



GENERAL PROCEDURES & STANDARDS

For Construction Management
Services

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1. DEFINITIONS

1.1.1 DEFINITIONS

- .1 Acceptance
 - .1 A formal action taken by a person with assigned authority (contractual or otherwise) to declare that some aspect of the project is permitted to proceed.
- .2 Agreed Budget
 - .1 The Budget identified in the TOR or subsequently in writing by the Departmental Representative.
- .3 Basis of Design
 - .1 Documentation of the primary thought processes and assumptions behind design decisions that were made to meet the Owner's Project Requirements (OPR). The basis of design describes the systems, components, conditions, and methods chosen to meet the OPR. (also refer to CSA Z320 Article 3, Definitions)
- .4 Buzzsaw FTP Site
 - .1 Buzzsaw is PWGSC's file storage site, which will be used to store and access all contract documents, photographs and submittals too large for transmission by e-mail. Access rights will be assigned to key individuals in each firm, who will be able to access, copy and store information.
- .5 "Canada", "Crown", "Her Majesty" means Her Majesty the Queen in right of Canada.
- .6 Commissioning (Cx) Manual
 - .1 Refer to CSA Z320 Article 4.9.2, Commissioning manual.
- .7 Commissioning Plan
 - .1 CM project specific commissioning plan, also refer to CSA Z320 Article 4.2.3 Commissioning Plan.
- .8 Commissioning Process
 - .1 Refer to CSA Z320 Article 4, Commissioning Process.
- .9 Commissioning Process Manager
 - .1 CM Cx Process Manger, overall responsible for managing the Commissioning Activities to demonstrate that the installed components and systems and overall facility meet the requirements of the OPR and facility design.
 - .2 Manager may require a unique combination of engineering, design fundamentals and building operations knowledge including: energy systems design, installation and operation, commissioning planning and process management, hands-on field experience with energy systems performance, interaction, start-up, balancing, testing, troubleshooting, operation, and maintenance procedures and energy systems automation control knowledge.
- .10 Commissioning (Cx) Advisor (PWGSC)
 - .1 PWGSC Commissioning Advisor is responsible for the oversight of the development, implementation and evaluation of the Commissioning Process.
- .11 Constructability



- .1 The extent to which the design of the building facilitates ease of construction, subject to the overall requirements for the completed building project.
 - .2 The effective and timely integration of construction knowledge into the conceptual planning, design, construction, and field operations of a project to achieve the overall project objectives in the best possible time and accuracy at the most cost-effective levels.
 - .3 The integration of construction knowledge in the project delivery process and balancing the various project and environmental constraints to achieve the project goals and building performance at the optimal level.
- .12 Construction manager (CM)
- .1 Construction Manager (CM) is defined as CM providing both Advisory and Contractor functional services under one contract throughout the specified project life cycle.
 - .1 Remuneration for Construction Management services, CM as Advisor or as CM Constructor, may have one or more 'fixed price' components and one or more 'cost reimbursement' components, with some of the services covered by the fixed price(s) and others cost reimbursable.
 - .2 CM is not held responsible for technical design defects and does not assume any contractual responsibilities or duties of the Design Consultant(s).
- .13 Construction Manager as Advisor
- .1 Construction Manager as Advisor is a form of Construction Management under which the Construction Manager acts as an advisor and support to, the Departmental Representative during Pre-Design, Design, Construction and Closeout by maintaining a working relationship with the Departmental Representative, User Department, the Designer Consultants (Architect/Engineers), construction subcontractors, and other consultants supporting the Departmental Representative.
- .14 Construction Management Percentage Fee
- .1 Construction Management Percentage Fee includes profit, overhead and general administration costs, all charges relating to the financing of the project, general supervision, site supervision, management and coordination of all subtrades, and the Contractor's expenses and administrative costs relative to the project, as described below:
 1. All CM personnel, (Project Manager, Project Co-coordinator, Site Superintendent, Tenant Move Co-ordinator, Safety Officer, Commissioning Specialist and assistants as required), and Security Officer, whose duties include applying for and obtaining security screening confirmation for Security Officer position, as mandated by PWGSC and NRCan security provisions, and applying for and obtaining security screening confirmation for all on-site construction personnel, exclusive of position.
 2. Travel costs, moving costs and living allowances for CM's staff.
 3. Comprehensive General Liability Insurance and Builder's Risk Insurance umbrella policy insurance.
 4. CM's Contract Security (not including Sub-Trade's bonding).



5. Charges for faxes, copying, telephone calls, courier and e-mail services.
 6. Legal costs arising out of the performance of the contract.
 7. Cost of computer time and usage.
 8. Management and co-ordination of shop drawings, samples and product data.
 9. Management and co-ordination of manuals, as-built drawings, maintenance schedule, training program, and related commissioning activities.
 10. Management and co-ordination of warranties,
 11. Layout of Work.
 12. Parking costs / charges.
 13. Temporary site office trailer complex, including furniture and furnishings to provide work space for all on-site CM staff, one enclosed meeting room with telephone for minimum of xx persons, and one enclosed drop-in office with telephone and internet access for PWGSC or consultant use, and
 14. Security for CM's lay-down area for material storage and office.
- .15 Construction Manager as Contractor
- .1 Construction Manager as Contractor is a form of Construction Management under which the Construction Manager enters into multiple trade contracts with the trade contractors and suppliers. The Construction Manager retains the contracting risks inherent in each of the trade contracts and assumes responsibility for the performance of the trade contracts (subcontracts), much as a general contractor would under the traditional method (design/bid/build), and is paid for the trade contract work on a cost reimbursement basis.
 - .2 CM is solely responsible for the construction means, methods, sequences and procedures used in construction of the project and for related performance.
 - .3 CM performs project management planning, cost management, time management, quality management, contract administration and safety management.
 - .4 Constant dollar estimate;
 - .1 This is an estimate expressed in terms of the dollars of a particular base fiscal year.
 - .1 It includes no provision for inflation.
 - .2 Cash flows over a number of fiscal years may also be expressed in constant dollars of the base year including no allowance for inflation in the calculation of costs.
 - .5 Current Dollar estimate:
 - .1 Budget year dollars is also be referred to as Nominal dollars or Budget Year dollars.
 - .2 This is an estimate based on costs arising in each FY of the project schedule.
 - .3 It is escalated to account for inflation and other economic factors affecting the period covered by the estimate.
 - .4 The costs and benefits across all periods should initially be tabulated in budget year dollars for the following reasons;



- .1 First; this is the form in which financial data are usually available,
 - .2 Second; adjustments, such as tax adjustments, are accurately and easily made in budget year dollars,
 - .3 Finally; working in budget-year dollar enables the analyst to construct a realistic picture over time, taking into account changes in relative prices.
- .16 CM Plan
- .1 Refer to Project Procedures Manual/ CM Plan.
- .17 Consultant Team
- .1 An architectural or engineering firm and their sub-consultants and professionals and advisors with whom PWGSC has contracted to provide other services on this project.
- .18 Departmental Representative
- .1 Means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person designated and authorized in writing by the Departmental Representative to the Contractor.
- .19 Design Development
- .1 Subsequent to the Consultant's Schematic Design, the Design Development process provides a method to:
 - .1 Coordinate and resolve the design of all major components associated with architectural, structural, mechanical, and electrical;
 - .2 Prepare an outline project specifications including an initial Cx focused testing procedures and check sheets/forms document related to;
 - .1 Static Verification,
 - .2 Start-up,
 - .3 Functional Performance Testing.
 - .3 Perform preliminary modeling and simulations (such as energy analysis and daylight simulation); and
 - .4 Update of the construction and commissioning cost estimates.
 - .2 The Design Consultants Design Report is of sufficient detail to assist with the ongoing development of the initial Cx Plan that also updates;
 - .1 Commissioning activities based on risk and complexity,
 - .2 Construction Cx cost.
- .20 Evaluation Report
- .1 A Cx Manual component.
 - .2 De-briefing report and including a complete assessment of the project, lessons learned, variances between the actual and planned levels of performance, listing of components and systems not commissioned and the reasons for this; recommended follow-up actions and any other related information.
- .21 Facility Turnover
- .1 CSA Z320 Article 4.7, Facility Turnover Activities.
- .22 Integrated Project Delivery Workshops
- .1 Mechanism that enables early and ongoing engagement of a project team to provide a better designed, constructed cost effective and timely project.



- .2 Early engagement of the CM allows for the potential of early starts in the construction sequence, as the design is proceeding.
- .23 Interim acceptance
 - .1 Refer to CSA Z320 Article 4.6, Interim Acceptance
 - .2 Interim Acceptance will be synonymous with Substantial Completion as GC's of the Consultant Contract.
- .24 Issues Log
 - .1 Log contains description of issues at variance with OPR.
 - .1 On an ongoing basis the log maintains status of current and resolved issues.
 - .2 Issues are identified and tracked as encounter during all design phases, construction and operations of the facility.
 - .3 Issues Log is included as part of the monthly construction phase reporting on the Cx Plan.
 - .4 For information to be documented refer to ASHRAE Guideline, The Commissioning Process.
- .25 Leads
 - .1 Facilitates activity and is accountable for the resultant final documentation delivery.
- .26 Master Schedule
 - .1 Master Schedule is produced by and is the responsibility of the CM with input from the Design Consultant team and Departmental Representative.
 - .2 An authoritative project schedule to which all other schedules roll up and are coordinated.
- .27 Owner Project Requirements
 - .1 A dynamic document that provides the explanation of the ideas, concepts, and criteria considered important to the owner. The OPR are site specific measurable goals for the owner's objective to the greatest extent possible. (Also refer to CSA Z320 Article 3, Definitions.)
- .28 Own Forces
 - .1 CM work force not subject to competitive bidding conducting limited amount of construction not included in trade contract work, such as temporary facilities and services (e.g. hoarding, temporary heat, site office, power, water, security, hoisting, etc.) clean-up, miscellaneous cutting, patching, blocking, and other similar items.
- .29 Participates
 - .1 Responsible participant in the activity and/or deliverable.
- .30 Partnering Session Workshops
 - .1 Workshop led by the Departmental Representative with all project stakeholders addressing;
 - .1 Role and responsibilities,
 - .2 Rules of engagement,
 - .3 Project status, goals, objectives, elements, scope, funding preliminary schedule,
 - .4 Project risks and development of initial risk management plan,
 - .5 Review of existing available documentation and site,
 - .6 Schedule bi-weekly project and milestone meetings, and



- .7 Establish communication and document control plan.
 - .2 CM as part of the design team is responsible for matters such as the Master Schedule and provides input into matters such as, commissioning, phasing, constructability, availability of material and equipment.
- .31 Permits and Fees
 - .1 CM will pay building permit fees CM to include but not limited to electrical and plumbing permit costs, landfill fees.
- .32 Project Procedures Manual/ CM Plan
 - .1 The Construction Management Plan is dynamic and establishes how the design, construction and closeout process will be structured to deliver a Project on time and within budget.
 - .2 A measure against which performance is evaluated and the success of a Project judged.
 - .3 Includes items such as;
 - .1 Organization and communication charts,
 - .2 Master Schedule complete with a detailed Work Breakdown Structure,
 - .3 Quality assurance procedures and documentation plan to determine for example documentation completeness and suitability, testing, inspection and submissions requirements,
 - .4 Cost estimating, control and management techniques,
 - .5 Bid packaging description and contracting strategy,
 - .6 Division 01 work and site mobilization, and
 - .7 Record management plan (including e-mails) establishing procedure regarding collection recording, tracking, access and storage.
- .33 PWGSC Cx Advisor
 - .1 Government commissioning liaison amongst all project stakeholders and reports to the Departmental Representative.
 - .2 A Cx Team member.
 - .3 Provides due diligence overview.
 - .4 Responsible for delivering the Final Cx Evaluation Report.
- .34 Roles and Responsibility Matrix
 - .1 Establishes pre-construction, construction and project closeout roles and responsibilities.
 - .2 Communication activities, consensus building, project team reviews, conceptual design, data gathering, documentation, and formal public notice are planned by the appropriate responsible party and coordinated with all team members. Overlapping accomplishment and parallel paths of activity are to be planned to finish the respective development phase in accordance with the shortest possible schedule.
 - .3 It is not the intent of the summarized Roles and Responsibilities be exclusive of overall contractual services to thereby alleviate CM's obligations.
- .35 Schematic Design
 - .1 Subsequent to the Consultant's BOD document, the Schematic Design process provides a method to fully investigate and fine tune the Owner's planning and technical requirements before beginning Design Development.



- .2 Detail includes preliminary selection of assemblies, systems and load calculations.
- .3 The Design Consultants Schematic Design Report is of sufficient detail to assist CM with the further development of the CM Plan/Project Procedures Manual.
- .36 Systems
 - .1 Refer to CSA Z320 Article, 5 Specific systems.
- .37 Webex
 - .1 PWGSC's remote meeting site accessed through e-mail invitation and computer access through dedicated internet website.
- .38 Work
 - .1 Means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the contract documents, and includes all labour, parts and material, other than provided in Construction Manager Advisory Fee and Construction Management Fee Percentage that is directly attributable to the performance of the Contract.



2. PROJECT ADMINISTRATION

2.1 GENERAL

2.1.1 GENERAL

- .1 Part 2 provides background information .

2.1.2 PROJECT MANAGEMENT

- .1 PWGSC administers the project on behalf of Canada and exercises control over the Design, Implementation and Close Out phases of Project Delivery.
- .2 This project is to be organized, managed and delivered in a collaborative manner.
- .3 The PWGSC Project Team, the Consultant, the CM and the User Department teams will be required to work together during the Design, Implementation and Close Out phases of Project Delivery.

2.2 LANGUAGE

- .1 Construction documents must be prepared in English.

2.3 MEDIA

- .1 The CM shall not respond to any media inquiry.
- .2 Direct all media requests to the Departmental Representative.

2.4 PROJECT MANAGEMENT

2.4.1 NATIONAL PROJECT MANAGEMENT SYSTEM

- .1 PWGSC uses the National Project Management System (NPMS) for management and delivery of its real property projects to align with the Federal Government review and approvals processes.
- .2 Refer to the PWGSC NPMS web site for more details.
 - .1 <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/index-eng.html>

2.4.2 DESIGN STAGE

- .1 Pre-design Process.
 - .1 The purpose of this process is to analyze project requirements including codes, regulations, programming, sustainability, cost, time management and risk to demonstrate a full understanding of the project.
 - .2 The Pre-Design documents become guiding documents utilized throughout the project to guide the delivery.
- .2 Schematic Design Process.
 - .1 The purpose of this process is to explore different design options and to analyze them against the project requirements.
 - .2 Typically, the Schematic Design will be in sufficient detail to illustrate and communicate the project characteristics, and would provide a detailed review and analysis of the project requirements including all updates and amendments to ensure all requirements are fully integrated into the Schematic Design.
 - .3 Out of this process the Schematic Design is accepted and authorization to proceed to Design Development is based on the accepted Schematic Design.



- .4 The *Departmental Representative*, in concert with others, chooses an option to be further developed.
- .5 The approved Schematic Design become guiding documents and will be utilized throughout the project to guide the delivery.

2.4.3 IMPLEMENTATION PHASE

- .1 Design Development Process.
 - .1 The purpose of this process is to further develop the design option selected for refinement during the Schematic Design process.
 - .2 Typically, the Design Development documents consist of drawings and other documents to describe the scope, quality and cost of the project in sufficient detail to facilitate design approval, confirmation of code compliance, detailed planning of construction and project approval.
 - .3 This design is used as the basis for preparation of construction documents.
 - .4 The approved Design Development documents become guiding documents and are utilized throughout the project to guide the delivery.
- .2 Commissioning Process.
 - .1 “Commissioning” is a quality assurance process, in which the functional requirements and the operational requirements of the project are tested, verified and proven to function as intended.
 - .2 Commissioning deliverables occur throughout the project as detailed in the TOR.
- .3 Construction Document Process.
 - .1 The purpose of this process is to translate design development documents into construction drawings and specifications, for use by the contractor to determine a cost for the work.
- .4 Construction Contract Procurement Process.
 - .1 The purpose of this process is to obtain and evaluate bids/proposals from qualified contractors to construct the work, as per the Construction Contract Documents and to award the construction contract according to government regulations.
- .5 Construction Contract Administration Process.
 - .1 The purpose of this process is to construct the work in compliance with the Construction Contract Documents and to direct and monitor all necessary or requested changes to the scope of work during construction, commissioning and closeout.

2.4.4 CLOSEOUT PHASE

- .1 Post Construction Process.
 - .1 The purpose of this process is to ensure the orderly completion and recording of project and contract required documents and deliverables and to liaise with Public Works and Government Services Canada and other agencies as appropriate to close out the project.

2.5 COST MANAGEMENT

2.5.1 GENERAL

- .1 Construction cost estimates are prepared and submitted to PWGSC by the Consultant Team Quantity Surveyor at various times during the Design and Implementation phases.



- .2 In addition to the Consultants' estimate, PWGSC may have independent estimates performed to compare with the Consultant estimate.
- .3 The CM provides cost confirmation using same format as well as by trade division breakouts.
- .4 The level of accuracy of a class D cost estimate is such that no more than a 20% design contingency allowance is required.
- .5 The level of accuracy of a class C cost estimate is be such that no more than a 15% design contingency allowance is required.
- .6 The level of accuracy of a class B cost estimate is such that no more than a 10% design contingency allowance is required.
- .7 The level of accuracy of a class A cost estimate is such that no more than a 5% design contingency allowance is required.

2.6 ROLES AND RESPONSIBILITIES

2.6.1 CONSTRUCTION MANAGER

- .1 The CM shall:
 - .1 Assign staff or engage the services of Specialist Consultants to provide the required services outlined in the TOR, Advisory and Support Services;
 - .2 Complete the Work outlined in the TOR, General Contractor Work using the CM's Own Forces and the CM's contracted Sub-Trades;
 - .3 Ensure continuity of key personnel and dedicate a working team for the life of this project;
 - .4 Submit in writing, to the Departmental Representative for review and acceptance;
- .1 The respective names, addresses and confirmation of qualifications of individuals and/or firms engaged to provide Services for this Project, who were not identified in the CM's response to the RFP, and
- .2 Proposed changes to the roles of persons to be employed by the CM or firms to be contracted by the CM to provide the Services and Work for the Project and shall include the names, addresses, qualifications and experience of the proposed individual(s) or firm(s).

2.6.2 THE CM TEAM

- .1 The CM's Key Personnel shall be located in city of the project or in the immediate surrounding area, for the period of their involvement in the Project.
- .2 The CM team shall:
 - .1 Have complete and collective understanding of the project requirements, including scope, budget and scheduling objectives; and
 - .2 Work to ensure a collaborative and cooperative team approach with knowledgeable and timely input and contribution by all project team members.

2.6.3 PWGSC

- .1 PWGSC will:
 - .1 Be responsible to deliver the project;
 - .2 Manage the internal stakeholders of PWGSC and the Used Department;
 - .3 Manage internal resources to Quality Assure the project deliverables;



- .4 Provide authorizations to the CM and Consultant on various tasking;
- .5 Ensure Integrated Design Review Sessions are organized at various stages of the project, as required;
- .1 Smaller sub-projects may only require reviews at 50% and 100%.
- .6 Manage the project and contracts with the Consultant and the CM.

2.6.4 THE PWGSC TEAM

- .1 The PWGSC Departmental Representative:
 - .1 Is the PWGSC Project Manager or delegated Deputy Project Manager assigned to administer the Project;
 - .2 Is responsible for the day-to-day management of the project and for overseeing its progress and delivery, on behalf of PWGSC;
 - .3 Is the representative for all project contract services and, as such, will be the CM's single point of contact for all project direction;
 - .4 Is the liaison amongst and between the Construction Manager, the Consultant, Public Works and Government Services Canada and the User Departments; and
 - .5 Is responsible for conveying all requirements of the User Department to the CM and Consultant Team.
- .2 The PWGSC Architecture and Engineering Centre of Expertise (AECOE) Team:
 - .1 Provides expert advice and quality assurance for architectural and engineering disciplines and specialities;
 - .2 Participates in pre-design, design and reviews construction documents.
 - .3 Attends construction meetings and conduct field reviews on behalf of the Departmental Representative, as required;
 - .4 Uses PWGSC Design Manager to coordinate its services;
 - .5 Offers technical advice, risk advice, reviews CM deliverables and tracks compliance and recommends design approaches;
 - .6 The PWGSC Architecture and Engineering Centre of Expertise (AECOE) Team will be represented by the following disciplines:
 - .1 Architecture & Interior Design,
 - .2 Structural Engineering,
 - .3 Civil Engineering,
 - .4 Mechanical Engineering,
 - .5 Electrical Engineering,
 - .6 Commissioning Advisor.
- .3 The PWGSC Commissioning Advisor:
 - .1 Represents the Crown's interests in the commissioning process;
 - .2 Provides technical advice and quality assurance on the commissioning process throughout delivery;
 - .3 Reviews documentation and reported results throughout the project delivery; and
 - .4 Participates in warranty reviews.

2.6.5 USER DEPARTMENT

- .1 The User Department Project Leader:
 - .1 Is accountable for the expenditure of public funds and delivery of the project in accordance with terms accepted by the Treasury Board;



- .2 Reports to User Department senior executive management;
- .3 Will play several roles in the delivery of the project, as follows;
 - .1 Coordinate the quality, timing and completeness of information and decisions related to the functional performance of the facility,
 - .2 Ensure User Department program requirements are understood by all, and
 - .3 Facilitate and provide User Department sign-offs and approvals, as required.

2.6.6 THE CONSULTANT TEAM

- .1 The consultant team includes the prime consultant, qualified professionals, sub-consultants and specialists with relevant experience, capable of providing required professional services for the Project.
- .2 The Consultant Team is responsible for:
 - .1 Completing the design for the built works and for coordinating and directing the work of sub-consultants and specialists;
 - .2 Preparing and assembling the tender documents for each identified tender package;
 - .3 Providing input into the Departmental Representative's Risk Management Plan; and
 - .4 Providing contract administration services during construction.

2.6.7 PROVINCIAL/TERRITORIAL AND MUNICIPAL AUTHORITIES

- .1 The federal government generally defers to provincial/territorial and municipal authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.
- .2 Municipal authority review.
 - .1 Submissions will be reviewed as required by the authority.
- .3 Permits.
 - .1 The Consultant will support the Contractor in applying for permits by providing documentation.
 - .1 The Consultant will negotiate and resolve building permit related issues.
 - .2 The Consultant shall support the Contractor in its application for an occupancy permit and coordinate the resolution of all outstanding issues relating to the permit.
 - .3 The Contractor shall pay for the permits on behalf of PWGSC.

2.7 COMMUNICATIONS AND MEETINGS

2.7.1 COMMUNICATION

- .1 Unless otherwise directed by the Departmental Representative, the CM shall conduct all project communication through the Departmental Representative only.
- .2 If any communication with the User Departments results in the need for change to the Project scope of work, quality, cost or schedule, the CM shall inform the Departmental Representative, and seek direction, before taking any action.
- .3 The Departmental Representative will arrange for the CM to obtain access to the PWGSC secure shared document management site (Buzzsaw).
- .4 Correspondence.
 - .1 All correspondence from the CM shall be distributed as directed by the Departmental Representative.



- .2 There shall be no correspondence between occupants or users of the facility and the CM unless directed by the Departmental Representative.
- .3 All correspondence must carry the Contract name/number, PWGSC Project title, PWGSC Project number and File number and a date (i.e. Year/Month/Day).
- .4 Automatic date fields shall not be used except when preceded by the text "Printed on".
- .5 The CM shall:
 - .1 Develop a communication and correspondence protocol, submit to the Departmental Representative for review and acceptance prior to undertaking the work and incorporate it into the Project Procedures Manual;
 - .1 Account for the involvement of all Stakeholders in this protocol.
 - .2 Direct communication and correspondence between members of the PWGSC Project Team, the Consultant and the User Departments on routine matters as may be required to enable the project to proceed in a timely and efficient manner;
 - .1 However, no communication shall alter the terms of the project scope, budget or schedules unless directed in writing by the Departmental Representative.

2.7.2 SUBMISSIONS TO PWGSC

- .1 Where submissions to PWGSC include summaries, reports, network diagrams, drawings, plans, specifications or finish schedules, submit one (1) original to the Departmental Representative in electronic format, unless otherwise directed in writing.
- .2 Electronic format.
 - .1 The electronic deliverables shall be provided using Microsoft applications.
 - .2 Alternatively, the CM may submit all work in Adobe Acrobat *.pdf format except for Network Diagrams which shall be submitted in their original electronic format.

2.7.3 PROJECT RESPONSE TIME

- .1 It is a requirement of this project that the key personnel of the CM are personally available to attend meetings or respond to inquiries.
- .2 During the project, the CM's key personnel shall be:
 - .1 Available to attend meetings and respond to inquiries within one (1) working day notice;
 - .2 Able to respond to emergencies within one (1) hour, including those occurring during off-hours and on weekends/ holidays; and
- .3 On occasion, there may be urgent, problem-solving meetings.
 - .1 The CM shall be available to attend such meetings in location agreed upon within four (4) business hours.

2.7.4 MEETINGS DURING THE PRE-DESIGN, SCHEMATIC DESIGN, DESIGN DEVELOPMENT AND CONSTRUCTION DOCUMENTATION PROCESSES

- .1 Meetings with PWGSC, the CM, the Consultant and User Department will be held in agreed upon location.



- .2 The Departmental Representative will arrange meetings bi-weekly with representatives from:
 - .1 PWGSC;
 - .2 Consultant team;
 - .3 Construction Management Team; and
 - .4 User Department representatives.
- .3 The Consultant Team will be responsible for:
 - .1 Preparing minutes of meetings;
 - .2 Forwarding minutes to the Departmental Representative and CM;
 - .3 These meetings are for the accurate exchange of information; and
 - .4 Requests and decisions taken shall follow the formal lines of communications.
- .4 The CM shall:
 - .1 Attend meetings, prior to construction start;
 - .1 Respond to meeting minute action items as required prior to the next meeting

2.7.5 MEETINGS DURING CONSTRUCTION PERIOD

- .1 The CM shall:
 - .1 Arrange and coordinate construction meetings on site and utilizing Webex, as required;
 - .1 Regular meetings to be held bi-weekly through the duration of the project,
 - .2 Prepare and distribute minutes within two (2) working days of the meeting, and
 - .3 Endeavour to hold meetings as Green Meetings (i.e. Electronic copies of documents where possible or double sided hard copies).
 - .2 Establish a list of standing agenda items, including (as a minimum):
 - .1 Schedule and progress;
 - .2 Cost issues and changes;
 - .3 Risk issues;
 - .4 Quality issues;
 - .5 Scope of work;
 - .6 Site safety;
 - .7 Sustainable development; and
 - .8 Commissioning.

2.8 REGULATORY REQUIREMENTS

2.8.1 FEDERAL GOVERNMENT

- .1 The PWGSC Departmental Representative will review work in progress on a continuing basis.
- .2 The following are authorities having Federal Government jurisdiction over the project:
 - .1 Treasury Board of Canada:
 - .1 Project funding and contract approvals.
 - .2 Public Works and Government Services Canada:
 - .1 Contracting authority and project delivery.
 - .3 National Research Council Canada:
 - .1 Building Codes and Standards;



- .1 National Building Code, and
- .2 National Fire Code.

2.8.2 PROVINCIAL/TERRITORIAL, MUNICIPAL AND OTHER AUTHORITIES HAVING JURISDICTION

- .1 Although the Federal Government is not subject to jurisdictions at other levels of government, voluntary compliance with the Departmental Policy of these other Authorities is a requirement unless otherwise directed by the Departmental Representative.
 - .1 Codes, regulations, by-laws and decisions of authorities identified herein as having jurisdiction shall be observed.
 - .2 In areas of conflict between codes, standards and regulations, the most rigid requirements shall be adhered to.
 - .3 The CM shall identify other jurisdictions appropriate to the project.
- .2 Provincial/Territorial Acts, Regulations, Standards and Inspections
 - .1 Unless directed otherwise by the Departmental Representative, the CM will:
 - .1 Adhere to all applicable provincial/territorial Construction Health and Safety Acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.
 - .2 Adhere to the requirements of the province or territory where the project is located for:
 - .1 Employment Standards;
 - .2 Construction Safety;
 - .3 Designated Substance Management; and
 - .4 Workers Compensation
 - .3 Adhere to the requirements of the the environmental acts or regulation in the province or territory where the project is located for:
 - .1 Building Discharges into the air, water and ground; and
 - .2 Disposal of Designated Substances including Asbestos.
 - .4 Adhere to the requirements of the province or territory where the project is located for:
 - .1 Construction Hoists; and
 - .2 Elevators, Escalators and Dumb Waiters.
 - .3 Municipal By-laws, Regulations, Standards and Inspections
 - .1 Unless directed otherwise by the Departmental Representative, the CM will:
 - .1 Make preliminary municipal submissions at stages required by the AHJ;
 - .2 Provide all required supporting documentation for permit applications;
 - .3 Apply for and obtain all permits and approvals necessary for the work, including, but not limited to Building, Electrical and Plumbing Permits;
 - .4 Resolve all Building Permit related issues, with support from the Consultant as may be required;
 - .5 Provide fire safety equipment and access for fire-fighting services, as required by the city; and
 - .6 If required by the AHJ, apply for an Occupancy Permit and co-ordinate the resolution of all outstanding issues related to obtaining the permit.
 - .4 Provide Municipal authorities with access to the site as required and arrange for inspections of the construction work by the AHJ or governing utility officials.



2.9 ACCEPTANCE OF PROJECT DELIVERABLES

2.9.1 ACCEPTANCE OF PROJECT DELIVERABLES

- .1 While PWGSC acknowledges the CM's obligations to meet project requirements, the project delivery process entitles PWGSC to review all work.
- .2 PWGSC reserves the right to reject undesirable or unsatisfactory work.
- .3 The CM must obtain Departmental Representative acceptance of all required deliverables for the Project.
 - .1 Acceptance indicates that based on a general review of material for specific issues, the material is considered to comply with governmental and departmental objectives and practices and those overall project objectives appear to be satisfied.
 - .2 Acceptance does not relieve the CM of responsibility for the work and compliance with the contract.
 - .3 Acceptance does not prohibit rejection of work, which is determined to be unsatisfactory at later stages of review.



3. General Requirements (Division 01)

3.1 GENERAL

3.1.1 MASTERFORMAT

- .1 Division 01 requirements are structured using Masterformat 2010 section numbering system.

3.2 01 11 00 – SUMMARY OF WORK

3.2.1 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Departmental Representative's continued use of the site and existing surrounding premises during construction.
- .2 Maintain fire access/control.

3.2.2 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

3.2.3 CONSTRUCTION MANAGER USE OF PREMISES

- .1 Restricted use of site and premises as directed by Departmental Representative until Substantial Performance.
- .2 Limit use of premises for Work, and for storage.
- .3 Utilize indicated Laydown Area for all storage, all vehicle and equipment parking, and all site offices and trailers.
- .4 Maintain Laydown Area to prevent dusting and mud.
- .5 Make good Laydown Area to original condition, composition, nature and character upon completion of Work.
- .6 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

3.2.4 DEPARTMENTAL REPRESENTATIVE FURNISHED ITEMS

- .1 Construction Manager Responsibilities:
 - .1 Disassemble, ship and reassemble all items being relocated;
 - .2 Arrange for replacement of damaged, defective or missing items;
 - .3 Designate submittals and delivery date for each product in progress schedule;
 - .4 Review shop drawings, product data, samples, and other submittals. Submit to Departmental Representative notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents;
 - .5 Receive and unload products at site;
 - .6 Inspect deliveries jointly with Departmental Representative; record shortages, and damaged or defective items;
 - .7 Handle products at site, including uncrating and storage;
 - .8 Protect products from damage, and from exposure to elements;
 - .9 Assemble, install, connect, adjust, and finish products;



- .10 Provide installation inspections required by public authorities; and
- .11 Repair or replace items damaged by Construction Manager or subcontractor on site.

3.2.5 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 7 days notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic and Departmental Representative's operations.
- .3 Provide alternative routes for personnel, pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services to maintain existing buildings' systems.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Provide traffic control in the event of one lane access.
- .9 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .10 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .11 Record locations of maintained, re-routed and abandoned service lines.
- .12 Construct barriers in accordance with Section 01 56 00.
- .13 Provide and maintain for purposes of the Work access road within construction area for Construction Manager's own construction vehicles, equipment and material access.

3.2.6 DOCUMENTS REQUIRED

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



- .13 Material and Labour Bonds.
- .14 Manufacturers' applicable instructions.
- .15 Municipal and Provincial/Territorial Permits.
- .16 Other documents as specified.

3.3 01 14 00 – WORK RESTRICTIONS

3.3.1 ACCESS AND EGRESS

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

3.3.2 SPECIAL REQUIREMENTS

- .1 Check in at indicated Check Point at all times of entry and exit from the Work Site and Laydown areas.
- .2 Submit schedule in accordance with Section 01 32 15.
- .3 Ensure that Construction Manager personnel employed on site become familiar with and abide by regulations including safety, fire, traffic and security regulations.
- .4 Keep within Limits of Work and ingress and egress access.
- .5 Keep within Limits of Site.

3.3.3 SECURITY CLEARANCES

- .1 Personnel employed on this project will be subject to security check.

3.3.4 BUILDING SMOKING RESTRICTIONS

- .1 Comply with smoking restrictions. Smoking is not allowed.

3.4 01 29 00 - PAYMENT PROCEDURES

3.4.1 APPLICATION FOR PROGRESS PAYMENT

- .1 Submit to Department Representative, at least 14 days before first application for payment, Cost Breakdown, in detail as directed by Department Representative, for parts of Work, aggregating total amount of each Contract Amount, so as to facilitate evaluation of applications for payment. After approval by Department Representative, Cost Breakdown will be used as basis for progress payments.
- .2 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Department Representative may reasonably require to establish value and delivery of products.

3.5 01 29 83 – PAYMENT PROCEDURES: TESTING LABORATORY SERVICES

3.5.1 APPOINTMENT AND PAYMENT

- .1 Obtain and pay for services of an accredited inspection/testing laboratory for:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Construction Manager's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Commissioning performance testing and verification.
 - .5 Mill tests and certificates of compliance.



- .6 Tests specified to be carried out by Construction Manager.
- .2 Where tests or inspections by an accredited testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.
- .3 Inspection/testing agencies engaged by Construction Manager shall be reviewed by and be acceptable to Departmental Representative.
- .4 Departmental Representative, at Departmental Representative's expense, may also engage inspection/testing agencies as may be deemed required.

3.5.2 CONSTRUCTION MANAGER'S RESPONSIBILITIES

- .1 Provide, for Construction Manager's and Departmental Representative's inspection/testing agencies, labour, equipment and facilities to:
 - .1 Provide access to Work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
 - .5 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
 - .6 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
 - .7 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

3.6 01 31 19 - PROJECT MEETINGS

3.6.1 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 Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within 2 days after meetings and transmit to meeting participants and, affected parties not in attendance and Departmental Representative.
- .8 Representative of Construction Manager, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

3.6.2 PRECONSTRUCTION MEETING

- .1 Within 7 days after each Contract award, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Construction Manager, major Subcontractors, field inspectors and supervisors will be in attendance.



- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 15.
 - .3 Schedule of submission of shop drawings, samples, colour chips, product data. Submit submittals in accordance with Section 01 33 00.
 - .4 Commissioning
 - .5 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
 - .6 Delivery schedule of specified equipment in accordance with respective specification Section.
 - .7 Site security in accordance with Section 01 56 00.
 - .8 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .9 Departmental Representative provided products.
 - .10 Record drawings in accordance with Section 01 33 00.
 - .11 Maintenance manuals in accordance with Section 01 78 00.
 - .12 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00.
 - .13 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .14 Appointment of inspection and testing agencies or firms.
 - .15 Insurances, transcript of policies.

3.6.3 PROGRESS MEETINGS

- .1 During course of Work schedule separate construction and commissioning progress meetings every two weeks.
- .2 Construction Manager, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 2 days after meeting.
- .5 Agenda to include the following items such as:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Commissioning.



- .11 Maintenance of quality standards.
- .12 Review proposed changes for affect on construction schedule and on completion date.
- .13 Health and Safety
- .14 Other business.

3.7 01 32 15 – CONSTRUCTION PROGRESS SCHEDULES

3.7.1 GENERAL

- .1 Use a project management control system based on Critical Path Method (CPM) and Bar (GANTT) Chart techniques as may be required and agreed upon by Departmental Representative to achieve project Work demands.
- .2 Schedule reviews by Departmental Representative shall not mean approval of detail inherent in schedule, responsibility for which lies with Construction Manager.

3.7.2 DEFINITIONS

- .1 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .2 Project Plan: formal, approved document used to guide both Project execution and Project control. Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. Project plan may be summary or detailed.
- .3 Project Schedule: planned dates for performing activities and planned dates for meeting milestones.
- .4 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.
- .5 Work Breakdown Structure (WBS): deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents increasingly detailed definition of Project Work.

3.7.3 SYSTEM DESCRIPTION

- .1 Construction Progress Schedule (Project Time Management): describes processes required to ensure timely completion of Project. These processes ensure that various elements of Project are properly coordinated. It consists of planning, time estimating, scheduling, progress monitoring and control.
- .2 Project monitoring and reporting: as Project progresses, keep team aware of changes to schedule, and possible consequences. In addition to Bar Charts and CPM networks, use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.
- .3 Narrative reporting begins with statement on general status of Project followed by summarization of delays, potential problems, corrective measures and Project status criticality.

3.7.4 SCHEDULE REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.
- .2 Acceptance of Master Plan and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract. Duration of Contract may only be changed through bilateral Agreement.



- .3 Consider Master Plan and Detail Schedule showing Work completed in less than specified Contract duration, to have float.
- .4 Calculate dates for completion milestones from Plan and Schedule.
- .5 Delays to non-critical activities, those with float may not be basis for time extension.
- .6 Allow for and show Master Plan and Detail Schedule adverse weather conditions normally anticipated. Specified Contract duration has been predicated assuming normal amount of adverse weather conditions.
- .7 Provide necessary crews and manpower to meet schedule requirements for performing Work within specified Contract duration. Simultaneous use of multiple crews on multiple fronts on multiple critical paths may be required.
- .8 Arrange participation on and off site of Construction Manager's Contractors, Own Forces and suppliers, as required by Departmental Representative for purpose of network planning, scheduling, updating and progress monitoring. Approvals by Departmental Representative of original networks and revisions do not relieve Construction Manager from duties and responsibilities required by Contract.
- .9 Substantial Completion Certificate and Final Certificate as defined times of completion are of essence of this contract.

3.7.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit preliminary construction progress schedule and Commissioning Schedule within 14 days of contract award to Departmental Representative for review.
- .3 Coordinate with Departmental Representative's project schedule.
- .4 After review, revise and resubmit schedule to comply with revised project schedule.
- .5 During progress of Work revise and resubmit as directed by Departmental Representative.
- .6 Submit to Departmental Representative Project Control System for planning, scheduling, monitoring and reporting of project progress.
- .7 Submit Project Control System to Departmental Representative for approval; failure to comply with each required submission, may result in progress payment being withheld in accordance with Federal Government's Terms of Payment.
- .8 Refer to article "Progress monitoring and reporting" of this specification Section for frequency of Project control system submittals.
- .9 Submit Project planning, monitoring and control system data as required by Departmental Representative in following form;
 - .1 Electronic files specified here in original scheduling software containing schedule and cash flow information, labelled with data date, specific update, and person responsible for update.
 - .2 Master Plan Bar Chart.
 - .3 Construction Detail schedule Bar Chart.
 - .4 Listing of project activities and tender packages including milestones and logical connectors, networks from Project start to end. Sort activities by activity identifier and accompany with descriptions. List early and late start and finish dates together with durations, codes and float time.
 - .5 Criticality report listing activities and milestones with days total float.
 - .6 Progress report in early start sequence, listing for each trade or tender package, activities due to start, underway, or finished within two



months from monthly update date. List activity identifiers, description and duration.

3.7.6 QUALITY ASSURANCE

- .1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

3.7.7 PROJECT MEETING

- .1 Meet with Departmental Representative within 5 working days of each Award of Sub-Contract or Own Forces date, to establish Work requirements and approach to project construction operations.

3.7.8 WORK BREAKDOWN STRUCTURE (WBS)

- .1 Prepare construction Work Breakdown Structure (WBS) within 5 working days of Award of Sub-Contract or Own Forces date.

3.7.9 PROJECT MILESTONES

- .1 Project milestones include:
 - .1 Award.
 - .2 Submissions such as shop drawings and samples.
 - .3 Mock-ups.
 - .4 Permits.
 - .5 Mobilization and demobilization.
 - .6 Demolition.
 - .7 Tender Packages/Own Forces Work.
 - .8 Excavation.
 - .9 Backfill.
 - .10 Substructure.
 - .11 Superstructure such as steel.
 - .12 Concrete Work.
 - .13 Building closed-in.
 - .14 Interior finishing including fitting and millwork.
 - .15 Fire Suppression.
 - .16 Plumbing.
 - .17 HVAC.
 - .18 Electrical.
 - .19 Communications.
 - .20 Electronic safety and security.
 - .21 Earthwork.
 - .22 Exterior improvements.
 - .23 Commissioning
 - .1 Components
 - .2 Systems
 - .3 Integrated Systems
 - .4 Final Commissioning Report
 - .24 Training
 - .25 Partial Interim and Interim Certificate(s) of Completion.
 - .26 Final Certificate Completion.

3.7.10 MASTER PLAN



- .1 Structure and base construction progress/ networks system on WBS coding.
- .2 Prepare comprehensive construction Master Plan and dependent Cash Flow Projection within 5 working days of finalizing agreement to proceed with construction.
 - .1 Master Plan will be used as baseline.
 - .1 Departmental Representative will review and return revised baseline within 10 working days.
- .3 Reconcile revisions to Master Plan and Cash Flow Projections with previous baseline to provide continuous audit trail.
- .4 Initial and subsequent Master Plans will include:
 - .1 Electronic files containing schedule and cash flow information, clearly labeled with data date, specific update, and Construction Manager's person responsible for update.
 - .2 Bar chart identifying coding, activity durations, early/late and start/finish dates, total float, completion as percentile, current status and budget amounts.
 - .3 Network diagram showing, activity sequencing (logic), total float, early/late dates, current status and durations.
 - .4 Actual/projected monthly cash flow: expressed annually and monthly and shown in both graphical and numerical form.

3.7.11 DETAIL SCHEDULE

- .1 Provide detailed project schedules within 5 working days of agreement to proceed with construction, showing activity sequencing, interdependencies and duration estimates. Include listed activities as follows:
 - .1 Shop drawings.
 - .2 Samples.
 - .3 Approvals.
 - .4 Procurement.
 - .5 Construction.
 - .6 Installation.
 - .7 Site works.
 - .8 Testing.
 - .9 Commissioning and acceptance.
- .2 Relate Detail Schedule activities to basic activities and milestones developed and approved in Master Plan.
- .3 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Departmental Representative for review effects created by insertion of new Change Order.

3.7.12 REVIEW OF THE CONSTRUCTION DETAIL SCHEDULE

- .1 Allow 10 workdays for review by Departmental Representative of proposed construction Detail Schedule.
- .2 Upon receipt of reviewed Detail Schedule make necessary revisions and resubmit to Departmental Representative for review within 5 workdays.
- .3 Promptly provide additional information to validate practicability of Detail Schedule as required by Departmental Representative.



- .4 Submittal of Detail Schedule indicates that it meets Contract requirements and will be executed generally in sequence.

3.7.13 COMPLIANCE WITH DETAIL SCHEDULE

- .1 Comply with reviewed Detail Schedule.
- .2 Proceed with significant changes and deviations from scheduled sequence of activities that cause delay, when agreed by Departmental Representative.
- .3 Identify activities that are behind schedule and causing delay. Provide measures to regain slippage.
 - .1 Construction delays affecting project schedule will not constitute justification for extension of contract completion date.
- .4 In the event of a request for Contract extension, submit as per a pre-agreed upon scheduled review periods to Departmental Representative, justification, project schedule data and supporting evidence for extension to Construction Manager's Contract or Construction Manager's Contractors' completion date, or partial or interim acceptance milestone date when required. Include as part of supporting evidence:
 - .1 Written submission of proof of delay based on revised activity logic, duration and costs, showing time impact analysis illustrating influence of each change or delay relative to approved contract schedule.
 - .2 Prepared schedule indicating how change will be incorporated. Demonstrate perceived impact based on date of occurrence of change and include status of construction at that time.
 - .3 Other supporting evidence requested by Departmental Representative.

3.7.14 PROGRESS MONITORING AND REPORTING

- .1 On ongoing basis, Detail Schedule on job site must show "Progress to Date". Arrange participation on and off site of Construction Manager's Own Forces, Contractors and suppliers, as, and when necessary, for purpose of network planning, scheduling, updating and progress monitoring. Inspect Work with Departmental Representative at least once monthly to establish progress on each current activity shown on applicable networks.
- .2 Update and reissue project Work Breakdown Structure and relevant coding structures as project develops and changes.
- .3 Perform Detail Schedule update monthly with status dated (Data Date) on last working day of month. Update to reflect activities completed to date, activities in progress, logic and duration changes.
- .4 Submit to Departmental Representative copies of updated Detail Schedule.
- .5 Requirements for monthly progress monitoring and reporting are basis for progress payment request.
- .6 Submit monthly written report based on Detail Schedule, showing Work to date performed, comparing Work progress to planned, and presenting current forecasts. Report must summarize progress, defining problem areas and anticipated delays with respect to Work schedule, and critical paths. Explain alternatives for possible schedule recovery to mitigate any potential delay. Include in report:
 - .1 Description of progress made.
 - .2 Pending items and status of: permits, shop drawings, Change Orders, possible time extensions.



- .3 Status of Construction Manager's Contractors' completion date and milestones.
- .4 Risk review including current and anticipated problem areas, potential areas of delays and gains and corrective measures and opportunities with gains in time.
- .5 Review of progress and status of critical activities.

3.8 01 33 00 – SUBMITTAL PROCEDURES

3.8.1 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and ensure affected adjacent Work is coordinated.
- .8 Construction Manager's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Construction Manager's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.
- .11 Unless otherwise stated, ensure 4 reviewed copies of all submissions are available to be retained by the Departmental Representative

3.8.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other product data which are to be provided by Construction Manager to illustrate details of a portion of Work.
- .2 Submit shop drawings bearing stamp and signature of qualified professional registered or licensed in the jurisdiction where the project is located, where required.
 - .1 Submit in addition to specified number of hard copies in electronic pdf version.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section



- under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 working days for Departmental Representative's review of each submission.
 - .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
 - .7 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Construction Manager's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Construction Manager.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Construction Manager's stamp, signed by Construction Manager's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
 - .9 After Departmental Representative's review, distribute copies.
 - .10 Submit electronic copies of shop drawings for each requirement requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .11 Submit electronic copies of product data sheets or brochures for requirements requested in respective specification Sections and as requested by Departmental



- Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .13 Submit electronic copies of certificates for requirements requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
 - .14 Submit electronic copies of manufacturers' instructions for requirements requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
 - .15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - .16 Submit electronic copies of Operation and Maintenance Data for requirements requested in respective specification Sections and as Departmental Representative may reasonably request.
 - .17 Delete information not applicable to project.
 - .18 Supplement standard information to provide details applicable to project.
 - .19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
 - .20 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Construction Manager submitting same, and such review shall not relieve Construction Manager of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.



- .2 Without restricting generality of foregoing, Construction Manager is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

3.8.3 SAMPLES

- .1 Submit for review samples in triplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of the Construction Manager's specifications.
- .4 Where colour, pattern or texture is criterion, submit manufacturer's full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Construction Manager's drawings and specifications.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

3.8.4 MOCK-UPS

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

3.8.5 PROGRESS PHOTOGRAPHS

- .1 Submit labeled progress photographs.
- .2 Each submission
 - .1 Prints sizes from electronic format, 200 x 300 mm.
 - .2 Electronic format.
- .3 Print Type: semi-matt colour with binding margin at one end.
- .4 Paper: single weight, not mounted.
- .5 Number of prints required: 3 sets.
- .6 Identification, print copy and electronic format: name and project number, viewpoint and date of photograph.
- .7 Viewpoints: interior and exterior locations: viewpoints determined by Departmental Representative.
- .8 Frequency: twice monthly and with each progress statement.

3.9 01 35 43 – ENVIRONMENTAL PROCEDURES

3.9.1 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and



includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

3.9.2 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.
- .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .4 Environmental protection plan includes:
 - .1 Name of person responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from site.
 - .3 Name and qualifications of person responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion control plan which identifies type and location of erosion controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion control plan, Federal, Provincial/Territorial, and Municipal laws and regulations.
 - .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
 - .12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial/Territorial,



and Municipal laws and regulations for storage and handling of these materials.

- .13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .15 Pesticide treatment plan: to be included and updated, as required.

3.9.3 FIRES

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

3.9.4 DISPOSAL OF WASTE

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

3.9.5 DRAINAGE

- .1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial/Territorial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sedimentations control plan.
- .3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

3.9.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties.
- .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 dripline 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.
- .5 Restrict tree removal to areas indicated or designated by Departmental Representative.

3.9.7 POLLUTION CONTROL



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

3.9.8 HISTORICAL/ARCHAEOLOGICAL CONTROL

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

3.9.9 NOTIFICATION

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

3.10 01 41 00 - REGULATORY REQUIREMENTS

3.10.1 REFERENCES AND CODES

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial/territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

3.10.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.



- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative.

3.10.3 BUILDING SMOKING ENVIRONMENT

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

3.11 01 45 00 - QUALITY CONTROL

3.11.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give at minimum, 3 working days notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Construction Manager covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

3.11.2 INDEPENDENT INSPECTION AGENCIES

- .1 Notwithstanding the testing responsibilities of the Construction Manager, the Departmental Representative will conduct re-testing where deemed necessary;
 - .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work.
 - .2 Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

3.11.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

3.11.4 PROCEDURES

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



- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

3.11.5 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

3.11.6 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

3.11.7 TEST AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested by Departmental Representative.
- .2 Include for tests and mix designs as specified.
- .3 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

3.11.8 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Mock-ups may remain as part of Work.

3.11.9 MILL TESTS

- .1 Submit mill test certificates as requested by Departmental Representative.

3.11.10 EQUIPMENT AND SYSTEMS

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

3.12 01 51 00 – TEMPORARY UTILITIES

3.12.1 INSTALLATION AND REMOVAL



- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

3.12.2 DEWATERING

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

3.12.3 WATER SUPPLY

- .1 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

3.12.4 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.
 - .6 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .4 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.
- .5 Permanent building heating system not to be used when available. Be responsible for damage to heating system if use is permitted.
- .6 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.
- .7 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

3.12.5 TEMPORARY POWER AND LIGHT



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

3.12.6 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telephone, fax, data, e-mail, internet access hook up, lines, equipment necessary for own use.

3.12.7 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

3.13 01 52 00 – CONSTRUCTION FACILITIES

3.13.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .2 Master Painters Institute (MPI)

3.13.2 SUBMITTALS

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

3.13.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Construction Manager, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be graveled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

3.13.4 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs.

3.13.5 HOISTING



- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists cranes to be operated by qualified operator.

3.13.6 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

3.13.7 CONSTRUCTION PARKING

- .1 Parking
 - .1 Parking is restricted to indicated Laydown Area.
- .2 Make good damage to roads used for project site access.
- .3 Provide and maintain adequate access to project site.
- .4 Clean site access areas/routes where used by Construction Manager's equipment.

3.13.8 OFFICES

- .1 Provide a separate site office for the Departmental Representative's use, lockable, complete with keys, furnishings and equipment.
- .2 Provide site office heated to 22 degrees C, lighted 750 lux and ventilated and air conditioned,
 - .1 Site office, 24/7/365 occupancy, of sufficient size to at the minimum accommodate site meetings for 12 people, a furnished drawing laydown table and a serviced kitchenette.
 - .2 Provide at the minimum 3 serviced and operational voice/data outlets;
 - .1 One outlet in each enclosed office and,
 - .2 One outlet in the meeting area.
 - .3 Provide data line speed as best locally available.
 - .4 Provide and maintain operational a site office scanner/fax machine.
 - .5 Scanner capacity/bed to accommodate at the minimum a 279mm x 430mm page size.
- .3 Provide additional site offices as required to accommodate Construction Manager's operation
- .4 Subcontractors to provide their own offices as necessary. Direct location of these offices.
- .5 Provide in each site office facility, marked and fully stocked first-aid cases in readily available locations.
- .6 Locate all site office facilities in indicated Laydown Area.
- .7 Make site good after decommissioning facilities.

3.13.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in 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 manner to cause least interference with work activities.

3.13.10 SANITARY FACILITIES



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

3.13.11 CONSTRUCTION SIGNAGE

- .1 No construction advertisement signs, other than health and safety, warning and instructional signs, are permitted on site.
- .2 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

3.13.12 PROTECTION AND MAINTENANCE OF TRAFFIC

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

3.13.13 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

3.14 01 56 00 – TEMPORARY BARRIERS AND ENCLOSURES



3.14.1 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

3.14.2 HOARDING FENCE

- .1 Erect temporary site enclosures using purpose made, 1.8m high, modular, prefinished metal mesh, self supporting, interlocking fencing.
- .2 Provide lockable truck entrance gate(s) and pedestrian door(s) as required and conforming to applicable traffic restrictions on adjacent streets and sites roadways. Equip gates with locks and keys.
 - .1 Provide keys to Departmental Representative's Commissionaire for surveillance and inspection as it may relate to facility operations.
- .3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law and directed by Departmental Representative.
- .4 Maintain enclosure in clean condition.
- .5 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
- .6 Fence and secure separately the Laydown and Work site areas.

3.14.3 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Provide as required by governing authorities.

3.14.4 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.

3.14.5 DUST TIGHT SCREENS

- .1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

3.14.6 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- .2 Maintain access in broom clean condition.

3.14.7 PUBLIC TRAFFIC FLOW

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

3.14.8 FIRE ROUTES

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

3.14.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY



- .1 Protect surrounding private and public property including laydown, site office facilities and parking areas from damage during performance of Work.
- .2 Be responsible for damage incurred.

3.14.10 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule 3 working days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

3.15 01 61 00 – COMMON PRODUCT REQUIREMENTS

3.15.1 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

3.15.2 AVAILABILITY

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

3.15.3 STORAGE HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.



- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

3.15.4 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Departmental Representative will pay for transportation cost of products supplied by Departmental Representative. Unload, handle and store such products.

3.15.5 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, to allow for Departmental Representative's review of the next course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

3.15.6 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative whose decision is final.

3.15.7 CO-ORDINATION

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

3.15.8 CONCEALMENT



- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

3.15.9 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.

3.15.10 LOCATION OF FIXTURES

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

3.15.11 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.

3.15.12 FASTENINGS – EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

3.15.13 PROTECTION OF WORK IN PROGRESS

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

3.15.14 EXISTING UTILITIES

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



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

3.16 01 71 00 - EXAMINATION AND PREPARATION

3.16.1 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.

3.16.2 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

3.16.3 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill, topsoil placement and landscaping features.
- .4 Stake slopes and berms.
- .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.

3.16.4 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

3.16.5 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

3.16.6 RECORDS

- .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.

3.16.7 SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform and do not conform with Contract Documents.

3.17 01 73 03 – EXECUTION REQUIREMENTS

3.17.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Departmental Representative or separate Construction Manager.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate Construction Manager.
 - .7 Written permission of affected separate Construction Manager.
 - .8 Date and time work will be executed.

3.17.2 MATERIALS

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00.

3.17.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

3.17.4 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill to complete Work.
- .2 Fit several parts together, to integrate with other Work.



- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.
- .13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.
 - .1 Remove all excess excavation and fill and all other material to off-site.

3.18 01 74 11 – CLEANING

3.18.1 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Construction Managers.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing 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 building 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.



3.18.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .7 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.
- .8 Clean lighting reflectors, lenses, and other lighting surfaces.
- .9 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .10 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .13 Remove dirt and other disfiguration from exterior surfaces.
- .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .15 Sweep and wash clean paved areas.
- .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .17 Clean roofs, downspouts, and drainage systems.
- .18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .19 Remove snow and ice from access to building.
- .20 Complete cleaning prior to start-up and commissioning of systems and integrated systems.

3.19 01 74 21 CONSTRUCTION DEMOLITION WASTE MANAGEMENT AND DISPOSAL

3.19.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management goals.
- .2 PWGSC's waste management goal 75 percent of total project waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.



3.19.2 DEFINITIONS

- .1 Demolition Waste Audit (DWA): relates to actual waste generated from project.
- .2 Inert Fill: inert waste - exclusively asphalt and concrete.
- .3 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .4 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .9 Separate Condition: refers to waste sorted into individual types.
- .10 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .11 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.
- .12 Waste Management Coordinator (WMC): Construction Manager representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .13 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

3.19.3 DOCUMENTS

- .1 Maintain at job site, one copy of following documents:
 - .1 Waste Audit.
 - .2 Waste Reduction Workplan.
 - .3 Material Source Separation Plan.
 - .4 Schedules completed for project.

3.19.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00.
- .2 Prepare and submit following prior to project start-up:
 - .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.



- .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
 - .3 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
 - .4 Submit 2 copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
 - .1 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.
 - .2 For each material reused, sold or recycled from project, include amount in tonnes or quantities by number, type and size of items and the destination.
 - .3 For each material land filled or incinerated from project, include amount of material and identity of landfill, incinerator or transfer station.

3.19.5 WASTE AUDIT (WA)

- .1 Conduct WA prior to project start-up.
- .2 Prepare WA: Schedule A.
- .3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

3.19.6 WASTE REDUCTION WORKPLAN (WRW)

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

3.19.7 DEMOLITION WASTE AUDIT (DWA)

- .1 Prepare DWA prior to project start-up.



- .2 Complete DWA: Schedule C.
- .3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

3.19.8 COST REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 Prepare CRAW: Schedule D.

3.19.9 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimize material damage.
- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
 - .1 Transport to approved and authorized recycling facility or to users of material for recycling.

3.19.10 STORAGE HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Construction Manager's property.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Protect structural components not removed for demolition from movement or damage.
- .5 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

3.19.11 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.



- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

3.19.12 USE OF SITE AND FACILITIES

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

3.19.13 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.
- .2

3.19.14 APPLICATION

- .1 Do Work in compliance with WRW.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.19.15 CLEANING

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

3.19.16 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged, recovered, reusable, recyclable materials is not permitted.
- .3 Demolition Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Acoustic Tile	50	[]
Acoustical Insulation	100	[]
Carpet	100	[]
De-mountable Partitions	80	[]
Doors and Frames	100	[]
Electrical Equipment	80	[]
Furnishings	80	[]
Marble Base	100	[]
Mechanical Equipment	100	[]
Metals	100	[]
Rubble	100	[]
Wood (uncontaminated)	100	[]



Other

.4 Construction Waste

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	[]
Plastic Packaging	100	[]
Rubble	100	[]
Steel	100	[]
Wood (uncontaminated)	100	[]
Other		[]

3.19.17 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA):

1) Material Category	2) Material Quantity Unit	3) Estimated Waste %	4) Total Quantity	5) Generation on Point of Waste (unit)	6) % Recycled	7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet						
Plastic Packaging						
Cardboard Packaging						
Other						
Doors and Windows Material Description						
Painted Frames						
Wood						
Metal						
Other						

3.19.18 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B:

1) Material Category	2) Person(s) Responsible	3) Total Quantity of Waste (units)	4) Projected Reused Amount (units)	5) Actual Reused Amount (units)	6) Projected Recycled Amount (units)	7) Actual Recycled Amount (units)	8) Material(s) Destination
Wood and Plastics Material Description							
Chutes							
Warped Pallet							



Plastic Packaging							
Cardboard Packaging							
Other:							
Doors and Windows Material Description							
Painted Frames							
Wood							
Metal							
Other							

3.19.19 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

1) Material Category	2) Quantity	3) Unit Total	4) Volume (cum)	5) Weight (cum)	6) Material Destination
Wood					
Wood Stud					
Plywood					
Baseboard					
Trim					
Wood Cabinet					
Doors and Windows					
Panel					
Regular Slab					

3.20 01 77 00 – CLOSEOUT PROCEDURES

3.20.1 INSPECTION AND DECLARATION

- .1 Construction Manager's Inspection: Construction Manager and SubContractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Construction Manager's Inspection and that corrections have been made.
 - .2 Request Departmental Representative Inspection.
- .2 Completion: submit written certificate that following have been performed:



- .1 Work has been completed and inspected for compliance with
 - .1 Contract Documents.
 - .2 Local authorities having jurisdiction.
 - .3 Local services/utility providers.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .4 Certificates required by Authorities Having Jurisdiction and by Utilities have been submitted.
 - .5 Operation of systems have been demonstrated to Departmental Representative's and the facility's personnel.
 - .6 Work is complete and ready for final inspection.
- .3 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Construction Manager. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

3.20.2 WARRANTY INSPECTION

- .1 In the case of one year warranty, conduct joint inspections ten (10) months after Interim Certificate of Completion. In the case of each extended warranty, conduct joint inspections as agreed by Departmental Representative.
- .2 Immediately prior to end of warranty period(s) Departmental Representative and Construction Manager shall make a joint final inspection of the remedial Work noted two (2) months prior to end of warranty(s) and reported within the two (2) month during remedial work.

3.21 01 78 00 - CLOSEOUT SUBMITTALS

3.21.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final inspection, with Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative;
 - .1 Four final copies plus electronic copies of operating and maintenance manuals in English.
 - .2 Four copies plus electronic copies of final Commissioning Report.
- .6 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.
- .7 Furnish evidence, if requested, for type, source and quality of products provided.
- .8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .9 Pay costs of transportation.

3.21.2 ELECTRONIC SUBMITTALS



- .1 Submit number of hard copies specified for each type and format of submittal and in also submit in electronic format as pdf files and also in MS Word, Excel, Project as may be appropriate and in AutoCAD dwg files all on appropriate media.
- .2 Departmental Representative will provide one electronic set of drawings, schedules and specifications for as-built drawing and specification purposes.
 - .1 Drawings are in AutoCAD.
 - .2 Specifications are in MS Word.
 - .3 Amendments are in MS Word.
- .3 Transfer as-built information from marked up set of documents to electronic format.
 - .1 Provide plotted or printed as specified.
- .4 As-built topographical and site surveys in AutoCAD and pdf format.

3.21.3 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by components, systems, integrated systems, process flow, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in pdf and dwg format.
- .10 On project completion submit to Departmental Representative 4 electronic pdf copies on appropriate media and 4 paper copies in binders of Operations and Maintenance Manual.
 - .1 Organize manuals into industry standard maintenance manual tabs with links in index to each descriptive section describing the component or maintenance procedure.
 - .2 Organize files into Masterformat 2010 numbering system.
 - .3 Label disk "Operational and Maintenance Data", project name, date, names of Construction Manager, subcontractors, consultants and subconsultants.
 - .4 Include scanned guarantees, bonds, diagrams and drawings.
 - .5 Organize contents into applicable sections of work to parallel specification break-down. Mark each section by labeled tabs (navigation buttons).
 - .6 Ensure all content is legible.

3.21.4 CONTENTS – EACH VOLUME

- .1 Table of Contents:
 - .1 Provide title of project;
 - .2 Date of submission; names.



- .3 Addresses, and telephone numbers of Department Representative and Construction Manager with name of responsible parties.
- .4 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.
- .6 Demonstration and Training: refer to Section 01 79 00.
 - .1 Submit to Departmental Representative 4 electronic copies on DVD R/W of demonstration and training sessions.

3.21.5 AS-BUILTS SPECIFICATIONS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.
- .6 Departmental Representative may furnish additional drawings and specifications to clarify Work.
 - .1 Such documents become part of Contract Document.
 - .2 Include such documents in As Built submission.
- .7 Turn over, at completion, with all as-built information:
 - .1 Drawings;
 - .1 1 electronic copy of drawings in AutoCad file format 2010.
 - .2 4 sets of printed as-built drawings.
 - .3 1 pdf copy.
 - .2 Specifications in Master format 2010;



- .1 1 electronic copy of specifications in MS Word 2007.
- .2 4 sets of printed as-built specifications.
- .3 1 pdf copy.
- .8 Submit to Departmental Representative one copy of drawings and specifications for review prior to final submission.

3.21.6 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of black line opaque drawings, and in copy of Specifications Documents.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: 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.
- .5 Specifications: 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.
- .6 Other Documents: maintain manufacturer's certifications, guarantees, inspection certifications, field test records, required by individual specifications sections.

3.21.7 FINAL SURVEY

- .1 Submit final site survey certificate in accordance with Section 01 71 00 certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

3.21.8 EQUIPMENT AND SYSTEMS

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.



- .5 Maintenance Requirements: include routine procedures and guide for troubleshooting; 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 Construction Manager's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 and 01 91 13.
- .15 Additional requirements: as specified in individual specification sections and Terms of Reference (TOR).

3.21.9 MATERIALS AND FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

3.21.10 SPARE PARTS

- .1 Provide spare parts.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site as directed; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

3.21.11 MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site as directed; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

3.21.12 SPECIAL TOOLS

- .1 Provide special tools.



- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site as directed; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

3.21.13 STORAGE, HANDLING AND PROTECTION

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

3.21.14 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 60 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:
 - .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, manufacturers' guarantees and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Departmental Representative permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Construction Managers, subcontractors, manufacturers or suppliers involved.



- .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems and integrated systems.
- .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Construction Manager's plans for attendance of the various required post-construction warranty inspections.
 - .5 Procedure and status of tagging of equipment covered by extended warranties.
 - .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .9 Respond in a timely manner to oral or written notification of required construction warranty repair work.
- .10 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Construction Manager.

3.21.15 PRE-WARRANTY CONFERENCE

- .1 Meet with Departmental Representative, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Departmental Representative.
- .2 Departmental Representative will establish communication procedures for:
 - .1 Notification of construction warranty defects.
 - .2 Determine priorities for type of defect.
 - .3 Determine reasonable time for response.
- .3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.
- .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

3.21.16 WARRANTY TAGS



- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Manager.

3.22 01 91 13 – GENERAL COMMISSIONING (CX) REQUIREMENTS

3.22.1 GENERAL

- .1 Refer to the TOR for Commissioning Requirements.

3.23 01 91 41 – DEMONSTRATION AND TRAINING

3.23.1 GENERAL

- .1 Refer to the TOR for Demonstration and Training Requirements.

4. Existing Conditions (Division 02)

4.1 GENERAL

4.1.1 MASTERFORMAT

- .1 Division 01 requirements are structured using Masterformat 2010 section numbering system.

4.2 02 81 01 HAZARDOUS MATERIALS

4.2.1 REFERENCES

- .1 Definitions:
 - .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
 - .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
 - .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .2 Reference Standards:
 - .1 Canadian Environmental Protection Act, 1999 (CEPA 1999)
 - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
 - .2 Department of Justice Canada (Jus)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act), (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).



- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .4 National Research Council Canada Institute for Research in Construction (NRC-IRC)
 - .1 National Fire Code of Canada-2010.
- .3 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2013, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

4.2.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.
 - .3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

4.2.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial/territorial regulations.
 - .1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.
- .4 Storage and Handling Requirements:
 - .1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
 - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial/territorial laws, regulations, codes, and guidelines.
 - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
 - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.



- .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
- .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
- .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
- .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
- .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
 - .6 Store hazardous materials and wastes in secure storage area with controlled access.
 - .7 Maintain clear egress from storage area.
 - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
 - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
 - .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
 - .11 When hazardous waste is generated on site:
 - .1 Co-ordinate transportation and disposal with Departmental Representative.
 - .2 Comply with applicable federal, provincial/territorial and municipal laws and regulations for generators of hazardous waste.
 - .3 Use licensed carrier authorized by provincial/territorial authorities to accept subject material.
 - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
 - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial/territorial regulations.
 - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.



- .7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.
- .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.
- .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial/territorial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.
- .5 Develop Construction Waste Management Plan related to Work of this Section.
- .6 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

4.2.4 MATERIALS

- .1 Description:
 - .1 Bring on site only quantities hazardous material required to perform Work.
 - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

4.2.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial/territorial acts, regulations, and guidelines.
- .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
- .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial/territorial regulations.



- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal.
 - .2 Hazardous waste burned for energy recovery.
 - .3 Lead-acid battery recycling.
 - .4 Hazardous wastes with economically recoverable precious metals.



5. Roles and Responsibilities Matrix

Roles and Responsibilities Matrix - CM as Advisor & Contractor					
LEGEND	A - Approves L - Leads S - Supports I - Informed NR - No Role		Approval authority, sign-offs on work provided by Lead. Responsible to direct & achieve the work and for the results. Contributes expert resources to complete the work. Being informed by Lead of work progress. No Role.		
	DR - Departmental Representative CT - Design Consulting Team CM - Construction Manager				
Phase Description/Work Product			DR	CT	CM
SP			Pre design Period; Concept & Schematic		
SP	1	Partnering Workshop	L	S	S
SP	2	Lines of Communication & Roles & Responsibilities	L	S	S
SP	3	Owner Project Requirements (OPR)	L	S	S
SP	4	Review Owner Functional & Operational Program	S	L	S
SP	5	Risk and Complexity Analysis	A	L	S
SP	6	Review As-Built, Current Design and Site Condition Review (Surveys, GeoTech Reports)	I	L	S
SP	7	Introductory CM Plan/Project Procedures Manual	A	S	L
SP	8	Introductory Master Schedule	A	S	L
SP	9	Project Team Task Analysis and Deliverables	I	L	S
SP	10	Integrated Project Delivery Workshop	A	L	S
SP	11	Design Kickoff Meeting	S	L	S
SP	12	Schematic Design and Report Review	A	L	S
SP	13	Basis of Design (BOD) support document	A	L	S
SP	14	CM Plan Update	A	S	L
SP	15	Prepare Construction Cost Estimate (+/-15%)	A	L	S
SP	16	Prepare & Submit Initial Construction Budget/Schedule	A	S	L
SP	17	Identify Long Lead Items, prepare orders	A/S	S	L
SP	18	Initial Cx Plan	A	L	S
SP	19	Apply for & track all Regulatory Permits Requirements	S	S	L
DP			Design Period		
DP	1	Pre-Design Meeting; minutes	A	L	S
DP	2	Design Development & Review Report	A	L	S
DP	3	OPR & BOD Updates	A	L	S
DP	4	CM Plan Update	A	S	L



LEGEND		A - Approves L - Leads S - Supports I - Informed NR - No Role	Approval authority, sign-offs on work provided by Lead. Responsible to direct & achieve the work and for the results. Contributes expert resources to complete the work. Being informed by Lead of work progress. No Role.		
		DR - Departmental Representative CT - Design Consulting Team CM - Construction Manager			
		Phase Description/Work Product	DR	CT	CM
DP	5	Risk Identification and Mitigation & Management Program Update	A	S	L
DP	6	Prepare Construction Cost Estimate (+/-10%)	A	L	S
DP	7	Prepare & Submit Initial Budget/Schedule	A	S	L
DP	8	Design Dwg and Outline Specs Submission(s)	A	L	NR
DP	9	QA Reviews	L	S	S
DP	10	Response to QA	S	L	S
DP	11	Integrated Project Delivery Workshop	A	L	S
DP	12	Constructability Review Workshop & Report	S	A/S	L
DP	13	Value Engineering Review	A	S	L
DP	14	Cx Plan Update	S	L	S
DP	15	Update Design Schedule	A	L	S
DP	16	Update Project Schedule	A	S	L
DP	17	Construction Document & Review Report (33%, 66% and 99% submissions)	L	A	S
DP	18	QA Reviews	L	S	S
DP	19	Response to QA	S	L	S
DP	20	Submit Design for Building Permit Review	A	S	L
DP	21	CM Plan Update	A	S	L
DP	22	Risk Identification and mitigation & Management Program Update	A	S	L
DP	23	Prepare Respective Construction Cost Estimate (+/-5%)	A	L	S
DP	24	Prepare & Submit Updated Construction Budgets/Schedules	A	S	L
DP	25	Constructability Review & Report	A	S	L
DP	26	Obtain Code AHJ Review Approval	A	L	S
DP	27	CM Construction Plan Kickoff Meeting	L	S	S
DP	28	Construction Planning & Delivery Methods	A	S	L
DP	29	Prepare & Review of Sample Contracts/ Agreements/Division 01	S	S	L
DP	30	Early Tender - Order Long Lead Items, Material/Fabrication & Industry Design Assistance to Project	S	S	L
DP	31	CM Tender Process & Contracting Plan	A	S	L
DP	32	CM Tender Sub-Contractor Work Package Plan & Respective Class A Estimates	A	S	L
DP	33	CM Tender Document Packages Compilation.	S	S	L
DP	34	CM Own Work Force Div 01 Work Plan	A	S	L
DP	35	Regulatory Approvals, Permits & Licenses Applications	I	L	S
DP	36	Cx Plan Update	A	S	L



LEGEND		A - Approves L - Leads S - Supports I - Informed NR - No Role	Approval authority, sign-offs on work provided by Lead. Responsible to direct & achieve the work and for the results. Contributes expert resources to complete the work. Being informed by Lead of work progress. No Role.		
		DR - Departmental Representative CT - Design Consulting Team CM - Construction Manager			
		Phase Description/Work Product	DR	CT	CM
DP	37	Cx Verification Checklists & Test Procedures and Forms	S	L	S
DP	38	CM Bid / Award	A	S	L
DP	39	Develop Sub-Contractor Bid List, Tender Advertisement	A	S	L
DP	40	Review & approve bid documents	A	S	L
DP	41	Develop General Contractor Bid List and Tender Advertisement	n/a	n/a	n/a
DP	42	Distribute Bid Documents	I	I	L
DP	43	Pre-Bid Conference	I	S	L
DP	44	Prepare & Distribute Minutes	I	S	L
DP	45	Prepare Addenda	A	S	L
DP	46	Schedule & Coordinate Bid Openings	I	S	L
DP	47	Receive, Open & Record Bids	I	S	L
DP	48	Review Bids and Provide Cost Analysis	I	S	L
DP	49	Review Sub-Contractors	I	S	L
DP	50	Sub-Contractor Contract Award	A	S	L
DP	51	CM Plan Update	A	S	L
DP	52	Risk Identification and Mitigation & Management Program Update	A	S	L
DP	53	Construction Cost , Cash Flow and Schedule Updates	A	S	L
CP		Construction & Administration Period			
CP	1	CM Plan Update	A	S	L
CP	2	Review/Approve Sub-Contractor Schedule of Values Breakdown	A	S	L
CP	3	Review/Approve CM Own-Forces Schedule of Values Breakdown	A	S/L	S
CP	4	Review Sub-Contractor's Progress Schedule	S	S	L/A
CP	5	Review/Approve Own-Forces Schedule of Values Breakdown	A	S/L	S
CP	6	Recommend Progress Claim & Payment Approval	A	L/A	S
CP	7	Pre-Construction Meeting	S	L	S
CP	8	Integrate Cx activities into Project Schedule	A	S	L
CP	9	OPR and BOD update	A	L	S
CP	10	Manage RFI process	A	S	L
CP	11	Submit Change Request	A	S	L
CP	12	Evaluate/Negotiate/Recommend Change Request	A	L	S
CP	13	Change Orders	A	L	S
CP	14	Track & Distribute Documents	S	L	S
CP	15	Review/Approve submittals	S	L	A
CP	16	Approve Shop Drawings	S	L	A



LEGEND		A - Approves L - Leads S - Supports I - Informed NR - No Role			
		Approval authority, sign-offs on work provided by Lead. Responsible to direct & achieve the work and for the results. Contributes expert resources to complete the work. Being informed by Lead of work progress. No Role.			
		DR - Departmental Representative CT - Design Consulting Team CM - Construction Manager			
		Phase Description/Work Product	DR	CT	CM
CP	17	Approve Test Reports	I	S	A
CP	18	Prepare Change Request Plans & Specs	S	L	S
CP	19	Weekly Project Progress Meetings	S	L	L
CP	20	Meeting Minutes, Construction Cost Estimate & Status Reports	I	L	S
CP	21	CM Construction Budget & Schedule	I	S	L
CP	22	Sub-Contractors' Progress Schedules	I	S	L
CP	23	Progress Payment to Date	L/A	S	S
CP	24	Cx Plan and Issues Log Update	A	S	L
CP	25	Field inspections re: Testing, Warranty, AHJ, Regulatory Agencies	I	S	L
CP	26	Submit Daily Field Reports	I	S	A/L
CP	27	Construction Photographs	I	L/S	S
CP	28	Prepare "As-Built" Plans	I	L/A	S
CP	29	Coordinate Partial Interim Acceptances/ Substantial Completions & Certificates	A	L	S
CP	30	Track All Permits	I	S	L/A
CP	31	Track All Project Documents	S	L	S
CP	32	Review CM Invoices	L/A	L	S
CP	33	Prepare O&M Manuals	S	A	L
CP	34	Develop and Conduct Training	A	S	L
CP	35	Cx Process	S	S	L
CP	36	Cx Progress Meetings	S	S	L
CP	37	Update Cx Plan submission	A	S	L
CP	38	Submit Cx Forms	S	S	L
CP	39	Witness and document Static Verification	I	A/S	L
CP	40	Witness and Document Scheduled Start-Up	I	A/S	L
CP	41	Witness and document Functional Performance Testing	I	A/S	L
CP	42	Prepare and update Cx Issues Log	S	A/S	L
CP	43	Resolve issues resulting from all tests	S	L/A	L
CP	44	Prepare Cx report submission	A	S	L
CP	45	Prepare Cx Manual submission	A	S	L
CP	46	Verify and review training Plan	A	L	S
CP	47	Conduct Training	A	S	L
CP	48	Assemble data for Operations and Maintenance Manuals	S	S	L
CP	49	Review O&M Manuals	S	L/A	S
CP	50	Partial Substantial Completion	A	L	S
CP	51	Substantial Completion	A	L	S



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		DR - Departmental Representative CT - Design Consulting Team CM - Construction Manager				
		Phase Description/Work Product	DR	CT	CM	
CO		Close Out Period				
CO	1	Conduct pre-final inspection	A/S	L	S	
CO	2	Prepare / consolidate Punch list(s)	S	A/L	S	
CO	3	Complete Punch list Items	A	S	L	
CO	4	Coordinate Code Inspection	I	L/A	S	
CO	5	Plan, Schedule & Control Final Inspection by All Parties Incl. Regulatory Agencies	A	S	L	
CO	6	Provide Maintenance & Operating Manuals	A	L	S	
CO	7	Provide All Guarantees & Reports	A	S	L	
CO	8	Assemble & Approve Close-Out Documents	A	L	S	
CO	9	Evaluate As-Built Plans	I	L	S	
CO	10	Prepare Record Set Drawings	A	L	S	
CO	11	Sign "Certificate Of Final Completion"	A	L	S	
CO	12	Final Contract Acceptance	A	L	S	
CO	13	All Permit closeouts	I	L	A	
CO	14	Occupancy certificate	I	L/A	S	
PO		Post Occupancy Period				
PO	1	Resolve Outstanding Cx issues	S	A/S	L	
PO	2	Perform Seasonal/ Deferred Testing	S	A/S	L	
PO	3	Resolve issues from seasonal/deferred testing	S	A/S	L	
PO	4	Update Issues Log from seasonal/ deferred testing	S	A/S	L	
PO	5	Complete final Cx report	A	L	S	
PO	6	Complete PWGSC Cx Evaluation Report	A/L	S	S	
PO	7	Provide Post-Occupancy Assistance	L	S	S	
PO	8	Correct Warranty Issues	I	S	A/L	
PO	9	Lessons Learned	L	S	S	



6. CM Monthly Reporting Outline

6.1 EXECUTIVE SUMMARY ON KEY POINTS

- .1 General commentary on where the project is at, milestones achieved, upcoming milestones, opinion on how the project is progressing at a high level.

6.2 GENERAL PROGRESS OF WORK

- .1 Description of Work Completed in the last reporting period.
- .2 Description of upcoming work that is anticipated to be completed in the next reporting period.
- .3 Issues that need to be resolved.

6.3 CONSTRUCTION COST PLAN REPORT

- .1 Budgeted dollars per month.
- .2 Expenditure Cash Flow per month.
- .3 Forecasted Expenditures per month.
- .4 Actual Expenditures per month.
- .5 Value of work done to end of reporting period, per fiscal year and overall for project.

6.4 MASTER SCHEDULE UPDATE (UPDATED SCHEDULE SHOWING PROGRESS TO DATE TO BE ATTACHED)

- .1 Identify Critical Path tasks completed, Critical Path tasks upcoming.
- .2 Progress on Schedule.
- .3 Deviations to Schedule to date.
- .4 Actions Required to Maintain Schedule, if required.

6.5 RISK MANAGEMENT

- .1 Identify risk, state if it is a new risk or ongoing.
- .2 Identify mitigation strategy of risk.
- .3 Report on the outcome of the mitigation strategy.

6.6 WASTE MANAGEMENT

- .1 Overview of the strategy employed to date related to the Waste Management Plan.
- .2 Summary of numbers i.e. weight or volume of waste diverted from landfill, recycled volume or weight, etc.

6.7 HEALTH & SAFETY REPORT

- .1 Safety Incidents identified.
- .2 Confirmation that Safety Tailgate Meetings are occurring.
- .3 On site activities that warrant special safety consideration or awareness.

6.8 COMMISSIONING PROGRESS REPORT

- .1 Update on Progress of Commissioning Plan.
- .2 Commentary on next steps.
- .3 Issues that need to be resolved.