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PWGSC Ontario	SPECIFICATION	Section 00 00 00
Region Project	TITLE SHEET	Page 1
Number R.074570.001		2015-12-08

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Project Title            Roof Replacement Animal Pathology Lab  
Health Canada, 110 Stone Road West, Guelph, Ontario

Project Number        R.074570.001

Project Date            2015-12-08

PWGSC Ontario  
Region Project  
Number

SEALS PAGE

Section 00 01 07

2015-12-08

Consultant for Building Code Review:



Building Code Designation Number (BCDN):

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PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Title and description of Work.
  - .2 Contract Method.
  - .3 Work by others.
  - .4 Work sequence.
  - .5 Contractor use of premises.
  - .6 Owner occupancy.
  - .7 Alterations to existing building.
- 1.2 PRECEDENCE
- .1 For Federal Government Projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 WORK COVERED BY CONTRACT DOCUMENTS
- .1 Work of this Contract comprises roof replacement of Canada Revenue Agency Animal Pathology Lab located at 110 Stone Road West, Guelph, Ontario; and further identified as APL Roof Replacement.
- 1.4 CONTRACT METHOD
- .1 Construct work under lump sum contract.
  - .2 Relations and responsibilities between Contractor and subcontractors and suppliers assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:
    - .1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Contractor is required to furnish such bonds to Departmental Representative.
    - .2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Departmental Representative.
-

- 1.5 COST BREAKDOWN
- .1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract Price.
  - .2 Show separately cost of equipment purchased exempt from Ontario Retail Sales Tax under your Ontario Sales Tax licence number.
  - .3 Within 48 hours of acceptance of bid submit a list of subcontractors.

- 1.6 WORK SEQUENCE
- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction.
  - .2 Coordinate Progress Schedule and coordinate with Owner Occupancy during construction.
  - .3 Maintain fire access/control.

- 1.7 CONTRACTOR USE OF PREMISES
- .1 Contractor shall limit use of premises for Work, for storage, and for access, to allow;
    - .1 Owner occupancy.
    - .2 Partial owner occupancy.
    - .3 Work by other contractors.
    - .4 Public usage.
  - .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.

- 1.8 OWNER OCCUPANCY
- .1 Owner will occupy premises during entire construction period for execution of normal operations.
  - .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

- 1.9 ALTERATIONS TO EXISTING BUILDING
- .1 Remove and recycle, compost, anaerobically digest, sell material for reuse or dispose of:
-

- 1.9 ALTERATIONS TO EXISTING BUILDING (Cont'd)
- .1 (Cont'd)
    - .1 Existing roofing system including gypsum sheathing board, insulation and membrane.
    - .2 Mechanical and electrical items as indicated.
  - .2 Remove in good order, turn over to Department, and store within building where designated by Departmental Representative:
    - .1 Mechanical and electrical items as indicated.
  - .3 Remove, temporarily store, clean, alter to suit and reinstall:
    - .1 Roof Drains.
    - .2 Parapet Caps. Number, store and protect each to facilitate reinstallation in same location from which they were removed.
    - .3 Metal panels and subgirts as indicated. Salvage for reuse where removal is possible without damaging panels, or replace with new to match existing.
    - .4 Stone ballast.
    - .5 Concrete paving stones.
    - .6 Mechanical and electrical items as indicated.
  - .4 Remove, temporarily store and turn over to other sections for building in:
    - .1 Mechanical and electrical items as indicated.
  - .5 Provide new openings required in existing construction.
  - .6 Block in openings where items removed with material and finish to match existing adjoining construction.

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 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.

1.2 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 Where security is reduced by work provide temporary means to maintain security.
- .4 Contractor shall be responsible for providing portable toilets for use by Contractor's personnel. Keep facilities clean.
- .5 Contractor shall provide own means of moving workers and material to roof.
  - .1 Protect walls of existing building, to approval of Departmental Representative prior to installation any equipment.
  - .2 Accept liability for damage, safety of equipment and overloading of existing equipment.
- .6 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS,  
ADDITIONS OR  
REPAIRS TO EXISTING  
BUILDING

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

1.4 EXISTING  
SERVICES

- .1 Notify, Departmental Representative 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 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.

1.5 SPECIAL  
REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16 - Construction Progress Schedule - Bar (GANTT) Chart.
  - .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
  - .3 Indicate time frames when noisy or other work that may be disruptive for the building occupants is scheduled. Provide minimum 5 days notice of such work to Departmental Representative.
  - .3 Keep within limits of work and avenues of ingress and egress.
  - .4 Ingress and egress of Contractor vehicles at site is limited to locations as indicated on drawings
  - .5 Coordinate delivery of materials with Departmental Representative.
-

1.5 SPECIAL REQUIREMENTS (Cont'd) .6 Prior to cutting or drilling horizontal or vertical surfaces including concrete, concrete block or other structural substrate, determine location of reinforcing, service lines, pipes, conduits or other items by x-ray, ground penetrating radar or other appropriate method. Submit findings to Departmental Representative prior to cutting or drilling.

1.6 SECURITY .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

.2 Security clearances:  
.1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.  
.2 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

1.7 BUILDING SMOKING ENVIRONMENT .1 Comply with smoking restrictions. Smoking is not permitted.

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 4 days in advance of meeting date to 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 Departmental Representative, meeting participants and affected parties not in attendance.
  - .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 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.
-

1.2 PRECONSTRUCTION  
MEETING  
(Cont'd)

- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 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, mock-ups, 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 Site security in accordance with Section 01 56 00.
  - .6 Health and safety in accordance with Section 01 35 29.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .8 Owner provided products.
  - .9 Record drawings and specifications in accordance with Sections 01 33 00 and 01 78 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 weeks prior to project completion, schedule progress meetings biweekly.
  - .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
  - .3 Notify parties minimum five days prior to meetings.
-

1.3 PROGRESS  
MEETINGS  
(Cont'd)

- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.
- .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  
(Cont'd)
- .9 Project Planning, Monitoring and Control 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 ten 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.
-

- 1.4 MASTER PLAN (Cont'd)
- .3 Revise impractical schedule and resubmit within 5 working days.
  - .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 Siding and Roofing.
    - .6 Plumbing.
    - .7 Lighting.
    - .8 Electrical.
    - .9 Piping.
    - .10 Controls.
    - .11 Heating, Ventilating, and Air Conditioning.
    - .12 Testing and Commissioning.
    - .13 Departmental Representative supplied equipment required dates.
- 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.
-

- 1.7 PROJECT MEETINGS
- .1 Discuss Project Schedule at regular site meetings specified in Section 01 31 19, 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 will in no way become a justification for contract changes to project total completion date or project cost.

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.
-

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 also submit in electronic format as pdf files. Forward pdf, NMSEdit Professional spp, MS Word, MS Excel, MS Project and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

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 10 working 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.
-

1.2 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
  - .7 Accompany submissions with transmittal letter, in duplicate, containing:
    - .1 Date.
    - .2 Project title and number.
    - .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 electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
-

1.2 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .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 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.
-

1.2 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .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.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, 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.
- .21 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.
-

- 1.3 SAMPLES  
(Cont'd)
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
  - .4 Where colour, pattern or texture is criterion, submit full range of samples.
  - .5 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 Section 01 45 00.

- 1.6 CERTIFICATES AND TRANSCRIPTS
- .1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

- 1.7 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.

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 2010 (NBC):
    - .1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
  - .3 National Fire Code 2010 (NFC):
    - .1 NFC 2010, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
  - .4 Province of Ontario:
    - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
    - .2 O. Reg. 490/09, Designated Substances.
    - .3 Workplace Safety and Insurance Act, 1997.
    - .4 Municipal statutes and authorities.
  - .5 Treasury Board of Canada Secretariat (TBS):
    - .1 Treasury Board, Fire Protection Standard April 1, 2010 [www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text](http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text).
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit 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.
    - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
    - .3 Measures and controls to be implemented to address identified safety hazards and risks.
-

1.2 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
(Cont'd)

- .3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Emergency 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.
  - .6 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.
  - .7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
  - .8 Submit names of personnel and alternates responsible for site safety and health.
  - .9 Submit records of Contractor's Health and Safety meetings when requested.
  - .10 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
-

1.2 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
(Cont'd)

- .11 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .12 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .13 Submit copies of incident and accident reports.
- .14 Submit Material Safety Data Sheets (MSDS).
- .15 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

1.3 FILING OF  
NOTICE

- .1 File Notice of Project with Provincial authorities prior to commencement of Work.

1.4 WORK PERMIT

- .1 Obtain building permits related to project prior to commencement of Work.
- .2 Obtain Hot Work Permit from Property Manager.

1.5 SAFETY  
ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 REGULATORY  
REQUIREMENTS

- .1 Comply with the Acts and regulations of the Province of Ontario.
  - .2 Comply with specified standards and regulations to ensure safe operations at site.
-

1.8 PROJECT/SITE  
CONDITIONS

- .1 Work at site may involve contact with designated or hazardous substances. Contractor shall coordinate and take necessary precautions and/or measures in accordance with information on hazardous or designated substances provided by Departmental Representative.

1.9 GENERAL  
REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.10 COMPLIANCE  
REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

1.11 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
  - .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
-

- 1.11 RESPONSIBILITY (Cont'd) .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.
- 1.12 UNFORSEEN 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.
- 1.13 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.
-

1.14 CORRECTION OF  
NON-COMPLIANCE  
(Cont'd) .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 POWDER  
ACTUATED DEVICES .1 Use powder actuated devices only after receipt  
of written permission from Departmental  
Representative.

1.16 WORK STOPPAGE .1 Give precedence to safety and health of public  
and site personnel and protection of environment  
over cost and schedule considerations for Work.

.2 Assign responsibility and obligation to  
Competent Supervisor to stop or start Work when,  
at Competent Supervisor's discretion, it is  
necessary or advisable for reasons of health or  
safety. Departmental Representative may also  
stop Work for health and safety considerations.

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 RELATED  
SECTIONS

- .1 Section 01 35 30: Fire safety plan.

1.2 GENERAL

- .1 This section specifies general requirements and procedures for fire safety. Additional requirements may be specified in individual sections elsewhere in specifications.

1.3 REPORTING FIRES

- .1 The Departmental Representative will co-ordinate arrangements for the Contractor to be briefed at the pre-construction meeting concerning Building's fire safety protocol.
- .2 Building Manager will supply a copy of "Fire Safety Emergency Evacuation Plan" in effect for this building. Contractor shall comply with outlined fire safety requirements.
- .3 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .4 Report immediately all fire incidents to Fire Department as follows:  
.1 activate nearest fire alarm box; or  
.2 telephone.
- .5 Person activating fire alarm box will remain at box to direct Fire Department to scene of fire.
- .6 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

1.4 FIRE WATCH

- .1 Appoint a Fire Watch at locations where welding and soldering, torching or roofing is to take place.
- .2 A dedicated Fire Watch is not required. A competent person from the workforce on site may be assigned as Fire Watch for duration of work.
-

- 1.4 FIRE WATCH  
(Cont'd)
- .3 Assign a person who is knowledgeable in the correct use of fire extinguishers on the project.
  - .4 Have work inspected by the Fire Watch up to 1.0 hours after work stoppage for each work period.
- 1.5 INTERIOR AND  
EXTERIOR FIRE  
PROTECTION AND  
ALARM SYSTEMS
- .1 Fire protection and alarm system will not be:
    - .1 obstructed;
    - .2 shut-off; or
    - .3 left inactive at end of working day or shift.
  - .2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Departmental Representative.
  - .3 Provide and maintain free access to fire extinguishing equipment. Maintain exit facilities. Keep means of egress free from materials, equipment and obstructing.
- 1.6 FIRE  
EXTINGUISHERS
- .1 Supply fire extinguishers, as necessary to protect work in progress and contractor's physical plant on site.
- 1.7 INSTALLATION  
AND/OR REPAIR OF  
ROOF TO INCLUDE  
CONTRACTORS  
PHYSICAL PLANT AT  
SITE
- .1 Ensure personnel use and take precautions as follows:
    - .1 Use kettles equipped with thermometers or gauges in good working order.
    - .2 Locate kettles in safe place outside of building. Locate to avoid danger of igniting combustible material.
    - .3 Maintain continuous supervision while kettles are in operation and provide metal covers for kettles to smother any flames in case of fire. Fire extinguishers shall be provided as required in 1.6.
    - .4 Prior to start of work, demonstrate container capacities to Departmental Representative.
    - .5 Use only glass fibre roofing mops.
-

- 1.7 INSTALLATION AND/OR REPAIR OF ROOF TO INCLUDE CONTRACTORS PHYSICAL PLANT AT SITE  
(Cont'd)
- .1 (Cont'd)  
.6 Used roofing mops will not be left unattended on roof and shall be stored away from building and combustible materials.  
.7 All roofing materials will be stored in location no closer than 3 m to any structures.
- 1.8 BLOCKAGE OF ROADWAYS
- .1 Advise Departmental Representative of any work that would impede fire apparatus response. This includes violation of minimum required overhead clearance.
- 1.9 SMOKING PRECAUTIONS
- .1 Smoking is not permitted within areas of work or site storage.
- 1.10 RUBBISH AND WASTE MATERIALS
- .1 Rubbish and waste materials are to be kept to a minimum.
- .2 Burning of rubbish is prohibited.
- .3 Remove all rubbish from work site at end of work day or shift or as directed.
- .4 Storage:  
.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.  
.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove from site daily or at the end of each shift.
- 1.11 FLAMMABLE AND COMBUSTIBLE LIQUIDS
- .1 Handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
-





- 1.15 FIRE INSPECTION (Cont'd)
- .3 Co-operate with Building Manager during routine fire safety inspection of work site.
  - .4 Immediately remedy all unsafe fire situations observed by Building Manager.

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 humans; or degrade environment aesthetically, culturally and/or historically.
  - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- 1.2 REFERENCES
- .1 Canadian Construction Documents Committee (CCDC)
    - .1 CCDC 2-2008, Stipulated Price Contract.
  - .2 U.S. Environmental Protection Agency (EPA)/Office of Water
    - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
    - .2 EPA General Construction Permit (GCP) 2012.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00.
  - .2 Product Data:
    - .1 Submit manufacturer's instructions, printed product literature and data sheets for products and include product characteristics, performance criteria, physical size, finish and limitations.
    - .2 Submit 2 copies of WHMIS MSDS.
  - .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
-

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
(Cont'd)

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- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 Include in Environmental Protection Plan:
  - .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.
  - .4 Descriptions of environmental protection personnel training program.
  - .5 Erosion and sediment control plan identifying 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 and EPA 832/R-92-005, Chapter 3.
  - .6 Drawings indicating 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.
    - .1 Plans to include measures to minimize amount of material 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.
    - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
          (Cont'd)

- .6 (Cont'd)
- .9 Spill Control Plan to include 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, are contained on project site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste Water Management Plan identifying methods and procedures for management and or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

1.4 FIRES

- .1 Fires and burning of rubbish on site is not permitted.
-

1.5 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include 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, EPA 832/R-92-005, Chapter 3.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
  - .2 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
  - .3 Waterways to be kept free of excavated fill, waste material and debris.
  - .4 Design and construct temporary crossings to minimize erosion to waterways.
  - .5 Do not skid logs or construction materials across waterways.
  - .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
  - .7 Blasting is allowed only above water and 100 m minimum from indicated spawning beds.
-

1.7 POLLUTION  
CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
  - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

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 identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite 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.
-

- 1.9 NOTIFICATION .2 (Cont'd)  
(Cont'd)
- .1 Take action only after receipt of written 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 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11.
- .1 Leave Work area clean at end of each day.
  - .2 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.
  - .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
  - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
  - .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21.
    - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

PART 1 - GENERAL

- 1.1 REFERENCES AND CODES
- .1 Perform Work in accordance with National Building Code of Canada (NBC) 2010, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2012, 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 as directed by the Departmental Representative.
  - .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, other than those identified in Section 01 35 29 are discovered in course of work.
- 1.3 BUILDING SMOKING ENVIRONMENT
- .1 Comply with smoking restrictions.
- 1.4 IAQ - INDOOR AIR QUALITY
- .1 Comply with CSA-Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings and CSA B651-12.
- 1.5 TAXES
- .1 Pay applicable Federal, Provincial and Municipal taxes.
- 1.6 EXAMINATION
- .1 Examine existing conditions and determine conditions affecting work.
-

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 13 - Commissioning - General Requirements.

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, Owner 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, above and beyond those required of the Contractor. Cost of such services will be borne by Owner.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Owner. 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 Amount 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.
  - .6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

- 1.11 MILL TESTS
- .1 Submit mill test certificates as requested.

- 1.12 EQUIPMENT AND SYSTEMS
- .1 Submit testing, adjusting and balancing reports for mechanical, electrical systems.
  - .2 Submit Commissioning Documentation in accordance with Section 01 91 13.

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 REFERENCES .1 U.S. Environmental Protection Agency (EPA) / Office of Water  
.1 EPA 833-R-06-004, May 2007, Developing Your Stormwater Pollution Prevention Plan - A Guide for Construction Sites.
- 1.4 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- 1.5 INSTALLATION AND REMOVAL .1 Provide temporary utilities controls in order to execute work expeditiously.  
.2 Remove from site all such work after use.
- 1.6 WATER SUPPLY .1 Owner will 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 POWER AND LIGHT .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 120 volts 15 amps.
-

1.7 TEMPORARY POWER  
AND LIGHT  
(Cont'd)

- .2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.
- .3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.8 TEMPORARY  
COMMUNICATION  
FACILITIES

- .1 Provide and pay for temporary telephone data hook up, lines equipment necessary for own use and use of Departmental Representative.

1.9 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, egulations and bylaws.
- .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 NOT USED

- .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Construction aids.
  - .2 Office and sheds.
  - .3 Parking.
  - .4 Project identification.
- 1.2 REFERENCES
- .1 Canadian Construction Documents Committee (CCDC)
    - .1 CCDC 2-2008, Stipulated Price Contract.
  - .2 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.
  - .3 Canadian Standards Association (CSA International)
    - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
    - .2 CSA 0121-08(R2013), Douglas Fir Plywood.
    - .3 CSA Z797-09(R2014), Code of practice for Access Scaffold.
    - .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment, withdrawn but still available from CSA, CCOHS and Techstreet.
  - .4 U.S. Environmental Protection Agency (EPA)/ Office of Water
    - .1 EPA 833-R-06-004, May 2007, Developing Your Stormwater Pollution Prevention Plan - A Guide for Construction Sites.
- 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.
- .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 CSA Z797.
- .2 Provide and maintain scaffolding, ramps, and ladders.

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 ELEVATORS

- .1 Existing elevators may not be used by construction personnel.
- .2 Provide alternative means of transporting material and personnel to roof.

1.8 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.
-

1.9 CONSTRUCTION  
PARKING

- .1 Parking will be permitted on site in locations indicated on drawings.
- .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.
- .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.
- .5 Clean construction runways and taxi areas where used by Contractor's equipment.

1.10 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.

1.11 SANITARY  
FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 Permanent facilities may not be used.

1.12 CONSTRUCTION  
SIGNAGE

- .1 Provide and erect, within three weeks of signing Contract, a project sign in a location designated by Departmental Representative.
  - .2 Construction sign 1200 mm x 2400 mm, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.
-



1.13 PROTECTION AND  
MAINTENANCE OF  
TRAFFIC  
(Cont'd)

- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.14 CLEAN-UP

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

- 1.14 CLEAN-UP  
(Cont'd)
- .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 NOT USED .1 Not Used.

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(R2013), 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 Erect temporary site enclosures using 38 x 89mm construction grade lumber framing at 600 mm o.c. and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.
  - .3 Apply plywood panels vertically as indicated.
-

1.5 HOARDING  
(Cont'd)

- .4 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .5 Paint selected colours with one coat primer to public side of site enclosure in CAN/CGSB-1.189 and one coat exterior paint to CAN/CGSB-1.59. Maintain public side of enclosure in clean condition.

1.6 GUARD RAILS AND  
BARRICADES

- .1 Provide secure, rigid guard rails and barricades around open shafts, and open edges of 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.
- .4 Provide removal of water from roof area throughout entire Contract. Water shall not be allowed to collect or gather on the existing/new roof during demolition and throughout entire reconstruction period.
- .5 Provide temperature controlled storage area for all materials and components as necessary for completion of the Work.
- .6 Provide temporary enclosures and heating as required during construction period. Heating shall include all required attendance, maintenance and fuel. Protect exposed and adjacent areas from freezing.

- 1.8 ACCESS TO SITE .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- 1.9 PUBLIC TRAFFIC FLOW .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.
- 1.10 FIRE ROUTES .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- 1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY .1 Protect surrounding private and public property from damage during performance of Work.  
.2 Be responsible for damage incurred.
- 1.12 PROTECTION OF BUILDING FINISHES .1 Provide full photographic coverage documentation to Departmental Representative of existing conditions before construction begins. Photographs shall show condition of existing wall adjacent to Contractor's roof access, existing penthouse walls, existing parapet caps on lower and penthouse roofs and any additional areas as necessary or as requested by Departmental Representative.  
.2 Provide protection for finished and partially finished building finishes and equipment during performance of Work.  
.3 Provide necessary screens, covers, and hoardings.  
.4 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.  
.5 Be responsible for damage incurred due to lack of or improper protection.
-

- 1.13 PROTECTION OF LIGHTNING PROTECTION SYSTEM
- .1 Provide protection for building lightning protection system and ensure system remains fully operational during performance of Work.
  - .2 Provide independant testing and inspection company to test system upon completion of Work to ensure system has been fully reinstated and is operating in its full capacity.

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 Departmental Representative 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.
-

1.5 AVAILABILITY  
(Cont'd)

- .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.

1.7 STORAGE,  
HANDLING AND  
PROTECTION  
(Cont'd)

- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and metal panels 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.
- .2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

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.
-

- 
- 1.15 FASTENINGS  
(Cont'd)
- .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, and/or building occupants and pedestrian and vehicular traffic.
  - .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 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 Submit proposed materials, finishes and installation method for patching to Departmental Representative for approval, prior to patching.
-

1.4 EXECUTION  
(Cont'd)

.11 Refinish surfaces to match adjacent finishes:  
Refinish continuous surfaces to nearest  
intersection. Refinish assemblies by  
refinishing entire unit.

1.5 WASTE  
MANAGEMENT AND  
DISPOSAL

.1 Separate waste materials for reuse, and  
recycling in accordance with Section 01 74 21.

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 areas as indicated on drawings or as designated by Departmental Representative.
  - .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 21.
  - .7 Remove waste material and debris from site and deposit in waste container at end of each working day.
  - .8 Dispose of waste materials and debris off site.
  - .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
  - .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
-

1.2 PROJECT  
CLEANLINESS  
(Cont'd)

- .11 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 If ground is covered with snow or ice and/or is frozen at the time of Project Completion, Schedule a time after thaw to complete cleaning.
  - .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 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
  - .8 Remove dirt and other disfiguration from exterior surfaces.
  - .9 Clean and sweep roofs, gutters, areaways, and sunken wells.
  - .10 Sweep and wash clean paved areas.
-

- 1.3 FINAL CLEANING  
(Cont'd)
- .11 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
  - .12 Clean roofs, downspouts, and drainage systems.
  - .13 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
  - .14 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 SECTION INCLUDES
- .1 Text, schedules and procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:
    - .1 Diversion of Materials.
    - .2 Waste Audit (WA) - Schedule A.
    - .3 Waste Reduction Workplan (WRW) - Schedule B.
    - .4 Demolition Waste Audit (DWA) - Schedule C.
    - .5 Cost/Revenue Analysis Workplan (CRAW) - Schedule D.
    - .6 Materials Source Separation Program (MSSP).
    - .7 Canadian Governmental Responsibility for the Environment Resources - Schedule E.

- 1.2 DEFINITIONS
- .1 Cost/Revenue Analysis Workplan (CRAW): Based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
  - .2 Demolition Waste Audit (DWA): Relates to actual waste generated from project.
  - .3 Materials Source Separation Program (MSSP): Consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
  - .4 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.
  - .5 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
-

1.2 DEFINITIONS  
(Cont'd)

- .6 Recycling: Process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
  - .7 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:
    - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
    - .2 Returning reusable items including pallets or unused products to vendors.
  - .8 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
  - .9 Separate Condition: Refers to waste sorted into individual types.
  - .10 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.
  - .11 Waste Audit (WA): Detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A. Target for this project is 75% diversion from landfill.
  - .12 Waste Management Coordinator (WMC) : Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
  - .13 Waste Reduction Workplan (WRW): Written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).
-

- 1.3 DOCUMENTS .1 Maintain at job site, one copy of following documents:
- .1 Waste Audit.
  - .2 Waste Reduction Workplan.
  - .3 Material Source Separation Plan.
  - .4 Schedules completed for project.
- 1.4 SUBMITTALS .1 Submittals in accordance with Section 1 33 00.
- .2 Prepare and submit following prior to project start-up:
- .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
  - .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
  - .3 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
  - .4 Submit 2 copies of Cost/Revenue Analysis Workplan (CRAW): Schedule D.
  - .5 Submit 2 copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
- .1 Failure to submit could result in hold back of final payment.
  - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.
  - .3 For each material reused, sold or recycled from project, include amount and the destination.
  - .4 For each material land filled or incinerated from project, include amount of material and identity of landfill, incinerator or transfer station.
- 1.5 QUALITY ASSURANCE - SITE VISIT .1 Pre-bid site visit:
- .1 Walk-through of project site prior to completion of bid submittal is mandatory.
  - .2 Date, time and location to be arranged by Departmental Representative.
-

- 1.6 WASTE AUDIT (WA)
- .1 Conduct WA prior to project start-up.
  - .2 Prepare WA: Schedule A.
  - .3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.
- 1.7 WASTE REDUCTION WORKPLAN (WRW)
- .1 Prepare WRW prior to project start-up.
  - .2 WRW should include but not limited to:
    - .1 Destination of materials listed.
    - .2 Deconstruction/disassembly techniques and sequencing.
    - .3 Schedule for deconstruction/disassembly.
    - .4 Location.
    - .5 Security.
    - .6 Protection.
    - .7 Clear labelling of storage areas.
    - .8 Details on materials handling and removal procedures.
    - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.
  - .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
  - .4 Describe management of waste.
  - .5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.
  - .6 Post WRW or summary where workers at site are able to review content.
  - .7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.
  - .8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.
-

- 1.8 DEMOLITION  
WASTE AUDIT (DWA)
- .1 Prepare DWA prior to project start-up.
  - .2 Complete DWA: Schedule C.
  - .3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.
- 1.9 COST/REVENUE  
ANALYSIS WORKPLAN  
(CRAW)
- .1 Prepare CRAW: Schedule D.
- 1.10 MATERIALS  
SOURCE SEPARATION  
PROGRAM (MSSP)
- .1 Prepare MSSP and have ready for use prior to project start-up.
  - .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.
  - .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
  - .4 Provide containers to deposit reusable and recyclable materials.
  - .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
  - .6 Locate separated materials in areas which minimize material damage.
  - .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
    - .1 Transport to approved and authorized recycling facility or to users of material for recycling.
  - .8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.
    - .1 Ship materials to site operating under Certificate of Approval.
-



1.12 STORAGE, HANDLING AND PROTECTION (Cont'd)

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off-site processing facility for separation.

.3 Provide waybills for separated materials.

1.13 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.

.2 Waste type of each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.14 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Maintain security measures established by existing facility.

1.15 SCHEDULING

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

- 3.1 APPLICATION
- .1 Do Work in compliance with WRW.
  - .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
- 3.2 CLEANING
- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
  - .2 Clean-up work area as work progresses.
  - .3 Source separate materials to be reused/recycled into specified sort areas.
- 3.3 DIVERSION OF MATERIALS
- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
    - .1 Mark containers or stockpile areas.
    - .2 Provide instruction on disposal practices.
  - .2 On-site sale of materials is not permitted.
  - .3 Demolition Waste

Material Type	Recommended Diversion %	Actual Diversion %
Mechanical Equipment	100	
Metals	100	
Rubble	100	
Wood (uncontaminated)	100	
Other		

.4 Construction Waste

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	
Plastic Packaging	100	

Plastic Packaging	100
Rubble	100
Steel	100
Wood (uncontaminated)	100
Other	

3.4 WASTE AUDIT (WA)

.1 The following pertains to Schedule A - Waste Audit (WA). Column-1 refers to the category of waste, and a physical description of the material (eg. off-cuts, clean drywall, etc.). Column-2 refers to the total quantity of materials received by the Contractor. Measurement units must be specified. Column-3 refers to the estimated percentage of material that is waste. Column-4 refers to the total quantity of waste (column-2 x column-3). Column-5 refers to the areas(s) in which the waste was generated. Column-6 refers to the total percentage of recycled material from the specified total quantity of waste (column-4). Column-7 refers to the total percentage of reused material from the specified total quantity of waste (column-4).

.2 Schedule A - Waste Audit (WA)

(1) Material Category	(2) Material Quantity Unit	(3) Estimate d Waste %	(4) Total Quantity of Waste (unit)	(5) Generati on Point	(6) % Recycled	(7) % Reused
-----------------------------	-------------------------------------	---------------------------------	--	-----------------------------	-------------------	-----------------

Wood and  
Plastics  
Material  
Descrip.  
Off-cuts  
Warped  
Pallet  
Forms  
Plastic  
Packagin  
g  
Cardboar  
dPackagi  
ng  
Other  
  
Doors

Doors  
and  
Windows  
Material  
Description  
Painted  
Frames  
Glass  
Wood  
Metal  
Other

3.5 WASTE REDUCTION WORKPLAN (WRW) .1 The following pertains to Schedule B - Waste Reduction Workplan (WRW). Column-1 refers to the category and type of waste materials. Column-2 refers to the persons responsible for completing the WRW. Column-3 refers to Column-4 of Schedule A. Column-4 refers to the amount of reused waste predicted and realized. Column-5 refers to the amount of recycled waste predicted and realized. Column-6 refers to the approved recycling facility.

.2 Schedule B

(1) Material Category	(2) Person(s) Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Project ed	Actual	(5) Recycled Amount (unit) Project ed	Actual	(6) Material(s) Destination
-----------------------------	---------------------------------	--	---	--------	--	--------	-----------------------------------

Wood  
and  
Plastics  
Material  
Description  
Chutes  
Warped  
Pallet  
Forms  
Plastic  
Packaging  
Cardboard

board  
Packag  
ing  
Other

Doors  
and  
Windows  
Materia  
lDescri  
p.  
Painted  
Frames  
Glass  
Wood  
Metal  
Other

3.6 DEMOLITION  
WASTE AUDIT (DWA)

.1 The following pertains to Schedule C - Demolition Waste Audit (DWA). Column-1 refers to the type of material salvaged. Column-2 refers to the material quantity shown in column-1. Several columns may be required to identify specific demolition areas. Column-3 refers to the unit of measurement used to describe Column-2. Column-4 refers to the total quantity of salvaged material. Column-5 refers to the cumulative volume of salvaged material. Column-6 refers to the total weight in killogrammes. Column-7 refers to remarks and assumptions made about the specified material.

.2 Schedule C - Demolition Waste Audit (DWA)

(1) Material Descrip.	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks and Assump- tions
-----------------------------	-----------------	----------	--------------	------------------------	------------------------	---

Wood  
Wood  
Stud  
Plywood  
Baseboar  
d-Wood  
Door  
Trim -  
Wood

Wood  
Cabinet  
Doors  
and  
Windows  
Panel  
Regular  
Slab  
Regular  
Wood  
Laminate  
Byfold -  
Closet  
Glazing

3.7 COST/REVENUE  
ANALYSIS WORKPLAN  
(CRAW)

.1 The following pertains to Schedule D - Cost/Revenue Analysis Workplan (CRAW). Column-1 refers to the type of material salvaged. Column-2 refers to the total quantity of material shown in Column-1. Column-3 refers to the cumulative volume of salvaged material. Column-4 refers to the total weight in killogrammes. Column-5 refers to either the cost associated with disposal indicated with a (-), or the credit received from disposal indicated with a (+). Column-6 refers to the sub-total of column-5 for individual categories. Row-7 refers to summation of all column-6. A negative total indicates a cost. A positive total indicates revenue.

.2 Schedule D - Cost/Revenue Analysis Workplan (CRAW)

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit \$(+/-)	(6) Category Sub-Total \$(+/-)
--------------------------------	---------------------------------	---------------------	---------------------	---	---

Wood  
Wood Stud  
Plywood  
Baseboard  
- Wood  
Door Trim  
- Wood  
Cabinet  
Doors and  
Windows

\$

Windows  
Panel  
Regular  
Slab  
Regular  
Wood  
Laminate  
Byfold -  
Closet  
Glazing

(7) Cost  
(-) /  
Revenue  
(+)

\$  
\$

3.8 CANADIAN .1 Schedule E - Government Chief Responsibility  
GOVERNMENTAL  
DEPARTMENTS CHIEF  
RESPONSIBILITY FOR  
THE ENVIRONMENT

for the Environment

Province	Address	General Inquires	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	

3.9 CONSTRUCTION & .1 Carefully deconstruct and source separate  
DEMOLITION WASTE materials/equipment and divert from D&C waste  
destined for landfill to maximum extent  
possible. Reuse, recycle or sell material off  
site for reuse except where indicated  
otherwise. On site sales are not permitted.

3.9 CONSTRUCTION &  
DEMOLITION WASTE  
(Cont'd)

.2 For construction and demolition projects, even for those not over 2,000 m<sup>2</sup> total floor area, source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.

.1 Provide facilities for collection, handling and storage of source separated wastes.

.2 Source separate the following waste:

.1 Brick and portland cement concrete.

.2 Corrugated cardboard.

.3 Wood, not including painted or treated wood or laminated wood.

.4 Gypsum board, unpainted.

.5 Steel.

Section 01 35 43 - Environmental Protection. This section has detailed lists of materials to be recycled.

.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 or recycled.

.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.

PART 1 - GENERAL

1.1 INSPECTION AND  
DECLARATION

- .1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2 Request Departmental Representative's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  - .4 Certificates required by PWGSC Fire Protection Engineer have been submitted.
  - .5 Operation of systems have been demonstrated to Owner's personnel.
  - .6 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.2 CLEANING

- .1 In accordance with Section 01 74 11.
-

1.2 CLEANING .2 Remove waste and surplus materials, rubbish  
(Cont'd) and construction facilities from the site in  
accordance with Section 01 74 21.

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 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 13 - Commissioning - General Requirements.

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.
  - .6 If requested, furnish evidence as to type, source and quality of products provided.
-

1.3 SUBMISSION  
(Cont'd)

- .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. Forward pdf, NMSEdit Professional spp, MS Word, MS Excel, and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

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;

- 
- 1.5 CONTENTS - EACH VOLUME  
(Cont'd)
- .1 (Cont'd)
    - .3 Schedule of products and systems, 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.
- 1.6 AS-BUILTS AND SAMPLES
- 
- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
    - .1 Contract Drawings.
    - .2 Specifications.
    - .3 Amendments and addenda.
    - .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 Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
-





1.9 SPARE PARTS  
(Cont'd)

- .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.

1.10 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.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.11 SPECIAL TOOLS

- .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.

1.12 STORAGE,  
HANDLING AND  
PROTECTION

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
-

- 1.12 STORAGE,  
HANDLING AND  
PROTECTION  
(Cont'd)
- .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.

- 1.13 WARRANTIES AND  
BONDS
- .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 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 SUMMARY
- .1 Section Includes:
    - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.
    - .2 Acronyms:
      - .1 AFD - Alternate Forms of Delivery, service provider.
      - .2 BMM - Building Management Manual.
      - .3 Cx - Commissioning.
      - .4 EMCS - Energy Monitoring and Control Systems.
      - .5 O&M - Operation and Maintenance.
      - .6 PI - Product Information.
      - .7 PV - Performance Verification.
      - .8 TAB - Testing, Adjusting and Balancing.
- 1.2 GENERAL
- .1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:
    - .1 Verify installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and intent.
    - .2 Ensure appropriate documentation is compiled into the BMM.
    - .3 Effectively train O&M staff.
  - .2 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.
    - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.
-

- 1.2 GENERAL  
(Cont'd)
- .2 (Cont'd)
    - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
  - .3 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.
  - .4 AFD managed projects the term Departmental Representative in Cx specifications to be interpreted as AFD Service Provider.
- 1.3 COMMISSIONING  
OVERVIEW
- .1 Cx to be a line item of Contractor's cost breakdown.
  - .2 Cx activities supplement field quality and testing procedures described in relevant technical sections.
  - .3 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the built facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities includes transfer of critical knowledge to facility operational personnel.
  - .4 Departmental Representative will issue Certificate of Substantial Performance when:
    - .1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative.
    - .2 Equipment, components and systems have been commissioned.
    - .3 O&M training has been completed.
-

- 1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS
- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance.
  - .2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.
- 1.5 PRE-CX REVIEW
- .1 Before Construction:
    - .1 Review contract documents, confirm by writing to Departmental Representative.
      - .1 Adequacy of provisions for Cx.
      - .2 Aspects of design and installation pertinent to success of Cx.
  - .2 During Construction:
    - .1 Co-ordinate provision, location and installation of provisions for Cx.
  - .3 Before start of Cx:
    - .1 Have completed Cx Plan up-to-date.
    - .2 Ensure installation of related components, equipment, sub-systems, systems is complete.
    - .3 Fully understand Cx requirements and procedures.
    - .4 Have Cx documentation shelf-ready.
    - .5 Understand completely design criteria and intent and special features.
    - .6 Submit complete start-up documentation to Departmental Representative.
    - .7 Have Cx schedules up-to-date.
    - .8 Ensure systems have been cleaned thoroughly.
    - .9 Complete TAB procedures on systems, submit TAB reports to Departmental Representative for review and approval.
    - .10 Ensure "As-Built" system schematics are available.
-

- 1.5 PRE-CX REVIEW (Cont'd) .4 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.
- 1.6 CONFLICTS .1 Report conflicts between requirements of this section and other sections to Departmental Representative before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.
- 1.7 SUBMITTALS .1 Submittals: in accordance with Section 01 33 00.
- .1 Submit no later than 4 weeks after award of Contract:
- .1 Name of Contractor's Cx agent.
- .2 Draft Cx documentation.
- .3 Preliminary Cx schedule.
- .2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least 8 weeks prior to start of Cx.
- .3 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least 8 weeks prior to start of Cx.
- .4 Provide additional documentation relating to Cx process required by Departmental Representative.
- 1.8 COMMISSIONING DOCUMENTATION .1 Departmental Representative to review and approve Cx documentation.
- .2 Provide completed and approved Cx documentation to Departmental Representative.
- 1.9 COMMISSIONING SCHEDULE .1 Provide detailed Cx schedule as part of construction schedule in accordance with Section 01 32 16.
-

1.9 COMMISSIONING  
SCHEDULE  
(Cont'd)

- .2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
  - .1 Approval of Cx reports.
  - .2 Verification of reported results.
  - .3 Repairs, retesting, re-commissioning, re-verification.
  - .4 Training.

1.10 COMMISSIONING  
MEETINGS

- .1 Convene Cx meetings following project meetings: Section 01 32 16 and as specified herein.
  - .2 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.
  - .3 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
  - .4 At 80% construction completion stage. Section 01 32 16. Departmental Representative to call a separate Cx scope meeting to review progress, discuss schedule of equipment start-up activities and prepare for Cx. Issues at meeting to include:
    - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
    - .2 Determine the degree of involvement of trades and manufacturer's representatives in the commissioning process.
  - .5 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.
  - .6 Meeting will be chaired by Departmental Representative, who will record and distribute minutes.
  - .7 Ensure subcontractors and relevant manufacturer representatives are present at 80% and subsequent Cx meetings and as required.
-

1.11 STARTING AND TESTING

- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.12 WITNESSING OF STARTING AND TESTING

- .1 Provide 14 days notice prior to commencement.
- .2 Departmental Representative to witness of start-up and testing.
- .3 Contractor's Cx Agent to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

1.13 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 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.

- 1.13 MANUFACTURER'S INVOLVEMENT (Cont'd)
- .4 (Cont'd)
    - .2 Ability to interpret test results accurately.
    - .3 To report results in clear, concise, logical manner.
- 1.14 PROCEDURES
- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
  - .2 Lightning protection systems:
    - .1 Perform tests to verify system has been reinstalled correctly and is fully functional.
  - .3 Conduct start-up and testing in following distinct phases:
    - .1 Included in delivery and installation:
      - .1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.
      - .2 Visual inspection of quality of installation.
    - .2 Start-up: follow accepted start-up procedures.
    - .3 Operational testing: document equipment performance.
    - .4 System PV: include repetition of tests after correcting deficiencies.
    - .5 Post-substantial performance verification: to include fine-tuning.
  - .4 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.
  - .5 Document require tests on approved PV forms.
  - .6 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by Departmental Representative. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:
    - .1 Minor equipment/systems: implement corrective measures approved by Departmental Representative.
-

- 1.14 PROCEDURES .6 (Cont'd)  
(Cont'd)
- .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by Departmental Representative.
  - .3 If evaluation report concludes that major damage has occurred, Departmental Representative shall reject equipment.
    - .1 Rejected equipment to be remove from site and replace with new.
    - .2 Subject new equipment/systems to specified start-up procedures.
- 1.15 START-UP .1 Assemble start-up documentation and submit to  
DOCUMENTATION Departmental Representative for approval before commencement of commissioning.
- .2 Start-up documentation to include:
    - .1 Factory and on-site test certificates for specified equipment.
    - .2 Pre-start-up inspection reports.
    - .3 Signed installation/start-up check lists.
    - .4 Start-up reports,
    - .5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time.
- 1.16 OPERATION AND .1 After start-up, operate and maintain equipment  
MAINTENANCE OF and systems as directed by equipment/system  
EQUIPMENT AND manufacturer.  
SYSTEMS
- .2 With assistance of manufacturer develop written maintenance program and submit Departmental Representative for approval before implementation.
  - .3 Operate and maintain systems for length of time required for commissioning to be completed.
  - .4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.
-

- 1.17 TEST RESULTS
- .1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.
  - .2 Provide manpower and materials, assume costs for re-commissioning.
- 1.18 START OF COMMISSIONING
- .1 Notify Departmental Representative at least 21 days prior to start of Cx.
  - .2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.
- 1.19 INSTRUMENTS / EQUIPMENT
- .1 Submit to Departmental Representative for review and approval:
    - .1 Complete list of instruments proposed to be used.
    - .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
  - .2 Provide the following equipment as required:
    - .1 2-way radios.
    - .2 Ladders.
    - .3 Equipment as required to complete work.
- 1.20 COMMISSIONING PERFORMANCE VERIFICATION
- .1 Carry out Cx:
    - .1 Under actual operating conditions, over entire operating range, in all modes.
    - .2 On independent systems and interacting systems.
  - .2 Cx procedures to be repeatable and reported results are to be verifiable.
  - .3 Follow equipment manufacturer's operating instructions.
  - .4 EMCS trending to be available as supporting documentation for performance verification.
-

1.21 WITNESSING  
COMMISSIONING

- .1 Departmental Representative to witness activities and verify results.

1.22 AUTHORITIES  
HAVING JURISDICTION

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.
- .3 Provide copies to Departmental Representative within 5 days of test and with Cx report.

1.23 EXTRAPOLATION  
OF RESULTS

- .1 Where Cx of weather, occupancy, or seasonal-sensitive equipment or systems cannot be conducted under near-rated or near-design conditions, a full test will be scheduled for weather permitting conditions.

1.24 EXTENT OF  
VERIFICATION

- .1 Elsewhere:
    - .1 Provide manpower and instrumentation to verify up to 100% of reported results, unless specified otherwise in other sections.
  - .2 Number and location to be at discretion of Departmental Representative.
  - .3 Conduct tests repeated during verification under same conditions as original tests, using same test equipment, instrumentation.
  - .4 Review and repeat commissioning of systems if inconsistencies found in any of reported results.
  - .5 Perform additional commissioning until results are acceptable to Departmental Representative.
-

- 1.25 REPEAT VERIFICATIONS
- .1 Assume costs incurred by Departmental Representative for third and subsequent verifications where:
    - .1 Verification of reported results fail to receive Departmental Representative's approval.
    - .2 Repetition of second verification again fails to receive approval.
    - .3 Departmental Representative deems Contractor's request for second verification was premature.
- 1.26 SUNDRY CHECKS AND ADJUSTMENTS
- .1 Make adjustments and changes which become apparent as Cx proceeds.
  - .2 Perform static and operational checks as applicable and as required.
- 1.27 DEFICIENCIES, FAULTS, DEFECTS
- .1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative.
  - .2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative.
- 1.28 COMPLETION OF COMMISSIONING
- .1 Upon completion of Cx leave systems in normal operating mode.
  - .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.
  - .3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.
-

1.29 ACTIVITIES UPON COMPLETION OF COMMISSIONING .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.30 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

1.31 OCCUPANCY .1 Cooperate fully with Departmental Representative during stages of acceptance and occupancy of facility.

1.32 OWNER'S PERFORMANCE TESTING .1 Performance testing of equipment or system by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

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 Methods and procedures for deconstruction of structures and parts of structures.
- 1.2 REFERENCES .1 Canadian Standards Association (CSA International).  
.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.  
.2 Federal Legislation.  
.1 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.  
.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.  
.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- 1.3 DEFINITIONS .1 Alternate Disposal: reuse and recycling of materials by designated facility, user or receiving organization which has valid Certificate of Approval to operate. Alternative to landfill disposal.  
.2 Deconstruction: systematic dismantling of structure in a manner that achieves safe removal/disposal of hazardous materials and maximum salvage/recycling of materials.  
.1 Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste system.  
.3 Demolition: rapid destruction of structure with or without prior removal of hazardous materials.  
.4 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health, well being or environment if handled improperly.
-

- 1.3 DEFINITIONS  
(Cont'd)
- .5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
  - .6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form.
    - .1 Recycling does not include burning, incinerating, or thermally destroying waste.
  - .7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
    - .1 Salvaging reusable materials from remodelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
    - .2 Returning reusable items including pallets or unused products to vendors.
  - .8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
  - .9 Source Separation: acts of keeping different types of waste materials separate, beginning from first time they became waste.
  - .10 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- 1.4 PERFORMANCE REQUIREMENTS
- .1 Separate materials from waste stream to obtain minimum percentages of division as specified in Section 01 74 21.
- 1.5 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00.
  - .2 Submit pre-demolition audit and deconstruction/disassembly plan prior to starting work.
-

- 1.5 SUBMITTALS  
(Cont'd)
- .3 Submit copies of certified bills of lading from authorized disposal sites and reuse and recycling facilities for material removed from site to Departmental Representative upon request.
    - .1 Written authorization from Departmental Representative is required to deviate from facilities listed in Waste Reduction Workplan.
  - .4 Include following information:
    - .1 Time and date of removal.
    - .2 Description of materials.
    - .3 Weight, volume, quantity of material.
    - .4 Breakdown of reuse, recycling and landfill quantities.
    - .5 End destination of materials.
  - .5 Workers, haulers and subcontractors must possess current, applicable permits to remove, handle and dispose of wastes categorized Provincially as hazardous.
    - .1 Provide proof of compliance within 24 hours upon written request of Departmental Representative.
- 1.6 QUALITY ASSURANCE
- .1 Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable provincial regulations.
- 1.7 STORAGE, HANDLING AND PROTECTION
- .1 Do in accordance with Section 01 61 00.
- 1.8 ENVIRONMENTAL REQUIREMENTS
- .1 Do Work in accordance with Section 01 35 43.
-

1.9 SITE  
CONDITIONS

- .1 Existing Conditions.
  - .1 Should materials resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.
  - .2 Label and package component parts of mechanical and electrical material specified for salvage in accordance with Departmental Representative's instructions to prevent damage or loss.
  
- .2 Protection.
  - .1 Prevent movement, settlement or damage of adjacent services. Provide bracing as required. Repair damage caused by deconstruction as directed by Departmental Representative.
  - .2 Support affected structures and, if safety of structure being deconstructed or adjacent structures or services appears to be endangered, take preventative measures. Cease operations and immediately notify Departmental Representative.
  - .3 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.
  
  - .2 Where possible use water efficient wetting equipment/trucks/attachments when minimizing dust.
  
  - .3 Demonstrate that tools are being used in manner which allows for salvage of materials in best condition possible.
-

PART 3 - EXECUTION

3.1 SITE  
VERIFICATION OF  
CONDITIONS

- .1 Determine if Environmental Assessment (EA) is required under requirements of CEAA.
  - .1 If necessary, employ licensed consultant to perform EA.
  - .2 Communicate findings and conclusions in writing to Departmental Representative prior to start of Work.

3.2 PREPARATION

- .1 Disconnect and re-route electrical, telephone and communication service lines entering areas to be deconstructed. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.
- .2 Locate and protect utility lines. Do not disrupt active or energized utilities traversing premises.
- .3 Disconnect and cap designated mechanical services.
  - .1 Natural gas supply lines: as directed by Departmental Representative.
  - .2 Sewer and water lines: as directed by Departmental Representative.

3.3 REMOVAL OF  
HAZARDOUS WASTES

- .1 Prior to start of deconstruction work remove contaminated or hazardous materials as directed by Departmental Representative from site and dispose of at designated disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

3.4 DISASSEMBLY

- .1 Materials removed from structures are property of Departmental Representative.
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3.4 DISASSEMBLY  
(Cont'd)

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- .2 Throughout course of deconstruction pay close attention to connections and material assemblies. Employ workmanship procedures which minimize damage to materials and equipment.
  - .3 Ensure workers and subcontractors are trained to carry out work in accordance with appropriate deconstruction techniques.
  - .4 Project supervisor with previous deconstruction experience must be present on site throughout project.
  - .5 Deconstruct in accordance with CSA S350 and other applicable safety standards.
  - .6 Workers must utilize adequate fall protection where Departmental Representative considers it necessary.
  - .7 Maintain structural integrity of structure.
  - .8 Systematically remove finishes, and mechanical and electrical equipment as instructed by Departmental Representative.
  - .9 Wherever possible, transfer material assemblies from heights to ground level for easier disassembly. Take appropriate measures to ensure safety.
  - .10 Separate from waste stream, material in condition suitable for reuse and/or recycling.
  - .11 Remove and store materials to be salvaged, in manner to prevent damage.
    - .1 Store and protect in accordance with requirements for maximum preservation of material.
    - .2 Handle salvaged materials as new materials.
  - .12 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt.
  - .13 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.
-

3.4 DISASSEMBLY  
(Cont'd)

- .14 Where existing materials are to be re-used in Work, use special care in removal, handling, storage and re-installation to assure proper function in completed work.  
.1 Vitreous parapet cap panels and subgirt system to be photographed before removal, and numbered upon disassembly, to facilitate reinstallation in same locations. Carefully store in protected area.

3.5 PROCESSING

- .1 Designate location for processing of materials which eliminates double handling and provides adequate space to maintain efficient material flow.  
.2 Denail, strip, and separate materials to ensure best possible condition of salvaged materials.  
.3 Keep processing area clean and free of excess debris.  
.4 Supply separate, marked disposal bins for categories of waste material. Notify Departmental Representative prior to removal of bins from site.  
.5 Separate processed materials into organized piles for stockpiling. Provide collection area for materials designated for alternate disposal. Pile materials on pallets to facilitate transport off-site or to storage areas.

3.6 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.  
.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.  
.3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
-

3.6 STOCKPILING  
(Cont'd)

.4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.7 REMOVAL FROM  
SITE

.1 Transport material designated for alternate disposal to approved facilities listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.

.2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan. Do not deviate from disposal facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.

3.8 CLEANING AND  
RESTORATION

.1 Keep site clean and organized throughout deconstruction.

.2 Upon completion of project, remove debris, trim surfaces and leave work site clean.

.3 Upon completion of project, reinstate areas affected by Work to condition which existed prior to beginning of Work.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian General Standards Board (CGSB):
    - .1 CGSB 19-GP-5M(1984), Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1).
  - .2 Canadian Standards Association (CSA):
    - .1 CAN/CSA-O86-09 Consolidation, Engineering Design in Wood.
    - .2 CAN/CSA-Z809-08(R2013), Sustainable Forest Management.
  - .3 National Lumber Grades Authority (NLGA)
    - .1 Standard Grading Rules for Canadian Lumber December 1, 2010.
  - .3 South Coast Air Quality Management District (SCAQMD):
    - .1 SCAQMD Rule 1168-05, Adhesive and Sealant Applications, Amended January 7, 2005.
  - .4 Underwriter Laboratories of Canada (ULC):
    - .1 CAN/ULC-S702-09, Standard for Mineral Fibre Thermal Insulation for Buildings.
- 1.2 QUALITY ASSURANCE
- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- 1.3 ENVIRONMENTAL REQUIREMENTS
- .1 Wood products: CAN/CSA-Z809, SFI or Forestry Stewardship Council (FSC) certified.
  - .2 Panel products:
    - .1 SCAQMD Rule 1168, Adhesives and Sealants Applications.
    - .2 CAN/CSA-Z809, SFI or Forest Stewardship Council (FSC) certified.
-

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Wood: S-DRY, graded and stamped to National Lumber Grades Authority, Standard Grading Rules for Canadian Lumber, S4S.
  - .1 Blocking, furring, strapping, curbs, nailers, bracing, bridging, and cants: spruce, pine or fir (SPF), 121d. and pine, 113d.
- .2 Fastenings: to CAN/CSA-086.
- .3 Field applied wood preservative: copper naphthenate to AWPA P8, green colour.
- .4 Loose insulation: mineral fibre to CAN/ULC-S702, Type 4, loose mineral fibres for hand application, Ecologo certified.
- .5 Sealant: one-component, acrylic base, solvent curing to CGSB 19-GP-5M, Ecologo certified.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Apply wood preservative to wood in contact with roofing.
- .2 Treat surfaces of pressure treated wood which are cut or bored after pressure treatment with field applied wood preservative.
- .3 Set items in place plumb, straight and level to a tolerance of 1:600 and rigidly secure in place.
- .4 Construct continuous members from pieces of longest practical length.
- .5 Secure exterior work with galvanized or non-ferrous fasteners.
- .6 Apply continuous bead of sealant at junction between roof deck and abutting parapet wall.
- .7 Insert loose insulation in space between roof cant and blocking and parapet wall.

PART 1 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 07 46 00: Siding Restoration.
- 1.2 PRODUCT DATA
- .1 Submit product data sheets for products in accordance with Sections 01 33 00 and 01 78 00.
- .2 For primers, adhesives and sealants, indicate VOC in g/L during application and curing.
- .3 For insulation, indicate VOC in g/L and any other off gassing at time of installation.
- 1.3 ENVIRONMENTAL CHOICE PROGRAM
- .1 Provide insulation, adhesive and sealant products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Certification Criteria Document (CCD):
- .1 CCD-016, Thermal Insulation Materials, 2005.
  - .2 CCD-046, Adhesives, 1995.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Polyisocyanurate insulation: CAN/ULC S704-11; Type 2, rigid polyisocyanurate foam core board to meet specified requirements.
- .2 Parapet protection board: 6 mm thick protection board fabricated from asphalt-saturated glass mat reinforcement over mineral-fortified asphaltic core.
- .3 Roof insulation: Refer to Section 07 52 16.
- .4 Adhesive: type recommended by insulation manufacturer, Ecologo certified.
-

2.1 MATERIALS  
(Cont'd)

- .5 Transitional membrane: Reinforced SBS rubberized asphalt compound laminated to cross-laminated polyethylene film, 40 mils thick; complete with primer and adhesive recommended by flashing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Face applied insulation:  
.1 Apply 3 mm wet film thickness of adhesive to entire face of rigid insulation.  
.2 Butter edges of rigid insulation with 3 mm wet film thickness of adhesive.  
.3 Apply rigid insulation to substrate with sliding motion to ensure adhesive contact.  
.4 Butt joints with moderate contact.
- .2 Parapet protection board:  
.1 Provide protection board to back of parapet walls over insulation as indicated on drawings.
- .2 Transitional membrane:  
.1 Install membrane in accordance with manufacturers written instructions.  
.2 Lap membrane 150 mm and seal.

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Section 07 20 00: Insulation.

.2 Section 07 62 00: Flashings.

1.2 DESIGN CRITERIA .1 Fastener type and spacing to design wind loads and shear values to NBC 2010, Division B.

1.3 QUALITY ASSURANCE .1 Provide new metal panels to match existing.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Steel parapet siding: 0.76 mm thick steel to ASTM A653/A653M-13, Z275 zinc coating designation, prefinished to CSSBI Technical Bulletin No. 7, October 1979, 10000 Series paint system, colour and profile to match existing.

.2 Vitreous parapet panels: Reuse existing salvaged panels and subgirts.

.3 Accessories: casing, internal and external corners of same material and finish as siding.

.4 Sealant: one component, elastomeric, chemical curing, to CAN/CGSB-19.13-M87, colour to match siding, Ecologo certified.

.5 Nails: zinc coated steel, spiral shank, 9 mm diameter head, to CSA B111-1974(R2003), minimum 25 mm penetration into framing.

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PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install salvaged vitreous parapet cap panels at penthouse and lower roof parapets. Provide new metal parapet siding in all other locations including behind lower roof parapet.
- .2 Install sheet metal drip cap over horizontal surfaces projecting through or beyond siding.
- .3 Install siding and accessories in accordance with CAN/CGSB-93.5-92.
- .4 Install level, plumb and straight to a tolerance of 1:500.
- .5 Stagger adjoining laps minimum 1000 mm.
- .6 Siding minimum 500 mm long.
- .7 Apply sealant where detailed, at junction with other materials.
- .8 Wash down surfaces with mild detergent.

PART 1 - GENERAL

- 1.1 SHOP DRAWINGS AND PRODUCT DATA SHEETS
- .1 Submit shop drawings of tapered insulation layout in accordance with Sections 01 33 00 and 01 78 00.
  - .2 Submit product data sheets for bitumen, primer, vapour retardant, vapour retardant adhesive, insulation, base sheet, cap sheet, plastic cement, roof drain, sheet metal and sealant in accordance with Sections 01 33 00 and 01 78 00.
- 1.2 ENVIRONMENTAL CHOICE PROGRAM
- .1 Provide insulation, adhesive and sealant products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Environmental Choice Product Guidelines ECP/PCE-40-91 for Building Materials: Thermal Insulation; ECP/PCE-35-91 for Building Materials: Acoustical Products; ECP/PCE-44-92 for Adhesives, ECP/PCE-45-92 for Sealants and Caulking Compounds.
  - .2 Submit one copy of the licensing criteria statements and the verification of compliance with Sections 3(a) and 3(b) of the ECP to the Departmental Representative. For primers, adhesives and sealants, indicate VOC in g/L.
- 1.3 ENVIRONMENTAL CONDITIONS
- .1 Weather and surfaces dry.
  - .2 Imminent weather forecast, dry.
- 1.4 WARRANTY
- .1 For the work of this Section 07 52 16 the 12 month warranty period prescribed in General Conditions GC3.13 is extended to two years.
  - .2 Repair leaks in roofing assembly and membrane flashing within 48 hours of notification.
  - .3 Inspect roof 30 days before expiry of warranty period and correct defects within 15 days of inspection.
-

1.5 GUARANTEE

- .1 Provide a manufacturer's written material guarantee stating that the roofing membrane and membrane flashing will remain free of manufacturing defects and deterioration for a period of ten years from the date of Certificate of Completion.

1.6 PROTECTION

- .1 Protect surrounding surfaces from bitumen splatter, cover walls in hoisting and pumping areas with tarpaulins.
- .2 Locate kettles so smoke shall not enter buildings or discolour surfaces.
- .3 Protect finished roofing at work areas or access to work areas with minimum 12 mm plywood extending 3 m beyond area.
- .4 Prevent bitumen, precipitation and debris entering openings and drains during work.

1.7 FIELD QUALITY CONTROL

- .1 48 hours before commencing work, provide Departmental Representative with date each phase of work will begin.

1.8 DELIVERY AND STORAGE

- .1 To manufacturer's instructions.
  - .2 Do not store material on roof.
  - .3 Under cover on elevated platform.
  - .4 In original package, labels intact.
  - .5 Remove and replace damaged, wet or broken material.
  - .6 Stand rolls on end with the lap edge side up; protect edges.
  - .7 Away from open flame or ignition sources.
-

PART 2 - PRODUCTS

2.1 MATERIAL

- .1 Asphalt primer: to CGSB 37-GP-9Ma.
  - .2 Asphalt: to CAN/CSA-A123.4-04(R2008), Type III.
  - .3 Deck sheathing: ASTM C1177/C117M, 6 mm thick.
  - .4 Tapered insulation: Tapered mineral wool fibre board bonded to top of closed cell polyisocyanurate foam board with bitumen and sanded top surface conforming to ASTM C726.
  - .5 Base sheet membrane: Styrene Butadiene Styrene (SBS) to CGSB 37-GP-56M, composite reinforcing with thermofusible underface and surface, minimum 2.5 mm thick.
  - .6 Cap sheet membrane: Styrene Butadiene Styrene (SBS) to CGSB 37-GP-56M, composite reinforcing with thermofusible surface and release film underface, minimum 3.0 mm thick.
  - .7 Base and Cap flashing: Styrene Butadiene Styrene (SBS) to CGSB 37-GP-56M, composite reinforcing, minimum 4.0 mm thick, thermofusible plastic film for torch application. Coloured granule surface in colour to be selected by Departmental Representative.
  - .8 Adhesive for base sheet insulation panel and tapered insulation: Low-rise, two-component polyurethane adhesive.
  - .9 Insulation: Rigid extruded polystyrene complete with drainage channel on underside for use on roofs. Insulation to conform to CAN/ULC S701.
  - .10 Roof drain:
    - .1 Reuse existing as requested.
    - .2 Provide new where required; Spun aluminum body, heavy duty cast aluminum strainer dome and clamping ring. Drain flange to have depressed sump area to facilitate water drainage. provide mechanical watertight connection to PVC or cast iron pipes.
-

2.1 MATERIAL  
(Cont'd)

- .11 Penetration sealing: waterproof, one-component polyurethane / bitumen resin complete with reinforcing and flexible sheet as detailed.
- .12 Pitch pocket (alternative): prefabricated polyurethane curb system, interlocking pocket, size indicated.
  - .1 Sealant: single component elastomeric polyurethane, isocyanate free.
  - .2 Mastic: fast setting, solvent free.
- .13 Plastic cement: asphalt type to CAN/CGSB-37.5-M89.
- .14 Ballast reducing fabric: High density polyethylene filter fabric with UV inhibitors for use under ballast.
- .15 Ballast: Reuse existing where possible and provide new to match existing as required.
- .16 Precast concrete pavers: Reuse salvaged pavers as much as possible and provide new to match existing as required.
- .17 Levelling pads: 150 mm x 150 mm x 25 mm thick pieces of rigid closed cell extruded expanded Type 4 polystyrene insulation conforming to CAN/ULC S701 at each corner of paving slabs to product a level, smooth surface for pedestrian traffic.
- .18 Lightning protection system: Provide new tension support wires and fasteners as required to restore system to full working order.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Remove water and condensation from deck.
- .2 Clean deck of foreign and bituminous substances.

3.2 BLOCKING AND CURBS

- .1 Secure treated wood blocking to deck at entire perimeter of roof and at projections and penetrations.

3.2 BLOCKING AND  
CURBS  
(Cont'd)

- .2 Treat surfaces cut after pressure treatment with wood preservative.
- .3 Secure plywood to horizontal and vertical surfaces as indicated. Support end and fasten to substrate at rate on one fastener per 0.2 m<sup>2</sup>.
- .4 Match height of blocking with height of insulation.
- .5 Securely anchor blocking and curbs to substrate at 300 mm o.c.

3.3 GENERAL  
APPLICATION

- .1 In accordance with manufacturer's recommendations and CRCA SBS Modified Bituminous Membrane Specifications.
  - .1 Concrete deck: Fully Adhered, Protected Membrane Assembly, January 1997, Two Ply Modified Bitumen Membrane, Slope Range: 1:50 to 1:6.
  - .2 Steel deck: Fully Adhered, Protected Membrane Assembly, January 1997, Two Ply Modified Bitumen Membrane, Slope Range: 1:50 to 1:6.
- .2 Complete roofing membrane to each day's termination point and install temporary water cut-off.
- .3 Remove water cut-off when work resumes only if directed by Departmental Representative.
- .4 Fasteners: as recommended by membrane and sheet metal manufacturer.

3.4 DECK SHEATHING

- .1 Apply adhesive to substrate and install deck sheathing in straight parallel rows.
- .2 Install boards with long dimensions across flutes and edges supported on deck flanges.
- .3 Stagger end joints and butt boards in moderate contact.

3.5 TAPERED  
INSULATION

- .1 Adhere tapered insulation to existing concrete deck.

3.5 TAPERED  
INSULATION  
(Cont'd)

- .2 Taper insulation board at roof drains for a minimum of 600 mm beyond the opening.
- .3 Tapered roof insulation: provide one layer to minimum 2% slope.
- .4 Joints in moderate contact. End joints staggered.

3.6 ROOF MEMBRANE

- .1 Install to CGSB 37-GP-56M+Amdt-Dec-85, Appendix, double-layer system and to manufacturer's instructions.
- .2 Adhere base layer to substrate.
- .3 Torch on top (cap) layer to manufacturer's instructions.
- .4 Pull taut and wrinkle free.
- .5 Lap side and end joints.
- .6 Seal joints to manufacturer's instructions.
- .7 Sprinkle granules on asphalt seepage and embed while the asphalt is hot.

3.7 MEMBRANE  
FLASHING

- .1 Apply asphalt primer to vertical concrete and masonry surfaces to receive bitumen or metal flashing and allow to cure prior to application.
  - .2 Install to:
    - .1 CGSB 37-GP-56M+Amdt-Dec-85, Appendix, double-layer system.
    - .2 Manufacturer's instructions.
    - .3 CRCA flashing guidelines for modified bitumen membrane.
  - .3 Provide penetration sealing in accordance with manufacturer's written instructions. Where weather precludes the use of penetration sealing provide pitch pockets as specified below.
  - .4 Install pitch pockets and accessories in accordance with manufacturer's written instructions.
-

3.8 INSULATION

- .1 Loose lay insulation in moderately tight contact at joints between boards and abutting surfaces.
- .2 When cutting insulation board cut completely through board thickness, do not break or tear insulation board to fit a detail. Areas of insulation system having voids will be rejected.
- .3 Stagger end joints of insulation boards in straight parallel rows.

3.9 PROJECTIONS

- .1 Cut the membrane around the projection.
- .2 Set flange in plastic cement.
- .3 Flash around the flange with membrane flashing.
- .4 Extend cap sheet 225 mm beyond the flange and torch on.
- .5 Seal joints of the cap sheet and upstand of metal with penetration sealant and reinforcing as required.

3.10 LIGHTNING  
PROTECTION SYSTEM

- .1 Carefully perform work around existing lightning protection system to ensure system remains operational throughout Work. Provide new tension support wires as required.
- .2 Anchors to be inspected by Structural Inspector appointed by Departmental Representative.

3.11 BALLAST  
REDUCING FABRIC

- .1 Position fabric over insulation, black side up, and overlap all edges a minimum 300 mm.
- .2 Extend fabric up 50 to 75 mm above ballast at perimeter and penetrations.

3.12 BALLAST AND  
PAVERS

- .1 Install at a minimum rate of 50 kg/m<sup>2</sup> progressively as membrane, insulation, and fabric is laid. Carefully spread ballast to an even thickness over entire roof.
-

3.12 BALLAST AND .2 Install pavers on levelling pads, one at each  
PAVERS corner, butted tightly.  
(Cont'd)

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American Society for Testing and Materials International (ASTM)
    - .1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
    - .2 ASTM D523-14, Standard Test Method for Specular Gloss.
  - .2 Canadian Roofing Contractors Association (CRCA)
    - .1 Roofing Specifications Manual 2012.
  - .3 Canadian Standards Association (CSA International)
    - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- 1.2 SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
    - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.
  - .3 Shop Drawings:
    - .1 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .4 Samples:
    - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.
  - .5 Quality assurance submittals: submit following in accordance with Section 01 45 00.
    - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
-

- 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 21.
    - .2 Materials and Resources Credit: prepare Construction Waste Management plan in accordance with Section 01 74 21.

PART 2 - PRODUCTS

- 2.1 SHEET METAL  
MATERIALS
- .1 Zinc coated steel sheet: 0.6 mm thickness, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

- 2.2 PREFINISHED  
STEEL SHEET
- .1 Prefinished steel with factory applied polyvinylidene fluoride.
    - .1 Class F2S.
    - .2 Colour selected by Departmental Representative from manufacturer's standard range.
    - .3 Specular gloss: 30 units +/- in accordance with ASTM D523.
    - .4 Coating thickness: not less than 22 micrometres.
    - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822/D822M as follows:
      - .1 Outdoor exposure period 2500 hours.
      - .2 Humidity resistance exposure period 5000 hours.

- 2.3 VITREOUS CAP  
PANELS
- .1 Vitreous cap panels: Reuse existing salvaged vitreous cap panels and subgirts.

- 2.4 ACCESSORIES
- .1 Isolation coating: alkali resistant bituminous paint.
  - .2 Plastic cement: to CAN/CGSB-37.5.
-

2.4 ACCESSORIES  
(Cont'd)

- .3 Sealants: In accordance with Section 07 92 00.
- .4 Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.
- .5 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .6 Touch-up paint: as recommended by prefinished material manufacturer.

2.5 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work as indicated.
- .2 Form pieces in 2400 mm maximum lengths.
  - .1 Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm.
  - .1 Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Reinstall existing vitreous cap panels over penthouse and lower roof parapets as indicated on drawings.
  - .2 Install sheet metal flashings in all other locations.
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- 3.2 INSTALLATION  
(Cont'd)
- .3 Use concealed fastenings except where approved before installation.
  - .4 Provide underlay under sheet metal.
    - .1 Secure in place and lap joints 100 mm.
  - .5 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
    - .1 Flash joints using S-lock forming tight fit over hook strips, as detailed.
  - .6 Lock end joints and caulk with sealant.
  - .7 Caulk flashing at cap flashing with sealant.
  - .8 Install pans, where shown around items projecting through roof membrane.
- 3.3 FIELD QUALITY CONTROL
- .1 Manufacturer's Field Services:
    - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- 3.4 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.
  - .3 Leave work areas clean, free from grease, finger marks and stains.

PART 1 - GENERAL

- 1.1 ENVIRONMENTAL CHOICE PROGRAM
- .1 Provide sealant products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Environmental Choice Product Guidelines ECP/PCE-45-92 for Sealants and Caulking Compounds, except maximum VOC 60 g/L during application and curing.
  - .2 For primers and sealants, indicate VOC in g/L during application and curing.
- 1.2 PRODUCT DATA
- .1 Submit manufacturer's literature indicating recommended surface preparation, sealant selection and primer for each substrate in accordance with Sections 01 33 00 and 01 78 00.

PART 2 - PRODUCTS

- 2.1 SEALANTS
- .1 Provide sealant products bearing Ecologo to ECP/PCE-45-92 with maximum VOC 60 g/L.
- 2.2 SEALANT MATERIAL DESIGNATIONS
- .1 Silicones One Part.
    - .1 To ASTM C920-14, primerless, Type S, Grade NS, Class 50, SWRI validated.
  - .2 Preformed compressible and non-compressible back-up materials '10', CFC free.
    - .1 Polyethylene, urethane, neoprene or vinyl foam. Extruded open cell foam backer rod. Size: oversize 30 to 50%.
    - .2 Neoprene or butyl rubber. Round solid rod, Shore A hardness 70.
    - .3 High density foam. Extruded closed cell polyvinyl chloride (PVC) or extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m<sup>3</sup> density, or neoprene foam backer, size as recommended by manufacturer.
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2.2 SEALANT MATERIAL DESIGNATIONS (Cont'd)  
(Cont'd)

.2 (Cont'd)  
.4 Bond breaker tape. Polyethylene bond breaker tape which will not bond to sealant.

2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION OF JOINT SURFACES

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.2 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape with approximately 30% compression.

3.3 MIXING

.1 Mix materials in accordance with sealant manufacturer's instructions.

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3.4 APPLICATION

- .1 Sealant.
  - .1 Protect installed work of other trades from staining or contamination.
  - .2 Apply sealant in accordance with manufacturer's application manual and written instructions.
  - .3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint. remove tape after sealant applied.
  - .4 Apply sealant in continuous beads.
  - .5 Apply sealant using gun with proper size nozzle.
  - .6 Use sufficient pressure to fill voids and joints solid.
  - .7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .2 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.
- .3 Cleanup.
  - .1 Clean adjacent surfaces immediately and leave work neat and clean.
  - .2 Remove excess and droppings, using recommended cleaners as work progresses.
  - .3 Remove masking tape after initial set of sealant.