated general purpose AC switches with following features:
- .1 Terminal holes approved for No. 10 AWG wire.
- .2 Silver alloy contacts.
- .3 Urea or melamine moulding for parts subject to carbon tracking.
- .4 Suitable for back and side wiring.
- .5 Ivory toggle.
- .6 Extra heavy duty specification grade.

.3 Switches of one manufacturer throughout project.

2.2 RECEPTACLES

.1 Duplex receptacles, CSA type 5-15 R, 125 V, 15 A, U ground, to: CSA C22.2 No.42 with following features:
- .1 Ivory urea moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Break-off links for use as split receptacles.
- .4 Eight back wired entrances, four side wiring screws.
- .5 Triple wipe contacts and rivetted grounding contacts.
- .6 Extra heavy duty specification grade.

.2 Single receptacles CSA type 5-15 R, 125 V, 15 A, U ground with following features:
- .1 Ivory urea moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Four back wired entrances, 2 side wiring screws.
- .4 Extra heavy duty specification grade.

.3 NEMA L6 Receptacles – 250V, 2-Pole, 3-Wire, amperage and wire size as per drawings, twist lock receptacle, extra heavy duty specification grade c/w brushed stainless steel cover plate, CSA approved.

.4 Other receptacles with ampacity and voltage as indicated.

.5 Receptacles of one manufacturer throughout project.

2.3 COVER PLATES

.1 Cover plates for wiring devices to: CSA C22.2 No.42.1.

.2 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.

.3 Stainless steel, vertically brushed, 1 mm thick cover plates for wiring devices mounted in flush-mounted outlet box.

.4 Cast cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.

.5 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.

.6 Weatherproof spring-loaded cast aluminum cover plates complete with gaskets for single receptacles or switches.

2.4 SOURCE QUALITY CONTROL

.1 Cover plates from one manufacturer throughout project.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Switches:
- .1 Install single throw switches with handle in "UP" position when switch closed.
- .2 Install switches in gang type outlet box when more than one switch is required in one location.
- .3 Mount toggle switches at height in accordance with Section 26 05 00 – Common Work Results for Electrical as indicated.

.2 Receptacles:
- .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.
- .2 Mount receptacles at height in accordance with Section 26 05 00 – Common Work Results for Electrical as indicated.
- .3 Where split receptacle has one portion switched, mount vertically and switch upper portion.
- .4 Install GFI type receptacles as indicated.

.3 Cover plates:
- .1 Install suitable common cover plates where wiring devices are grouped.
- .2 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning & Waste Management.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.

.3 Repair damage to adjacent materials caused by wiring device installation.

END OF SECTION

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit fuse time-current characteristics for each fuse type and size. Time-current characteristics to include: average melting time-current, I^2t (for fuse coordination), and peak let-through current.

1.2 DELIVERY, STORAGE AND HANDLING

.1 Ship fuses in original containers.

.2 Do not ship fuses installed in equipment.

.3 Store fuses in original containers in moisture-free storage cabinet.

1.3 EXTRA MATERIALS

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Three spare fuses of each type and size.

PART 2 PRODUCTS

2.1 FUSES - GENERAL

.1 Fuse type references as per coordination study, have been adopted for use in this specification.

.2 Fuses: product of one manufacturer.

2.2 FUSE TYPES

.1 Refer to drawings and provided short circuit and coordination study.

2.3 FUSE STORAGE CABINET

.1 Fuse storage cabinet, manufactured from 2.0mm thick aluminum 750 mm high, 600mm wide, 300mm deep, hinged, lockable front access door finished in accordance with Section26 05 00 - Common Work Results for Electrical.

.2 Wall mounted in each main electrical room, in final location to be determined by the DCC Representative on-site.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Install fuses in mounting devices immediately before energizing circuit.

.2 Ensure correct fuses fitted to physically matched mounting devices.

.3 Ensure correct fuses fitted to assigned electrical circuit.

.4 Install spare fuses in fuse storage cabinet.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 24 16.01 – BREAKER TYPE PANELBOARDS.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).
- .1 CSA-C22.2 No. 5-25, Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, fourteenth edition, and the sixth edition of NMX-J-266-ANCE).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Include time-current characteristic curves for breakers with ampacity of 30A and over.

.3 Certificates:
- .1 Prior to installation of circuit breakers in either new or existing installation, Contractor must submit a copy of a production certificate of origin from the manufacturer. Production certificate of origin must be duly signed by factory and local manufacturer's representative certifying that circuit breakers come from this manufacturer and are new and meet standards and regulations.
  - .1 Production certificate of origin must be submitted to the DCC Representative for approval.
- .2 Delay in submitting production of certificate of origin will not justify any extension of contract and additional compensation.
- .3 Any work of manufacturing, assembly or installation to begin only after acceptance of production certificate of origin by the DCC Representative. Unless complying with this requirement, the DCC Representative reserves the right to mandate manufacturer listed on circuit breakers to authenticate new circuit breakers under the contract, and to Contractor's expense.
- .4 Production certificate of origin must contain:
  - .1 Manufacturer's name and address and person responsible for authentication. Person responsible must sign and date certificate.
  - .2 Licensed dealer's name and address and person of distributor responsible for Contractor's account.
  - .3 Contractor's name and address and person responsible for project.
  - .4 Local manufacturer's representative name and address. Local manufacturer's representative must sign and date certificate.
  - .5 Name and address of building where circuit breakers will be installed:
    - .1 Project title: Project DC.
    - .2 End user's reference number.
    - .3 List of circuit breakers.

PART 2 PRODUCTS

2.1 BREAKERS GENERAL

.1 Moulded-case circuit breakers, Circuit breakers, and Ground-fault circuit-interrupters: to CSA C22.2 No. 5

.2 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.

.3 Common-trip breakers: with single handle for multi-pole applications.

.4 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
- .1 Trip settings on breakers with adjustable trips to range from 3-8 times current rating.

.5 Circuit breakers with interchangeable trips if applicable.

.6 120/208V and 347/600 circuit breakers to have symmetrical rms interrupting capacity rating as indicated on the attached short circuit and coordination study.

2.2 THERMAL MAGNETIC BREAKERS DESIGN A

.1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

2.3 MAGNETIC BREAKERS DESIGN B

.1 Moulded case circuit breaker to operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short circuit protection.

2.4 CURRENT LIMITING AND SERIES RATED THERMAL MAGNETIC BREAKERS DESIGN C

.1 Thermal magnetic breakers with current limiters.
- .1 Time current limiting characteristics of fuses limiters coordinated with time current tripping characteristics of circuit breaker.
- .2 Co-ordination to result in interruption by breaker of fault-level currents up to interrupting capacity of breaker.

.2 Series rated breakers to be manufacturer tested and listed. Breakers to be applied following manufacturer's guidelines and accepted best practice.
- .1 Breakers applied following manufacturer's guidelines and accepted best practice.

2.5 SOLID STATE TRIP BREAKERS

.1 Moulded case circuit breaker to operate by means of solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition, and long time, short time and instantaneous tripping for phase and/or ground fault short circuit protection.

2.6 OPTIONAL FEATURES

.1 Include where necessary to meet design intent indicated on the drawings:
- .1 Shunt trip.
- .2 Shunt close
- .3 Auxiliary switch.
- .4 Motor-operated mechanism c/w time delay unit.
- .5 Under-voltage release.
- .6 On-off locking device.
- .7 Handle mechanism.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Install circuit breakers in appropriate location to suit equipment type as indicated.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA International).
- .1 CAN/CSA C22.2 No.4 (R2020), Enclosed Switches.
- .2 CSA C22.2 No.39 (R2022), Fuseholder Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for in accordance with Section 01 74 00 – Cleaning & Waste Management.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal of packaging material or for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 DISCONNECT SWITCHES

.1 Fusible, non-fusible, horsepower rated disconnect switch in CSA Enclosure one, to CAN/CSA C22.2 No.4, size as indicated and as required.

.2 Provision for padlocking in on-off switch position by three locks.

.3 Mechanically interlocked door to prevent opening when handle in ON position.

.4 Fuses: size as indicated and/or as required to suit manufacturer supplied equipment, in accordance with Section 26 28 13.01 - Fuses - Low Voltage.

.5 Fuseholders: to CSA C22.2 No.39 suitable without adaptors, for type and size of fuse required.

.6 Quick-make, quick-break action.

.7 ON-OFF switch position indication on switch enclosure cover.

.8 Provide auxiliary contact for elevator disconnects as noted on plans.

.9 Ratings:
- .1 To be provided as per the drawings and attached short circuit and coordination study.

2.2 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification to suit DCC Representative labelling requirements in accordance with Section 26 05 00 - Common Work Results – Electrical.

.2 Indicate fuse sizes and name of load controlled on size 4 nameplate.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Install disconnect switches complete with fuses if applicable.

.2 Ensure all disconnect switches are installed in locations acceptable for operation from standing position without need for ladder, etc. and include 1 meter of clearance in accordance with OESC and ESA inspector requirements, confirm with inspector prior to rough-in as necessary.

END OF SECTION

PART 1 PART 1 - GENERAL

1.1 INTRODUCTION

.1 The specifications provided herein only apply to Civil works.

.2 Current Ontario Provincial Standard Specifications (OPSS) shall govern for all works.

1.2 RELATED REQUIREMENTS

.1 .1 Reserved.

1.3 REFERENCE STANDARDS

.1 CANADIAN GENERAL STANDARDS BOARD (CGSB)
- .1 138.1-96 Fabric for Chain Link Fence
- .2 138.2-96 Steel Framework for Chain Link Fence
- .3 138.4-96 Gates for Chain Link Fence

.2 ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
- .1 OPSS.MUNI 772 Construction Specification for Chain-Link Fence
- .2 OPSS.MUNI 1541 Material Specification for Chain-Link Fence Components

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for fences, gates, and posts and include product characteristics, performance criteria, physical size, finish, limitations, and installation instructions.
- .2 For vertical pivot gates also provide wiring diagram for gate operators, operator’s and parts manual, shop drawings showing location of gate and operator in relationship with adjacent fencing and paving, details of installation, hardware locations, and accessories.

.2 Furnish manufacturer’s certification indicating system provided complies with specified requirements.

1.5 QUALITY ASSURANCE

.1 Field Measurements: verify dimensions and component layout by field measurements prior to shop drawing submittal and again prior to installation.

.2 Vertical pivot gate installer qualifications: firm approved by manufacturer or with minimum five years successful experience completing vertical pivot gate installations similar to that required.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store and protect fence and gates from damage, in accordance with manufacturer’s

instructions.
.2 Replace defective or damaged materials with new.

PART 2 PRODUCTS

.1 Wire fence
.1 9 ga. zinc-coated galvanized before weaving steel fabric
.2 Material per CAN/CGSB 138.1
.3 Dimensions as indicated on drawings.

.2 Barbed Wires:
.1 2.3mm 4-point barbed wire at 150mm intervals
.2 Material per CAN/CGSB 138.2

.3 Posts and Rails:
.1 Sched. 40 galvanized steel pipe
.2 Material per CAN/CGSB 138.2
.3 Dimensions as indicated on drawings

.4 Privacy Screen:
.1 Back polyethylene knitted to provide 85% visibility blockage

.5 Manual Gate:
.1 3.0m wide double swing gates per OPSD 972.102
.2 Provide chain hook to hold gate open and gate latches suitable for use with Owner’s padlock that can be accessed from either side.
.3 Material per CAN/CGSB 138.4
.4 Dimensions as indicated on drawings

PART 3 PART 3 – EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections are acceptable for fence and gate installation in accordance with manufacturer's written instructions.
.1 Inform Third-Party Geotechnical Reviewer of unacceptable conditions immediately upon discovery.
.2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Level ground along fence line in order to ensure that bottom wire of fence between posts can be maintained at not more than 40 mm above ground.

3.3 ERECTION OF FENCE

.1 Erect fence along lines as indicated and per OPSS 722.

.2 Installation of posts:
.1 Space posts at 3 m intervals
.2 Install posts true to line and plumb with minimum 2.1 m of post projecting above ground.
.3 Install corner posts to depth of 1570 mm and intermediate posts to depth of 1500 mm.
.4 Set posts in concrete and provide engineered shop drawings of installation details.
.5 Brace corner, end, and gate posts as indicated.

.6 Install barbed wire as indicated.
.7 Stretch wires to have uniform tension. Splice wires with standard wire splices.

.3 Installation of manual gates:
.1 Install gates at locations as indicated and per OPSS 722.
.2 Install gates to prevent over-stress on posts when gates are open. Allow for finished grades as indicated and allow for free movement of gate.
.3 Locate anchor pipe for drop bolt and install pipe flush with finished grade.

3.4 CLEANING

.1 Leave Work area clean at end of each day.

.2 Clean damaged galvanized surfaces with wire brush, removing loose and cracked coatings. Apply two coats of zinc-rich coating.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment off-site.

END OF SECTION