

Public Works and Government Services Canada
Ontario Region

MILLHAVEN INSTITUTION
MAXIMUM SECURITY CELL UNIT
ELECTRICAL TRANSFORMER

Project No. R45116.003
Date: September 17, 2013
Issued: for Bid
VOLUME 1 of 1

Bid Set No. _____

PROJECT TITLE

Electrical Transformer for
96 Bed Maximum Living Unit
Millhaven Institution
Bath, Ontario
Issued for Bid

Project Number

R.45116.003

Project Date

2013-09-17

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PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Connecting to existing services.
 - .2 Special scheduling requirements.
- 1.2 RELATED SECTIONS
- .1 Section 01 32 16.07 - Project Time Management, Planning, Monitoring and Control System - Bar (GANTT) Chart Method.
 - .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- 1.3 ACCESS AND EGRESS
- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
- 1.4 USE OF SITE AND FACILITIES
- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
 - .2 Maintain existing services to building and provide for personnel and vehicle access.
 - .3 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- 1.5 EXISTING SERVICES
- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
 - .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry
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- 1.5 EXISTING SERVICES
(Cont'd)
- .2 (Cont'd)
out interruptions after normal working hours of occupants, preferably on weekends.
 - .3 Provide for personnel and vehicular traffic.
 - .4 Construct barriers in accordance with Section 01 56 00.
- 1.6 SPECIAL REQUIREMENTS
REQUIREMENTS
- .1 Unless otherwise indicated by the Departmental Representative, carry out noise generating Work Monday to Friday from 07:00 to 17:00 hours and on Saturdays, Sundays, and statutory holidays.
 - .2 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
 - .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 Deliver materials during regular work hours: Normal work hours are 07:00 to 17:00, 7 days per week. Hours outside of this to be by agreement with the Institution.
 - .6 Existing security fencing and parameters:
 - .1 A full construction security fence with cameras, lights and fence detection has already been constructed and is in place around all the medium and maximum security living unit construction areas to provide the same level of delay as the perimeter fence. The resulting secure construction compound is considered outside of the institution perimeter but is subject to all the rules of the penitentiary reserve.
 - .2 The fence detection system on this fence will have the capacity to remain on 24hrs even when there are no workers on site.
-

1.7 SECURITY REQUIREMENTS .1 Refer of Sections 01 35 55 and 01 35 56 for security requirements inside and outside the perimeter of the facility.

1.8 BUILDING SMOKING ENVIRONMENT .1 Comply with smoking restrictions.
.2 Designated smoking area for construction staff without line of sight from exterior.
.1 Smoking area must not be in view of inmates.
.2 Smoking paraphenalia must not be accessible to inmates.
.3 No smoking waste to be left out of lock up after hours.
.3 No smoking on construction site, within site of detention centre.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - LIST OF DRAWINGS

1.1 ELECTRICAL

- .1 E0.01 Electrical Site Plan
- .2 E0.02 - Existing Electrical Single Line Diagrams
with Modifications
- .3 E0.03 Main Electrical Room Proposed Phasing for
Electrical Transformer

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Inspecting and testing by inspecting firms or testing laboratories designated by Departmental Representative.
- 1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.
- 1.3 APPOINTMENT AND PAYMENT .1 Departmental 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 the supervision of Departmental Representative.
.6 Additional tests specified in the following paragraph.
- .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 Departmental Representative to verify acceptability of corrected work.
- 1.4 CONTRACTOR'S RESPONSIBILITIES .1 Provide labour, equipment and facilities to:
.1 Provide access to Work to be inspected and tested.
.2 Facilitate inspections and tests.
.3 Make good Work disturbed by inspection and test.
-

- 1.4 CONTRACTOR'S RESPONSIBILITIES (Cont'd) .1 (Cont'd)
- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify the Departmental Representative sufficiently 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 approved by Departmental Representative.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 ADMINISTRATIVE
- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
 - .2 Prepare agenda for meetings.
 - .3 Distribute written notice of each meeting four days in advance of meeting date to the Departmental Representative.
 - .4 Provide physical space and make arrangements for meetings.
 - .5 Preside at meetings.
 - .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
 - .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance Departmental Representative.
 - .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.
- 1.2 PRECONSTRUCTION MEETING
- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
 - .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
-

1.2 PRECONSTRUCTION .5
MEETING
(Cont'd)

- Agenda to include:
- .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
 - .5 Delivery schedule of specified equipment in accordance with Section 01 32 16.07.
 - .6 Site security in accordance with Section 01 56 00.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .8 Owner provided products.
 - .9 Record drawings in accordance with Section 01 33 00.
 - .10 Maintenance manuals in accordance with Section 01 78 00.
 - .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00.
 - .12 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .13 Appointment of inspection and testing agencies or firms.
 - .14 Insurances, transcript of policies.

1.3 PROGRESS
MEETINGS

- .1 During course of Work and two (2) weeks prior to project completion, schedule progress meetings bi-weekly.
 - .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
 - .3 Notify parties minimum seven (7) days prior to meetings.
 - .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 5 days after meeting.
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1.3 PROGRESS
MEETINGS
(Cont'd)

- .5 Agenda to include the following:
- .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for affect on construction schedule and on completion date.
 - .12 Other business.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 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 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
 - .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
 - .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
 - .5 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.
 - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
 - .7 Milestone: significant event in project, usually completion of major deliverable.
 - .8 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.
-

- 1.1 DEFINITIONS .9 Project Planning, Monitoring and Control
(Cont'd) System: overall system operated by
Departmental Representative to enable
monitoring of project work in relation to
established milestones.
- 1.2 REQUIREMENTS .1 Ensure Master Plan and Detail Schedules are
practical and remain 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 it is understood that Award of
Contract or time of beginning, rate of
progress, Certificate of Substantial
Performance and Certificate of Completion as
defined times of completion are of essence of
this contract.
- 1.3 SUBMITTALS .1 Provide submittals in accordance with Section
01 33 00.
- .2 Submit to Departmental Representative within
10 working days of Award of Contract Bar
(GANTT) Chart as Master Plan for planning,
monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental
Representative within 5 working days of
receipt of acceptance of Master Plan.
- 1.4 MASTER PLAN .1 Structure schedule to allow orderly planning,
organizing and execution of Work as Bar Chart
(GANTT).
- .2 Departmental Representative will review and
return revised schedules within 5 working
days.
- .3 Revise impractical schedule and resubmit
within 5 working days.
-

- 1.4 MASTER PLAN (Cont'd) .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.
- 1.5 PROJECT SCHEDULE .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Excavation.
 - .6 Backfill.
 - .7 Building footings.
 - .8 Slab on grade.
 - .9 Structural Steel.
 - .10 Siding and Roofing.
 - .11 Interior Architecture (Walls, Floors and Ceiling).
 - .12 Plumbing.
 - .13 Lighting.
 - .14 Electrical.
 - .15 Piping.
 - .16 Controls.
 - .17 Heating, Ventilating, and Air Conditioning.
 - .18 Millwork.
 - .19 Fire Systems.
 - .20 Testing and Commissioning.
- 1.6 PROJECT SCHEDULE REPORTING .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
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- 1.7 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 Weather related delays with their remedial measures will be discussed and negotiated.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 ADMINISTRATIVE
- .1 Submit to Departmental 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.
 - .2 Do not proceed with Work affected by submittal until review is complete.
 - .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
 - .4 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .5 Review submittals prior to submission to Departmental 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 stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
 - .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
 - .7 Verify field measurements and affected adjacent Work are co-ordinated.
 - .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
 - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
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- 1.1 ADMINISTRATIVE (Cont'd)
- .10 Keep one reviewed copy of each submission on site.
 - .11 Submit number of hard copies specified for each type and format of submittal and in also submit in electronic format as pdf files. Forward pdf files on CD or through email.
- 1.2 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 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario of Canada.
 - .3 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.
 - .4 Allow fifteen (15) days for Departmental representative's review of each submission.
 - .5 Adjustments made on shop drawings by Departmental representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental representative prior to proceeding with Work.
 - .6 Make changes in shop drawings as Departmental representative may require, consistent with Contract Documents. When resubmitting, notify Departmental representative writing of revisions other than those requested.
 - .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
-

- 1.2 SHOP DRAWINGS .7 (Cont'd)
AND PRODUCT DATA
(Cont'd)
- .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions shall include:
- .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 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.
- .9 After Departmental representative's review, distribute copies.
- .10 Submit one transparency on plastic film three hard copies and one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental representative may reasonably request.
- .11 Submit three hard copies and one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit three hard copies and one electronic copy of test reports for requirements
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- 1.2 SHOP DRAWINGS .12 (Cont'd)
AND PRODUCT DATA
(Cont'd)
-
- .12 requested in specification Sections and as requested by Departmental 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.
- .13 Submit three hard copies and one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental 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.
- .14 Submit three hard copies and one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental representative.
- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit three hard copies and one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit three hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental representative.
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- 1.2 SHOP DRAWINGS .18 Supplement standard information to provide
AND PRODUCT DATA details applicable to project.
(Cont'd)
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- .19 If upon review by Departmental
representative, no errors or omissions are
discovered or if only minor corrections are
made, transparency copies 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.
- .20 The review of shop drawings by Public Works
and Government Services Canada (PWGSC) is for
sole purpose of ascertaining conformance with
general concept.
- .1 This review shall not mean that PWGSC
approves detail design inherent in shop
drawings, responsibility for which shall
remain with Contractor submitting same, and
such review shall not relieve Contractor of
responsibility for errors or omissions in shop
drawings or of responsibility for meeting
requirements of construction and Contract
Documents.
- .2 Without restricting generality of
foregoing, Contractor is responsible for
dimensions to be confirmed and correlated at
job site, for information that pertains solely
to fabrication processes or to techniques of
construction and installation and for
co-ordination of Work of sub-trades.
- 1.3 SAMPLES .1 Submit for review samples in duplicate as
requested in respective specification
Sections. Label samples with origin and
intended use.
- .2 Deliver samples prepaid to Departmental
representative's business address.
- .3 Notify Departmental representative in
writing, at time of submission of deviations
in samples from requirements of Contract
Documents.
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- 1.3 SAMPLES
(Cont'd)
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
 - .5 Adjustments made on samples by Departmental representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .6 Make changes in samples which Departmental representative may require, consistent with Contract Documents.
 - .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.
- 1.4 MOCK-UPS
- .1 Erect mock-ups in accordance with 01 45 00.
- 1.5 PHOTOGRAPHIC DOCUMENTATION
- .1 Submit electronic and hard copy of colour digital photography in jpeg format, fine resolution monthly with progress statement and as directed by Departmental representative.
 - .2 Project identification: name and number of project and date of exposure indicated.
 - .3 Number of viewpoints: 8 locations.
 - .1 Viewpoints and their location as determined by Departmental Representative.
 - .4 Frequency of photographic documentation: weekly and as directed by Departmental Representative.
 - .1 Upon completion of: excavation, foundation, framing and services before concealment, of Work, and as directed by Departmental Representative.
- 1.6 FEES, PERMITS AND CERTIFICATES
- .1 Provide authorities having jurisdiction with information requested.
 - .2 Pay fees and obtain certificates and permits required.
 - .3 Furnish certificates and permits.
-

1.6 FEES, PERMITS .4 Submit acceptable certificate stating that
AND CERTIFICATES suspended ceiling systems provide adequate
(Cont'd) support for electrical fixtures, as required
by current bulletin of Electrical Inspection
Department of Ontario Hydro.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA): Canada
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2005 (NBC).
 - .3 National Fire Code 2010 (NFC).
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
 - .5 Fire Commissioner of Canada (FCC):
 - .1 FC-301 Standard for Construction Operations, June 1982.
 - .2 FC-302 Standard for Welding and Cutting, June 1982.

Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
Willowdale, Ontario M2N 6A8

and copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
 - .2 Submit site-specific Health and Safety Plan:
Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
-

1.2 SUBMITTALS
(Cont'd)

- .2 (Cont'd)
- .2 Results of safety and health risk or hazard analysis for site tasks and operations found in work plan.
 - .3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Emergency Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Emergency Procedures and Evacuation Plan. Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.
 - .4 Contractor's and Sub-contractors' Safety Communication Plan.
 - .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Emergency Response requirements and procedures provided by Departmental Representative.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .5 Submit names of personnel and alternates responsible for site safety and health.
- .6 Submit records of Contractor's Health and Safety meetings when requested.
- .7 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
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- 1.2 SUBMITTALS
(Cont'd)
- .8 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
 - .9 Submit copies of incident and accident reports.
 - .10 Submit Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00.
 - .11 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.
- 1.3 FILING OF NOTICE
- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.4 WORK PERMIT
- .1 Obtain Hot Work Permit from Departmental Representative.
- 1.5 SAFETY ASSESSMENT
- .1 Perform site specific safety hazard assessment related to project.
- 1.6 MEETINGS
- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- 1.7 REGULATORY REQUIREMENTS
- .1 Comply with the Acts and regulations of the Province of Ontario.
 - .2 Comply with specified standards and regulations to ensure safe operations at site.
- 1.8 GENERAL REQUIREMENTS
- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
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- 1.8 GENERAL REQUIREMENTS (Cont'd)
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.
- 1.9 COMPLIANCE REQUIREMENTS
- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.
- 1.10 RESPONSIBILITY
- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.
- 1.11 UNFORSEEN HAZARDS
- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.
-

- 1.12 HEALTH AND SAFETY CO-ORDINATOR .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
- .1 Have working knowledge of occupational safety and health regulations.
 - .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .4 Be on site during execution of Work and report directly to and be under direction of site supervisor.
-
- 1.13 POSTING OF DOCUMENTS .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.
- .1 Contractor's Safety Policy.
 - .2 Constructor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid certificate of first aider on duty.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.
-

- 1.14 CORRECTION OF NON-COMPLIANCE .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
- 1.15 BLASTING .1 Blasting or other use of explosives is not permitted.
- 1.16 POWDER ACTUATED DEVICES .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.
- 1.17 WORK STOPPAGE .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian Standards Association (CSA): Canada
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2005 (NBC).
 - .3 National Fire Code 2010 (NFC).
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
 - .5 Fire Commissioner of Canada (FCC):
 - .1 FC-301 Standard for Construction Operations.
 - .2 FC-302 Standard for Welding and Cutting, June 1982.

Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor Willowdale,
Ontario M2N 6A8

and copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

- 1.2 SUBMITTALS
- .1 Make submittals in accordance with Section 01 33 00.
 - .2 Submit site-specific Health and Safety Plan, within 7 days after date of Notice to Proceed and prior to mobilization to site. Address following items:
-

- 1.2 SUBMITTALS
(Cont'd)
-
- .3 Safety and health risk or hazard analysis for each site task and operation found in work plan.
- .4 Develop checklist for items to be inspected on a daily basis. Document actions taken.
- .5 Personnel training requirements including:
- .1 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.
 - .2 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.
- .6 Personal protective equipment (PPE) program addressing:
- .1 Donning and doffing procedures.
 - .2 PPE selection based upon site hazards.
 - .3 PPE use and limitations of equipment.
 - .4 Work mission duration, PPE maintenance and storage.
 - .5 PPE decontamination and disposal.
 - .6 PPE inspection procedures prior to, during, and after use.
 - .7 Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
 - .8 Medical surveillance requirements for personnel assigned to work at site.
 - .9 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
 - .10 Site control measures employed at site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
 - .11 Decontamination procedures for both personnel and equipment.
-

- 1.2 SUBMITTALS .6 (Cont'd)
(Cont'd)
- .12 Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.
 - .13 Written respiratory protection program for project activities.
 - .14 Procedures dealing with heat and/or cold stress.
 - .15 Spill containment program if drummed waste material is generated, excavated, stored, or managed on site.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 7 days after receipt of comments from Departmental Representative.
- .8 Medical Surveillance: submit certification of medical surveillance for site personnel, within 7 days after date of Notice to Proceed and prior to mobilization to site. Submit additional certifications as personnel are sent to site.
- .9 Respirator Fit Testing: submit proof of respirator fit testing for site personnel, within 7 days after date of Notice to Proceed and prior to mobilization to site.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
-

- 1.2 SUBMITTALS
(Cont'd)
- .11 Off-site Contingency and Emergency Response Plan:
.1 Prior to commencing Work involving handling of hazardous materials, develop off-site Contingency and Emergency Response Plan.
.2 Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from site.
- 1.3 REGULATORY REQUIREMENTS
- .1 Comply with Acts and regulations of the Province of Ontario.
.2 Comply with specified standards and regulations to ensure safe operations at site.
.3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.
- 1.4 SITE CONDITIONS
- .1 Work at site will involve contact with:
.1 Soils contaminated (primarily) with lead and zinc or other designated substances.
.2 Asbestos containing materials and soils.
- 1.5 GENERAL REQUIREMENTS
- .1 Develop written site-specific Health and Safety Plan prior to commencing site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
.2 Ensure Health and Safety guidelines provide for safe and minimal risk working environment for site personnel and minimize impact of activities involving contact with hazardous materials or hazardous wastes on general public and surrounding environment.
.3 Relief from or substitution for portion or provision of minimum Health and Safety Guidelines specified or reviewed site-specific Health and Safety Plan must submitted to Departmental Representative in writing.
-

- 1.5 GENERAL REQUIREMENTS (Cont'd) .3 (Cont'd)
Departmental Representative will respond in writing, either accepting or requesting improvements.
- 1.6 RESPONSIBILITY .1 Be responsible for safety of persons and property on site and for protection of persons off site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Ontario Act.
- 1.7 HAZARD COMMUNICATION REQUIREMENTS .1 Comply with Workplace Hazardous Materials Information System (WHMIS) Regulation, R.R.O.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances.
- .3 Provide Departmental Representative with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site.
- 1.8 WORK STOPPAGE .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Health and Safety Officer where required to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.
-

- 1.9 UNFORESEEN HAZARDS
- .1 Should unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, stop work and immediately advise Departmental Representative verbally and in writing.
 - .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Act for the Province of Ontario.
- 1.10 HEALTH AND SAFETY OFFICER AND REGISTERED OCCUPATIONAL HYGIENIST / CERTIFIED INDUSTRIAL HYGIENIST
- .1 Employ and assign to Work competent and authorized representative as Health and Safety Adviser. Health and Safety Adviser must:
 - .1 Have minimum 2 years' site-related working experience specific to contaminated site work of a similar nature.
 - .2 Have basic working knowledge of specified occupational safety and health regulations.
 - .3 Be responsible for completing Health and Safety Training Session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work in Exclusion Zone or Contaminant Reduction Zone.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan.
 - .5 Be on site during execution of Work.
- 1.11 PERSONNEL HEALTH, SAFETY, AND HYGIENE
- .1 Medical Surveillance:
 - .1 Conduct medical surveillance of personnel as required by specified regulations.
 - .2 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
 - .3 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity. Minimum PPE required for each level of protection as follows:
-

1.11 PERSONNEL
HEALTH, SAFETY, AND
HYGIENE
(Cont'd)

- .4 Level B:
 - .1 Respiratory: airline with escape bottle.
 - .2 Head, Eye, Ear Protection: hard hat, safety glasses with sideshields, ear muffs or plugs.
 - .3 Hand Protection: gloves, [Type [_____] undergloves], Type [_____] overgloves.
 - .4 Foot Protection: [safety shoes].
 - .5 Clothing: chemically resistant coverall.

- .5 Level C/Modified Level C:
 - .1 Respiratory: [full-face respirator, Cartridge - MSA GME-H (GME-P100)] [halfmask, Cartridge - MSA GME-H (GME-P100)] [escape, Type [_____]].
 - .2 Head, Eye, Ear Protection: [hard hat] [goggles] [safety glasses with sideshields] [face shield] [chemical goggles] [ear muffs or plugs].
 - .3 Hand Protection: gloves, [Type [_____] undergloves] [_____], Type [_____] overgloves.
 - .4 Foot Protection: safety shoes.
 - .5 Clothing: chemically resistant coverall.

- .6 Level D:
 - .1 Head, Eye, Ear Protection: hard hat, safety glasses with sideshields and ear muffs or plugs.
 - .2 Clothing: standard work uniform.

- .7 Anticipated levels of personal protection based on work activity are as follows:

<u>Work Activity</u>	<u>Anticipated Level of Personal Protection</u>
<u>[_____]</u>	<u>Level [_____]</u>

- .8 Personal Protective Equipment:
 - .1 Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.

- .9 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - .1 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within work zones.

1.11 PERSONNEL
HEALTH, SAFETY, AND
HYGIENE
(Cont'd)

- .9 (Cont'd)
 - .2 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
 - .3 Dispose of or decontaminate PPE worn on site at end of each workday.
 - .4 Decontaminate reusable PPE before reissuing.
 - .5 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.
 - .6 Ensure facial hair does not interfere with proper respirator fit.
- .10 Respiratory Protection:
 - .1 Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.
 - .2 Develop, implement, and maintain respirator program.
 - .3 Monitor, evaluate, and provide respiratory protection for site personnel.
 - .4 Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified on site.
 - .5 In absence of additional air monitoring information or substance identification, minimum levels of respiratory protection will be required as follows:

.1 Table:

<u>Sustained Total</u>	<u>Level of Respirator</u>
<u>Organic Vapour</u>	<u>Protection Required</u>
<u>Concentration Above</u>	
<u>Background (ppm)</u>	
[_____]	Half-facepiece
	air-purifying
	respirator, Level C
[_____]	Full-facepiece
	air-purifying
	respirator, Level C
[_____]	Shut down
	activities, evaluate
	the need for Level B
	or higher
	respiratory
	protection

- 1.11 PERSONNEL HEALTH, SAFETY, AND HYGIENE (Cont'd)
- .10 Respiratory Protection:(Cont'd)
 - .6 Immediately notify Departmental Representative when level of respiratory protection required increases.
 - .7 Ensure appropriate respiratory protection during work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.
 - .8 Assess ability for site personnel to wear respiratory protection.
 - .9 Ensure site personnel are able to pass respirator fit test prior to entering potentially contaminated work areas.
 - .11 Heat Stress/Cold Stress: implement heat stress and/or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
 - .12 Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
 - .1 Suitable containers for storage and disposal of used disposable PPE.
 - .2 Potable water and suitable sanitation facility.
 - .13 Emergency and First-Aid Equipment:
 - .1 Locate and maintain emergency and first-aid equipment in appropriate location on site including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
 - .2 As minimum, provide 1 certified first-aid technician on site at all times when work activities are in progress.
 - .14 Site Communications:
 - .1 Post emergency numbers near site telephones.
 - .2 Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
 - .3 Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
 - .4 Furnish selected personnel with 2-way radios.
-

- 1.11 PERSONNEL .14 Site Communications:(Cont'd)
HEALTH, SAFETY, AND .5 Safety Meetings: conduct mandatory daily
HYGIENE safety meetings for personnel, and
(Cont'd) additionally as required by special or
work-related conditions; include refresher
training for existing equipment and protocols,
review ongoing safety issues and protocols,
and examine new site conditions as
encountered. Hold additional safety meetings
on as-needed basis.
- .15 Custodian: employ and assign to Work
Custodian to report directly to Health and
Safety Officer and who is responsible for
keeping safety equipment and facilities clean,
properly equipped, and maintained. Custodian
may perform other duties for Contractor but
Custodian's first priority is maintenance of
protective equipment and personnel
decontamination area.
- 1.12 AIR MONITORING .1 Air Monitoring Program:
.1 Develop air monitoring program meeting
specified requirements.
.2 During progress of work activities,
monitor air quality in and around work zones.
Conduct monitoring on regular periodic basis,
and additionally as required by special or
work-related conditions. Report departures
from general background to Departmental
Representative who will, in conjunction with
Health and Safety Officer, determine when
operations should be shut down and restarted.
.3 Provide minimum required instruments for
air monitoring as follows:
.1 [_____].
.4 Operate air monitoring equipment with
personnel trained in equipment provided and
under control of Health and Safety Officer.
.5 Conduct air monitoring on routine basis
around active work locations. Perform hourly
monitoring minimum and additionally as
dictated by site activities.
.6 Furnish wind speed and direction
indicator capable of providing permanent
record, at unobstructed location on site
located above elevation of work area with
unobstructed view to affected workers.
-

- 1.12 AIR MONITORING (Cont'd) .2 Air Monitoring Reporting: report air monitoring results daily to Departmental Representative on separate form.
- 1.13 CONTINGENCY AND EMERGENCY RESPONSE .1 Meet specified requirements.
.2 Arrange and attend co-ordination meeting held with appropriate authorities including City, Fire, Hospital, Provincial and City Police, Ministry of Transportation, Ministry of Health, and Community Emergency Co-ordinator; meeting will identify off-site Emergency Response Co-ordinator through whom information and co-ordination will occur in event of incident.
- 1.14 SITE CONTROL .1 Meet specified requirements.
.2 Prior to commencing work involving handling of drums and other containers, submit procedures for safe handling of drums and other containers. Implement and enforce drum handling program during activities involving drummed waste characterization including but not limited to handling, opening, sampling, staging, and consolidating.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.
-

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
 - .2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.
 - .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
 - .4 Environmental protection plan: include:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
-

1.2 SUBMITTALS
(Cont'd)

- .4 Environmental protection plan:(Cont'd)
- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
- .12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste water management plan that identifies methods and procedures for
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- 1.5 DRAINAGE
(Cont'd)
- .3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
 - .4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
 - .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- 1.6 POLLUTION
CONTROL
- .1 Maintain temporary erosion and pollution control features installed under this contract.
 - .2 Control emissions from equipment and plant to local authorities' emission requirements.
 - .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.
 - .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
 - .5 Spills of deleterious substances:
 - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
 - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
 - .3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.
- 1.7 HALOCARBONS
- .1 Comply with Federal Halocarbon Regulations 2003 under the Canadian Environmental Protection Act 1999, EPAM and PWGSC Ontario Region Halocarbon Information Sheet dated March 2010.
-

1.8 HISTORICAL/
ARCHAEOLOGICAL
CONTROL

- .1 Provide historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be on site or in area are discovered during construction.
- .2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental representative .

1.9 NOTIFICATION

- .1 Departmental representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
 - .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .3 Departmental representative will issue stop order of work until satisfactory corrective action has been taken.
 - .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 PURPOSE .1 To ensure that both the construction project and institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.
- 1.2 DEFINITIONS .1 "Contraband" means:
.1 an intoxicant,
.2 a weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization,
.3 an explosive or a bomb or a component thereof,
.4 currency over any applicable prescribed limit, when possessed by an inmate without prior authorization, and
.5 any item not described in above paragraphs (.1) and (.4) that could jeopardize the security of a Penetentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
- .3 "CSC" means Correctional Service Canada.
- .4 "Director" means Director, Warden of the Institution.
- .5 "Construction employees" means persons working for the General Contractor, the Subcontractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
- .6 "Perimeter" means the fenced or walled area of the institution that restrains the movement of inmates.
-

1.2 DEFINITIONS
(Cont'd)

- .7 "Construction limits" means the areas as shown on the Contract Drawings that the Contractor will be allowed to work. This area may or may not be isolated from the security area of the institution.
- .8 "CD" means Commissioner's Directive.
- .9 "CPIC" means RCMP Canadian Police Information Centre.
- .10 "Commissionaire" - Designated representative of the Director to monitor construction related activities including surveillance of inmate labour.

1.3 GENERAL
INSTRUCTIONS

- .1 Cooperate with institutional personnel in ensuring that security requirements are observed by all construction employees.
- .2 Inside of the Institution proper all normal rules will apply.

1.4 CONSTRUCTION
EMPLOYEES
REQUIREMENTS FOR
ADMITTANCE

- .1 Submit to the Director a signed security clearance request form for each construction employee seeking admission to the Millhaven Institution.
 - .2 Allow two (2) weeks for processing of security clearances (CPIC's). Employees will not be admitted to the Institution without a valid security clearance (CPIC) in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC institutions are not valid at this institution.
 - .3 The Director requires that these photographs (ID Cards) be displayed prominently on the construction employee's clothing while they are on the Site.
 - .4 Entry to Institutional Property will be refused to any person there may be a reason to believe may be a security risk.
-

1.4 CONSTRUCTION
EMPLOYEES
REQUIREMENTS FOR
ADMITTANCE
(Cont'd)

- .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
 - .1 appear to be under the influence of alcohol, drugs or narcotics.
 - .2 behave in an unusual or disorderly manner.
 - .3 are in possession of contraband.

- .6 CPIC's will be done for all construction workers but are not essential for access to the secure construction compound. The Warden retains the right to refuse access to the penitentiary reserve to anyone. However, work within the Main Institution will require a valid CPIC.

1.5 SITE ACCESS

- .1 Access to the construction site is controlled by Commissionaires. Commissionaires will verify that workers and material are a valid part of the construction but will not do vehicle searches. Commissionaires will verify the ID of all who access site.

- .2 Access to the site will be controlled by the Contractor and during the normal course of business Institutional staff will not be permitted on to the site due to Health and Safety Regulations.

1.6 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the Owner or an employee of the company that owns the vehicle. Failure to comply with the above will result in an immediate shutdown of the jobsite and a stoppage of the Work for an indefinite period of time at the General Contractor's expense.

 - .2 The Director may limit at any time the number and type of vehicles allowed with the Institution.

 - .3 If the Director permits trailers to be left inside the secure perimeter of the Institution, or within the fenced primary construction site compound, these trailer
-

- 1.6 VEHICLES .3 (Cont'd)
(Cont'd) doors and windows will be locked at the close of business daily. All windows will be securely locked when left unoccupied.
- 1.7 PARKING .1 Construction employees shall park in the "Contractor Parking Lot" designated. Parking in other locations is prohibited and vehicles may be subject to removal.
- 1.8 SHIPMENTS .1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his own employees on site to receive and verify any deliveries or shipments. CSC staff will not accept receipt of deliveries or shipments of any materials or tools.
- 1.9 WORK HOURS .1 Normal work hours are 07:00 to 17:00, 7 days per week. Hours outside of this to be by agreement with the Institution.
- .2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of two days (48 hours) advance notice will be required to obtain the required permission.
- 1.10 OVERTIME WORK .1 No overtime work will be allowed without the permission of the Director. If overtime work is required because of an emergency such as the completion of a concrete pour or work to make construction safe and secure, the Contractor will advise the Director as soon as this condition is known.
- 1.11 TOOLS AND EQUIPMENT .1 Particular attention is to be placed on the physical location of power driven tools, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device, to
-

1.11 TOOLS AND
EQUIPMENT
(Cont'd)

- .1 (Cont'd)
ensure they are not accessible to inmates on the outer reaches of the fenced enclosure.
- Note: Ram sets (Hilti guns) and other cartridge driven tools are not permitted for Work at this Institution.
- .2 The Contractor is to ensure that, at the close of each business day, all tools and equipment are locked in a secure room or in secure lockable tool boxes.
- .3 All missing or lost tools or equipment shall be reported immediately to the Director.
- .4 When not in use all tools will be secured as indicated in this Section. Lay down areas will be inside the construction site unless alternative arrangements are made and materials and equipment in areas outside the fence will be secured by the Contractor.

1.12 HARDWARE

- .1 Security Hardware/Keys - Existing:
.1 Turn over all removed security hardware to the Director of the Institution for disposal or for safekeeping until required for reinstallation.
- .2 Security Hardware/Keys - New:
.1 The Contractor shall arrange with the security hardware supplier to have the cylinders/keys for the security hardware to be delivered from the manufacturer directly to the Institution, specifically the Security Maintenance Officer (SMO).
.2 The SMO will provide a receipt to the Contractor for security hardware keys.
.3 The Contractor will provide a copy of the above-mentioned receipt to the Departmental Representative.
- .3 Construction Hardware/Keys:
.1 The Contractor will use standard construction cylinders for locks for his use during the construction period.
.2 The Contractor will issue instructions to his employees and subtrades, as necessary, to ensure safe custody of the construction set of keys.
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- 1.12 HARDWARE .3 Construction Hardware/Keys:(Cont'd)
(Cont'd)
- .3 Upon completion of each phase of the construction, the CSC representative will, in conjunction with the lock manufacturer:
- .1 accept the operational keys and lock manufacturer.
 - .2 CSC will arrange for removal and return of the construction cores and install the operational core in all locks.
- .4 Upon putting operational security hardware/keys into use, the CSC Commissionaire shall obtain these keys as they are required by the Contractor. The contractor shall issue instructions to his employees advising them that all security keys shall always remain with the CSC Commissionaire.
- 1.13 PRESCRIPTION .1 Employees of the Contractor who are required
DRUGS to take prescription drugs during the work day shall obtain approval of the Director to bring a one day supply only to the Institution.
- 1.14 CONTRABAND .1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on Institutional Property.
- .2 The discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the Director.
- .3 Contractors should be vigilant with both their staff and the staff of their subcontractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.
- .4 Presence of arms and ammunition in vehicles of Contractors, Subcontractors and suppliers of employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.
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- 1.15 SEARCHES .1 All vehicles and persons entering Institutional Property may be subject to search.
- .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband, he may order order that person to be searched.
- 1.16 ACCESS TO AND REMOVAL FROM INSTITUTIONAL PROPERTY .1 Construction personnel and commercial vehicles will not be admitted to the fenced primary construction site of institution after normal working hours, unless approved by the Director.
- 1.17 MOVEMENT OF VEHICLES .1 Vehicles shall be refused access to Institutional Property if, in the opinion of the Director, they contain any article which may jeopardize the security of the institution.
- .2 Private vehicles of construction employees will not be allowed within the security wall of fence of medium or maximum security institutions without the permission of the Director.
- .3 When equipment is to remain on the construction site overnight or over the weekend, this equipment must be securely locked and disabled.
- 1.18 SURVEILLANCE AND INSPECTION .1 Construction activities and all related movement of personnel and vehicles may be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
- 1.19 STOPPAGE OF WORK .1 The Director may request at any time that the Contractor, his employees, Subcontractors and their employees not enter or leave the Work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the
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- 1.19 STOPPAGE OF WORK (Cont'd)
- .1 (Cont'd)
name of the staff member making the request and the time of the request and obey the order as quickly as possible.
- .2 The Contractor shall advise the Departmental Representative of this delay to the progress of the Work.
- 1.20 LOCKDOWN
- .1 In the event of a lockdown in the Institution the construction site will not be affected unless a count is short or there is a real threat to the site by riot. If an escape is suspected the gates to the site may be closed and Institutional staff will verify persons leaving the site.
- 1.21 CONTACT WITH INMATES
- .1 Unless specifically authorized, and in the course of Work related activity, it is forbidden to come into contact with inmates, to them with them, to receive objects from them or to give them objects. Any Contractor doing any of the above may be removed from the Site and may have his security clearance revoked.
- .2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this Contract.
- 1.22 COMPLETION OF CONSTRUCTION PROJECT
- .1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction Contract.
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PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 PURPOSE .1 To ensure that both the construction project and institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.
- 1.2 DEFINITIONS .1 "Contraband" means:
.1 an intoxicant,
.2 a weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization,
.3 an explosive or a bomb or a component thereof,
.4 currency over any applicable prescribed limit, when possessed by an inmate without prior authorization, and
.5 any item not described in above paragraphs (.1) and (.4) that could jeopardize the security of a Penetentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
- .3 "CSC" means Correctional Service Canada.
- .4 "Director" means Director, Warden of the Institution.
- .5 "Construction employees" means persons working for the General Contractor, the Subcontractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
- .6 "Perimeter" means the fenced or walled area of the institution that restrains the movement of inmates.
-

1.2 DEFINITIONS
(Cont'd)

- .7 "Construction limits" means the areas as shown on the Contract Drawings that the Contractor will be allowed to work. This area may or may not be isolated from the security area of the institution.
- .8 "CD" means Commissioner's Directive.
- .9 "CPIC" means RCMP Canadian Police Information Centre.
- .10 "Commissionaire" - Designated representative of the Director to monitor construction related activities including surveillance of inmate labour.

1.3 GENERAL
INSTRUCTIONS

- .1 Prior to the commencement of the Work, the Contractor will meet with the Director or designated representative to:
 - .1 Discuss the nature and extent of all activities involved in the Project.
 - .2 The Contractor will:
 - .1 Ensure that all construction employees are aware of the security requirements.
 - .2 Ensure that a copy of the security requirements is always prominently on display at the job site.
 - .3 Cooperate with Institutional personnel in ensuring that security requirements are observed by all construction employees.
 - .3 Subcontractors shall provide their Contractor with a list of contact names and "after hours" telephone numbers in case the Contractor needs to contact them after hours on behalf of the Institution. This information will be considered confidential and the Contractor is responsible for its secure storage. The Contractor shall also provide the Director or designated representative of the Institution a list of Contractor company contact names and after hours telephone numbers in case of emergency.
 - .4 Inside of the Institution proper all normal rules will apply.
-

1.4 CONSTRUCTION
EMPLOYEES
REQUIREMENTS FOR
ADMITTANCE

- .1 Submit to the Director a signed security clearance request form for each construction employee seeking admission to the Millhaven Institution.
 - .2 Allow two (2) weeks for processing of security clearances (CPIC's). Employees will not be admitted to the Institution without a valid security clearance (CPIC) in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC institutions are not valid at this institution.
 - .3 The Director shall require that facial photographs be taken of construction employees and these photographs may be displayed at appropriate locations in the institution or in an electronic database for identification purposes. The Director may require that these photographs be displayed prominently on the construction employees clothing while employees are in the Institution. Photograph ID's issued to construction employees by the Institution must be added to tool lists and returned to the Institution must be added to tool lists and returned to the Institution at the completion of their work activity at the Site.
 - .4 Entry to Institutional Property will be refused to any person there may be a reason to believe may be a security risk.
 - .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
 - .1 appear to be under the influence of alcohol, drugs or narcotics.
 - .2 behave in an unusual or disorderly manner.
 - .3 are in possession of contraband.
 - .4 CPIC's will be done for all construction workers but are not essential for access to the secure construction compound. The Warden retains the right to refuse access to the penitentiary reserve to anyone. However, work within the Main Institution will require a valid CPIC.
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1.5 SITE ACCESS

- .1 Access to the construction site is controlled by Commissionaires. Commissionaires will verify that workers and material are a valid part of the construction but will not do vehicle searches. Commissionaires will verify the ID of all who access site.
- .2 Access to the site will be controlled by the Contractor and during the normal course of business Institutional staff will not be permitted on to the site due to Health and Safety Regulations.

1.6 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the Owner or an employee of the company that owns the vehicle. Failure to comply with the above will result in an immediate shutdown of the job site and a stoppage of the Work for an indefinite period of time at the General Contractor's expense.
 - .2 The Director may limit at any time the number and type of vehicles allowed with the Institution.
 - .3 Drivers of delivery vehicles for material required by the Project may require (Exceptions are Bonded Couriers) security clearances (CPIC check) and must remain with their vehicle the entire time that the vehicle is in the Institution. The Director shall require that these vehicles be escorted by Institutional staff or Commissionaires while in the Institution.
 - .4 If the Director permits trailers to be left inside the secure perimeter of the Institution, these trailer doors will be locked at all times. All windows will be securely locked when left unoccupied. Subcontractors will be responsible for providing locks and keys for their trailers and to supply an extra key to the Contractor in case access is required after hours.
-

- 1.7 PARKING .1 Construction employees shall park in the "Contractor Parking Lot". Parking in other locations is prohibited and vehicles may be subject to removal. All Contractor's vehicles brought inside the Institution will have to be removed at the end of the day.
- 1.8 SHIPMENTS .1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his own employees on site to receive and verify any deliveries or shipments. CSC staff will not accept receipt of deliveries or shipments of any materials or tools.
- 1.9 TELEPHONES .1 The installation of telephones, facsimile machines and computers requires the prior approval of the Director and must be included on the tool lists. Internet Connections are not permitted.
- .2 Telephones (land lines), computers, facsimile machines and digital telephones are not permitted within the Institution unless approved by the Director. If approved, the Contractor is responsible to ensure they are not accessible by inmates and that they have password protection (as applicable). this equipment must be listed on tool lists and secured at all times. No office equipment is to be operated by inmates under any circumstances. Cellular phones are not permitted within the perimeter.
- .3 The Director may approve but limit the use of two way radios.
- 1.10 WORK HOURS .1 Normal work hours are 07:00 to 17:00, 7 days per week. Hours outside of this to be by agreement with the Institution.
- .2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of two days (48
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- 1.10 WORK HOURS .2 (Cont'd)
(Cont'd)
- hours) advance notice will be required to obtain the required permission.
- 1.11 OVERTIME WORK .1 No overtime work will be allowed without the permission of the Director. If overtime work is required because of an emergency such as the completion of a concrete pour or work to make construction safe and secure, the Contractor will advise the Director as soon as this condition is known and follow the directions given by the Director.
- .2 When overtime work, weekend statutory holiday work is required and approved by the Director, extra staff members may be posted by the Director of his designate, to maintain security surveillance. The Departmental Representative may post extra staff for inspection of construction activities.
- 1.12 TOOLS AND EQUIPMENT .1 General Contractor and his Subcontractors are to maintain a complete list of all tools and equipment on site and make this inventory available for inspection when required. Tool lists are to be prepared by the Contractor in consultation with the Commissionaire at the Principal Entrance upon arrival. The tool list will then be vetted by institutional security and, once approved, the Contractor and tools will be permitted access.
- .2 Through the construction project the Contractor and Subcontractors shall maintain an up-to-date list of tools and equipment specified above.
- On a daily basis the Contractor and Subcontractors shall utilize a sign-out system for any tools issued. At a minimum, the sign-out system shall include a notation of the tool, to whom it was issued and confirmation that it was returned. All tools, not issued, shall be secured at all times.
- .3 Particular attention is to be placed in the distribution and physical location of power driven tools, files, saw blades, rod saws,
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1.12 TOOLS AND
EQUIPMENT
(Cont'd)

- .3 (Cont'd)
wire, rope, ladders and any sort of jacking device.
- Note: Ram sets (Hilti guns) and other cartridge driven tools are not permitted for Work at this Institution.
- .4 Store all tools and equipment in a secure room on in secure lockable tool boxes. Location of room and location and type of tool boxes are subject to the approval of the Director.
- .5 Tool boxes or room are to remain locked unless placing or removing tools. Keys to remain in the possession of the employees of the Contractor. Subcontractors shall provide their General Contractor with a copy of keys to tool boxes in the event access is required after hours.
- .6 All missing or lost tools or equipment shall be reported immediately to the Director.
- .7 The Director will ensure that the Commissionaires carry out verifications of the Contractor's tools and equipment against the list provided by the Contractor. These checks shall be carried out at the following intervals:
- .1 At the beginning and conclusion of every construction project.
- .2 Weekly, when the construction project extends longer than a one week period. This physical inspection is to be done by the Commissionaires with the assistance of the applicable Contractor or Subcontractor and may take about one and one half (1 1/2) hours to complete. During this procedure, every tool listed by the Contractor will be located and accounted for.
- .8 Also, at the end of each work day the Contractor and all his Subcontractors are required to ensure all tools are accounted for before leaving the site for the day. Once tools have been verified by each Contractor, they shall proceed to the Commissionaire's on-site office (immediately prior to departure) to make a verbal and a written
-

1.12 TOOLS AND
EQUIPMENT
(Cont'd)

- .8 (Cont'd)
declaration amounts to the person signing a logbook utilized to record this activity.
- .9 Certain tools/equipment such as hacksaw blades, drill bits, etc., considered consumable items, are to be counted (in bulk) and listed on the tool lists (i.e. 15 hacksaw blades) and are highly controlled items. The Contractor is responsible to retrieve and securely store any broken bits and blades during the work week until the weekly tool inspection is conducted with the Commissionaires. The Commissionaire and Contractor will then amend the tool list accordingly and the Contractor is responsible to remove the broken items from the Institution. Note: To avoid excessive buildup, quantities of these types of items on the job site shall be limited to what can normally be used in a one week period.
- .10 If a Contractor needs to remove tools from the Site, he shall be responsible to notify the Commissionaire on duty, who shall record this information, noting Contractor, tool, date and initial the entry. Tool lists are to be modified accordingly. If the Contractor needs to bring additional tools or return previously removed tools to the work site, the Contractor is responsible to alert the Commissionaire, at the Principal Entrance. Tool lists are to be modified accordingly.
- .11 When not in use all tools will be secured as indicated in this Section. Lay down areas will be inside the construction site unless alternative arrangements are made and materials and equipment in areas outside the fence will be secured by the Contractor.

1.13 HARDWARE

- .1 Security Hardware/Keys - Existing:
.1 Turn over all removed security hardware to the Director of the Institution for disposal or for safekeeping until required for reinstallation.
- .2 Security Hardware/Keys - New:
.1 The Contractor shall arrange with the security hardware supplier to have the
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- 1.15 CONTRABAND (Cont'd)
- .2 The discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the Director.
 - .3 Contractors should be vigilant with both their staff and the staff of their subcontractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.
 - .4 Presence of arms and ammunition in vehicles of Contractors, Subcontractors and suppliers of employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.
- 1.16 SEARCHES
- .1 All vehicles and persons entering Institutional Property may be subject to search.
 - .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband, he may order that person to be searched.
 - .3 All employees entering the Institution may be subject to screening of personal effects for traces of contraband drug residue.
- 1.17 ACCESS TO AND REMOVAL FROM INSTITUTIONAL PROPERTY
- .1 Construction personnel and commercial vehicles will not be admitted to the Institution after normal working hours, unless approved by the Director.
- 1.18 MOVEMENT OF VEHICLES
- .1 Escorted commercial vehicles will be allowed to enter or leave the Institution through the vehicle access gate during the following hours: Regular working hours indicated.
 - .2 The Contractor shall advise the Director twenty four (24) hours in advance to the
-

- 1.18 MOVEMENT OF VEHICLES
(Cont'd)
- .2 (Cont'd)
arrival on the Site of heavy equipment such as concrete, trucks, cranes, etc.
- .3 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC staff or Commissionaires working under the authority of the Director.
- .4 Commercial vehicles will only be allowed access to Institutional Property when their contents are certified by the Contractor or his representative as being strictly necessary to the execution of the construction project.
- .5 Vehicles shall be refused access to Institutional Property if, in the opinion of the Director, they contain any article which may jeopardize the security of the institution.
- .6 Private vehicles of construction employees will not be allowed within the security wall of fence of maximum security institutions without the permission of the Director.
- .7 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked and disabled, with the power source removed (ie.e battery or propane tank) and taken outside the Institution or locked in a secure location, at the discretion of the Director. The Director may also require that equipment be secured with a chain and padlock to another solid object.
- 1.19 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY
- .1 Subject to the requirements of good security, the Director will permit the Contractor and his employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Director may:
- .1 Prohibit or restrict access to any part of the Institution.
- .2 Require that in certain areas of the Institution , either during the entire
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- 1.19 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY
(Cont'd)
- .2 (Cont'd)
.2 (Cont'd) construction project or at certain intervals, construction employees only be allowed access when accompanied by a member of the CSC security staff.
- .3 During the lunch and coffee breaks, all Contractors' Construction Employees will remain within the construction site. Contractors' Construction Employees are not permitted to eat in the officer's lounge and dining room.
- 1.20 SURVEILLANCE AND INSPECTION
AND INSPECTION
- .1 Construction activities and all related movement of personnel and vehicles may be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
- .2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among construction employees and maintained throughout the construction project.
- 1.21 STOPPAGE OF WORK
WORK
- .1 The Director may request at any time that the Contractor, his employees, Subcontractors and their employees not enter or leave the Work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.
- .2 The Contractor shall advise the Departmental Representative of this delay to the progress of the Work.
- 1.22 LOCKDOWN
LOCKDOWN
- .1 In the event of a lockdown in the Institution the construction site will not be affected unless a count is short or there is a real threat to the site by riot. If an escape is suspected the gates to the site may be closed
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- 1.22 LOCKDOWN .1 (Cont'd)
(Cont'd) and Institutional staff will verify persons leaving the site.
- 1.23 CONTACT WITH .1 Unless specifically authorized, and in the
INMATES course of Work related activity, it is forbidden to come into contact with inmates, to them with them, to receive objects from them or to give them objects. Any Contractor doing any of the above may be removed from the Site and may have his security clearance revoked.
- .2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this Contract.
- 1.24 COMPLETION OF .1 Upon completion of the construction project
CONSTRUCTION or, when applicable, the takeover of a
PROJECT facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction Contract.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 REFERENCES AND CODES .1 Perform Work in accordance with National Building Code of Canada (NBC) 2005, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2006, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
- 1.2 HAZARDOUS MATERIAL DISCOVERY .1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances or PCB's.
- 1.3 IAQ - INDOOR AIR QUALITY .1 Comply with CSA-Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings.
- 1.4 ACCESSIBLE DESIGN .1 Comply with CAN/CSA-B651-04, Accessible Design for the Built Environment, unless specified otherwise. In any case of conflict or discrepancy between the building codes and CAN/CSA-B651, the requirements of CAN/CSA-B651 shall apply.
- 1.5 STATISTICAL INFORMATION .1 Provide statistical information to Departmental Representative:
.1 Within ten working days after March 31 and September 30 occurring between commencement of work and final completion
.2 Within ten working days after final completion.
-

- 1.5 STATISTICAL INFORMATION (Cont'd) .2 Include in statistical information:
.1 Statement of total person days of labour used on site in performance of contract, including labour provided under sub-contracts.
.2 Estimate of total value in dollars of material delivered to site and installed, including material provided and installed under sub-contracts.
.3 This information is required by Government of Canada solely to provide statistics that will aid in assessing socio-economic benefits of this project.
- 1.6 TAXES .1 Pay applicable Federal, Provincial and Municipal taxes.
- 1.7 EXAMINATION .1 Examine existing conditions and determine conditions affecting work.
.2 Conduct concrete floor moisture testing using Calcium Chloride moisture tests.
.1 Submit test results to Departmental Representative for approval prior to installing any flooring. Conduct one test per 100 m² of area being covered.
- PART 2 - PRODUCTS
- 2.1 NOT USED .1 Not Used.
-

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 ABBREVIATIONS AND ACRONYMS .1 The abbreviations and acronyms are commonly found in the Project Manual and represent the associated organizations or terms.
- 1.2 MATERIALS, EQUIPMENT AND METHODS .1 A:
- .1 AC: acoustic.
 - .2 AC PAN: acoustic panel.
 - .3 ACU: acoustic unit ceiling.
 - .4 AFF: above finished floor.
 - .5 AC PLAS: acoustic plaster.
 - .6 ACT: acoustic tile.
 - .7 ACR CU LVR: acrylic cube louvre.
 - .8 ADH: adhesive.
 - .9 ADJ: adjustable.
 - .10 A/C: air conditioner.
 - .11 AL: aluminum.
 - .12 AB: anchor bolt.
 - .13 ANOD: anodized.
 - .14 ARCH: architecture.
 - .15 ARCH BLK: architectural block.
- .2 B:
- .1 B: base.
 - .2 BEAST: benthic assessment of sediment.
 - .3 BH: bore hole.
 - .4 BL: bottom layer.
 - .5 BLK: block.
 - .6 BLKD: bulkhead.
 - .7 BM: beam.
 - .8 BOT: bottom.
 - .9 BMP: best management practice.
 - .10 B PL: base plate.
 - .11 BRG: bearing.
 - .12 BRK: brick.
 - .13 BSMT: basement.
 - .14 BTEX: benzene, toluene, ethylbenzene, and xylenes.
 - .15 BUR: built-up roof.
- .3 C:
- .1 CAL: caliper.
 - .2 CANTIL: cantilever.
 - .3 CB: catch basin.
 - .4 CC: centre to centre.
 - .5 CCN: contemplated change notice.
 - .6 CDF: controlled density fill.
-

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .3 C:(Cont'd)
- .7 CEC: Canadian electrical code.
 - .8 CF: chair fabric.
 - .9 CHAN: channel.
 - .10 CHS: Canadian hydrographic service.
 - .11 CJ: construction joint.
 - .12 CL: centreline.
 - .13 CK: cork.
 - .14 CLG: ceiling.
 - .15 CLR: clear.
 - .16 COL: column.
 - .17 CONC: concrete.
 - .18 CONC BLK: concrete block.
 - .19 CONC BRK: concrete brick.
 - .20 CONT: continuous.
 - .21 CONT J: control joint.
 - .22 COMPL: complete.
 - .23 CM: centimetre. (Nursery stock).
 - .24 CPL: cement plaster.
 - .25 CPM: critical path method.
 - .26 CPT: carpet.
 - .27 CPTT: carpet tile.
 - .28 CT: ceramic tile.
 - .29 CVT: conductive vinyl tile.
 - .30 C/W: complete with.
- .4 D:
- .1 D: deep.
 - .2 DD: dutch door.
 - .3 DEG: degree.
 - .4 DF: drinking fountain.
 - .5 DIA: diameter.
 - .6 DIM: dimension.
 - .7 DL: dead load.
 - .8 DMNT: demountable.
 - .9 DP: dampproofing.
 - .10 DR: door.
 - .11 DRP: drapery.
 - .12 DWL: dowel.
- .5 E:
- .1 EA: each.
 - .2 ECF: engineered containment facility.
 - .3 EE: each end.
 - .4 EF: each face.
 - .5 EL: elevation.
 - .6 ELEC: electric.
 - .7 ELEV: elevator.
 - .8 EM: expanded metal.
 - .9 ENCL: enclosure.
 - .10 EQ: equal.
 - .11 EXH: exhaust.
-

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .5 E:(Cont'd)
- .12 EXIST: existing.
 - .13 EXPJ: expansion joint.
 - .14 EXP STRUCT: exposed structure.
 - .15 EXT: exterior.
 - .16 EW: each way.
- .6 F:
- .1 FC: fuel contributed.
 - .2 FD: floor drain.
 - .3 FDN: foundation.
 - .4 FEAT W: feature wall.
 - .5 FEXT: fire extinguisher.
 - .6 FH: fire hose.
 - .7 FHC: fire hose cabinet.
 - .8 FHR: fire hose rack.
 - .9 FIN: finish.
 - .10 FIP: federal identity program.
 - .11 FL: floor.
 - .12 FLD: field.
 - .13 FLUOR: fluorescent.
 - .14 FR: frame.
 - .15 FRR: fire resistance rating.
 - .16 FTG: footing.
- .7 G:
- .1 GALV: galvanized steel.
 - .2 GBD: gypsum board.
 - .3 GC: General Conditions.
 - .4 GF: ground floor.
 - .5 GFCI: ground fault circuit interrupter.
 - .6 GL: glass or glazing.
 - .7 GL BLK: glass block.
 - .8 GPC: gypsum plaster ceiling.
 - .9 GPW: gypsum plaster wall.
- .8 H:
- .1 HB: hose bib.
 - .2 HC: hollow core.
 - .3 HCWD: hollow core wood door.
 - .4 HDW: hardware.
 - .5 HDWD: hardwood.
 - .6 HM: hollow metal.
 - .7 HOR: horizontal.
 - .8 HOR EF: horizontal each face.
 - .9 HP: hydro pole.
 - .10 HPA: Hamilton Port Authority.
 - .11 HRV: heat recovery ventilator.
 - .12 HT: height.
 - .13 HTR: heater.
 - .14 HWT: hot water tank.
 - .15 HYD: hydrant.
-

1.2 MATERIALS, EQUIPMENT AND METHODS (Cont'd)	.9	I:	
		.1	ICF: insulated concrete formwork.
		.2	ID: inside diameter.
		.3	INS: insulation.
		.4	INTLK: interlock.
	.10	J:	
		.1	JT: joint.
	.11	K:	
		.1	KPL: kick plate.
	.12	L:	
		.1	LAV: lavatory.
		.2	LDG: landing.
		.3	LG: long.
		.4	LINO: linoleum.
		.5	LL: live load.
	.13	M:	
		.1	MAS: masonry.
		.2	MAS FL: masonry flashing.
		.3	MAX: maximum.
		.4	MCL: metal cube louvre.
		.5	MECH: mechanical.
		.6	MET: metal.
		.7	MET DK: metal deck.
		.8	MET FL: metal flashing.
		.9	MET GRID CLG: metal grid ceiling.
		.10	MET GRTG: metal grating.
		.11	MET LIN CLG: metal linear ceiling.
		.12	MET T PTN: metal toilet partition.
		.13	MH: maintenance hole.
		.14	MIN: minimum.
		.15	MLP: metal lath and plaster.
		.16	MO: masonry opening.
		.17	MR: marble.
		.18	MT: metal threshold.
		.19	MWP: membrane waterproofing.
	.14	N:	
		.1	NBC: national building code.
		.2	NF: near face.
		.3	NFC: national fire code.
		.4	NIC: not in contract.
		.5	NRC: noise reduction coefficient.
		.6	NRP: non removable pin.
		.7	NTS: not to scale.
	.15	O:	
		.1	OBC: Ontario building code.
		.2	OC: on centre.

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .15 O: (Cont'd)
- .3 OD: outside diameter.
 - .4 OPNG: opening.
 - .5 OPR: operator.
 - .6 OVHD: overhead.
 - .7 OWSJ: open web steel joist.
- .16 P:
- .1 P: prefinished.
 - .2 PAH: polynuclear aromatic hydrocarbons.
 - .3 PARG: parging.
 - .4 PCC: precast concrete.
 - .5 PCT: porcelain ceramic tile.
 - .6 PED ACS FLG: pedestal access flooring.
 - .7 PF: panel fabric.
 - .8 PL: plate.
 - .9 PLAM: plastic laminate.
 - .10 PLAS: plaster.
 - .11 PLYWD: plywood.
 - .12 PR: pair.
 - .13 PREFAB: prefabricated.
 - .14 PRFL: profile.
 - .15 PT: paint.
 - .16 PTN: partition.
 - .17 PVC: polyvinyl chloride.
- .17 Q:
- .1 QTB: quarry tile base.
 - .2 QTF: quarry tile floor.
 - .3 QTR: quarry tile roof.
- .18 R:
- .1 R: radius.
 - .2 RA: return air.
 - .3 RB: resilient base.
 - .4 RC: reinforced concrete.
 - .5 RCPT: receptacle.
 - .6 RD: roof drain.
 - .7 REINF: reinforced/reinforcing.
 - .8 REQD: required.
 - .9 REQT: requirement.
 - .10 RFT: rubber floor tile.
 - .11 RM: room.
 - .12 RO: rough opening.
 - .13 RP: radiant panel.
 - .14 RRS: recycled rubber sheet.
 - .15 RRT: recycled rubber tile.
 - .16 RSD: rolling steel door.
 - .17 RSF: rubber sheet flooring.
 - .18 RWL: rain water leader.
-

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .19 S:
.1 SAN SEW: sanitary sewer.
.2 SCHED: schedule.
.3 SC: solic core.
.4 SCRN: screen.
.5 SCWD: solid core wood door.
.6 SD: smoke developed.
.7 SDT: static dissipative tile.
.8 SECT: section.
.9 SL: sliding.
.10 SLR: sealer.
.11 SPEC: specification.
.12 SS: stainless steel.
.13 STD: standard.
.14 STL: steel.
.15 STL BM: steel beam.
.16 STC: sound tranmission class.
.17 STL FL DK: steel floor deck.
.18 STL PL: steel plate.
.19 STN: stone.
.20 STR: structure or structural.
.21 ST SEW: storm sewer.
.22 S&U: stain and urethane.
.23 S&V: stain and varnish.
.24 SVT: solid vinyl tile.
- .20 T:
.1 T: top.
.2 T&B: top and bottom.
.3 TCB: turbidity control plan.
.4 TEL: telephone.
.5 TER: terrazzo.
.6 TERT: terrazzo tile.
.7 THKNS: thickness.
.8 THR: threshold.
.9 TMPD: tempered.
.10 TOPG: topping.
.11 TRANSV: transverse.
.12 TYP: typical.
- .21 U:
.1 U: urethane.
.2 UCUT: undercut.
.3 UGRD: underground.
.4 UOS: unless otherwise specified.
.5 U/S: underside.
.6 UR: urinal.
- .22 V:
.1 VCF: vinyl coated fabric.
.2 VCT: vinyl composition tile.
.3 VERT: vertical.
-

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .22 V:(Cont'd)
- .4 VERT B: vertical blinds.
 - .5 VERT EF: vertical each face.
 - .6 VSF: vinyl sheet flooring.
 - .7 VT: vinyl tile.
 - .8 VWC: vinyl wall covering.
- .23 W:
- .1 WC: water closet.
 - .2 W-C: wall connectors.
 - .3 WD: wood.
 - .4 WDV: wood veneer.
 - .5 WH: wall hydrant.
 - .6 WHMIS: workplace hazardous materials information system.
 - .7 WP: waterproofing.
 - .8 WR: washroom.
 - .9 WSIB: workplace safety and insurance board.
 - .10 WT: weight.
 - .11 WTP: water treatment plant.

1.3 STANDARDS
ORGANIZATIONS

- .1 Standards writing organizations:
- .1 AA - Aluminum Association.
 - .2 ACPA - American Concrete Pipe Association.
 - .3 ANSI - American National Standards Institute.
 - .4 ASHRAE - American Society of Heating and Refrigerating and Air-Conditioning Engineers.
 - .5 ASTM - American Society for Testing and Materials.
 - .6 AWI/AWMAC - Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada.
 - .7 AWPA - American Wood Preservers' Association.
 - .8 AWWA - American Water Works Association.
 - .9 BHMA - Builders Hardware Manufacturers Association.
 - .10 CCDC - Canadian Construction Documents Committee.
 - .11 CCMPA - Canadian Concrete Masonry Producers Association.
 - .12 CGSB - Canadian General Standards Board.
 - .13 CNTA - Canadian Nursery Trades Association.
 - .14 CPCA - Canadian Painting Contractors Association.
-

1.3 STANDARDS
ORGANIZATIONS
(Cont'd)

- .1 (Cont'd)
- .15 CRCA - Canadian Roofing Contractors Association.
 - .16 CSA - Canadian Standards Association.
 - .17 CSC - Construction Specifications Canada.
 - .18 CSDMA - Canadian Steel Door Manufacturers Association.
 - .19 CSI - Construction Specifications Institute.
 - .20 CSSBI - Canadian Sheet Steel Building Institute.
 - .21 CRCA - Canadian Roofing Contractors Association.
 - .22 DHI - Door and Hardware Insitute.
 - .23 EEMAC - Electrical and Electronic Manufacturer's Association of Canada.
 - .24 ESA - Electrical Safety Authority.
 - .25 FCC - Fire Commissioner of Canada.
 - .26 FSC - Forest Stewardship Council.
 - .27 GANA - Glass Association of North America.
 - .28 HMMA - Hollow Metal Manufacturers Association.
 - .29 IEEE - Institute of Electrical and Electronics Engineers Inc.
 - .30 ISO - International Organization for Standardization.
 - .31 IWFA - International Window Film Association.
 - .32 LEED - LEED Canada, Leadership in Energy and Environmental Design.
 - .33 MPI - Master Painters Insitute.
 - .34 NAAMM - National Association of Architectural Metal Manufacturers.
 - .35 NCPI - National Clay Pipe Institute.
 - .36 NEMA - National Electrical Manufacturers Association.
 - .37 NFPA - National Fire Protection Association.
 - .38 OPSD - Ontario Provincial Standard Drawings.
 - .39 OPSS - Ontario Provincial Standard Specifications.
 - .40 PPI - Plasctics Pipe Institute.
 - .41 SDI - Steel Door Intitute.
 - .42 SCAQMD - South Coast Air Quality Management District.
 - .43 TIA - Telecommunications Industry Association.
 - .44 TIAC - Thermal Insulation Association of Canada.
-

1.3 STANDARDS ORGANIZATIONS (Cont'd)	.1	(Cont'd) .45 TTMAC - Terrazzo Tile and Marble Association of Canada. .46 UL - Underwriters Laboratories. .47 ULC - Underwriters Laboratories of Canada. .48 US EPA - United States Environmental Protection Agency. .49 WH - Warnock Hersey.
1.4 FEDERAL GOVERNMENT DEPARTMENTS AND AGENCIES	.1	Departments, agencies and crown corporations. .1 CEAA - Canadian Environmental Assessment Agency. .2 CSC - Correctional Service Canada. .3 CRA - Canada Revenue Agency. .4 DND - Department of National Defence. .5 EC - Environment Canada. .6 FHBRO - Federal Heritage Buildings Review Office. .7 HC - Health Canada. .8 HCD - Heritage Conservation Directorate. .9 LC - Labour Canada. .10 PC - Parks Canada. .11 PWGSC - Public Works and Government Services Canada. .12 RCMP - Royal Canadian Mounted Police. .13 TBS - Treasury Board Secretariat. .14 TC - Transport Canada.
1.5 PROVINCIAL GOVERNMENT DEPARTMENTS AND AGENCIES	.1	MOEE - Ontario Ministry of Environment and Energy.
	.2	MOL - Ontario Ministry of Labour.
	.3	MTO and MOT - Ontario Ministry of Transportation.
	.4	TSSA - Technical Standards and Safety Authority.

- 1.6 INTERNATIONAL GOVERNMENT DEPARTMENTS AND AGENCIES .1 DOHMH - New York City Department of Health and Mental Hygiene, USA.
- .2 GSA - Government Services Administration, USA.
- 1.7 UNITS OF MEASURE METRIC .1 The following abbreviations of units of measure are commonly found in the Project Manual:
- .1 C: Celsius.
 - .2 cm: centimetre.
 - .3 kg: kilogram.
 - .4 kg/m³: kilogram per cubic metre.
 - .5 kN: kilonewton.
 - .6 kPa: kilopascals.
 - .7 kw: kilowatts.
 - .8 l/s: litre per second.
 - .9 m: metre.
 - .10 m³: cubic metre.
 - .11 mg/kg: milligrams per kilogram.
 - .12 mg/L: milligrams per litre.
 - .13 mm: millimetres.
 - .14 MPa: megapascal.
 - .15 NTU: nephelometric turbidity unit.
 - .16 ppm: parts per million.
 - .17 ug/L: micrograms per litre.
 - .18 ug/m³: micrograms per cubic metre.
- 1.8 UNITS OF MEASURE IMPERIAL .1 The following abbreviations of units of measure are commonly found in the Project Manual:
- .1 F: Fahrenheit.
 - .2 ft: foot/feet.
 - .3 ga: guage.
 - .4 gpm: gallons per minute.
 - .5 in: inches.
 - .6 lbs: pounds.
 - .7 NTU: nephelometric turbidity unit.
 - .8 psi: pounds-force per square inch.
 - .9 ppm: parts per million.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Inspection and testing, administrative and enforcement requirements.
 - .2 Tests and mix designs.
 - .3 Mock-ups.
 - .4 Mill tests.
 - .5 Equipment and system adjust and balance.
- 1.2 RELATED SECTIONS
- .1 Section 01 91 20 - Project Commissioning.
- 1.3 INSPECTION
- .1 Allow Departmental 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 Departmental 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 Departmental representative may order any 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, Departmental Representative shall pay cost of examination and replacement.
-

1.4 INDEPENDENT
INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work.
- .2 Allocated costs: to Section 01 21 00.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 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 Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.5 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.

1.6 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative 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 an orderly sequence so as not to cause delay 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.
-

- 1.7 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 Departmental 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.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.
- 1.8 REPORTS .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to Subcontractor of work being inspected or tested, and manufacturer or fabricator of material being inspected or tested.
- 1.9 TESTS AND MIX DESIGNS .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative and may be authorized as recoverable.
- 1.10 MOCK-UPS .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Construct in all locations acceptable to Departmental Representative.
-

- 1.10 MOCK-UPS
(Cont'd)
- .3 Prepare mock-ups for Departmental Representative 's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
 - .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
 - .5 If requested, Departmental Representative will assist in preparing a 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 testing, adjusting and balancing reports for mechanical, electrical and building equipment systems.
 - .2 Submit Commissioning Documentation in accordance with Section 01 91 00.
 - .3 Refer to Section 01 91 20 for definitive requirements.

PART 2 - PRODUCTS

- 2.1 NOT USED
- .1 Not Used.
-

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Temporary utilities.
- 1.2 RELATED SECTIONS .1 Section 01 52 00 - Construction Facilities.
.2 Section 01 56 00 - Temporary Barriers and Enclosures.
- 1.3 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- 1.4 INSTALLATION AND REMOVAL .1 Provide temporary utilities controls in order to execute work expeditiously.
.2 Remove from site all such work after use.
- 1.5 DEWATERING .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
- 1.6 WATER SUPPLY .1 Provide continuous supply of potable water for construction use.
.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.
- 1.7 TEMPORARY HEATING AND VENTILATION .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
-

1.7 TEMPORARY
HEATING AND
VENTILATION
(Cont'd)

- .3 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.
- .4 Maintain temperatures of minimum 10°C in areas where construction is in progress.
- .5 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.
- .6 Permanent heating system of building, may not be used when available. Be responsible for damage to heating system if use is permitted.
- .7 On completion of Work for which permanent heating system is used, restore to "new" condition.
- .8 Pay costs for maintaining temporary heat, when using permanent heating system.
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.

- 1.10 FIRE PROTECTION
(Cont'd)
- .2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 - PRODUCTS

- 2.1 NOT USED
- .1 Not Used.

PART 3 - EXECUTION

- 3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL
- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Construction aids.
 - .2 Office, sheds and trailers.
 - .3 Parking.
 - .4 Project identification.
- 1.2 REFERENCES
- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-2000, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-08, Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M87(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.
- 1.3 SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00.
- 1.4 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.
-

- 1.4 INSTALLATION AND REMOVAL (Cont'd)
- .4 Provide construction facilities in order to execute work expeditiously.
 - .5 Remove from site all such work after use.
- 1.5 SCAFFOLDING
- .1 Scaffolding in accordance with CAN/CSA-S269.2.
 - .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs as required for the Work.
- 1.6 HOISTING
- .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
 - .2 Hoists/cranes shall be operated by qualified operator.
- 1.7 SITE STORAGE/LOADING
- .1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.
 - .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.
- 1.8 CONSTRUCTION PARKING
- .1 Parking will not be permitted on site during regular work hours. Parking may be permitted on site after hours in a location as designated by the Departmental Representative provided it does not disrupt performance of Work. Coordinate with Sections 01 35 55 and 01 35 56.
 - .2 Provide and maintain adequate access to project site.
 - .3 Build and maintain temporary roads where indicated or directed by Departmental representative and provide snow removal during period of Work.
-

- 1.8 CONSTRUCTION PARKING
(Cont'd)
- .4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- 1.9 SECURITY
- .1 Pay for responsible security personnel to guard site and contents of site after working hours and during holidays.
- .2 Coordinate with Sections 01 35 55 and 01 35 56.
- 1.10 OFFICES
- .1 Provide office heated to 22°C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors may provide their own offices as necessary. Direct location of these offices.
- 1.11 TRAILER
- .1 Provide trailer for Clerk of Works to electric heating, air conditioning and lighting; washroom and water closet with hot and cold running water and supplies; and labour for daily cleaning of the washrooms and trailer.
- .2 Equip trailer with a lockable desk and two swivel chairs.
- .3 Provide and pay for telephone services consisting of one facsimile machine on a separate line and two business lines (plus intercom) on five key sets for local calls and a dedicated separate line for a facsimile machine.
-

1.12 EQUIPMENT,
TOOL AND MATERIALS
STORAGE

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.13 SANITARY
FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.14 CONSTRUCTION
SIGNAGE

- .1 No other signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN/CSA-Z321.
- .3 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 Departmental representative.

1.15 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 Departmental 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
-

1.15 PROTECTION
AND MAINTENANCE OF
TRAFFIC
(Cont'd)

- .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 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .9 Dust control: adequate to ensure safe operation at all times.
- .10 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental representative.
- .11 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .12 Provide snow removal during period of Work.
- .13 Remove, upon completion of work, haul roads designated by Departmental representative.

1.16 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.
 - .3 Store materials resulting from demolition activities that are salvageable.
 - .4 Stack stored new or salvaged material.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 TEMPORARY
EROSION AND
SEDIMENTATION
CONTROL .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Barriers.
 - .2 Environmental Controls.
 - .3 Traffic Controls.
 - .4 Fire Routes.
- 1.2 RELATED SECTIONS
- .1 Section 01 51 00 - Temporary Utilities.
 - .2 Section 01 52 00 - Construction Facilities.
- 1.3 REFERENCES
- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
 - .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 Canadian Standards Association (CSA):
 - .1 CSA-O121-08, Douglas Fir Plywood.
- 1.4 INSTALLATION AND REMOVAL
- .1 Provide temporary controls in order to execute Work expeditiously.
 - .2 Remove from site all such work after use.
- 1.5 HOARDING
- .1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
 - .2 Temporary fencing:
 - .1 Erect temporary site enclosure using modular freestanding fencing: galvanized, minimum 1.8 m high, chain link or welded steel mesh, pipe rail.
 - .2 Wire fabric shall be pulled taut before fixing in place. Tautness, when fixed in place, is to be established by pull tests. The application of a 12 kg perpendicular pull at the mid point of the mesh panel (mid point of
-

- 1.5 HOARDING (Cont'd) .2 Temporary fencing:(Cont'd)
.2 (Cont'd)
posts/rails) shall show a displacement of no more than 30 mm from the vertical plane.
.3 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets.
.4 Equip gates with locks and keys.
.5 Maintain fence in good repair.
- 1.6 GUARD RAILS AND BARRICADES .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
.2 Provide as required by governing authorities.
- 1.7 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.
- 1.8 DUST TIGHT SCREENS .1 Provide dust tight screens or insulated partitions 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.
- 1.9 ACCESS TO SITE .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
-

1.10 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.

1.11 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 Department representative locations and installation schedule 3 days prior to installation.
.4 Be responsible for damage incurred due to lack of or improper protection.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Product quality, availability, storage, handling, protection, and transportation.
 - .2 Manufacturer's instructions.
 - .3 Quality of Work, coordination and fastenings.
 - .4 Existing facilities.
- 1.2 RELATED SECTIONS
- .1 Section 01 45 00 - Quality Control.
- 1.3 REFERENCES
- .1 Within text of specifications, reference may be made to reference standards.
 - .2 Conform to these standards, in whole or in part as specifically requested in specifications.
 - .3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
 - .4 The cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.
 - .5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.
 - .6 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at <http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage>.
-

1.4 QUALITY

- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .2 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.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Departmental representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
 - .2 In event of failure to notify Departmental representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.
-

1.6 METRIC SIZED
MATERIALS

- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
- .2 The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.
- .3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.
- .4 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.
- .5 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

1.7 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
-

- 1.7 STORAGE, HANDLING AND PROTECTION
(Cont'd)
- .5 (Cont'd)
platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental representative.
- .9 Touch-up damaged factory finished surfaces to Departmental representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 1.8 TRANSPORTATION .1 Pay costs of transportation of products required in performance of Work.
- 1.9 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 Departmental representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental representative may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental representative to require removal and re-installation at no increase in Contract Price or Contract Time.
-

- 1.10 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 Departmental 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. Departmental 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 Departmental representative, whose decision is final.
- 1.11 CO-ORDINATION .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- 1.12 CONCEALMENT .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Departmental representative if there is interference. Install as directed by Departmental Representative.
- 1.13 REMEDIAL WORK .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate 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.
-

- 1.14 LOCATION OF FIXTURES
- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
 - .2 Inform Departmental Representative of conflicting installation. Install as directed.
- 1.15 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.
- 1.16 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.
-

- 1.17 PROTECTION OF WORK IN PROGRESS .1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Departmental Representative.
- 1.18 EXISTING UTILITIES .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Field engineering survey services to measure and stake site.
 - .2 Survey services to establish and confirm inverts for Work.
 - .3 Recording of subsurface conditions found.
- 1.2 REFERENCES
- .1 Owner's identification of existing survey control points and property limits.
- 1.3 QUALIFICATIONS OF SURVEYOR
- .1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to Departmental representative.
- 1.4 SURVEY REFERENCE POINTS
- .1 Existing base horizontal and vertical control points are designated on drawings.
 - .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
 - .3 Make no changes or relocations without prior written notice to. Departmental representative.
 - .4 Report to Departmental representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - .5 Require surveyor to replace control points in accordance with original survey control.
- 1.5 SURVEY REQUIREMENTS
- .1 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.
-

- 1.8 RECORDS .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.
- 1.9 SUBMITTALS .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental 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 After prompt investigation, should Departmental representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SUBMITTALS .1 Submittals: in accordance with Section
01 33 00.
- .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.
 .8 Date and time work will be executed.
- 1.2 MATERIALS .1 Required for original installation.
- .2 Change in Materials: Submit request for
substitution in accordance with Section
01 33 00.
- 1.3 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.
-

1.3 PREPARATION
(Cont'd)

- .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; maintain excavations free of water.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching 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 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

- 1.4 EXECUTION
(Cont'd)
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
 - .12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00, full thickness of the construction element.
 - .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Progressive cleaning.
 - .2 Final cleaning.
- 1.2 PROJECT CLEANLINESS
- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
 - .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental representative. Do not burn waste materials on site.
 - .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
 - .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .5 Provide on-site containers for collection of waste materials and debris.
 - .6 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 20.
 - .7 Remove waste material and debris from site at end of each working day.
 - .8 Dispose of waste materials and debris off site.
 - .9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
 - .10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
 - .11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
-

1.2 PROJECT
CLEANLINESS
(Cont'd)

- .12 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 FINAL CLEANING

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
 - .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
 - .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
 - .4 Remove waste products and debris other than that caused by Owner or other Contractors.
 - .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental representative. Do not burn waste materials on site.
 - .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .7 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.
 - .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.
 - .9 Clean lighting reflectors, lenses, and other lighting surfaces.
-

- 1.3 FINAL CLEANING
(Cont'd)
- .10 HEPA vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
 - .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .14 Remove dirt and other disfiguration from exterior surfaces.
 - .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
 - .16 Sweep and wash clean paved areas.
 - .17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
 - .18 Clean roofs, downspouts, and drainage systems.
 - .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .20 Remove snow and ice from access to building.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.
-

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 CONSTRUCTION & DEMOLITION WASTE
- .1 Carefully deconstruct and source separate materials/equipment and divert, from D&C waste destined for landfill to maximum extent possible. Target for this project is [50] [60] [75] [95]% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
 - .2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separated wastes.
 - .2 Source separate the following waste:
 - .1 Brick and portland cement concrete.
 - .2 Corrugated cardboard.
 - .3 Wood, not including painted or treated wood or laminated wood.
 - .4 Gypsum board, unpainted.
 - .5 Steel.
 - .6 Items indicated in Section 02 42 93, Deconstruction and Waste Products Workplan Summary.
 - .3 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
 - .1 Indicate how material being removed from the site will be reused, recycled, composted or anaerobically digested using Section 02 42 93, Deconstruction and Waste Products Workplan Summary.
 - .4 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.
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1.2 WASTE
PROCESSING SITES

- .1 Province of: Ontario.
 - .1 Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.
 - .2 Telephone: 800-565-4923 or 416-323-4321.
 - .3 Fax: 416-323-4682.

- .2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.
 - .1 Telephone: 416-657-2797
 - .2 Fax: 416-960-8053
 - .3 Email: rco@rco.on.ca.
 - .4 Internet: <http://www.rco.on.ca/>.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 CANADIAN
GOVERNMENTAL
DEPARTMENTS CHIEF
RESPONSIBILITY FOR
THE ENVIRONMENT

- .1 Government Chief Responsibility for the Environment.

Province	Address	General Inquiries	Fax
Ontario	Ministry of Environment and Energy 135 St Clair Avenue West Toronto, ON M4V 1P5	(416) 323-4321 (800) 565-4923	(416) 323-4682
	Environment Canada Toronto, ON	(416) 734-4494	

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 As-built, samples, and specifications.
 - .2 Equipment and systems.
 - .3 Product data, materials and finishes, and related information.
 - .4 Operation and maintenance data.
 - .5 Spare parts, special tools and maintenance materials.
 - .6 Warranties and bonds.
 - .7 Final site survey.
- 1.2 RELATED SECTIONS
- .1 Section 01 91 00 - Commissioning - General Requirements.
 - .2 Section 01 91 20 - Project Commissioning.
 - .3 Section 01 79 00 - Demonstration and Training.
- 1.3 SUBMISSION
- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
 - .2 Copy will be returned after final inspection, with Departmental Representative's comments.
 - .3 Revise content of documents as required prior to final submittal.
 - .4 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of maintenance manuals and commissioning documentation in English.
 - .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
-

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- 1.3 SUBMISSION
(Cont'd)
- .6 If requested, furnish evidence as to type, source and quality of products provided.
 - .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
 - .8 Pay costs of transportation.
- 1.4 FORMAT
- .1 Organize data in the form of an instructional manual.
 - .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
 - .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
 - .4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
 - .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
 - .7 Text: Manufacturer's printed data, or typewritten data.
 - .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
 - .9 Provide 1:1 scaled CAD files in dwg format on CD.
- 1.5 CONTENTS -
EACH VOLUME
- .1 Table of Contents: provide title of project;
 - .1 date of submission; names,
 - .2 addresses, and telephone numbers of Contractor with name of responsible parties;
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- 1.5 CONTENTS - .1 (Cont'd)
EACH VOLUME .3 schedule of products and systems,
(Cont'd) indexed to content of volume.
-
- .2 For each product or system:
.1 list names, addresses and telephone
numbers of subcontractors and suppliers,
including local source of supplies and
replacement parts.
- .3 Product Data: mark each sheet to clearly
identify specific products and component
parts, and data applicable to installation;
delete inapplicable information.
- .4 Drawings: supplement product data to
illustrate relations of component parts of
equipment and systems, to show control and
flow diagrams.
- .5 Typewritten Text: as required to supplement
product data. Provide logical sequence of
instructions for each procedure, incorporating
manufacturer's instructions specified in
Section 01 45 00.
- .6 Training: Refer to Section 01 79 00.
- 1.6 AS-BUILTS AND .1 In addition to requirements in General
SAMPLES Conditions, maintain at the site for
Departmental Representative one record copy
of:
.1 Contract Drawings.
.2 Specifications.
.3 Amendments.
.4 Change Orders and other modifications to
the Contract.
.5 Reviewed shop drawings, product data,
and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.
- .2 Store record documents and samples in field
office apart from documents used for
construction. Provide files, racks, and secure
storage.
- .3 Label record documents and file in accordance
with Section number listings in List of
-

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- 1.6 AS-BUILTS AND SAMPLES
(Cont'd)
- .3 (Cont'd)
Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.
- .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work.
- .7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".
- 1.7 RECORDING
ACTUAL SITE CONDITIONS
- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
- .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
-

- 1.7 RECORDING
ACTUAL SITE
CONDITIONS
(Cont'd)
- .4 Contract Drawings and shop drawings:(Cont'd)
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
 - .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Amendments and change orders.
 - .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- 1.8 FINAL SURVEY
- .1 Submit final site survey certificate in accordance with Section 01 71 00, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
- 1.9 EQUIPMENT AND SYSTEMS
- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 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. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer,
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1.9 EQUIPMENT AND
SYSTEMS
(Cont'd)

- .4 Operating Procedures:(Cont'd)
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 coordination 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 and 01 91 00.
- .15 Additional requirements: As specified in
individual specification sections.

1.10 MATERIALS AND
FINISHES

- .1 Building Products, Applied Materials, and
Finishes: include product data, with catalogue
number, size, composition, and colour and
texture designations. Provide information for
re-ordering custom manufactured products.
-

- 1.10 MATERIALS AND FINISHES
(Cont'd)
- .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.
- 1.11 SPARE PARTS
- .1 Provide spare parts, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- 1.12 MAINTENANCE MATERIALS
- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
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- 1.12 MAINTENANCE MATERIALS
(Cont'd)
- 1.13 SPECIAL TOOLS
- 1.14 STORAGE, HANDLING AND PROTECTION
- 1.15 WARRANTIES AND BONDS
- .5 Obtain receipt for delivered products and submit prior to final payment.
 - .1 Provide special tools, in quantities specified in individual specification section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
 - .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 to satisfaction of Departmental Representative.
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and
-

- 1.15 WARRANTIES AND BONDS (Cont'd) .3 (Cont'd)
manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Certificate of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Procedures for demonstration and instruction of equipment and systems to Owner's O&M personnel.
 - .2 O&M personnel includes property facility manager, building operators, maintenance staff, security staff and technical specialists, as applicable.
- 1.2 DESCRIPTION
- .1 Demonstrate scheduled operation and maintenance of equipment and systems to Departmental Representative's personnel two weeks prior to date of substantial performance.
 - .2 Departmental Representative will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.
- 1.3 QUALITY CONTROL
- .1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.
 - .2 Submit training schedule of time and date for demonstration and training of each item of equipment and each system in accordance with the training plan four weeks prior to designated dates, for Departmental Representative's approval.
 - .3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
 - .4 Report shall give time and date of each demonstration and training, with list of persons present.
-

- 1.4 CONDITIONS FOR DEMONSTRATIONS
- .1 Equipment has been inspected and put into operation in accordance with Sections [_____].
 - .2 Testing, adjusting, and balancing has been performed in accordance with Section 01 91 00 and equipment and systems are fully operational.
 - .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.
- 1.5 PREPARATION
- .1 Verify that conditions for demonstration and instructions comply with requirements.
 - .2 Verify that designated O&M personnel are present.
- 1.6 DEMONSTRATION AND INSTRUCTIONS
- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times and locations.
 - .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
 - .3 Review contents of manual in detail to explain all aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.
- 1.7 TIME ALLOCATED FOR INSTRUCTIONS
- .1 Ensure amount of time required for instruction of each item of equipment or system as follows:
 - .1 [...].
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Includes general requirements for commissioning facilities and facility systems.
- 1.2 RELATED SECTIONS .1 Section 01 79 00 - Demonstration and Training.
- .2 Section 01 91 20 - Project Commissioning.
- 1.3 QUALITY ASSURANCE .1 Provide System Commissioning Administrator for the work of this Contract.
- .2 Comply with applicable procedures and standards of the certification sponsoring association.
- .3 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.
- 1.4 REFERENCES .1 Associated Air Balance Council (AABC): National Standards For Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems, 2002.
- .2 ASHRAE Guideline 1-2007, HVAC&R Technical Requirements for the Commissioning Process.
- .3 ASHRAE Guideline 4-2008, Preparation of Operating and Maintenance Documentation for Building System.
- .4 NEBB Procedural Standards for Whole Building Systems Commissioning of New Construction(2009).
- .5 ANSI/NETA ATS Standard for Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (2009).
-

1.5 SUBMITTALS

- .1 Submit documentation to confirm System Commissioning Administrator compliance with quality assurance provision.
- .2 Submit 3 preliminary specimen copies of each type of startup checklist, product information and performance verification report forms proposed for use.
- .3 Submit completed report forms within 3 days after completion of each testing to Departmental representative for review and verification.
- .4 Fifteen days prior to Substantial Performance, submit 3 copies of final reports on applicable forms for functional performance verification.
- .5 Submit post-commissioning reports of testing, adjusting, and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.
- .6 Submit all other commissioning documentation in accordance with Section 01 91 20.

1.6 REPORT FORMS

- .1 System Commissioning Administrator shall make reports.
 - .2 Report forms shall include:
 - .1 Startup Checklists.
 - .2 Product Information (PI) Report forms.
 - .3 Performance Verification (PV) Report forms.
 - .3 Ensure each form bears signature of recorder, and that of supervisor of reporting organization.
 - .4 Submit signed form to Departmental representative for review and approval. After approval, immediately submit form bearing Departmental representative's signature to Departmental Representative.
 - .5 Submit signed form to Departmental Representative for review, approval and signature.
-

1.7 CONTRACTOR'S
RESPONSIBILITIES

- .1 Prepare each system for testing and balancing.
- .2 Cooperate with testing organization and provide access to equipment and systems.
- .3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.
- .4 Notify testing organization and Departmental Representative 7 days prior to time project will be ready for testing, adjusting, and balancing.
- .5 Accurately record data for each step.
- .6 Report to Departmental Representative any deficiencies or defects noted during performance of services.
- .7 Correct deficiencies identified in accordance with Departmental Representative's written instructions.

1.8 MANUFACTURER'S
INVOLVEMENT

- .1 Factory testing: manufacturer to:
 - .1 Coordinate time and location of testing.
 - .2 Provide testing documentation for approval by Departmental Representative.
 - .3 Arrange for Departmental Representative to witness tests.
 - .4 Obtain written approval of test results and documentation from Departmental Representative before delivery to site.
 - .2 Obtain manufacturers installation, start-up and operations instructions prior to start-up of components, equipment and systems and review with Departmental Representative.
 - .1 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.
 - .2 Modify procedures detrimental to equipment performance and review same with manufacturer before start-up.
 - .3 Integrity of warranties:
 - .1 Use manufacturer's trained start-up personnel where specified elsewhere in other
-

- 1.8 MANUFACTURER'S INVOLVEMENT (Cont'd) .3 Integrity of warranties:(Cont'd)
- .1 (Cont'd) divisions or required to maintain integrity of warranty.
 - .2 Verify with manufacturer that testing as specified will not void warranties.
 - .4 Qualifications of manufacturer's personnel:
 - .1 Experienced in design, installation and operation of equipment and systems.
 - .2 Ability to interpret test results accurately.
 - .3 To report results in clear, concise, logical manner.
 - .5 Manufacturer's factory representative must be present to sign off and verify the detention door and hardware system as per Sections:
 - .1 Section 11 19 20 for detention hardware.
 - .2 Section 11 19 30 for detention doors and frames.
 - .3 Section 11 19 40 for detention grille doors and barriers.
 - .4 Section 11 19 50 for detention chain link gates.
 - .5 Section 11 19 60 for detention exterior windows.
 - .6 Section 11 19 70 for steel unit masonry.
 - .7 Section 13 26 01 for prefabricated security components.
 - .8 Section 32 31 13 for chain link fences and gates.
- 1.9 DEMONSTRATION AND TESTING .1 Refer to Section 01 79 00 for requirements for demonstration and training required for Work of this Project.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 SPECIAL
WARNING

- .1 This project requires a special enhanced commissioning. The General Contractor must read and fully understand the special requirements specified in this Section prior to bidding this project.
- .2 One of the commissioning requirements is that the General Contractor must engage a qualified independent System Commissioning Administrator (SCA) to coordinate and organize all Pre-Commissioning Testing, Commissioning Testing, and O&M Training. The SCA must complete the Contractor's Commissioning Documentation as specified in this Section.
- .3 A total of 4% of the construction price will be held back by PWGSC for unfinished commissioning work.

1.2 RELATED
SECTIONS

- .1 Section 01 91 00: Commissioning - General Requirements.

1.3 GENERAL

- .1 The "Commissioning" for this project is defined as a planned program of activities which enhance quality management and information transfer that extends throughout all stages of project delivery.
- .2 The commissioning activities shall include the standard activities and the enhanced activities which are traditionally not provided by the design and construction industry and which are defined in this document.

1.4 REFERENCE
STANDARDS

- .1 The most stringent requirements of the following commissioning standards and guidelines shall apply:
 - .1 Associated Air Balance Council (AABC): National Standards for Field Measurements and Instrumentation, Total Systems Balance, Air Distribution - Hydronics Systems, 2002.
-

1.4 REFERENCE
STANDARDS
(Cont'd)

- .1 (Cont'd)
- .2 ASHRAE Guideline 1.1-2007, the HVAC Commissioning Process.
- .3 ASHRAE Guideline 4-2008, Preparation of Operating and Maintenance Documentation for Building System.
- .4 NEBB Procedural Standards for Building Systems Commissioning (1999).
- .5 NETA Standard for Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems 2009.

1.5 ROLES AND
RESPONSIBILITIES

- .1 The key members of the commissioning team include the Contractor and the Departmental Representative.
 - .1 It is the Contractor's responsibility to engage a qualified independent System Commissioning Administrator (SCA) to represent the Contractor including the Sub-Contractors. The SCA shall be responsible for carrying out the Contractor's commissioning activities under the direction of the Departmental Representative.
 - .2 The Departmental Representative is the Commissioning Authority for this project.
 - .2 The Contractor is responsible for the following standard commissioning activities and enhanced commissioning activities during project construction, commissioning and operation phases.
 - .1 Construction Phase:
 - .1 Engage a qualified independent System Commissioning Administrator as single point of contact for all matters relating to commissioning (enhanced activity).
 - .2 Conduct separate commissioning meetings and prepare minutes of meeting.
 - .3 Submit shop drawings (standard activity).
 - .4 Conduct equipment installation and startup tests, and submit test reports (standard activity).
 - .5 Perform TAB and submit TAB report (standard activity).
 - .6 Conduct System Startup Verification Testing and complete Startup Checklists and PI Report forms (enhanced activity).
-

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- 1.5 ROLES AND RESPONSIBILITIES (Cont'd)
- .2 (Cont'd)
- .2 Commissioning Phase:
- .1 Conduct separate commissioning meetings and prepare minutes of meeting.
 - .2 Conduct Functional Performance Testing and complete PV Report forms (enhanced activity).
 - .3 Prepare Startup Checklists, PI and PV Report Forms and Functional Performance Test Forms (enhanced activity).
 - .4 Demonstrate system operation (standard activity).
 - .5 Submit Maintenance Manuals (formerly called O&M Manuals) (standard activity).
 - .6 Submit "As-Built" drawings (standard activity).
 - .7 Conduct O&M training (standard activity).
 - .8 Update Standard Operating Procedures (SOP) Manual (enhanced activity).
 - .9 Prepare and update commissioning report (enhanced activity).
- .3 Operation Phase:
- .1 Conduct separate commissioning meetings and prepare minutes of meeting.
 - .2 Conduct deferred Functional Performance Testing and complete PV Report forms (enhanced activity).
 - .3 Provide fine-tuning (standard activity).
 - .4 Provide specified inspection and maintenance services during warranty period (standard activity).
- .3 The Departmental Representative will carry out the following commissioning activities related to the Contractor:
- .1 Review and approve the qualifications of the System Commissioning Administrator (SCA) submitted by the Contractor.
 - .2 Review and approve Startup Checklists, PI and PV Report Forms.
 - .3 Review and approve shop drawings (standard activity).
 - .4 Review and inspect installation, and prepare construction deficiencies report (standard activity).
 - .5 Review and approve TAB report (standard activity).
-

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- 1.5 ROLES AND RESPONSIBILITIES (Cont'd)
- .3 (Cont'd)
 - .6 Witness System Startup Verification Testing (enhanced activity) and review test reports.
 - .7 Witness Functional Performance Testing (enhanced activity) and review test reports.
 - .8 Review and approve Maintenance Manuals (standard activity).
 - .9 Review and approve "As-Built" drawings (standard activity).
 - .10 Review O&M training (standard activity).
 - .11 Witness post-acceptance commissioning testing (enhanced activity).
 - .12 Witness the post-acceptance commissioning testing conducted by the Contractor and review test reports.
 - .13 Review commissioning documentation submitted by the Contractor.
 - .14 Review and approved commissioning report.
 - .15 Review and approve updated commissioning report.
- 1.6 QUALIFICATIONS OF SYSTEM COMMISSIONING ADMINISTRATOR (SCA)
- .1 The System Commissioning Administrator: a qualified independent System Commissioning Administrator (SCA) for scheduling, coordination and supervision of Contractor's commissioning activities during construction, acceptance, and post-acceptance stages. The System Commissioning Administrator shall provide Contractor's Commissioning Documentation.
 - .2 Unless approved by the Departmental Representative, the System Commissioning Administrator shall be a NEBB qualified SCA in building systems commissioning. The Contractor shall hire and submit the name of SCA with documentation confirming qualifications within 15 working days of award of contract.
- 1.7 SCHEDULING
- .1 Within 15 working days of contract award, the Contractor shall submit bar chart commissioning schedules indicating anticipated date of start, duration, and date of completion for the following key activities:
 - .1 Commissioning meetings.
 - .2 Shop drawings.
-

- 1.7 SCHEDULING .1 (Cont'd)
(Cont'd)
- .3 Pre-startup installation inspections and tests.
 - .4 System and Equipment Startup and Verification.
 - .5 TAB.
 - .6 Functional Performance Test.
 - .7 Maintenance Manuals.
 - .8 "As-Built" drawings.
 - .9 O&M Training.
 - .10 O&M Training report.
- .2 Bar chart commissioning schedule shall be prepared for each component, equipment, sub-system, system and integrated system to be commissioned.
- .3 The Commissioning shall be carried out to meet the approved project schedule.
- 1.8 CONTRACTOR'S COMMISSIONING DOCUMENTATION .1 The Contractor's Commissioning Documentation shall include the following:
- .1 Commissioning Schedule.
 - .2 Minutes of Commissioning meetings.
 - .3 Shop drawings and product data.
 - .4 Installation inspection and test reports.
 - .5 TAB reports.
 - .6 Startup Checklists.
 - .7 Product Information (PI) Report forms.
 - .8 Performance Verification (PV) Report forms.
 - .9 "As-Built" drawings.
 - .10 Maintenance Manuals.
 - .11 O&M Training Schedule
 - .12 O&M Training Report.
- 1.9 PRE-COMMISSIONING TESTING - STARTUPS .1 Requirements of Pre-commissioning Verification: a full range of checks and tests to determine that all components, equipment, systems, and interfaces between systems (eg., emergency, fire, and life safety) operate in accordance with contact documents. This includes all operating modes, interlocks, control responses, and specific responses to abnormal or emergency conditions. Verification of the proper operation of the control system also includes verifying the interface of the
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- 1.11 EXTENT OF COMMISSIONING (Cont'd)
- .1 (Cont'd)
 - .7 Lighting Control.
 - .8 Fire Alarm.
 - .9 Security and CCTV.
-
- 1.12 O&M TRAINING
- .1 The Contractor shall provide qualified training instructors to conduct O&M training.
 - .2 Four weeks prior to commencement of O&M training, the Contractor shall submit training schedule with course outline, agenda and a copy of training manual in accordance with the training plan for review by the Departmental Representative.
 - .3 Training shall include familiarization sessions, hands-on instruction, and classroom sessions.
 - .4 Classroom training shall include: review of Maintenance Manuals, System Operational Procedures for all modes of operation, acceptable tolerances for system adjustments and procedures for dealing with abnormal and emergency situations.
- 1.13 UNFINISHED COMMISSIONING WORK
- .1 Prior to the "Interim Certificate of Completion" a total of 4% of the construction price will be held back by the Departmental Representative until the acceptable Functional Performance Testing, O&M Training, and commissioning documentation have been completed.
- 1.14 COMMISSIONING REPORT AND POST-ACCEPTANCE COMMISSIONING
- .1 When the acceptable Functional Performance Testing, O&M Training, and commissioning documentation have been completed, the Departmental Representative shall prepare a commissioning report. The report will identify the completed functional performance tests, the deferred functional performance tests, construction deficiencies, design deficiencies, user's changes of requirement, and outstanding commissioning issues. The report will provide review comments on test results, O&M training and commissioning
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- 1.14 COMMISSIONING .1 (Cont'd)
REPORT AND documentation, and will recommend follow-up
POST-ACCEPTANCE actions to be taken during post-acceptance
COMMISSIONING commissioning.
(Cont'd)
-
- .2 The Departmental Representative will not
issue the "Interim Certificate of Completion"
until the commissioning report with a
recommendation of acceptance is submitted.
- 1.15 ADDITIONAL .1 Refer to other specifications sections for
COMMISSIONING additional commissioning requirements.
REQUIREMENTS
-
- PART 2 - PRODUCTS Not used.
- PART 3 - EXECUTION Not used.

1.1 SECTION INCLUDES

- .1 Title and description of Work.
- .2 Contract Method.
- .3 Work sequence.
- .4 Contractor use of premises.
- .5 Partial Owner occupancy.

1.2 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises the Installation of an electrical transformer at the New 96 Bed Maximum Security Living Unit in the Millhaven Institution, located in Kingston, Ontario.

1.5 CONTRACT METHOD

- .1 Construct Work under a single, stipulated price contract.

1.6 COST BREAKDOWN

- .1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract price.
- .2 Within 48 hours of acceptance of bid submit a list of subcontractors.

1.7 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued intermittent use of premises during construction.
- .2 Coordinate Progress Schedule and coordinate with Owner Occupancy during construction.

1.8 CONTRACTOR USE OF PREMESIS

- .1 Contractor has use of site until Substantial Performance

- .2 Coordinate use of premises under direction of Departmental Representative.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .4 Site area for Contractor's use:
 - .1 Provide security fencing (speed fencing, etc.).
- .5 All vehicles to be removed from construction site at the end of each day. Vehicles are not to be left unattended on the construction site.
- .6 If equipment is left on the construction site, the equipment must be decommissioned prior to the end of each working day.

1.9 PARTIAL OWNER
OCCUPANCY

- .1 Schedule and substantially complete designated portions of Work for Owner's occupancy prior to Certificate of Substantial Performance of entire Work.
- .2 Owner will occupy designated areas for purpose of installation of equipment.
- .3 Execute Partial Certificate of Substantial Performance for each designated portion of Work prior to Owner occupancy. Contractor shall allow:
 - .1 Access for Owner personnel.
 - .2 Use of parking facilities.
 - .3 Operation of HVAC and electrical systems.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 SUMMARY

- .1 Scope:
 - .1 Remove 2 - 1000kVA Dry Type transformers (Essential Power and Non-Essential Power)
 - .2 Supply and Install 2 new 1500kVA 600 Volt 3 Phase, 3 Wire dry type transformers as indicated. Due to site constraints, transformer size not to exceed 3550mm wide, 3550mm high and 1375mm deep (90' high x 90: wide x 54"deep.
 - .3 Supply and Installation of an 800 Amp 3 Pole molded case circuit breaker for the Essential Power System.
 - .4 Provide and connect a temporary 600kW, 600 Volt, 3 Phase, 3 Wire Diesel Generator complete with diesel oil in a sound rated enclosure for the duration of the project. Final location of the temporary generator to be determined on site.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-C22.1 Latest Edition, Canadian Electrical Code, Part 1 (21st Edition), Safety Standard for Electrical Installations.
 - .2 CAN3-C235-[83(R2006)], Preferred Voltage Levels for AC Systems, 0 to 50,000 V
- .2 The Ontario Electrical Safety Code 2009, and all bulletins (Ontario).
- .3 Hydro requirements and local applicable codes and regulations.

1.3 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.

1.4 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Product Data: submit WHMIS MSDS.
- .3 Submit for review single line electrical diagrams under Plexiglas and locate as follows:
 - .1 Updated Electrical distribution system in main electrical room.
- .5 Shop drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario within [3] weeks of Award of Contract.

- .6 Quality Control: in accordance with Section 01 45 00.
 - .1 Provide CSA certified [equipment] [and] [material].
 - .2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: in accordance with General Conditions of contract. Pay associated fees. Departmental Representative will provide drawings and specifications required by Electrical Inspection Department and Supply Authority at no cost.
 - .5 Submit, upon completion of Work, load balance report as described in PART 3 - Load Balance.
 - .6 Submit certificate of acceptance from Electrical Inspection Department authority having jurisdiction upon completion of Work to Departmental Representative.

1.5 QUALITY
ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00.
- .2 The work of this Division to be carried out by a contractor who holds a valid Master Electrical Contractor License as issued by the Province of Ontario.
- .3 Qualifications: electrical Work to be carried out by qualified, licensed electricians or apprentices in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.
- .4 Conduct a complete testing, start-up and Commissioning Program as specified in Division 01.
- .5 Submit a complete testing and Commissioning Schedule and notify the Engineer a minimum of 40 hours prior to performance of testing.
- .6 Submit a complete testing and Commissioning report at completion of the work.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Material Delivery Schedule: provide Departmental Representative with schedule within 2 weeks after award of Contract.
- .2 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 20.

- 1.7 SYSTEM STARTUP
- .1 Instruct Departmental 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 with aspects of its care and operation.

PART 2 - PRODUCTS

- 2.1 SUSTAINABLE REQUIREMENTS
- .1 Provide Materials and products in accordance with Section 01 61 15.
- 2.2 MATERIALS AND EQUIPMENT
- .1 Provide material and equipment in accordance with Section 01 61 00.
 - .2 Material and equipment to be CSA certified. Where CSA certified material and equipment is not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - Submittals.
 - .3 Factory assemble control panels and component assemblies. .
 - .4 Uniformity of manufacturer shall be maintained for any particular item or type of equipment throughout the building.
- 2.4 WARNING SIGNS
- .1 Warning Signs: in accordance with requirements of authority having jurisdiction, inspection authorities and Departmental Representative.
 - .2 Decal signs, minimum size 175 x 250 mm.
- 2.5 WIRING TERMINATIONS
- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.6 EQUIPMENT
IDENTIFICATION

- .1 Identify electrical equipment with nameplates and labels as follows:
 - .1 Nameplates: lamicaid 3mm thick black face, white core, mechanically attached with self-tapping screws.
 - .2 Sizes 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
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with [6] mm high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.
- .4 Allow for minimum of twenty-five (25) letters per nameplate and label.
- .5 Identification to be English.
- .6 Transformers: indicate capacity, primary and secondary voltages.
- .7 All nameplates shall be mechanically attached with a minimum of two chrome self tapping screws as well as the self adhesive.

2.7 WIRING
IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA-C22.1.

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 switchgear and distribution enclosures light gray to EEMAC 2Y-1.

PART 3 - EXECUTION

- 3.1 INSTALLATION .1 Do complete installation in accordance with CSA-C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise.
- 3.2 NAMEPLATES AND LABELS .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.
- 3.3 CONDUIT AND CABLE INSTALLATION .1 Install cables, conduits and fittings neatly and close to building structure.
- 3.4 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.
- 3.5 CO-ORDINATION OF PROTECTIVE DEVICES .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.
- 3.6 FIELD QUALITY CONTROL .1 Load Balance:
- .1 Measure phase current to panelboards 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:
- .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Circuits originating from branch distribution

panels.

- .3 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.

- .3 Carry out tests in presence of Departmental 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.

3.8 CLEANING

- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 Provide a short-circuit and protective device coordination study for the electrical distribution system. The intent of this study is to verify that the specified and supplied equipment are properly rated, correctly applied, and within industry and manufacturer's tolerances.
- .2 Short circuit study shall:
 - .1 Consider operation during normal conditions, alternate operations, emergency power conditions, and any other operations which could result in maximum fault conditions.
- .3 Coordination study shall:
 - .1 Determine the correct settings for the protective devices which will minimize the damage caused by an electrical fault and allow for selective coordination between the devices.
 - .2 Include the closest upstream utility protective device down to the panelboard main, branch, or feeder circuit breakers.
 - .3 Consider operation during normal conditions, alternate operation, and during emergency power conditions.

1.2 QUALIFICATIONS

- .1 Contractor shall have the coordination study prepared by qualified engineers of an independent consultant. Consultant shall be a Registered Professional Electrical Engineer, licensed in the province where the project is completed, who has at least ten (10) years of experience and specializes in performing power system studies.
- .2 Perform short circuit and coordination study using the industry recognized program for Windows computer software package.

1.3 SUBMITTALS

- .1 Submit power system studies within 30 days after the electrical equipment submittals have been received for review by the Departmental Representative.
- .2 Submit three (3) copies of the power systems study.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 IMPEDANCE ONE-LINE DIAGRAM .1 Create an impedance one-line diagram. Protect all electrical equipment wiring by overcurrent devices installed under this project and indicate each location where the fault current will be calculated. Clearly indicate, on the single-line, the schematic wiring of the electrical distribution system.

- .2 Show reference nodes on the single-line diagram referring to a formal report and include the following specific information:
- .1 X/R ratios, utility contribution, and short circuit values (asymmetrical and symmetrical) at the bus of the main service, and all downstream equipment containing overcurrent devices.
 - .2 Transformer kVA and voltage ratings, percent impedance, X/R ratios and wiring connections.
 - .3 Voltage at each bus.
 - .4 Identifications of each bus.
 - .5 Conduit material, feeder sizes and length.

3.2 SHORT CIRCUIT STUDY .1 Calculate by means of the industry recognized program for Windows computer software package. Incorporate pertinent data, rationale employed, and assumptions in developing the calculations in the introductory remarks of the study.

- .2 Do study in accordance with applicable ANSI and IEEE Standards.
- .3 Determine available 3 phase short circuit and ground fault currents at each bus. Incorporate motor contribution in determining momentary and interrupting ratings of the protective devices.
- .4 Present data determined by short circuit study in table format. Include:
- .1 Node & Device identification.
 - .2 Operating voltage.
 - .3 Type of Protective device. (i.e. fuse, molded case circuit breaker, etc.)
 - .4 Device short circuit rating.
 - .5 Calculated maximum short circuit current, 3 phase or ground fault, asymmetrical and symmetrical,

and X/R ratio.

.6 De-rate the devices where the tested X/R ratio is less than the calculated X/R ratio. (maximum fault current multiplied by MF.)

.7 Comments section indicating that device is underrated.

3.3 PROTECTIVE
DEVICE COORDINATION
STUDY

- .1 Calculate by means of the industry recognized program for Windows computer software package.
- .2 Meet or exceed CSA-C22.1-2009 Canadian Electrical Code (CEC) and Ontario Electrical Safety Code 2009 (OESC).
- .3 Include the closest upstream utility protective device down to the panelboard main, branch, or feeder circuit breakers. Prepare coordination curves to determine the required settings of protective devices to assure selective coordination.
- .4 Include phase and ground overcurrent protection, as well as settings for all other adjustable protective devices.
- .5 Graphically illustrate on log-log paper that adequate time separation exists between devices. Use sufficient curves to clearly indicate the coordination achieved between devices. Maintain reasonable coordination intervals and separation of characteristic curves. Plot the specific time-current characteristics of each protective device in such a manner that the upstream devices will be clearly depicted on the sheet.
- .6 Plots shall include complete titles, representative one-line diagram and legends, associated power company's relays or fuse characteristics, and complete parameters of transformers. Maximum of eight protective devices per sheet.
- .7 Indicate the following specific information on the coordination curves:
 - .1 Device identifications.
 - .2 Time and current ratio for curves.
 - .3 Fuse circuit breaker, and relay curves, showing complete operating bands of low-voltage circuit breaker trip curves.
 - .4 Significant maximum symmetrical or asymmetrical short circuit cutoff point.
 - .5 Electric utility's relays and/or fuses including manufacturer's minimum melt, total clearing, tolerance.
 - .6 Medium voltage equipment relays.
 - .7 Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
 - .8 Low voltage equipment circuit breaker trip

devices, including manufacturers tolerance bands.

.9 Pertinent transformer full-load currents at 100% and 600%.

.10 Ground fault protective device settings.

.11 Other system load protective devices for largest branch circuit and feeder circuit breaker in each motor control center and panelboard.

.8 Develop a table to summarize the settings selected for the protective devices. Include the following:

.1 Device identification.

.2 Current transformer ratio, relay tap, time delay, and instantaneous pickup.

.3 Circuit breaker sensor rating, long-time, short-time, and instantaneous settings, and time bands.

.4 Fuse rating and type.

.5 Ground fault pickup and time delay.

3.4 ANALYSIS

.1 Analyze short circuit calculations and highlight any equipment that is determined to be underrated as specified or not coordinated. Propose approaches to effectively protect the underrated equipment. Proposed major corrective modifications will be taken under advisement by the Departmental Representative, and the Contractor will be given further instructions.

.2 After developing the coordination curves, highlight areas lacking coordination. For each sheet, present a technical evaluation with a discussion of the logical compromises for best coordination.

3.5 REPORT

.1 Summarize the results of the power system study in a final report.

.2 Report shall include the following sections:

.1 Introduction, executive summary and recommendations, assumptions, impedance one line drawing, and copies of the project single-line drawings.

.2 Tabulations of equipment ratings versus calculated short circuit values and X/R ratios, and commentary regarding same.

.3 Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.

.4 Copies of manufacturer's time current curves for the devices studied and plotted.

PART 1 - GENERAL

1.1 SECTION INCLUDES .1 Materials and installation for wire and box connectors.

1.2 REFERENCES .1 Canadian Standards Association (CSA International)
.1 CAN/CSA-C22.2 No.18.4-04(R2009), Hardware for the Support of Conduit, Tubing and Cable.
.2 CAN/CSA-C22.2 No.18-98(R2003), Outlet Boxes,
.3 CSA C22.2 No.65-03, Wire Connectors.
.2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
.1 EEMAC 1Y-2, 1961 Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
.3 National Electrical Manufacturers Association (NEMA).

1.3 WASTE MANAGEMENT AND DISPOSAL .1 Separate and recycle waste materials in accordance with Section 01 74 20.
.2 Divert unused wiring materials from landfill to metal recycling facility as approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Pressure type wire connectors to: CSA C22.2 No.65], with current carrying parts of copper sized to fit copper aluminum conductors as required.
.2 Lugs, terminals, and screws used for termination of conductors, shall be suitable for type of conductor used.
.3 Wire connectors to CSA C22.2 No. 65-93.
.4 Acceptable manufacturers: Buchanan or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION .1 Remove insulation carefully from ends of conductors and:
.1 Install mechanical pressure type connectors and tighten screws [with appropriate compression tool recommended by manufacturer]. Installation shall meet secureness tests in accordance with CSA C22.2 No.65.

PART 1 - GENERAL

1.1 PRODUCT DATA .1 Provide product data in accordance with Section 01 33 00.

PART 2 - PRODUCTS .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
.2 Copper conductors: size as indicated, with 1000 V insulation of cross-linked thermosetting polyethylene material rated R90, RW90 XLPE and RWU90 XLPE as noted on the drawings.

2.1 GENERAL .1 Power service feeders shall be conduit and wire as noted.
.2 Minimum power conductor size shall be #12 AWG.
.6 Minimum control conductor size shall be #14 AWG.
.7 Wire and cables for 600 volt wiring shall be insulated to 1000 volts.

2.1 BUILDING WIRES .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
.2 Copper conductors: size as indicated, with 1000 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Non Jacketed.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL .1 Perform tests in accordance with Section 26 05 00.
.2 Perform tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.
.3 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION .1 Terminate cables in accordance with Section 26 05 20.
.4 Cable Colour Coding: to Section 26 05 00.
.5 Conductor length for parallel feeders to be identical.

.6 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.

3.3 INSTALLATION OF BUILDING WIRES

.1 Install wiring as follows:
.1 In conduit systems in accordance with Section 26 05 34.

PART 1 - GENERAL

- | | | |
|--|----|--|
| <u>1.1 SECTION INCLUDES</u> | .1 | Materials and installation for connectors and terminations. |
| <u>1.2 RELATED SECTIONS</u> | .1 | Section 26 05 33 - Raceway and Boxes for Electrical Systems. |
| <u>1.3 REFERENCES</u> | .1 | Canadian Standards Association (CSA International)
.1 CSA C22.2 No.41-07, Grounding and Bonding Equipment. |
| <u>1.4 PRODUCT DATA</u> | .1 | Submit product data in accordance with Section 01 33 00. |
| <u>1.5 CERTIFICATES</u> | .1 | Obtain inspection certificate of compliance covering high voltage stress coning from inspection authority and include it with as-built drawings. |
| <u>1.6 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate and recycle waste materials in accordance with Section 01 74 20. |
| | .2 | Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative. |

PART 2 - PRODUCTS

- | | | |
|--|----|--|
| <u>2.1 CONNECTORS AND TERMINATIONS</u> | .1 | Copper long barrel compression connectors to CSA C22.2 as required sized for conductors. |
|--|----|--|

PART 3 - EXECUTION

- 3.1 INSTALLATION
- .1 Install stress cones, terminations, and splices in accordance with manufacturer's instructions.
 - .2 Bond and ground as required [to CSA C22.2 No.41].

PART 1 - GENERAL

1.1 REFERENCES

- .1 Institute of Electrical and Electronics Engineers (IEEE)
 - .1 IEEE 837-2002, Standard for Qualifying Permanent Connections Used in Substation Grounding.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Conductors: bare, stranded, tinned soft annealed copper wire, size No. 4/0 AWG and 2/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, switchgear, motors, ground connections.
- .2 Conductors: pvc insulated coloured green, stranded tinned soft annealed copper wire, size No. 4 AWG for grounding cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers.
- .7 Bolted removable test links.
- .8 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:
 - .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.
- .10 Wire connectors and terminations: as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Connect new Electrical Equipment to the existing Primary Grounding System to the requirements of local authority having jurisdiction.
- .2 Install connectors and cadweld in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors during and after installation of the new equipment.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.

- .5 Use No. 4/0 AWG bare copper cable for main ground bus of substation and No. 2/0 AWG mhd bare copper cable for taps on risers from main ground bus to equipment.
- .6 Do not use bare copper conductors near un-jacketed lead sheath cables.

3.3 EQUIPMENT
GROUNDING

- .1 Ground hinged doors to main frame of electrical equipment enclosure with flexible jumper.

3.10 FIELD QUALITY
CONTROL

- .1 Perform tests in accordance with Section 26 05 00.

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 26 05 01 - Common Work Results - Electrical.
- 1.2 REFERENCES
- .1 Institute of Electrical and Electronics Engineers (IEEE)
- .1 IEEE 837-2002, Standard for Qualifying Permanent Connections Used in Substation Grounding.
- .2 Canadian Standards Association, (CSA International)
- .1 CAN/CSA-Z32-09, Electrical Safety and Essential Electrical Systems in Health Care Facilities.

PART 2 - PRODUCTS

- 2.1 EQUIPMENT
- .1 Clamps for grounding of conductor: size as required.
- .2 Grounding conductors: bare stranded copper, [tinned], soft annealed, size [as indicated].
- .3 Insulated grounding conductors: green.
- .4 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.

PART 3 - EXECUTION

- 3.1 INSTALLATION GENERAL
- .1 Connect complete permanent, continuous grounding system including to the existing Secondary Grounding System.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 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] [one] end[s] to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.

3.2 EQUIPMENT
GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear.

3.10 FIELD QUALITY
CONTROL

- .1 Perform tests in accordance with Section 26 05 01.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.
- .4 Disconnect ground fault indicator during tests.

PART 1 - GENERAL

- 1.1 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with Section 01 74 20.
 - .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 Divert unused metal materials from landfill to metal recycling facility as approved by Engineer.
 - .5 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 41] mm, [2.5] mm thick, surface mounted or suspended.

PART 3 - EXECUTION

- 3.1 INSTALLATION
- .1 Secure equipment to poured concrete with expandable inserts.
 - .2 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
 - .3 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
 - .4 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.
 - .7 Suspended support systems.
 - .1 Support individual cable or conduit runs with

6 mm dia threaded rods and spring clips.

.2 Support 2 or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.

- .8 For surface mounting of two or more conduits use channels at 3.0 m on centre spacing.
- .9 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .10 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .11 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .12 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Departmental Representative.
- .13 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

PART 1 - GENERAL

- 1.1 REFERENCES .1 Canadian Standards Association (CSA International)
.1 CSA C22.1-[09], Canadian Electrical Code, Part 1, 21st Edition.
- 1.2 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- 1.3 DELIVERY, STORAGE AND HANDLING .1 Deliver, store and handle materials in accordance with Section 01 61 00.
.2 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 0.

PART 2 - PRODUCTS

- 2.1 OUTLET AND CONDUIT BOXES GENERAL .1 Size boxes in accordance with CSA C22.1.
.2 Blank cover plates for boxes without wiring devices.
- 2.2 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 35 mm 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 Provide correct size of openings in boxes for conduit. Do not install reducing washers.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-C22.2 No. 18-[98(R2003)], Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
 - .2 CAN/CSA-C22.2 NO. 18.1-04, Metallic Outlet Boxes.
 - .3 CSA C22.2 No. 45-[M1981(R2008)], Rigid Metal Conduit.
 - .4 CSA C22.2 No. 56-[04], Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .5 CSA C22.2 No. 83-[M1985(R2008)], Electrical Metallic Tubing.

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

- 1.3 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .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.

- 2.2 CONDUITS
- .1 Rigid metal conduit: to CSA C22.2 No. 45, hot dipped galvanized steel threaded.
 - .2 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, [with couplings] [with expanded ends].

- 2.3 CONDUIT
- .1 One hole steel straps to secure surface conduits 50 mm and smaller.

- FASTENINGS
- .2 Two hole steel straps for conduits larger than 50 mm.
 - .3 Beam clamps to secure conduits to exposed steel work.
 - .4 Channel type supports for two or more.
 - .4 Threaded rods, 6 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 90 degrees bends for 25 mm and larger conduits.
 - .3 Watertight connectors and couplings for EMT.
 - .1 Set-screws are not acceptable.

- 2.5 FISH CORD
- .1 Polypropylene.

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 Use rigid hot dipped galvanized steel threaded conduit except where specified otherwise.
 - .3 Use electrical metallic tubing (EMT) above 2.4 m not subject to mechanical injury.
 - .4 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
 - .5 Mechanically bend steel conduit over 19 mm diameter.
 - .6 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
 - .7 Install fish cord in empty conduits.

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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 Do not pass conduits through structural members except as indicated.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 11.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Dry type transformers with ratings up to 5000 kVA single phase and up to 7500 kVA three phase and voltage class up to 46 kV
- 1.2 REFERENCES
- .1 Canadian Standards Association (CSA International)
 - .1 CSA C9-02(R2007), Dry-Type Transformers.
 - .2 CAN/CSA-C802.2-06, Minimum Efficiency Values For Dry-Type Transformers.
 - .2 National Electrical Manufacturers Association (NEMA)
 - .1 NEMA [_____].
- 1.3 SHOP DRAWINGS
- .1 Submit shop drawings in accordance with Section 01 33 00.
 - .2 Include:
 - .1 Dimensioned drawing showing enclosure, mounting devices, terminals, taps, internal and external component layout.
 - .2 Technical data:
 - .1 kVA rating.
 - .2 Primary and secondary voltages.
 - .3 Frequency.
 - .4 Three phase.
 - .5 Polarity or angular displacement.
 - .6 Full load efficiency.
 - .7 Regulation at unity pf.
 - .8 BIL.
 - .9 Insulation type.
 - .10 Sound rating.
- 1.4 CONTROL SUBMITTALS
- .1 Submit to Departmental Representative 6 copies of standard factory test certificates of each transformer and type test of each transformer in accordance with CSA C9.
- 1.5 CLOSEOUT SUBMITTALS
- .1 Provide operation and maintenance data for dry type transformers for incorporation into manual specified in Section 01 78 00.
 - .2 Operation and maintenance instructions to include:
 - .1 Tap changing.
 - .2 Recommended environmental conditions.
 - .3 Recommended periodic inspection and maintenance.
 - .4 Bushing replacement.

1.6 DELIVERY,
STORAGE AND
HANDLING

.1 Store transformers indoors in dry location.

.2 Transformer Core and Coils to be shipped without the enclosures. Enclosures to be assembled on site.

1.7 WASTE
MANAGEMENT AND
DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 20.

.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 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.

.5 Fold up metal banding, flatten and place in designated area for recycling.

1.8 EXTRA MATERIALS

.1 Provide maintenance materials in accordance with Section 01 78 00.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Dry-type transformers: to CSA C9.

.2 Bushings: to [EEMAC GL1-3] [NEMA].

2.2 TRANSFORMER
CHARACTERISTICS

.1 Type: ANN.

.2 Rating: 1500 K.V.A, 3 phase, 60 Hz.

.3 220 insulation system class, 150°C temperature rise.

.4 Impedance: not to exceed 6%.

.5 Primary winding: 15.0 kV, delta, BIL 95 kV and grounded.

.6 Secondary winding: 600 V, star.

.7 No load losses not to CAN/CSA-C802.2.

.8 Full load losses not to CAN/CSA-C802.2.

.9 Sound rating to CAN/CSA-C802.2.

2.3 ENCLOSURE

.1 Fabricated from sheet steel.

.2 Bolted removable panels for access to tap connections, enclosed terminals.

.3 Conductor entry:
.1 Knockouts.

.4 Designed for floor mounting.

.5 Indoor, self-ventilated. Temperature of exposed metal parts not to exceed 65°C rise.

2.4 VOLTAGE TAPS

.1 Standard.

2.5 TAP CHANGER

.1 Bolted-link type.

2.6 WINDINGS

.1 Primary and secondary coils:
.1 Copper.

.2 Coil and core assembly:
.1 Taps located at front of coils for accessibility.

2.7 ACCESSORIES

.1 Winding temperature detector relay and sensing elements [with] [one] [two] [set[s] of SPDT contacts].

.2 Wiring and terminal box for protective devices.

.3 [Dial] [Digital] type winding temperature indicator [with] [alarm contacts] [sequence contacts [3] required].

.4 Grounding terminal: inside of enclosure.

2.8 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section [26 05 00].

.2 Equipment labels: nameplate size [7], labelled.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Locate, install and ground transformer[s] in accordance with manufacturer's instructions.
- .2 Set and secure transformers in place, rigid plumb and square.
- .3 Connect primary terminals to high voltage circuit.
- .4 Connect secondary terminals to secondary cables.
- .5 Use flexible conduit to make connections to transformer.
- .6 Energize transformers and check secondary no-load voltage.
- .7 Adjust primary taps as necessary to produce rated secondary voltage at no-load.
- .8 Wire one set of contacts on winding temperature detector relay to sound alarm, wire second set of contacts to BAS.
- .9 Wire alarm contacts on winding temperature indicator to sound alarm when excessive temperature reached.
- .10 Use torque wrench to adjust internal connections in accordance with manufacturers' recommended values.
- .11 Check transformer for dryness before putting it into service and if it has not been energized for some considerable time.

3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00.

PART 1 - GENERAL

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|--|----|--|
| <u>1.1 SECTION INCLUDES</u> | .1 | Materials for moulded-case circuit breakers. |
| <u>1.2 REFERENCES</u> | .1 | Canadian Standards Association (CSA International).
.1 CSA-C22.2 No. 5-[02(R2007)], Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE). |
| <u>1.3 SUBMITTALS</u> | .1 | Submit product data in accordance with Section [01 33 00]. |
| <u>1.4 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 20. |
| | .2 | 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. |

PART 2 - PRODUCTS

- | | | |
|-----------------------------|----|--|
| <u>2.1 BREAKERS GENERAL</u> | .1 | Moulded-case circuit breakers to CSA C22.2 No. 5 |
| | .2 | Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation. |
| | .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 3-10 times current rating. |
| | .6 | Circuit breakers with interchangeable trips as indicated. |
| | .7 | Circuit breakers to have minimum 25,000A symmetrical rms interrupting capacity rating. |

2.2 THERMAL .1 Moulded case circuit breaker to operate automatically
MAGNETIC BREAKERS by means of thermal and magnetic tripping devices to
provide inverse time current tripping and
instantaneous tripping for short circuit protection.

PART 3 - EXECUTION

3.1 INSTALLATION .1 Install circuit breakers as indicated.