Part 1 General

1.1 SECTION INCLUDES

.1 Contract method.

.2 Sustainable design certification.

.3 City-supplied Products.

.4 Work by others.

.5 Contract use of the premises

.6 Documents required.

1.2 RELATED REQUIREMENTS

.1 Bid Opportunity No. 1018-2016; Part C – General Conditions for Construction; Part D – Supplemental Conditions

.2 All other Division 01 specification sections.

.3 This section describes requirements applicable to all Sections within Divisions 02 to 32.

1.3 REFERENCES

.1 ECD Energy & Environment Canada

.1 Green Globes Canada, Design for New Construction and Major Retrofits v.2 2014

1.4 SUSTAINABLE DESIGN CERTIFICATION

.1 Project is targeting Green Globes for New Construction, 3 Globes certification.

1.5 CITY-SUPPLIED PRODUCTS

.1 Obtain the necessary Shop Drawings from the Contract Administrator and proceed to coordinate details for installation, expedite, receive, unload, install, connect and test the specified equipment, and be responsible for warranty.

.2 Receive City-supplied Products and equipment F.O.B. and store and process Products and equipment until installation.

.3 Contract Administrator Responsibilities:

.1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.

.2 Deliver supplier's bill of materials to Contractor.

.3 Arrange and pay for delivery to the Place of the Work in accordance with Progress Schedule.

.4 Inspect deliveries jointly with Contractor.

.5 Submit claims for transportation damage.

.6 Arrange for replacement of damaged, defective or missing items.

.7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.

.4 Contractor Responsibilities:

.1 Designate submittals and delivery date for each Product in progress schedule.

.2 Review shop drawings, product data, samples, and other submittals. Submit to Contract Administrator, notification of any observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Receive and unload Products at site.

.4 Inspect deliveries jointly with Contract Administrator; record shortages, and damaged or defective items.

.5 Handle Products at site, including uncrating and storage.

.6 Protect Products from damage, and from exposure to elements.

.7 Assemble, install, connect, adjust, and finish Products.

.8 Arrange for installation inspections required by public authorities.

.9 Repair or replace items damaged by Contractor or Subcontractor on site (under their control).

.5 Schedule of City-supplied Products.

.1 Paper towel dispenser.

1.6 WORK BY OTHERS

.1 Work executed during Work of this Contract, and which is specifically excluded from this Contract:

.1 Supply, installation and maintenance of an automatic book sorter system and self check-in devices.

.2 Work of this Contract must include provisions for coordinating installation of the automatic book sorter system and self check-in devices.

1.7 CONTRACTOR USE OF PREMISES

.1 Contractor has unrestricted use of site until Substantial Performance of the Work.

1.8 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed Shop Drawings, product data, and samples.

.6 List of outstanding Shop Drawings.

.7 Field test records.

.8 Inspection certificates.

.9 Manufacturer's certificates.

.10 Copy of approved Construction Schedule.

.11 Health and safety plan and other safety related documents.

.12 Other documents as specified.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Complementary documents.

.2 Specification grammar.

1.2 RELATED REQUIREMENTS

.1 City of Winnipeg Bid Opportunity No. 1018-2016; Part C - General Conditions, and Part D – Supplemental Conditions

.2 Section 01 10 00 – Summary of Work.

.3 This section describes requirements applicable to all sections within Divisions 02 to 49.

1.3 COMPLEMENTARY DOCUMENTS

.1 Drawings, specifications, and schedules are complementary each to the other and what is called for by one to be binding as if called for by all. Should any discrepancy appear between documents which leave doubt as to the intent or meaning, abide by General Condition C2 Interpretation.

.2 Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate specific components, assemblies, and identify quality.

.3 All specification sections of the Project Manual and Drawings are affected by requirements of Division 01 sections.

.4 Examine all discipline drawings, specifications, and schedules and related Work to ensure that Work can be satisfactorily executed. Notify Contract Administrator of conflicts or additional work required beyond work described.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Cash allowances.

.2 Inspection and testing allowances.

1.2 RELATED REQUIREMENTS

.1 Section 01 45 00 – Quality Control: Independent inspection and testing.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 CASH ALLOWANCES

.1 The Contract Price includes the cash allowances.

.2 The Contract Price, not the cash allowances, include the Contractor's overhead and profit in connection with such cash allowances

.3 Expenditures under cash allowances shall be authorized by the Contract Administrator.

.4 Where the actual cost of the Work under any cash allowance exceeds the amount of the allowance, the Contractor shall be compensated for the excess incurred and substantiated plus an amount for overhead and profit on the excess as set out in the Contract Documents. Where the actual cost of the Work under any cash allowance is less than the amount of the allowance, the City will be credited for the unexpended portion of the cash allowance, but not for the Contractor's overhead and profit on such amount. Multiple cash allowances shall not be combined for the purpose of calculating the foregoing.

.5 The Contract Price shall be adjusted by Change Order to provide for any difference between the amount of each cash allowance and the actual work under that cash allowance.

.6 The value of the work performed under a cash allowance is eligible to be included in progress payments.

.7 The Contractor and the Contract Administrator shall jointly prepare a schedule that shows when the Contract Administrator must authorize ordering of items called for under cash allowances to avoid delaying the progress of the Work.

.8 Obtain three quotations for each Cash Allowance, and for each type of inspection and testing service paid for by Cash Allowance, and submit to Contract Administrator for review. Contract Administrator reserve right to select quotation.

1.4 LUMP SUM ALLOWANCES

.1 If a Cash Allowance item described in the Allowances Schedule below indicates the inclusion of installation, include in the Cash Allowance amount, provision for Product handling at the site, including unloading, uncrating, storage, protection of Products from elements and from damage, labour for installation and finishing, insurance, labour costs, taxes, bonding if applicable, equipment rental, overhead and profit.

.2 If a Cash Allowance item described in the Allowances Schedule below indicates supply only, include in the Contract Price costs not included in Cash Allowances but included in the Contract Price: Product handling at the site including unloading, uncrating, storage, protection of Products from elements and from damage, labour for installation and finishing, insurance, labour costs, taxes, bonding if applicable, equipment rental, overhead and profit.

.3 Contract Administrator Responsibilities:

.1 Consult with Contractor for consideration and selection of Products, suppliers, and installers.

.2 Select Products.

.3 Prepare Change Order.

.4 Contractor Responsibilities:

.1 Selection and Purchase:

.1 At the earliest practical date after award of the Contract, advise Contract Administrator of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

.2 At Contract Administrator's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

.3 Purchase products and systems selected by Contract Administrator from the designated supplier.

.2 Submittals for Review:

.1 Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

.2 Arrange for and process shop drawings, product data, and samples. Arrange for delivery.

.3 Submittals for Information:

.1 Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

.2 Submit time sheets and other documentation to show labour time and cost for installation of allowance items that include installation as part of the allowance.

.3 Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

.4 Coordination:

.1 Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

.5 Promptly inspect Products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

1.5 INSPECTING AND TESTING ALLOWANCES

.1 Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.

.2 Costs Not Included in the Inspecting and Testing Allowance But Included in the Contract Price:

.1 Costs of incidental labour and facilities required to assist inspecting or testing agency.

.2 Costs of testing services used by Contractor separate from Contract Document requirements.

.3 Costs of retesting upon failure of previous tests as determined by Contract Administrator.

.3 Payment Procedures:

.1 Submit one copy of the inspecting or testing firm's invoice with next application for payment.

.2 Pay invoice on approval by Contract Administrator.

1.6 ALLOWANCES SCHEDULE

.1 Cash Allowance No. 1 - Building Signage Allowance:

.1 Amount: $25,000 for purchase, delivery, and installation.

.2 Cash Allowance No. 2 - Inspecting and Testing Allowance:

.1 Amount: $27,500, for inspection of piling, concrete and compaction testing, planting soil testing, roofing inspections, envelope inspection and testing.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the Work.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Contract Administrator.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, to affected parties not in attendance, and Contract Administrator.

.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 START-UP MEETING

.1 After award of Contract, but before start of Work, a Start-Up Meeting will be held to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of the Contractor, major Subcontractors, field inspectors and supervisors, and Contract Administrator will be in attendance.

.3 Contract Administrator will establish time and location of meeting and notify parties concerned minimum five Business Days before meeting.

.4 Contract Administrator will chair Start-Up Meeting, record minutes, and distribute minutes to all attending parties within four Business Days of meeting.

.5 Agenda to include:

- .1 Appointment of official representative of participants in Work.
- .2 Schedule of Work, progress scheduling.
- .3 Critical work sequencing and long-lead items.
- .4 Lines of communications.
- .5 Procedures for RFIs.
- .6 Submittal procedures.
- .7 Green Globes Certification requirements, environmental objectives, and waste management objectives.
- .8 Requirements for temporary facilities, site sign, offices, storage sheds, utilities.
- .9 Delivery schedule of specified equipment.
- .10 Safety.
- .11 Site security.
- .12 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
- .13 City-supplied, Contractor-installed products.
- .14 Record drawings.

.15 Maintenance manuals.

.16 Take-over procedures, acceptance, and warranties.

.17 Monthly progress claims, administrative procedures, photographs, and holdbacks.

.18 Appointment of inspection and testing agencies or firms.

.19 Insurances and transcript of policies.

1.3 PROGRESS MEETINGS

.1 Administrative Requirements:

.1 During course of Work, schedule progress meetings at intervals and times agreed to by the Contractor and Contract Administrator. Progress meetings shall occur at least bi-weekly.

.2 Provide location for regular Progress Meetings.

.3 Prepare agenda for meetings.

.4 Notify parties concerned minimum 72 hours in advance of each meeting.

.5 Preside at meetings.

.6 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three Business Days after meeting. Include significant proceedings and decisions, and identify actions by parties in minutes.

.7 Bring one set of As-Built drawings, and project manual to progress meetings.

.2 Contractor, major Subcontractors involved in Work, and Contract Administrator are to be in attendance.

.3 Persons attending meetings shall be empowered to act on behalf of organizations whose representatives they are.

.4 Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

.1 Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

.1 Review schedule for next period.

.2 Review present and future needs of each entity present, including the following:

.1 Interface requirements.

.2 Sequence of operations.

.3 Status of submittals.

.4 Safety.

.5 Deliveries.

.6 Off-site fabrication.

.7 Access.

.8 Site utilization.

.9 Temporary facilities and controls.

.10 Progress cleaning.

.11 Quality and work standards.

.12 Status of correction of deficient items.

.13 Field observations.

.14 Status of RFIs.

.15 Status of proposal requests.

.16 Pending changes.

.17 Status of Change Orders.

.18 Documentation of information for payment requests.

.3 Problems which impede construction schedule.

.4 Green Globes Certification requirements, environmental objectives, and waste management objectives.

.5 Other business.

1.4 PREINSTALLATION MEETINGS

.1 Conduct a preinstallation meeting at Project site before each construction activity that requires coordination with other construction.

.2 Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Notify Contract Administrator of scheduled meeting dates five Business Days before meeting.

.3 Agenda: Review progress of other construction activities and preparations for the particular activity under consideration

.4 Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

.5 Reporting: Distribute minutes of the meeting to Contract Administrator, each party present, and to other parties requiring information, within four Business Days of meeting.

.6 Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Schedules, form, content, submission.

.2 Critical path scheduling.

.3 Progress photographs.

.4 Submittals schedules.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SCHEDULES

.1 Submit schedules as follows:

- .1 Construction Progress Schedule.
- .2 Schedule of trade costs and monthly cash flow of estimated progress payment claims.
- .3 Submittal Schedule for Shop Drawings and Product Data.
- .4 Submittal Schedule for Samples.
- .5 Submittal Schedule for timeliness of City-furnished Products.
- .6 Product Delivery Schedule.
- .7 Cash Allowance Schedule for acquiring Products and Installation.

.2 Schedule Format.

- .1 Prepare schedule in form of a horizontal Gantt bar chart.
- .2 Provide a separate bar for each major item of work.
- .3 Split horizontally for projected and actual performance.
- .4 Provide horizontal time scale identifying first Business Day of each week.
- .5 Format for listings: Chronological order of start and finish of each item of work.
- .6 Identification of listings: By systems description.

.3 Schedule Submission.

- .1 Submit initial format of each schedule within 10 Business Days of award of Contract.
- .2 Submit one copy of each schedule in electronic format.
- .3 Contract Administrator will review schedules and return review copy within 10 Business Days after receipt.
- .4 Resubmit finalized schedules within 10 Business Days after return of review copy.
- .5 Distribute copies of revised schedules to:
  - .1 Job site office.
  - .2 Subcontractors.
  - .3 Contract Administrator.
  - .4 Other concerned parties.
- .6 Instruct recipients to report to Contractor within ten days, any problems anticipated by timetable shown in schedules.

.4 Bring Construction Progress Schedule, and Submittal Schedule for Shop Drawings and Product Data to initial start-up meeting.

1.4 CONSTRUCTION PROGRESS SCHEDULING

.1 Submit revised schedules with each Application for Payment, identifying changes since previous version.

.2 Submit computer generated network analysis diagram using the critical path method (CPM).

.3 Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

.4 Indicate estimated percentage of completion for each item of Work at each submission.

.5 Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by the City and required by Allowances.

.6 Include dates for start and completion of each major element of construction as follows:

.1 Permits.
.2 Mobilization.
.3 Site clearing.
.4 Site utilities.
.5 Foundation work.
.6 Cast-in-place concrete.
.7 Structural framing.
.8 Cladding and roofing.
.9 Doors, windows and glazing.
.10 Interior architecture and finishes (walls, floors and ceiling).
.11 Millwork.
.12 Interior Specialties.
.13 Plumbing.
.14 Lighting.
.15 Power.
.16 Environmental controls.
.17 Heating, ventilating, and air conditioning.

.7 Indicate projected percentage of completion of each item as of first day of month.

.8 Indicate progress of each activity to date of submission schedule.

.9 Allow for preparation and review of mock-ups in schedule.

.10 Indicate changes occurring since previous submission of schedule:

.1 Major changes in scope.
.2 Activities modified since previous submission.
.3 Revised projections of progress and completion.
.4 Other identifiable changes.

.11 Provide a narrative report to define:

.1 Problem areas, anticipated delays, and impact on schedule.
.2 Corrective action recommended and its effect.

.12 Schedule Updating: Revise Construction Progress Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting

1.5 PROGRESS PHOTOGRAPHS

.1 Digital Photography:

.1 Submit electronic copy of colour digital photography in *.jpg format, minimum 6 megapixel resolution.

.2 Identification: Name and number of project and date of exposure indicated.

.2 Number of Viewpoints: Sufficient views and proximity to clearly indicate stages of completion of all work and services before concealment, including exterior and interior, above ceiling, in-wall, in-floor, and underground conditions.

.3 Frequency: continually. Submit monthly with progress application.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Shop Drawings and Product Data

.2 Samples

.3 Certificates and transcripts

.4 Requests for Interpretation (RFI)

1.2 RELATED REQUIREMENTS

.1 Section 01 32 00 - Construction Progress Documentation.

.2 Section 01 78 10 - Closeout Submittals.

.3 Other sections requesting submittals.

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 DEFINITIONS

.1 Submittals for Review: Written and graphic information and physical samples that require Contract Administrator's responsive action. Unless specifically noted otherwise in individual sections, the following shall be considered Submittals for Review:

.1 Product Data.

.2 Shop Drawings.

.3 Samples.

.2 Submittals for Information: Written and graphic information and physical samples that do not require Contract Administrator's responsive action. Submittals may be rejected for not complying with requirements. Unless noted otherwise in individual sections, the following shall be considered Submittals for Information:

.1 Certificates.

.2 Maintenance Data.

.3 Test and Inspection Reports.

.4 Delegated Design Calculations.

.5 Closeout Submittals.

.6 Sample warranties.

.3 Request for Interpretation (RFI): Request from Contractor requesting interpretation or clarification of the Contract Documents, that is not easily inferable from the Contract Documents.

1.4 ADMINISTRATIVE

.1 Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of the construction schedule and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal process 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 manufactured or produced in SI metric units, converted values within the metric measurement tolerances are acceptable.

.5 Review submittals prior to submission to Contract Administrator. 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.

.6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.

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

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.

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

1.5 ELECTRONIC SUBMISSIONS

.1 Electronic Submittals:

.1 Provide in Portable Document Format (*.pdf) with selectable text and graphics that are readable. Merge documents into one bookmarked document up to 20 mb. Use hierarchical bookmarks to form a table of contents and provide hyperlinks to subject topic.

.2 Break down information into documents of related materials or systems.

.3 Where the Contract Administrator returns the submittal "Reviewed As Noted" and includes mark-ups or comments that change the originally submitted ratings, parameters, specifications, options, etc., correct the documents in the original electronic document before submitting final electronic documents.

.4 Highlight specific rating, parameter, specification, option, etc. when original document includes multiple alternatives.

.5 PDF drawing size: maximum 279 by 432 mm (11 by 17 inches).

1.6 SHOP DRAWINGS AND PRODUCT DATA

.1 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.2 Allow 15 Business Days for Contract Administrator's review of each submission. Allow for extra time where Shop Drawings are submitted in bulk or mass to allow proper review and coordination.

.3 Adjustments made on Shop Drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

.4 Make changes in Shop Drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator in writing of any revisions other than those requested.

.5 Accompany submissions with transmittal letter, 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.

.6 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 other parts of the Work.

.7 After Contract Administrator’s review, distribute copies.

.8 Submit one electronic copy and one hard copy of Shop Drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.9 Submit one electronic copy and one hard copy of product data sheets or brochures for requirements requested in specification sections and as requested by Contract Administrator where Shop Drawings will not be prepared due to standardized manufacture of product.

- .1 Delete information not applicable to project.
- .2 Mark submittal to show which products and options are applicable.

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

1.7 SAMPLES

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

.2 Deliver samples prepaid to Contract Administrator's business address.

.3 Notify Contract Administrator 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 Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

.6 Make changes in samples which Contract Administrator 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.

1.8 CERTIFICATES AND TRANSCRIPTS

.1 Refer to Part D - Supplemental Conditions.

1.9 REQUESTS FOR INTERPRETATION (RFI)

.1 General: Immediately on discovery of the need for interpretation of the Contract Documents, prepare and submit a RFI to the as Contract Administrator in the form specified.

.1 Contract Administrator will return RFIs submitted to Contract Administrator by entities other than the Contractor and controlled by Contractor with no response.

.2 Coordinate and submit RFIs in a prompt manner so as to avoid delays in Work.

.3 For RFIs submitted electronically, include project name and RFI number in subject line of email.

.2 Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

.1 Project name.

.2 Project number.

.3 Date.

.4 Name of Contractor.

.5 Name of Contract Administrator.

.6 RFI number, numbered sequentially.

.7 RFI subject.

.8 Specification Section number and title and related paragraphs, as appropriate.

.9 Drawing number and detail references, as appropriate.

.10 Field dimensions and conditions, as appropriate.

.11 Contractor's suggested resolution. If Contractor's suggested resolution impacts the construction schedule or the Contract Price, state impact in the RFI.

.12 Contractor's signature.

.13 Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

.1 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

.3 RFI Forms: Contractor generated form including all content indicated in this Section.

.1 Form and attachments: electronic files in Adobe Acrobat PDF format.

.4 Contract Administrator's Action: Contract Administrator will review each RFI, determine action required, and respond. Allow ten Working Days for Contract Administrator's response for each RFI. RFIs received by Contract Administrator after 1:00 p.m. will be considered as received the following Working Day.

.1 The following Contractor-generated RFIs will be returned without action:

.1 Requests for approval of submittals.

.2 Requests for approval of substitutions.

.3 Requests for approval of Contractor's means and methods.

.4 Requests for approval of corrective actions for deficient work.

.5 Requests for coordination information already indicated in the Contract Documents.

.6 Requests for adjustments in the schedule or the Contract Price.

.7 Requests for interpretation of Contract Administrator's actions on submittals.

.8 Incomplete RFIs or inaccurately prepared RFIs.

.2 Contract Administrator's action may include a request for additional information, in which case Contract Administrator's time for response will date from time of receipt of additional information.

.3 If Contractor believes the RFI response warrants change in the construction schedule or the Contract Price, notify Contract Administrator in writing within ten Business Days of receipt of the RFI response.

.5 RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log with progress meeting minutes. Include the following:

.1 Project name.

.2 Name and address of Contractor.

.3 Name and address of Contract Administrator.

.4 RFI number including RFIs that were returned without action or withdrawn.

.5 RFI description.

.6 Date the RFI was submitted.

.7 Date Contract Administrator's response was received.

.6 On receipt of Contract Administrator action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Contract Administrator within 10 Business Days if Contractor disagrees with response.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Site fires.

.2 Site drainage.

.3 Site clearing and plant protection.

.4 Pollution control.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 63 - Sustainability Certification Project Requirements

.2 Section 01 57 13 - Temporary Erosion and Sediment Control

.3 Section 01 74 00 - Cleaning and Waste Processing

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 FIRES

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

1.4 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 Protect roots of designated trees to drip-line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation. Restrict tree removal to areas indicated, or as designated by Contract Administrator.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

END OF SECTION

Part 1 General

1.1 SECTION INCLUES

.1 Requirements for development of an Indoor Air Quality (IAQ) Management Plan for use throughout construction

.2 Recommendations for product installation sequencing

.3 Building flush out requirements

.4 Indoor air quality testing requirements

.5 Documentation and reporting requirements

1.2 RELATED REQUIREMENTS

.1 Section 01 35 63 – Sustainability Certification Project Requirements

.2 Section 23 05 01 - Use of HVAC Systems During Construction

1.3 DEFINITIONS

.1 *Dry-Application Products*: Products used in a solid state, such as gypsum board, carpet, acoustical panels, tiles, and textiles.

.2 *MERV*: Minimum Efficiency Reporting Value.

.3 *VOC*: Volatile Organic Compounds

.4 *Wet-Application Products*: Products used in a liquid or semi-liquid state, including adhesives, joint sealers, paints, and coatings.

1.4 REFERENCES

.1 American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)

.1 ASHRAE 52.2-1999 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.

.2 ASHRAE 62.1-2010 – Ventilation for Acceptable Indoor Air Quality

.2 ECD Energy & Environment Canada

.1 Green Globes Canada, Design for New Construction and Major Retrofits v.2 2014

.3 Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)

.1 SMACNA IAQ Guideline for Occupied Buildings under Construction, 2nd Edition 2007

.4 United States Environmental Protection Agency (EPA)

.1 Testing for Indoor Air Quality

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Identify, program, and schedule IAQ testing well in advance of construction in a manner to prevent delays to the performance of the Work in order to perform and complete testing after completion of construction activities and before occupancy.

.2 Scheduling and Sequencing:

.1 Schedule product delivery based on actual construction progress to minimize time products are stored on site.

.2 Inspect products upon delivery to ensure they are free from moisture damage.

.3 Avoid installation of gypsum board and other porous materials until building is weather-tight.

.4 Do not install dry materials overtop of wet materials until wet materials have been allowed to dry to greatest extent practical.

.5 Schedule installation of solvent containing materials early in the construction process to allow for off-gassing before building occupancy.

.6 Install VOC emitting products before installation of porous and fibrous products, or protect with sealed polyethylene sheeting.

.7 Complete installation of interior finishing materials before building occupancy to allow time for building flush-out, or conduct indoor air quality testing before occupancy.

.8 HVAC System Verification: To assure compliance with recognized standards for indoor air quality including ASHRAE 62.1, the Contractor's independent testing and balancing agency shall verify performance of each HVAC system before IAQ testing, including space temperature and space humidity uniformity, outside air quantity, filter installation, drain pan operation, and any obvious contamination sources.

1.6 SUBMITTALS

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

.2 Provide Indoor Air Quality Management Plan to be used during construction.

.3 Building Flush-Out:

.1 Provide signed report describing procedures taken to administer building flush out. Include flush-out start and stop times, outdoor air volumes and durations, and a record of internal building temperatures during flush-out. Where mechanical cooling equipment is operated during flush out, record indoor humidity levels during building flush-out.

.2 Following building flush-out, provide a list of filters that were installed during construction, before building flush-out, and before occupancy. Include details about filter model number and MERV value.

.4 IAQ Testing:

.1 Submit test plan describing procedures, times, instrumentation, and proposed sampling methods.

.2 Submit report for each test site specified for IAQ baseline testing as specified in this Section, and in Division 23 on "Testing, Adjusting, and Balancing." Report on air concentrations of targeted pollutants identified in Article INDOOR AIR QUALITY TESTING.

.5 Concurrent with each Application for Payment, provide the following:

.1 Weekly inspection record of damage or deficiencies and maintenance of IAQ management measures.

1.7 QUALITY ASSURANCE

.1 IAQ Testing Agency: Minimum of 5 years' experience in performing types of specified testing.

Part 2 Products

Part 3 Execution

3.1 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

.1 Not more than 30 days after the date of the Award of Contract but before construction starts, prepare and submit a draft Construction IAQ Management Plan to the Contract Administrator. Include:

.1 Construction procedures for meeting or exceeding the minimum requirements of the SMACNA IAQ Guidelines for Occupied Buildings under Construction, including procedures for HVAC protection.

.2 Construction procedures for protecting absorptive materials (stored on-site or installed) from moisture damage.

.3 Proposed schedule for submitting photographs of IAQ management measures installed during construction. Photos must illustrate all aspects of the IAQ Management Plan.

.4 Procedures to be used during construction to protect the air handling equipment. Include a description of filtration media to be used at each return air grille.

.5 Procedure for replacing air-filtration media immediately before building flush-out and prior to occupancy (following the flush-out), including a description of filtration media to be used at each air handling unit

.6 Manufacturers' cut sheets and product data highlighting the MERV value for filtration media to be installed at return air grilles during construction, during the building flush-out, and for filters that are installed during occupancy.

3.2 CONSTRUCTION SITE MANAGEMENT

.1 During construction, protect absorptive and dry-application materials, stored on-site or installed, from moisture damage. If weather or plumbing leaks result in interior of building becoming wet:

.1 Remove standing water as soon as it is observed

.2 Ensure building is properly dried out before installation of additional materials.

.3 Inspect installed materials for mould and mildew.

.4 Remove and replace absorptive materials that have retained more than 20% moisture after 48 hours following moisture exposure.

.5 Remove water-damaged materials.

.2 Regularly inspect conditions on site to ensure that IAQ Management measures are being correctly implemented and maintained:

.1 Verify filtration media is intact.

.2 Observe materials are adequately protected from exposure to moisture and debris.

.3 Ensure spaces and voids to be concealed by construction are free of debris prior to enclosing them.

.3 HVAC Protection: Protect HVAC equipment as follows, but not necessarily limited to:

.1 Ventilate project site with temporary exhaust until HVAC system is substantially installed.

.2 During heavy construction periods, shut down return side of HVAC system and use temporary exhaust to increase amount of outside air in order to dilute construction area airborne pollutants.

.3 Replace HVAC filters at frequent intervals throughout construction period, before flush-out or IAQ testing, and before occupancy.

.4 Shrink wrap ductwork inlets and outlets at both ends when not in use.

.5 Keep equipment returns wrapped until final installation of finish grilles.

.6 Take photographs regularly throughout construction period to document HVAC protection.

.4 Prohibit smoking indoors and adjacent to door openings.

3.3 BUILDING FLUSH-OUT

.1 Following construction completion and installation of interior finishes, but before building occupancy, conduct building flush-out using air-handling units that serve regularly occupied space. Flush out building with 100% outdoor air for 14 consecutive days.

.1 Install new MERV 8 (or better) filtration media

.2 Flush-out the building by providing 4300m^3 of outdoor air per m^2 of floor area.

.3 During flush-out, maintain indoor temperature of minimum 16 deg C.

.4 If mechanical cooling equipment is operating during flush-out, maintain relative humidity no higher than 60%.

.2 Collect trending data for the full flush-out period, showing fan start and stop times, and internal temperature readings.

.3 After flush-out is completed, install new MERV 13 or better filtration media.

3.4 INDOOR AIR QUALITY TESTING

.1 In the instance where a building flush-out can not be completed, engage an independent IAQ testing agency to complete IAQ testing.

.1 Conduct baseline IAQ testing using testing protocols consistent with US Environmental Protection Agency “Compendium of Methods for the Determination of Air Pollutants in Indoor Air”.

.2 Perform IAQ testing for at least the minimum number of required sampling locations as follows:

.1 For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 2322 sq. m., or for each contiguous floor area, whichever is larger, and include areas with the least ventilation as calculated by Ventilation Rate Procedure of ASHRAE 62.1, and greatest presumed source strength as identified by Contract Administrator. Collect air samples on three consecutive days and average the results of each three-day test cycle to determine compliance or non-compliance of indoor air quality for each air handling zone tested.

.3 Perform IAQ testing after completion of interior construction activities and before occupancy. Perform testing after installation of interior finishes including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Perform testing before installation of furniture, workstation components, and casework.

.4 Perform IAQ testing within breathing zone, between 915 and 1830 mm AFF, over a minimum 4-hour period.

.5 Collect air samples during normal occupied hours (before occupancy) with the building ventilation system starting at the daily normal start times and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.

.6 Sample and record outside air levels of formaldehyde and TVOC contaminants at three outside air locations (as determined by the Contract Administrator) simultaneously with indoor tests to establish basis of comparison for these contaminant levels by averaging the three outdoor readings for each contaminant.

.7 Perform airborne mould and mildew air sampling and speciation with simultaneous indoor and outdoor readings:

.1 Collect samples using 12 litre-per-minute pump and 0.45 micron polycarbonate filter, with a 4-hour duration for each sample.

.2 Speciation shall be done with DNA detection using quantitative polymerase chain reaction (QPCR) method. To ensure that filters are not precontaminated with mould, test a field blank filter cartridge after every eighth sample is tested.

.8 Acceptance of respective portions of the building by the Contract Administrator is subject to compliance with specified limits of indoor air quality contaminant levels.

.2 Indoor air quality acceptance criteria:

.1 Formaldehyde: <20 microgram/m^3 (16.3 ppb)

.2 Sum of VOCs: <200 microgram/m^3

.3 Carbon Monoxide: Not to exceed 9 ppm

.4 Other compounds found on the California Office of Environmental Health Hazard Assessment's list of chronic inhalation Reference Exposure Levels (RELs) are not to exceed those levels, as published on: http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html

.5 Airborne Mould and Mildew: species identified in indoor air cannot vary by more than 10% from those identified in the exterior samples.

.3 Test Reports: Prepare test reports showing results and location of each test, a summary of HVAC operating conditions, and a listing of discrepancies, and recommendations for corrective actions, if required.

.1 Include certification of test equipment calibration with each test report.

.4 For each sampling location where the maximum concentration limit is exceeded, conduct a partial building flush-out and retest for the specific contaminant that was exceeded until the maximum concentration limit is achieved. Collect samples for retesting from original sampling locations. Re-test at no additional cost to Contract.

.5 For each sampling point where airborne mould and mildew indoor species distribution varies by more than 10% from exterior sampling speciation, identify source of mould or mildew and remediate with corrective action. Retest until compliant results are attained.

.6 In the event non-compliant test results occur, provide a written report describing the source of non-compliant conditions and the corrective actions implemented.

3.5 INDEPENDENT MATERIALS TESTING

.1 Test all materials listed below for permanent, in-place indoor air quality performance in accordance with requirements of these specifications. Provide results to Contract Administrator.

.1 Field-applied paint systems on appropriate substrate. Apply paint primers and intermediate coats with a typical drying time allowed between coats (not to exceed 7 days).

.2 Carpet, including manufacturer's recommended adhesive. Apply carpet to appropriate substrate per manufacturer's instructions so that testing is of the "carpet assembly."

.3 Ceiling tile.

.4 Fireproofing material that may be exposed to indoor air, directly or in a plenum, applied to appropriate substrate.

.2 Materials for Testing: Test representative samples of actual products selected for use on this project. Tests of products generically or technically similar but produced by a manufacturer other than that of the product selected for use on this project are invalid.

.3 Materials Testing and Evaluation Protocol: California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," July 2004.

.4 Performance Thresholds: All compounds detected that have chronic reference exposure levels listed in the California DHS Standard Practice document shall be analyzed and compared to the allowable concentration levels.

.5 Materials Test Reports: Submit test reports to Contract Administrator. Include raw emission levels, as well as calculated resulting concentrations and the assumptions (loading, volume of space, ventilation rates) used to determine those resulting concentrations.

.6 Product/Material Evaluation: Products/materials shown by testing to comply with emissions limits and other criteria specified in this Section will be approved for use subject to compliance with all other specified requirements of the Contract Documents. Products/materials shown to exceed specified emission limits shall be discussed, test results interpreted, and a determination made as to alternative product uses or selections.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 General requirements and procedures for compliance with certain Green Building Initiatives need to comply with Green Globes for New Construction program.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 46 - Indoor Air Quality Procedures

.3 Section 01 45 00 - Quality Control

.4 Section 01 51 00 - Temporary Utilities

.5 Section 01 57 13 - Temporary Erosion and Sediment Control

.6 Section 01 74 20 - Waste Management and Disposal

.7 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REFERENCES

.1 ECD Energy & Environment Canada

.1 Green Globes Canada, Design for New Construction and Major Retrofits v.2 2014

1.4 SUSTAINABLE DESIGN CERTIFICATION

.1 The project is required to meet or exceed the Green Globes™ Canada – Design for New Construction and Major Retrofits v.2 2014. The target certification rating is 3 Globes (55 – 69%).

1.5 GREEN GLOBES OBJECTIVES

.1 This Section includes general requirements and procedures for compliance with certain Green Globes requirements needed for the Project to obtain certification:

.1 Other Green Globes Canada, Design for New Construction and Major Retrofits requirements to obtain certification are dependent on material selections and may not be specifically identified as Green Globes requirements.

.2 Compliance with requirements needed to comply with Green Globe initiatives may be used as one criterion to evaluate requests for substitutions described in Section 01 61 00.

.3 Additional requirements to obtain Green Globes certification are dependent on the design and other aspects of the Project that are not part of the Work of the Contract.

.2 No single manufacturer, supplier, fabricator or subcontractor can fulfill the total requirements for Green Globes Certification for the project. Green Globes Certification requires the cooperation and diligence of project participants for a successful application and acceptance for certification.

.3 Green Globes Canada, Design for New Construction and Major Retrofits requirements apply to all Sections and Work of this Project, whether specifically indicated or not.

1.6 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Green Globes Action Plans: Provide preliminary submittals indicating how the following requirements will be met:

.1 Waste Management Plan complying with Section 01 74 20.

.2 Construction indoor air quality procedures complying with Section 01 35 46.

.3 Green Globes Progress Reports: Concurrent with each Application for Payment, submit report comparing actual construction activities with Green Globes action plans for the following:

.1 Waste reduction progress reports complying with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 VOC LIMITS

.1 Adhesives and Sealants:

Product Area	Product Sub-Area	VOC Content	VOC Emissions
Adhesives – Architectural Applications	Carpet / Carpet Pads	50 g/L	To determine acceptability of the emission results, the estimated building concentrations are compared to ½ their corresponding chronic RELs. The two exceptions to this requirement are (1) formaldehyde for which the calculated building concentration shall not exceed ½ of the indoor REL of 33µg/m³ and (2) acetaldehyde in which the full chronic REL of 9µg/m³ shall not be exceeded
	Wood Flooring	100 g/L	
	Rubber Flooring	60 g/L	
	Subfloor	50 g/L	
	Ceramic Tile	65 g/L	
	VCT / Asphalt Tile	50 g/L	
	Dry Wall Panel	50 g/L	
	Cove Base	50 g/L	
	Multipurpose Construction	70 g/L	
	Structural Glazing	100 g/L	
	Single Ply Roof Membrane	250 g/L	
Adhesives – Substrates	Metal to Metal	30 g/L	
	Plastic Foams	50 g/L	
	Porous Material (except wood)	50 g/L	
	Wood	30 g/L	
	Fibreglass	80 g/L	
Adhesives – Specialty	PVC Welding	510 g/L	
	CPVC Welding	490 g/L	
	ABS Welding	325 g/L	
	Plastic Cement Welding	250 g/L	
	Adhesive Primer for Plastic	550 g/L	
	Contact Adhesive	80 g/L	
	Special Purpose Contact Adhesive	250 g/L	
Sealants	Architectural	250 g/L	
	Non-membrane Roof	300 g/L	
	Single Ply Roof Membrane	450 g/L	

VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. VOC limits must be in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1168.
VOC emissions results are determined by either of the following test methods: “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers CA/DHS/EHLB/R-174, July 14, 2004 with Addendum 2004-01, October 19, 2004" or “GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008)".
Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA).Alternatively, projects can require that certain products have third-party certifications showing compliance to predetermined indoor air quality standards. Programs listed in ANSI/GBI 01-2010, section 12.2.1.1 include the following: • EcoLogoM (Paints & Adhesives) – Environmental Choice • EcoLogo Standard for Adhesives – CCD-046 • EcoLogo Standard for Paints – Architectural Surface Coatings CCD-047 • EcoLogo Standard for Recycled Paints – Architectural Surface Coatings – Recycled Water-bourne CCD-048 • Green Seal (Paints & Adhesives) • Green Seal Environmental Standard for Paints and Coatings, GS-11 • Green Seal Environmental Standard for Commercial Adhesives, GS-36 • GREENGUARD Children & Schools – GREENGUARD Environmental Institute • “Program Manual For GREENGUARD Product Certification Programs” GG.PM.01 2009 • GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008) • Indoor Advantage Gold TM – Scientific Certification Systems • California Department of Health Services Standard Practice for the Testing Of Volatile Organic Emissions Sources Using Small Scale Environmental Chambers (CA/DHS/EHLB/R-174, JULY 15, 2004 with Addendum 2004-01) • SCS - EC10.2 -2007, Environmental Certification Program—Indoor Air Quality Performance, May, 2007
VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. For VOC content, a VOC is any organic compound that participates in atmospheric photochemical reactions as defined by the U.S. EPA in 40 CFR §51.100 (s) and has an initial boiling point lower than or equal to 280°C measured at standard conditions of temperature and pressure. The VOC concentration of the product shall not exceed those listed below in grams of VOC per liter of product as determined by ASTM D6886-03 “Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatography”. Source of test method and criteria is Green Seal (GS-11).

.2 Paint:

<table>
<tr><th>Product Area</th><th>Product Sub-Area</th><th>VOC Content</th><th>VOC Emissions</th></tr>
<tr><td rowspan="3">Walls</td><td>Paints - Interior Latex coatings flat</td><td>50 g/L</td><td rowspan="3">To determine acceptability of the emission results, the estimated building concentrations are compared to ½ their corresponding chronic RELs. The two exceptions to this requirement are (1) formaldehyde for which the calculated building concentration shall not exceed ½ of the indoor.
.3 REL of 33µg/m³ and (2) acetaldehyde in which the full chronic REL of 9µg/m³ shall not be exceeded.</td></tr>
<tr><td>Paints - Interior Latex Coatings non flat</td><td>150 g/L</td></tr>
<tr><td>Untreated Masonry or Concrete</td><td>not applicable</td></tr>
<tr><td colspan="4">VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. VOC limits must be in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1168.</td></tr>
<tr><td colspan="4">VOC emissions results are determined by either of the following test methods: “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers CA/DHS/EHLB/R-174, July 14, 2004 with Addendum 2004-01, October 19, 2004" or “GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008)"</td></tr>
<tr><td colspan="4">Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA).
Alternatively, projects can require that certain products have third-party certifications showing compliance to predetermined indoor air quality standards. Programs listed in ANSI/GBI 01-2010, section 12.2.1.1 include the following:
• EcoLogoM (Paints & Adhesives) – Environmental Choice
• EcoLogo Standard for Adhesives – CCD-046
• EcoLogo Standard for Paints – Architectural Surface Coatings CCD-047
• EcoLogo Standard for Recycled Paints – Architectural Surface Coatings – Recycled Water-bourne CCD-048
• Green Seal (Paints & Adhesives)
• Green Seal Environmental Standard for Paints and Coatings, GS-11
• Green Seal Environmental Standard for Commercial Adhesives, GS-36
• GREENGUARD Children & Schools – GREENGUARD Environmental Institute</td></tr>
</table>

• "Program Manual For GREENGUARD Product Certification Programs" GG.PM.01 2009 • GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008) • Indoor Advantage Gold TM – Scientific Certification Systems • California Department of Health Services Standard Practice for the Testing Of Volatile Organic Emissions Sources Using Small Scale Environmental Chambers (CA/DHS/EHLB/R-174, JULY 15, 2004 with Addendum 2004-01) • SCS - EC10.2 -2007, Environmental Certification Program—Indoor Air Quality Performance, May, 2007
VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. For VOC content, a VOC is any organic compound that participates in atmospheric photochemical reactions as defined by the U.S. EPA in 40 CFR §51.100 (s) and has an initial boiling point lower than or equal to 280°C measured at standard conditions of temperature and pressure. The VOC concentration of the product shall not exceed those listed below in grams of VOC per liter of product as determined by ASTM D6886-03 "Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatography". Source of test method and criteria is Green Seal (GS-11).

.3 Floor and Floor Coverings:

Product Area	VOC Emissions Criteria
Floors / Floor Coverings (including carpeting, resilient and other non-carpet flooring) and Other Interior Products (including insulation, acoustical ceilings, and wall covering but excluding countertops, casework, cabinetry, and shelving)	To determine acceptability of the emission results, the estimated building concentrations are compared to ½ their corresponding chronic RELs. The two exceptions to this requirement are (1) formaldehyde for which the calculated building concentration shall not exceed ½ of the indoor REL of 33µg/m³ and (2) acetaldehyde in which the full chronic REL of 9µg/m³ shall not be exceeded.
VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. VOC limits must be in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1168.	
VOC emissions results are determined by either of the following test methods: "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers CA/DHS/EHLB/R-174, July 14, 2004 with Addendum 2004-01, October 19, 2004" or "GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008)"	
Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA). Alternatively, projects can require that certain products have third-party certifications showing compliance to predetermined indoor air quality standards. Programs listed in ANSI/GBI 01-2010, section 12.2.1.1 include the following: • EcoLogoM (Paints & Adhesives) – Environmental Choice • EcoLogo Standard for Adhesives – CCD-046 • EcoLogo Standard for Paints – Architectural Surface Coatings CCD-047	

• EcoLogo Standard for Recycled Paints – Architectural Surface Coatings – Recycled Water-bourne CCD-048 • Green Seal (Paints & Adhesives) • Green Seal Environmental Standard for Paints and Coatings, GS-11 • Green Seal Environmental Standard for Commercial Adhesives, GS-36 • GREENGUARD Children & Schools – GREENGUARD Environmental Institute • "Program Manual For GREENGUARD Product Certification Programs" GG.PM.01 2009 • GREENGUARD Environmental Institute: Standard Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers (GGTM.P066.R8, 10/29/2008) • Indoor Advantage Gold TM – Scientific Certification Systems • California Department of Health Services Standard Practice for the Testing Of Volatile Organic Emissions Sources Using Small Scale Environmental Chambers (CA/DHS/EHLB/R-174, JULY 15, 2004 with Addendum 2004-01) • SCS - EC10.2 -2007, Environmental Certification Program—Indoor Air Quality Performance, May, 2007
VOC content is determined by subtracting water and exempt compounds and expressed as grams per liter, with no exception granted to chlorinated chemical species. For VOC content, a VOC is any organic compound that participates in atmospheric photochemical reactions as defined by the U.S. EPA in 40 CFR §51.100 (s) and has an initial boiling point lower than or equal to 280°C measured at standard conditions of temperature and pressure. The VOC concentration of the product shall not exceed those listed below in grams of VOC per liter of product as determined by ASTM D6886-03 "Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatography". Source of test method and criteria is Green Seal (GS-11).

Part 3 Execution

3.1 SITE DISTURBANCE

.1 Comply with requirements of Section 01 57 13.

3.2 CONSTRUCTION WASTE MANAGEMENT

.1 Comply with requirements of Section 01 74 20.

3.3 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT

.1 Comply with requirements of Section 01 35 46.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 References and codes

.2 Laws, notices, permits and fees

1.2 RELATED REQUIREMENTS

.1 Part C – General Conditions for Construction

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REFERENCES AND CODES

.1 Do Work in accordance with:

.1 National Building Code of Canada (NBC 2010), and Manitoba amendments, The Buildings and Mobile Homes Act (C.C.S.M. C. B93)

.2 Province of Manitoba: The Workplace Safety and Health Act, C.C.S.M c. W210.

.3 City of Winnipeg Accessibility Design Standard 2015

.2 Meet or exceed requirements of:

.1 Contract Documents.

.2 Specified standards, codes and referenced documents.

1.4 LAWS, NOTICES, PERMITS AND FEES

.1 If the Contractor knowingly performs or allows work to be performed that is contrary to any laws, ordinances, rules, regulations or codes, the Contractor shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations or codes.

.2 Determine detailed requirements of authorities having jurisdiction.

1.5 SMOKING

.1 No smoking is permitted during execution of the Work within or outside the premises.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 References and standards.

.2 Standards producing industry organizations and their addresses.

1.2 RELATED REQUIREMENTS

.1 Section 01 61 00 - Product Requirements.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REFERENCES

.1 For Products or quality specified by association, trade, or other references or consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

.2 Conform to reference standard by date specified in the individual specification sections except where a specific date is established or required by code.

.3 Obtain copies of standards where required by product specification sections.

.4 Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Contract Administrator shall be altered from the Contract Documents by mention or inference otherwise, in any reference document.

1.4 STANDARDS PRODUCING INDUSTRY ORGANIZATIONS

.1 The following associations and organizations are cited in specification sections. Acronym, name, address, and Internet URL: addresses are as follows.

.2 Canadian Organizations:

.1 ACEC - Association of Consulting Engineers of Canada, 130 Albert Street, Suite 616, Ottawa, ON K1P 5G4; URL: http://www.acec.ca.

.2 AWMAC - Architectural Woodwork Manufacturers Association of Canada, 516-4 Street West, High River, AB T1V 1B6; URL: http://www.awmac.com.

.3 CGA - Canadian Gas Association, 20 Eglinton Avenue West, Suite 1305, Toronto, ON M4R 1K8; URL: http://www.cga.ca.

.4 CGSB - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 0S5; URL: http://w3.pwgsc.gc.ca/cgsb.

.5 CISC - Canadian Institute of Steel Construction, 201 Consumers Road, Suite 300, Willowdale, ON M2J 4G8; URL: http://www.cisc-icca.ca.

.6 CNLA - Canadian Nursery Landscape Association, RR #4, Stn. Main,7856 Fifth Street, Milton, ON L9T 2X8; URL: http://www.canadanursery.com.

.7 CRCA - Canadian Roofing Contractors Association, 155 Queen Street,Suite 1300, Ottawa, ON K1P 6L1; URL: http://www.roofingcanada.com.

.8 CSA - Canadian Standards Association International, 178 Rexdale Blvd., Toronto, ON M9W 1R3; URL: http://www.csa-international.org.

.9 CSDMA - Canadian Steel Door Manufacturers Association, One Yonge Street, Suite 1801, Toronto, ON M5E 1W7; URL: http://www.csdma.org.

.10 CSPI - Corrugated Steel Pipe Institute, 652 Bishop Street N, Unit 2A, Cambridge, ON N3H 4V6; URL: http://www.cspi.ca.

.11 CSSBI - Canadian Sheet Steel Building Institute, 652 Bishop St. N., Unit 2A, Cambridge, ON N3H 4V6; URL: http://www.cssbi.ca.

.12 EC - Environment Canada, Conservation and Protection, Inquiry Centre, 351 St. Joseph Blvd, Hull, QC KIA 0H3; URL: http://www.ec.gc.ca.

.13 MPI - The Master Painters Institute, 4090 Graveley Street, Burnaby, BC V5C 3T6; URL: http://www.paintinfo.com.

.14 NLGA - National Lumber Grades Authority, 406-First Capital Place, 960 Quayside Drive, New Westminster, BC V3M 6G2; URL: http://www.nlga.org.

.15 NRC - National Research Council, Building M-58, 1200 Montreal Road, Ottawa, ON K1A 0R6; URL: http://www.nrc.gc.ca.

.16 SCC - Standards Council of Canada, 270 Albert Street, Suite 2000, Ottawa, ON K1P 6N7; URL: http://www.scc.ca.

.17 TTMAC - Terrazzo, Tile and Marble Association of Canada, 30 Capston Gate, Unit 5 Concord, ON L4K 3E8; URL: http://www.ttmac.com.

.18 ULC - Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, ON M1R 3A9; URL: http://www.ulc.ca.

.3 USA Organizations:

.1 AA - Aluminum Association, 900 19th Street N.W., Washington, DC 20006; URL: http://www.aluminum.org.

.2 AASHTO - American Association of State Highway and Transportation Officials, 444 N Capitol Street N.W., Suite 249, Washington, DC 20001; URL: http://www.aashto.org.

.3 AMCA - Air Movement and Control Association Inc., 30 West University Drive, Arlington Heights, IL 60004-1893; URL: http://www.amca.org.

.4 ANSI - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036; URL: http://www.ansi.org.

.5 API - American Petroleum Institute, 1220 L St. Northwest, Washington, DC 20005-4070; URL: http://www.api.org.

.6 ARI - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, VA 22203; URL: http://www.ari.org.

.7 ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329; URL: http://www.ashrae.org.

.8 ASME - American Society of Mechanical Engineers, ASME Headquarters, 3 Park Avenue, New York, NY 10016-5990; URL: http://www.asme.org.

.9 ASTM International, 100 Barr Harbor Drive West, Conshohocken, PA 19428-2959; URL: http://www.astm.org.

.10 AWCI - Association of the Wall and Ceiling Industries International, 803 West Broad Street, Suite 600, Falls Church, UA 22046; URL: http://www.awci.org.

.11 AWPA - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA 22314-1757; URL: http://www.awpa.org.

.12 AWPA - American Wood Preservers' Association, P.O. Box 5690, Granbury TX 76049-0690; URL: http://www.awpa.com.

.13 AWS - American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; URL: http://www.amweld.org.

.14 AWWA - American Water Works Association, 6666 W. Quincy Avenue, Denver, CO 80235; URL: http://www.awwa.org.

.15 EIMA - EIFS Industry Manufacturer's Association, 3000 Corporate Center Drive, Suite 270, Morrow, GA 30260; URL: http://www.eima.com.

.16 ISAP - International Society for Asphalt Paving, 400 Selby Avenue, Suite 1, St. Paul, MN 55102; URL: http://www.asphalt.org.

.17 IEEE - Institute of Electrical and Electronics Engineers, IEE Corporate Office, 3 Park Avenue, 17th Floor, New York, NY 10016-5997;URL: http://www.ieee.org.

.18 MSS - Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, N.E., Vienna, VA 22180-4602; URL: http://www.mss-hq.com.

.19 NAAMM - National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 1000, Chicago, IL 60603;URL: http://www.naamm.org.

.20 NEMA - National Electrical Manufacturers Association, 1300 N 17th Street, Suite 1847, Rosslyn, VA 22209; URL: http://www.nema.org.

.21 NFPA - National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101Quincy, MA 02269-9101; URL: http://www.nfpa.org.

.22 NHLA - National Hardwood Lumber Association, 6830 Raleigh-La Grange Road, Memphis, TN 38184-0518; URL: http://www.natlhardwood.org.

.23 NSPE - National Society of Professional Engineers, 1420 King Street, Alexandria, VA 22314-2794; URL: http://www.nspe.org.

.24 PCI - Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938; URL: http://www.pci.org.

.25 PEI - Porcelain Enamel Institute, PO Box 920220, Norcross, GA 30010;URL: http://www.porecelainenamel.com.

.26 SSPC - The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4656; URL: http://www.sspc.org.

.27 UL - Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, IL60062-2096; URL: http://www.ul.com.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Definitions.

.2 Procedures.

.3 Test reports.

.4 Tests and mix designs.

.5 Mock-ups.

.6 Test and inspection logs.

.7 Mill tests.

.8 Equipment and systemS.

1.2 RELATED REQUIREMENTS

.1 Section 01 21 00 - Allowances.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 DEFINITIONS

.1 Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

.2 Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Contract Administrator.

.3 Mock-ups: Full-size physical assemblies that are constructed on-site. Mock-ups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mock-ups are not Samples. Unless otherwise indicated, approved mock-ups establish the standard by which the Work will be judged.

.1 Integrated Exterior Mock-ups: Mock-ups of the exterior envelope, consisting of multiple products, assemblies, and subassemblies.

.4 Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

.5 Product Testing: Tests and inspections that are performed by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

.6 Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

.7 Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

.8 Independent Inspection and Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Engage independent inspection and testing agencies for purpose of inspecting and testing portions of the Work.

.2 Costs:

.1 Quality Control Testing: borne by the Contractor.

.2 Quality Assurance Testing: Specific quality assurance testing and inspections specified in technical specification sections, unless explicitly assigned to the City, are paid for by cash allowance. Refer to Section 01 21 00 - Allowances.

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

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

.5 If defects are revealed during inspection or testing, appointed agency will request additional inspection and testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract Administrator at no additional cost to the Work. Pay costs for retesting and re-inspection.

1.5 PROCEDURES

.1 Notify appropriate agency and Contract Administrator in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and 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.

.4 Provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

.5 Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

.1 Submit a certified written report, in duplicate, of each quality-control service.

.6 Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

.7 Provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

.8 Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

1.6 REPORTS

.1 Submit electronic copy of signed inspection and test reports to Contract Administrator.

.2 Provide electronic copy of signed inspection and test reports to manufacturer or fabricator of material being inspected or tested, and Subcontractor of work being inspected or tested.

.3 Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

.1 Date of issue.
.2 Project title and number.
.3 Name, address, and telephone number of testing agency.
.4 Dates and locations of samples and tests or inspections.
.5 Names of individuals making tests and inspections.
.6 Description of the Work and test and inspection method.
.7 Identification of product and Specification Section.
.8 Complete test or inspection data.
.9 Test and inspection results and an interpretation of test results.
.10 Record of temperature and weather conditions at time of sample taking and testing and inspecting.
.11 Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
.12 Name and signature of laboratory inspector.
.13 Recommendations on retesting and reinspecting.

.4 Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

.1 Name, address, and telephone number of technical representative making report.
.2 Statement on condition of substrates and their acceptability for installation of product.
.3 Statement that products at Project site comply with requirements.
.4 Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
.5 Results of operational and other tests and a statement of whether observed performance complies with requirements.
.6 Statement whether conditions, products, and installation will affect warranty.
.7 Other required items indicated in individual Specification Sections.

.5 Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

.1 Name, address, and telephone number of factory-authorized service representative making report.
.2 Statement that equipment complies with requirements.
.3 Results of operational and other tests and a statement of whether observed performance complies with requirements.
.4 Statement whether conditions, products, and installation will affect warranty.
.5 Other required items indicated in individual Specification Sections.

1.7 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 Contract Administrator and may be authorized as recoverable.

1.8 MOCK-UPS

.1 Mock-ups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

.1 Build mock-ups in location and of size indicated or, if not indicated, as directed by Contract Administrator.

.2 Notify Contract Administrator five Business Days in advance of dates and times when mock-ups will be constructed.

.3 Employ supervisory personnel who will oversee mock-up construction. Employ workers that will be employed during the construction at Project.

.4 Demonstrate the proposed range of aesthetic effects and workmanship.

.5 Obtain Contract Administrator's approval of mock-ups before starting work, fabrication, or construction.

.1 Allow five Business Days for initial review and each re-review of each mock-up.

.6 Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.

1.9 TEST AND INSPECTION LOG

.1 Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

.1 Date test or inspection was conducted.

.2 Description of the Work tested or inspected.

.3 Date test or inspection results were transmitted to Contract Administrator.

.4 Identification of testing agency or special inspector conducting test or inspection.

.2 Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Contract Administrator's reference during normal working hours.

1.10 MILL TESTS

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

1.11 EQUIPMENT AND SYSTEMS

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

.2 Refer to Divisions 21, 22, 23 and 26 for definitive requirements.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 63 - Sustainability Certification Project Requirements

.2 Section 01 52 00 - Construction Facilities.

.3 Section 01 53 00 - Temporary Construction.

.4 Section 23 05 01 - Use of HVAC Systems During Construction.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

.3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.4 DEWATERING

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

1.5 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

1.6 TEMPORARY HEATING AND VENTILATION

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

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture condensation on surfaces.

.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.

.5 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Permanent heating system of building may be permitted as specified in Section 23 05 01 – Use of HVAC Systems During Construction.

.7 Ensure date of Substantial Performance of the Work and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Contract Administrator.

.8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

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

1.7 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

.3 Provide and pay for temporary power for electric cranes and other equipment requiring temporary power.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination is not less than that required by legislation. Use high-efficiency lighting for the construction site if possible.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Contract Administrator 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 three months.

1.8 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary high speed internet, telephone and data hook up, lines and equipment necessary for own use and use of Contract Administrator.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Sanitary facilities.

.5 Construction signs.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 63 - Sustainability Certification Project Requirements

.2 Section 01 51 00 - Temporary Utilities.

.3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

.3 Select an ecologically appropriate staging area, for storing construction equipment and materials.

.4 Locate temporary buildings, parking and vehicle access ways away from sensitive areas to avoid damage to vegetation and topsoil.

1.4 SCAFFOLDING

.1 Provide and maintain stairs, ladders, ramps, platforms, and scaffolding.

1.5 HOISTING

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

.2 Hoists shall be operated by qualified operator.

1.6 USE OF THE WORK

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

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

1.7 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Maintain existing roads used for access to project site for duration of Contract and make good damage resulting from Contractors' use of roads.

1.8 SECURITY

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 OFFICES

.1 Provide office heated to 22 degrees C; lighted and ventilated, of sufficient size to accommodate site meetings and furnished with drawing layout table.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.10 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.

.3 Except where connected to municipal sewer system, periodically remove wastes from Site.

.4 New permanent facilities may not be used.

.5 Keep sanitary facilities clean and fully stocked with the necessary supplies at all times.

1.12 CONSTRUCTION SIGNS

.1 Safety Signs:

.1 Format, location, and quantity of signs and notices to be approved by Contract Administrator.

.2 Signs and notices for safety or instruction to be in English language, or commonly understood graphic symbols.

.2 Maintain signs and notices for duration of project. Remove and dispose of signs off site when directed by Contract Administrator.

.3 Do not advertise or promote systems, construction or assembly methods, tools or equipment used or incorporated without written approval of Contract Administrator.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Site enclosure.

.2 Guardrails and barriers.

.3 Weather enclosures.

.4 Dust tight barriers.

.5 Protection for off-site and public property.

.6 Protection of applied finishes.

.7 Protection of surrounding Work.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 63 - Sustainability Certification Project Requirements

.2 Section 01 51 00 - Temporary Utilities.

.3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.4 SITE ENCLOSURE

.1 Before construction operations begin, provide site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

.1 Type of fence at Contractor's discretion. Minimum 2.0 m high and anchored securely to ground to withstand wind pressure, with adjacent panels securely fastened together to resist vandalism.

.2 Provide one lockable truck gate.

.3 Maintain enclosure in good repair.

1.5 GUARD RAILS AND BARRIERS

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

.2 Provide as required by governing authorities.

1.6 WEATHER ENCLOSURES

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

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

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

1.7 DUST TIGHT BARRIERS

.1 Provide dust tight barriers and screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work.

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

1.8 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.

1.9 PROTECTION OF APPLIED FINISHES

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

.2 Provide necessary screens, covers, and hoardings.

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

1.10 PROTECTION OF SURROUNDING WORK

.1 Provide protection for finished and partially finished Work from damage.

.2 Provide necessary cover and protection.

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Informational and warning devices.

.2 Protection and control of public traffic.

.3 Informational and warning devices.

.4 Fire routes.

1.2 RELATED REQUIREMENTS

.1 Section 01 53 00 - Temporary Construction. Roadway and pedestrian access to the site.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REFERENCES

.1 Municipal guidelines and regulations enforceable in the Place of the Work.

1.4 ACCESS TO SITE

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

1.5 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.

1.6 PROTECTION OF PUBLIC TRAFFIC

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

.2 When working on or near a travelled way:

.1 Place equipment in position to present minimum of interference and hazard to traveling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.3 Do not close any lanes of road without approval of Contract Administrator. Before re-routing traffic erect suitable signs and devices in accordance authority having jurisdiction.

.4 Keep travelled way free of pot holes and of sufficient width for required number of lanes of traffic.

.5 Provide and maintain road access and egress to propery fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Contract Administrator.

1.7 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in municipal guidelines.

.3 Place signs and other devices in locations recommended in municipal guidelines.

.4 Meet with Contract Administrator before start of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Contract Administrator.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.8 FIRE ROUTES

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for an erosion and sediment control plan.

.2 Prevent loss of soil during construction by storm water runoff and wind erosion.

.3 Protect stockpiled topsoil.

.4 Prevent sedimentation of storm water and receiving streams.

.5 Prevent pollution of the air with dust and particulate matter.

1.2 RELATED REQUIREMENTS

.1 Division 31 – Earthwork

1.3 REFERENCES

.1 EPA 832/R-92-005 - Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices, September 1992.

.2 Local erosion and sediment control guidelines.

1.4 DEFINITIONS

.1 Erosion: Deterioration, displacement, or transportation of land surface by wind or water, intensified by land-clearing practices related to construction activates.

.2 Rain or Rain Storm: An event defined causing the pooling of water on road or other impervious surfaces.

.3 Sediment: Particulate matter transported and deposited as a layer of solid particles within a body of water.

.4 Snow Melt: An event in snow conditions when the temperature is above 0 degrees C or when environmental conditions causing snow on the ground to melt.

1.5 SUBMITTALS

.1 Provide requested information specified in Section 01 33 00.

.2 Provide erosion and sediment control plan within 14 Business Days of date established for start the Work, and before start of the Work on site.

.3 Application for Payment: Concurrent with each application, provide the following Inspection Log information:

.1 Weekly inspection record.

.2 Report damages or deficiencies and maintenance of erosion and sediment control measures.

.3 Identify and address standing rainwater or snowmelt conditions.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 Provide and implement erosion and sediment control plan to meet following objectives:

- .1 Prevent loss of soil during construction by storm water runoff and wind erosion, including protecting topsoil.
- .2 Prevent sedimentation of the storm sewer and receiving streams.
- .3 Prevent polluting air with dust and particulate matter.

.2 Erosion and Sediment Control Plan will describe how each of the following has been implemented for the project. If any of the items are not applicable to the site, the Plan must explain why it is not applicable:

- .1 Preserve vegetation and mark clearing limits
- .2 Establish and delineate construction access
- .3 Control flow rates
- .4 Install sediment controls
- .5 Stabilize soils
- .6 Protect drain inlets
- .7 Stabilize channels and outlets
- .8 Control pollutants
- .9 Control dewatering
- .10 Maintain the erosion control measures
- .11 Maintain and report on the Erosion and Sediment Control Plan

Part 3 Execution

3.1 INSTALLATION AND REMOVAL

.1 Provide erosion and sedimentation control measures before Work is started on site. Do not remove erosion and sedimentation control measures until work is complete and vegetation has been adequately established.

.2 Remove all such work after use. Restore and stabilize areas disturbed during removal.

3.2 GENERAL

.1 Prevent cleared topsoil and excavated earth stockpiled on site from being eroded by rain storm, snow melt or wind.

.2 Minimize amount of disturbed soil.

- .1 Site disturbance shall only occur where necessary for project completion and must be conducted in a timely manner.
- .2 Stockpile disturbed soil in one location, until removal, to a maximum height of 2 metres.
- .3 Cover stockpiled materials at the end of each work day to prevent soil erosion. Extend covering material below stockpiled materials.

.4 Correct disturbed soils using erosion control mats, or mulch and seed within 90 days of disturbance.

.1 Where snow cover precludes re-vegetation, complete re-vegetation as soon as practical.

.3 Remove sediment from onsite runoff before it leaves the site.

.1 Install straw wattles or other sediment filtering devices around storm sewer inlets to prevent sedimentation of the storm sewer.

.4 Slow down runoff flowing across the site.

.1 Maintain existing drainage patterns that flow into sod areas and ditches in order to filter water through sod or other vegetation.

.2 Filter water pumped from excavations, foundations and other areas as part of dewatering before discharging to storm sewer.

.3 Place rip-rap around storm sewer outlets. Remove silt and debris after each 24-hour rainfall of 5 mm or more.

.5 Prevent polluting air with dust and particulate matter.

.1 Minimize period of soil exposure, through temporary ground covers, mulches, or acceptable environmentally-safe soil stabilizers and dust control agents.

.2 Provide silt fencing to prevent wind erosion from carrying sediment off the site or into storm sewers.

.3 Provide gravel pads at site entries. Maintain and clean pads during construction period.

.4 During dry days, control dust by wetting soil each day for 15 to 30 minutes before construction activities begin, and again after construction activities cease for the day.

.6 Meet or exceed local sediment and erosion control requirements.

.1 Coordinate erosion and sedimentation control provisions with the municipal and provincial requirements where applicable.

.7 Complete visual inspection of erosion and sedimentation control measures daily. Repair damage immediately.

.8 Inspect erosion control measures on periodic basis, minimum once/month.

.1 Provide formal documentation of the inspection, including photographs, and completion of a log, checklist, or inspection log with a description of any corrective actions taken.

.9 Maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.10 Where erosion and sedimentation control measures must be removed temporarily to accommodate construction operations, reinstate affected barriers as soon as practical.

.11 Clean sediment control devices of accumulated silt and debris on a monthly basis, and after all rain events, or more often as necessary.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Product substitution procedures.

.3 Manufacturer's instructions.

.4 Quality of Work, coordination and fastenings.

.5 Existing facilities.

1.2 RELATED REQUIREMENTS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 TERMINOLOGY

.1 New: Produced from new materials.

.2 Defective: A condition determined exclusively by the Contract Administrator.

1.4 PRODUCT QUALITY

.1 Products, materials, equipment, parts or assemblies (referred to as “Products” in the specifications, and “Materials” in the General Conditions) incorporated in Work: New, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide 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 Contract Administrator.

.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.

.2 If delays in supply of Products are foreseeable, notify Contract Administrator of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.3 In event of failure to notify Contract Administrator at start of Work and should it subsequently appear that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available Products of similar character, at no increase in Contract Price or affect to the construction schedule.

1.6 STORAGE AND PROTECTION

.1 Store and protect Products in accordance with manufacturers' written instructions.

.2 Store with seals and labels intact and legible.

.3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.

.4 For exterior storage of fabricated Products, place on sloped supports above ground.

.5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

.6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

.7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

.8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.7 TRANSPORTATION AND HANDLING

.1 Transport and handle Products in accordance with manufacturer's written instructions.

.2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

.3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 MANUFACTURER'S WRITTEN INSTRUCTIONS

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

.2 Notify Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contract Administrator may establish course of action.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Contract Administrator to require removal and re-installation at no increase in Contract Price or affect to construction schedule.

1.9 QUALITY OF WORK

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

.2 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site any workers deemed incompetent or careless.

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

1.10 COORDINATION

.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.

1.11 CONCEALMENT

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

.2 Before installation, inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

1.12 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.

1.13 LOCATION OF FIXTURES

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

.2 Inform Contract Administrator of conflicting installation. Install as directed.

1.14 FASTENINGS

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

.2 Prevent electrolytic action between dissimilar metals and materials.

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

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

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

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

1.15 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.16 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of the Project.

.2 Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Contract Administrator.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Field engineering survey services to measure and stake site.

.2 Recording of subsurface conditions found.

.3 Survey services to determine measurement inverts for the Work.

1.2 RELATED REQUIREMENTS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REFERENCES

.1 Identification of existing survey control points and property limits.

1.4 SUBMITTALS

.1 Submit name and address of surveyor to Contract Administrator.

.2 On request of Contract Administrator, submit documentation to verify accuracy of field engineering work.

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

1.5 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practise in the Place of the Work, acceptable to Contract Administrator.

1.6 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on Drawings.

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

.3 Make no changes or relocations without prior written notice to Contract Administrator.

.4 Report to Contract Administrator when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

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

1.7 SURVEY REQUIREMENTS

.1 Record locations, with horizontal and vertical data in Project Record Documents.

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

.3 Stake for grading, landscaping features, fill placement, and topsoil placement.

.4 Stake slopes.

.5 Establish pipe invert elevations.

.6 Stake batter boards for foundations.

.7 Establish foundation, column locations, and floor elevations.

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

1.8 SUBSURFACE CONDITIONS

.1 Promptly notify Contract Administrator in writing if discovered surface or subsurface conditions at Place of Work differ materially from those indicated in Contract Documents.

.2 Advise the Contract Administrator of a reasonable assumption of probable conditions when determined.

1.9 EXAMINATION

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

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

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

1.10 PREPARATION

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

.2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.11 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Contract Administrator of findings.

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

1.12 SURVEY RECORD

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

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Execution requirements for all Work.

1.2 RELATED REQUIREMENTS

.1 Section 01 70 00 - Examination and Preparation.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 TOLERANCES

.1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.

.2 Do not permit tolerances to accumulate beyond effective or practical limits.

.3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Contract Administrator before proceeding.

.4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

1.4 EXECUTION

.1 Execute cutting, fitting, and patching to complete the Work.

.2 Perform required excavation and fill to complete the Work.

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

.4 Uncover Work to install ill-timed Work.

.5 Remove and replace defective or non-conforming Work.

.6 Remove samples of installed Work for testing, if not designated in the respective Section as remaining as part of the Work.

.7 Provide openings in non-structural elements of Work for penetrations of electrical and mechanical Work. Limit opening dimensions to minimal sizes required, and performed in a neat and clean fashion.

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

.9 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.10 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry or concrete work without prior approval.

.11 Restore Work with new Products in accordance with requirements of Contract Documents.

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

.13 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, for full thickness of the constructed element.

.14 Re-finish surfaces to match adjacent finishes: For continuous surfaces re-finish to nearest intersection; for an assembly, re-finish entire unit.

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Cleaning prior to acceptance.

1.2 RELATED REQUIREMENTS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

.2 Section 01 74 20 - Waste Management and Disposal

Part 2 Products

2.1 CLEANING MATERIALS

.1 Cleaning Agents and Materials: Low VOC content.

Part 3 Execution

3.1 PROGRESSIVE CLEANING

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Contract Administrator or other contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site.

.3 Clear snow and ice from area of construction, remove from site.

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

.5 Containers:

.1 Provide on-site steel framed, hinged lid containers for collection of waste materials and debris.

.6 Remove waste material and debris from site and deposit in waste containers at end of each working day.

.7 Dispose of waste materials and debris off site.

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

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

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

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

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

3.2 CLEANING PRIOR TO ACCEPTANCE

.1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

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

.4 Remove waste products and debris including that caused by Contract Administrator or other contractors.

.5 Do not burn waste materials on site.

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

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.

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

.10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.11 Clean and polish surface finishes, as recommended by manufacturer.

.12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, and sunken wells.

.16 Sweep and wash clean paved areas.

.17 Clean equipment and fixtures to a sanitary condition; clean filters of mechanical equipment.

.18 Clean roof surfaces, and drainage components.

.19 Remove debris and surplus materials from crawl space areas and other accessible concealed spaces.

.20 Remove snow and ice from access to facilities.

3.3 FINAL PRODUCT CLEANING

.1 Execute final cleaning prior to final project assessment. Refer to Section 01 74 00.

.2 Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

.3 Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

.4 Clean filters of operating equipment.

.5 Clean site; sweep paved areas, rake clean landscaped surfaces.

.6 Remove waste and surplus materials, rubbish, and construction facilities from the site.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Waste management goals.

.2 Waste management plan.

.3 Waste management plan implementation.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 63 - Sustainability Certification Project Requirements

.3 Section 01 74 00 - Cleaning and Waste Processing

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49

1.3 DEFINITIONS

.1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.

.2 Construction and Demolition Waste: Solid wastes typically including but not limited to, building materials, packaging, trash, debris, and rubble resulting from construction, re-modelling, repair and demolition operations.

.3 Hazardous: Exhibiting the characteristics of hazardous substances including, but not limited to, ignitability, corrosiveness, toxicity or reactivity.

.4 Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including, but not limited to, ignitability, corrosiveness, toxicity, or reactivity.

.5 Non-toxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

.6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and re-manufactured into a new product for reuse by others.

.7 Recycle: To remove a waste material from the Project site to another site for re-manufacture into a new product for reuse by others.

.8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Return: To give back reusable items or unused products to vendors for credit.

.10 Reuse: To reuse a construction waste material in some manner on the Project site.

.11 Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.

.12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

.13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.14 Toxic: Poisonous to humans either immediately or after a long period of exposure.

.15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

.16 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

.17 Waste Audit (WA): Detailed inventory of materials expected to become waste during the construction process. Involves quantifying (by weight) the amount of material waste that is expected to be generated during construction, and indicates the expected quantity of reuse, recycling and landfill.

.18 Waste Management Plan: A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Prepare and submit the following documentation as a Waste Management Plan prior to construction start-up:

.1 Submit an electronic copy of the completed Waste Audit (WA).

.2 Submit an electronic copy of the draft and final Waste Management Plan.

.3 Submit a list of waste management firms or receivers that will be used for waste diversion.

.4 Submit signed letters from waste management firms or receivers, listing material types they accept and end use for each material.

.3 Provide monthly summary of waste materials leaving the site.

.1 Classify each load of material leaving the site by material type and disposal type (landfilled, recycled, salvaged, donated, sold, or reused). Materials that are considered hazardous material or excavated material need not be submitted.

1.5 WASTE MANAGEMENT GOALS

.1 Goals:

.1 Generate least amount of waste possible.

.2 Divert minimum 50% (by weight) of construction waste from landfill.

.3 Reuse, salvage, or recycle as required.

.4 Accomplish maximum control of solid construction waste.

.5 Preserve environment and prevent pollution and environment damage.

.2 Prior to start of Work, conduct meeting with the Contract Administrator to review and discuss Project Waste Management Plan and Goals.

1.6 WASTE AUDIT (WA)

.1 Conduct a Waste Audit before Project start-up.

.2 Prepare Waste Audit, and submit to Contract Administrator.

.3 Maintain one copy of Waste Audit on site.

1.7 WASTE MANAGEMENT PLAN

.1 Waste Management Plan: Submit draft Waste Management Plan within 14 days after receipt of Award of Contract, or prior to any waste removal, whichever occurs sooner.

.2 At a minimum, include:

.1 Proposed destination for all materials listed.

.2 Proposed on site location for material sorting and storage.

.3 Labelling system for storage areas.

.4 Details about material handling and removal procedures.

.5 Plan for reducing, reusing, and recycling waste, by material type.

.6 Identify a person who will be responsible for implementing the Waste Management Plan.

.7 Timetable for implementing the Waste Management Plan.

.8 Plan for educating site workers on the requirements of the Waste Management Plan.

.9 Projected total weight of waste materials generated

.3 Structure Waste Management Plan to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Identify opportunities for reduction, reuse, and recycling of materials based on information acquired from the Waste Audit.

.5 Post final Waste Management Plan on site where workers are able to review content regularly.

.6 Monitor and report monthly on waste reduction by documenting quantity of waste removed from the site.

.7 Maintain one copy of Waste Audit on site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

.1 Manager: Designate an on-site party responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for Project.

.2 Distribution: Distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, and the Contract Administrator.

.3 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by parties at appropriate stages of Project.

.4 Separation facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Keep recycling and waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

.5 Hazardous wastes: Separate, store and dispose of hazardous wastes according to local regulations.

3.3 MATERIALS SOURCE SEPARATION

.1 Provide on-site facilities for collection, sorting, handling, and storage of anticipated quantities of reusable and recyclable materials.

.2 Provide containers to deposit reusable and recyclable materials.

.3 Locate containers in locations to facilitate deposit of materials without hindering daily operations.

.4 Locate separated materials in areas that minimize material damage.

.5 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition. Transport to appropriate facility approved by the Contract Administrator.

3.4 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled, or salvaged in locations as approved by the Contract Administrator.

.2 Unless specified otherwise, materials for removal become the property of the Contractor.

.3 Retain packaging products for reuse when possible.

.4 Protect, stockpile, store, and catalogue salvaged items.

.5 Separate non-salvageable items from salvageable items. Transport and deliver non-salvageable items to licensed disposal/recycling facility.

.6 Prevent contamination of salvageable/recyclable materials and handle materials in accordance with requirements for acceptance by designated facilities.

3.5 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not burn or incinerate waste materials, including land clearing debris.

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

.4 Keep records of construction waste including:

.1 Number and weight of bins.

.2 Waste type for each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Starting equipment in preparation for adjusting and commissioning.

1.2 RELATED REQUIREMENTS

.1 Section 01 79 00 - Demonstration and Training.

.2 Section 01 91 00 - Commissioning.

.3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

Part 2 Products

Part 3 Execution

3.1 STARTING SYSTEMS

.1 Coordinate schedule for start-up of various equipment and systems.

.2 Notify Contract Administrator, five Business Days prior to start-up of each item.

.3 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

.4 Verify tests, metre readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

.5 Verify that wiring and support components for equipment are complete and tested.

.6 Execute start-up under supervision of applicable Subcontractors' personnel in accordance with manufacturers' written instructions.

.7 When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

.8 Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.2 CONTRACTOR START UP

.1 Contractor shall perform the following during start-up:

- .1 Start equipment and systems.
- .2 Test, adjust and balance equipment and systems.
- .3 Demonstrate equipment and systems as specified in Section 01 79 00.
- .4 Complete and submit start-up reports including:
  - .1 Contractor's system and equipment start up reports.
  - .2 Testing, adjusting and balancing reports.
  - .3 Manufacturers' equipment start up reports.
- .5 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.

.6 Correct Contract deficiencies and defects identified as a result of the foregoing and as may be identified by the Contract Administrator.

.7 Execute and complete approved Change Orders.

.8 Perform other work and activities required for fulfillment of prerequisites to Interim Acceptance of the Work.

.2 Commissioning Agent will perform the following during start-up:

.1 Perform preliminary interim inspections as necessary.

.2 Witness manufacturers' equipment start-up.

.3 Verify starting, testing, adjusting and balancing by Contractor.

.4 Provide start-up reports for all systems and equipment and review and approve Contractor start-up reports.

.5 Cooperate in systems and equipment demonstration and instruction.

.6 Initiate Change Orders as required.

.7 Verify correction of Contract deficiencies and defects by Contractor.

.8 Verify execution of Change Orders performed by Contractor.

.9 Perform other activities related to Substantial Completion of the Work.

3.3 PERFORMANCE TESTING

.1 Performance testing will be performed by the Commissioning Agent and:

.1 Completed prior to Substantial Completion.

.2 Completed when all systems have been balanced and tested and are operating to the satisfactory of the Commissioning Agent.

.2 The Commissioning Agent will do the following during Performance Testing:

.1 Carry out a series of preplanned systems and equipment operating tests under conditions simulating, to the extent possible, full and partial operating loads.

.2 Record test results.

.3 Diagnose problems and determine whether they are the result of Contract Deficiencies.

.4 Initiate Change Orders as required.

.5 Repeat tests as required following correction of deficiencies and execution of Change Orders by Contractor and verify results.

.6 Perform other activities related to Substantial Completion.

.3 Contractor shall perform the following during Performance Testing:

.1 Correct Contract deficiencies and defects previously outstanding and those identified during performance testing.

.2 Execute Change Orders.

3.4 SEASONAL CONSTRAINTS

.1 Notwithstanding requirements in this Section, additional separate cycles of Contractor start-up, performance testing and fine tuning may be needed at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

.2 Contractor's responsibilities with respect to later facility start-up activities are specified in this section.

3.5 PARTIAL USE OF WORK

.1 When partial use of the Work is required, the applicable requirements specified in this section apply to the parts of the Work to be used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Inspections and declarations.

.2 Closeout submittals.

.3 Operation and maintenance manuals.

.4 Recording actual site conditions – As-Builts.

.5 Record documents.

.6 Final survey.

.7 Warranties and bonds.

.8 Maintenance materials, special tools and spare parts.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 79 00 - Demonstration and Training.

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 DEFINITIONS

.1 As-Built Documents: Project documents that are annotated by the Contractor during construction to record changes in the Work.

.2 Record Documents: As-built documents consisting of Drawings and Specifications produced, usually electronically, from information derived from the Contractor's as-built documents.

1.4 REFERENCES

.1 WCA/MAA Technical Bulletin #15 – Operations and Maintenance Manuals, dated December 24, 2001.

1.5 INSPECTIONS AND DECLARATIONS

.1 Substantial Performance:

.1 Contractor's Pre-Substantial Performance Inspection:

.1 Before requesting Substantial Performance review, the Contractor and Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.2 Notify Contract Administrator of Contractor's Pre-Substantial Performance inspection dates.

.3 After conducting pre-substantial performance inspection, notify Contract Administrator in writing of time allotted for completion of repairs and correction of deficiencies and defects. Indicate proposed date for Substantial Performance review.

.2 Substantial Performance Application: Once corrections have been made and Work is considered ready for Substantial Performance review, make formal application for Substantial Performance, confirming that the following has been completed:

.1 Work has been completed and inspected for compliance with the Contract Documents, and requirements of Substantial Performance as defined by Provincial lien legislation.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced, and are fully operational and complete.

.4 Certificates required by authorities having jurisdiction have been submitted.

.5 Certificates required by utility companies have been submitted.

.6 Operation of systems have been demonstrated to Contract Administrator's personnel.

.7 Operations and maintenance manuals, as-built drawings have been submitted to Contract Administrator.

.8 Application for occupancy permit has been initiated.

.9 Detailed listing of seasonal work and schedule for completion has been provided.

.10 Final cleaning including cleaning of air handling systems and ductwork.

.3 Substantial Performance Review:

.1 Request Contract Administrator’s review.

.2 Have initial operating and maintenance manuals on site for Substantial Performance review.

.3 Accompany Contract Administrator on Substantial Performance review to identify obvious defects or deficiencies and items requiring completion or correction.

.4 Upon completion of review, Contract Administrator will verify whether Substantial Performance has been achieved and advise the Contractor accordingly.

.5 Comply with Contract Administrator’s instructions for correction of items of Work listed in closeout review report.

.6 Notify Contract Administrator of completion of items of Work determined in Contract Administrator’s Substantial Performance review, and request review by Contract Administrator.

.4 Declaration of Substantial Performance: When Contract Administrator considers defects and deficiencies have been corrected, and it appears requirements of Contract have been substantially performed, the Contract Administrator will determine the date of Substantial Performance of the Work, and issue a certificate of Substantial Performance.

.2 Commencement of Warranty Periods: The date for the commencement of the warranty period shall be as set out in the Supplemental Conditions.

.3 Commencement of Lien Periods: The date of publication of the certificate of Substantial Performance of the Work shall be the date for commencement of the lien period, unless required otherwise by the lien legislation applicable at the Place of the Work.

.4 Final Payment: When Contract Administrator considers final deficiencies and defects have been corrected and it appears requirements of Contract have been completed, make application for final payment.

.5 Payment of Hold-back: After issuance of certificate of Substantial Performance of the Work, submit an application for payment of hold-back amount, upon expiry of the lien period.

1.6 CLOSEOUT SUBMITTALS

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection with Contract Administrator'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 Contract Administrator, four final copies of operating and maintenance manuals in Canadian 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.

.7 Defective Products will be rejected, regardless of previous inspections. Replace Products at own expense.

.8 Pay costs of transportation.

1.7 OPERATION AND MAINTENANCE MANUALS

.1 Submission:

.1 Prepare operation and maintenance instructions and data using personnel experienced in maintenance and operation of described products.

.2 Two weeks before Substantial Performance of the Work, submit to the Contract Administrator, one initial copy of operating and maintenance manuals.

.3 Initial copy will be returned after Substantial Performance, with Contract Administrator’s comments.

.4 Revise content of documents as required before final submittal.

.5 Should comments be extensive, the Contract Administrator may require the initial submission to be repeated before Substantial Performance.

.6 Two weeks prior to final inspection of the Work, submit to the Contract Administrator, one electronic copy and four final hard copies of operating and maintenance manuals in English.

.2 Organize data in accordance with WCA/MAA Technical Bulletin #15, and as follows:

.1 Text:

.1 Hard copy: Manufacturer's printed data.

.2 Electronic copy: Provide electronic documents in accordance with requirements for electronic submissions in Section 01 33 00 – Submittal Procedures.

.2 Drawings:

.1 Hard copies: with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.2 Electronic: CAD and PDF copies of drawings in ledger size.

.3 Provide full size drawings in 1:1 scaled CAD files in dwg format on DVD, when size is not practical for inclusion as paper drawings.

.3 Contents – Each Volume:

.1 Table of Contents: Include:

.1 Title of project.

.2 Date of submission.

.3 Names, addresses, and telephone numbers of Contract Administrator and Contractor with name of responsible parties.

.4 Schedule of products and systems, indexed to content of volume.

.5 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.2 Materials and Finishes:

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Include instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Building Envelope: Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.

.3 Each Item of Equipment and Each System:

.1 Include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination Drawings, with installed colour-coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports.

.15 Additional requirements: As specified in individual specification sections.

.4 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.

.5 Warranties and bonds.

.6 List of spare parts and maintenance materials.

.7 Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.8 Certificate of Acceptance: Relevant certificates issued by authorities having jurisdiction, including pressure vessel acceptance, code compliance certificate, life safety systems performance certificate.

.9 Training documentation: Refer to Section 01 79 00.

1.8 RECORDING ACTUAL SITE CONDITIONS – AS-BUILTS

.1 Record information on set of black line opaque drawings, and within the Project Manual, provided by Contract Administrator.

.2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

.3 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately recorded.

.4 Maintain documents in clean, dry and legible condition. Do not use for construction purposes.

.5 Contract drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.6 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.7 Other Documents: Maintain manufacturer's certifications, field test records, and inspection certifications, required by individual specifications sections.

1.9 RECORD DOCUMENTS

.1 Prior to Substantial Performance of the Work, electronically transfer the marked up information from the as-built documents to a master set of Drawing and specification files provided by the Contract Administrator, as follows:

.1 Drawings: AutoCAD 2000 or later.

.2 Specifications: Adobe Acrobat.

.2 Mark revised documents as RECORD DOCUMENTS. Include all revisions.

.3 Employ a competent computer draftsperson to indicate changes on the electronic set of record drawings. Provide updated record drawings in Adobe Acrobat and AutoCAD 2000 or later.

.4 Submit completed record documents to Contract Administrator on a DVD, accompanied by one hard copy set.

1.10 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 70 00, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

.2 Inaccurate or neglectful information shall become a liability of the Contractor.

1.11 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 10 Business Days after completion of the applicable item of work.

.4 Except for items put into use with Contract Administrator's permission, leave date of beginning of time of warranty until the Date 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 submittals.

1.12 MAINTENANCE MATERIALS, SPECIAL TOOLS AND SPARE PARTS

.1 Package spare parts, maintenance materials, and special tools in suitable containers, labelled for maintenance use. Clearly identify contents of each package (eg. one mechanical seal and one pump casing gasket for pump P-1 located in Room 123). Include catalogue, serial or replacement number for each part.

.2 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 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Operations and Maintenance Manual.

.4 Obtain receipt for delivered maintenance materials, and submit prior to final payment.

.3 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Operations and Maintenance Manual.

.4 Obtain receipt for delivered spare parts, and submit prior to final payment.

.4 Tools:

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Operations and Maintenance Manual.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Procedures for demonstration and instruction of Products, equipment and systems to facility personnel.

.2 Seminars and demonstrations.

1.2 RELATED REQUIREMENTS

.1 Section 01 91 00 - Commissioning.

.2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 DESCRIPTION

.1 Demonstrate operation and maintenance of building systems and equipment to facility personnel two weeks prior to date of Substantial Performance.

.2 Contract Administrator will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.4 COMPONENT DEMONSTRATION

.1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems.

.2 Instruct facility personnel, and provide written report that demonstration and instructions have been completed.

1.5 SUBMITTALS

.1 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Contract Administrator's approval.

.2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.3 Give time and date of each demonstration, with list of persons present.

1.6 CONDITIONS FOR DEMONSTRATIONS

.1 Equipment has been inspected and put into operation in accordance with:

.1 Section 08 42 29 – Automatic Entrances.
.2 Section 22 05 00 – Common Work Results for Plumbing.
.3 Section 22 10 10 – Plumbing Pumps
.4 Section 22 42 01 – Plumbing Specialties and Accessories
.5 Section 23 05 00 – Common Work Results for HVAC.
.6 Section 23 74 00 – Packaged Outdoor HVAC Equipment.
.7 Section 23 84 13 – Humidifiers
.8 Section 26 05 00 – Electrical – Common Work Results.
.9 Section 26 80 00 – Commissioning of Electrical Systems

.2 Testing, adjusting, and balancing have been performed, and equipment and systems are fully operational.

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 PREPARATION

.1 Verify that suitable conditions for demonstration and instructions are available.

.2 Verify that designated personnel are present.

.3 Prepare agendas and outlines.

.4 Establish seminar organization.

.5 Explain component design and operational philosophy and strategy.

.6 Develop equipment presentations.

.7 Present system demonstrations.

.8 Accept and respond to seminar and demonstration questions with appropriate answers.

3.2 PREPARATION OF AGENDAS AND OUTLINES

.1 Prepare agendas and outlines including the following:

.1 Equipment and systems to be included in seminar presentations.

.2 Name of companies and representatives presenting at seminars.

.3 Outline of each seminar's content.

.4 Time and date allocated to each system and item of equipment.

.5 Provide separate agenda for each system.

3.3 SEMINAR ORGANIZATION

.1 Coordinate content and presentations for seminars.

.2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.

.3 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.

.4 Coordinate proposed dates for seminars with Contract Administrator and select mutually agreeable dates.

3.4 DEMONSTRATION AND INSTRUCTIONS

.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the equipment location.

.2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.

.3 Instruct personnel on control and maintenance of sensory equipment and operational equipment associated with maintaining energy efficiency and longevity of service.

.4 Review contents of manual in detail to explain all aspects of operation and maintenance.

.5 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

3.5 TIME ALLOCATED FOR INSTRUCTION

.1 Ensure amount of time required for instruction of each item of equipment or system as follows:

.1 Section 08 42 29 – Automatic Entrances: two hours of instruction.

.2 Section 22 05 00 – Common Work Results for Plumbing: five hours of instruction.

.3 Section 22 10 10 – Plumbing Pumps: one hour of instruction.

.4 Section 22 42 01 – Plumbing Specialties and Accessories: five hours of instruction.

.5 Section 23 05 00 – Common Work Results for HVAC: five hours of instruction.

.6 Section 23 74 00 – Packaged Outdoor HVAC Equipment: five hours of instruction.

.7 Section 23 84 13 – Humidifiers: two hours of instruction

.8 Section 26 80 00 – Commissioning of Electrical Systems: 20 hours of instruction

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Commissioning, testing and documentation.

.2 Audit testing and the commissioning auditor.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 70 00 - Examination and Preparation.

.3 Section 01 75 16 - Start-up Procedures.

.4 Section 01 79 00 - Demonstration and Training.

.5 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 DEFINITIONS

.1 Commissioning: The process for achieving, verifying, and documenting that the facility and its systems are planned, designed, installed, and tested to ensure that they meet the original project requirements.

.2 Commissioning Team:

- .1 City Representative: Representative of the City.
- .2 Contract Administrator.
- .3 Commissioning Manager: Party engaged by the City to lead commissioning activities, and coordinate other team members.
- .4 Contractor Representatives: Representatives of the Contractor, including any sub-contractors whose scope of work includes items requiring commissioning.
- .5 Commissioning Auditor: Party engaged by the City to audit or verify results assembled by the Commissioning Team.
- .6 Testing Agency: Specialty agency engaged by the City to perform tests on components or systems to verify conformance to specified requirements.

.3 Commissioning Documents:

- .1 Commissioning Plan: A project-specific document which defines the scope and approach to commissioning of this facility.
- .2 Submittal: Contract submittal, as specified in Contract Documents.
- .3 Static check certificate: A document used to verify equipment data actually installed, prior to start-up or operation.
- .4 Operating check certificate. A document used to verify equipment operation, including performance statistics.
- .5 Start-up Reports: Report prepared by equipment start-up personnel, including start-up sequence, and performance statistics. Refer to Section 01 75 16.
- .6 Balancing Report: Report prepared by the balancing agency, indicating initial and final system performance.
- .7 Operations and Maintenance Manual: A document containing detailed descriptions and technical information about start-up, operation and maintenance of equipment.

1.4 METHODOLOGY

.1 Commissioning Manager shall develop a Commissioning Plan, including as a minimum the management of commissioning meetings, and the management of project-specific commissioning documents.

.2 Commissioning Plan to include:

.1 Assembly of project requirements, including design criteria, performance goals, budgets, and schedules.

.2 Scheduling and chairing of commissioning meetings between team members.

.3 Development of static and operating check certificates for individual equipment.

.4 Assembly of commissioning reports, including testing and balancing reports, maintenance manuals, start-up reports, and testing reports.

.5 Verification of data by testing agency.

.6 Audit procedure, to be performed in the event of dispute or failure.

.3 Execute the commissioning plan.

1.5 REGULATORY REQUIREMENTS

.1 Arrange for regulatory authorities to witness those commissioning start up procedures which are also required by regulatory authorities.

.2 Obtain certificates of approval and for compliance with regulations from Authorities Having Jurisdiction; include copies of certificates with start up reports.

1.6 CONTRACT COMMISSIONING REQUIREMENTS

.1 Witnessing: Allow commissioning team members to witness starting, testing, adjusting, and balancing procedures.

.2 Allow Commissioning Manager and Auditor free access to the site.

.3 Costs: Pay costs associated with starting, testing, adjusting, and relevant instruments and supplies required to perform those duties.

.4 Employ experienced personnel for equipment start-up and commissioning, who are able to interpret results of readings and tests, and report the system status in a clear and concise manner.

.5 Provide equipment required to perform testing, balancing, and commissioning of systems. Calibrate instruments used in start up as accurate; provide calibration certificates if requested by the Commissioning Manager.

.6 Use equipment check certificates and other commissioning documents required by the Commissioning Manager.

.7 Verify that equipment is installed in accordance with Contract Documents, and reviewed shop drawings. Sign and date static check certificates.

.8 Do not start up equipment unless static check sheets have been completed and submitted.

.9 Complete in detail, and sign operating check certificates.

Part 2 Products

Part 3 Execution

3.1 COMMISSION TESTING

.1 Allow for work, effort, and associated costs necessary to assist the Commissioning Manager, for fulfilment of a commission testing process of the facility and Work.

.2 Coordinate, cooperate, and harmonize efforts with the Commissioning Manager.

.3 Commission testing will include a random testing and evaluation process as determined by the Commissioning Manager.

.4 System and device checks to be suitably logged, tabulated, signed, and incorporated into project Operation and Maintenance Manuals:

.1 Prior to start of testing, provide two complete sets of up-to-date contract drawings and specifications including addenda to the Commissioning Manager.

.2 Provide two of each approved notice of change and clarification.

.3 Coordinate site visits by the Commission Manager and the affected parties during warranty periods.

.5 The commissioning process will not:

.1 Preclude the duties and responsibilities described in the Contract Documents nor the requirements and obligations of the Contract.

.2 Circumvent any required warranties.

.3 Relieve the Contractor from warranty requirements, responsibilities, or obligations.

.6 Prior to commission testing, provide the following information to the Commissioning Manager:

.1 Static test certificates.

.2 Equipment operating certificates.

.3 Three copies of valve tag list.

.4 Inspection certificates from authorities having jurisdiction.

.5 Required copies of shop drawings.

.6 Manufacturer's operating and maintenance brochures of all major equipment.

.7 Ensure systems have been started, adjusted to design criteria, and are functionally operational, ready for independent testing.

.8 Cooperate with the Commissioning Manager in advance of activating operating systems.

.9 Test results that reveal failure to conform to the Contract Documents, will result in a second series of tests performed by an Auditor.

3.2 AUDIT TESTING AND THE COMMISSIONING AUDITOR

.1 In the event on non-compliance or test failure described in the commission testing process above, comply with the following requirements.

.2 Allow for work, effort, and associated costs necessary to assist a City-appointed and remunerated Auditor, for fulfilment of a further audit testing of the facility and Work.

.3 Coordinate, cooperate, and harmonize efforts with the Auditor.

.4 Audit testing will include further random testing and evaluation as determined by the Contract Administrator, the Auditor, and the Commissioning Manager.

.5 Suitably log, tabulate, and incorporate signed system and device check certificates into Operating and Maintenance Manuals.

.6 Coordinate site visits by the Auditor, Commission Manager and the affected parties during warranty periods.

.7 The audit process will not:

.1 Preclude the duties and responsibilities described in the Contract nor the requirements and obligations of the Contract.

.2 Circumvent any required warranties.

.3 Relieve the Contractor from warranty requirements, responsibilities, or obligations.

.8 Cooperate with the Auditor prior to testing of operating systems.

.9 Test results that demonstrate failure to conform to the Contract Documents, may result in the following, at the Contract Administrator's sole discretion:

.1 Complete rejection of the subject component, assembly, or system.

.2 Removal of defective items from the Work.

.3 An adjustment credit to the Contract Price for the Contract Administrator's estimated value of the subject item plus remuneration for associated damages and inconvenience.

.4 Provision of a suitable substitute Product in place of the defective Product.

.5 Substituted Products will be required to be commissioned and audited and undergo the same scrutiny as described for commission testing and audit testing described above.

END OF SECTION