

# Construction Management Services **TERMS OF REFERENCE**

## **Fort Walsh Visitor Reception Centre Renewal**

**Parks Canada Agency (PCA)  
Fort Walsh National Historic Site  
Saskatchewan**

July 29, 2015



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# 1. PROJECT DESCRIPTION

## 1.1 GENERAL

### 1.1.1 PURPOSE

- .1 These Terms of Reference (TOR) have been developed to engage the services of a Construction Manager (CM) to provide advisory and general contractor services for the Fort Walsh Visitor Reception Centre Renewal project and to ensure that the CM has a clear understanding of the project scope, procedures and performance requirements.
- .2 The TOR describes project specific requirements, services and deliverables for the construction management of the Fort Walsh Visitor Reception Centre Renewal project.

### 1.1.2 PROJECT INFORMATION

- .1 The aging Fort Walsh Visitor Reception Centre (VRC) requires extensive renovations and repairs to address health, safety and operational issues; improve energy efficiency and to accommodate a future new interpretive display.

Project Information	
Project Title:	Fort Walsh Visitor Reception Centre Renewal
Project Address:	Fort Walsh National Historic Site, Saskatchewan
User Department:	Parks Canada Agency
PWGSC Project Number:	R.074819.001

## 1.2 BACKGROUND INFORMATION

### 1.2.1 USER DEPARTMENT NEED

- .1 The Fort Walsh Visitor Reception Centre (VRC) is in need of extensive renovations and repairs to address health, safety and operational issues (e.g. visitor flow and experience, washroom and storage deficiencies, deterioration of building systems and building envelope); improve energy efficiency and to accommodate a future new heritage interpretive display.

### 1.2.2 USER DEPARTMENT

- .1 The User Department referred to throughout the TOR is the Parks Canada Agency (PCA)
- .2 On behalf of the people of Canada, Parks Canada Agency protects and presents nationally significant examples of Canada's natural and cultural heritage, and foster public understanding, appreciation and enjoyment in ways that ensure the ecological and commemorative integrity of these places for present and future generations.

### 1.2.3 EXISTING CONDITIONS

- .1 Overlooking the Fort Walsh valley and near the historic fort buildings, the VRC is the key operational building for the Fort Walsh National Historic Site. The Fort Walsh National Historic Site is adjacent to the Cypress Hills Interprovincial Park and southwest of the town of Maple Creek, Saskatchewan.
- .2 The VRC provides an introduction to the historic Fort Walsh site through heritage interpretive displays and a small theatre. Other visitor amenities include a public reception area, public washrooms and food service. Support facilities include office



and storage space, mechanical and electrical rooms, staff washrooms, lunchroom and lockers.

- .3 The VRC is a modern curvilinear wood clad steel and wood frame building built in 1978. The single storey building includes an enclosed and unfinished crawlspace.
- .4 Refer to the PCA Inspection Report (November 2007) in Appendix A for a more detailed building description and evaluation.

#### 1.2.4 CONSTRAINTS AND CHALLENGES

- .1 Time and quality control are of the essence with this project.
  - .1 The work must be substantially complete by March 3, 2017.
- .2 Budget for a total construction value established by PWGSC and PCA by adjusting the scope of the individual work items accordingly and as agreed with the Departmental Representative.
- .3 The Construction Manager must provide on-site services until final completion.
- .4 Construction activities must be coordinated with PCA to minimize visitor conflict.
- .5 The work must meet all PCA environmental requirements.

### 1.3 PROJECT DELIVERY APPROACH

#### 1.3.1 PROJECT DELIVERY OBJECTIVES AND REQUISITE

- .1 Under this project delivery approach, responsibility of the CM shall include Advisory and Support services and General Contractor (GC) work.
  - .1 The primary reason for this approach is that a Construction Manager (CM) will provide PWGSC with valuable construction advice and the flexibility to implement and coordinate multiple projects and sub-projects and phases and expedite the schedule of completion of the work.
  - .2 Having one construction manager to oversee all sub-projects on this project provides advantages of coordination, quality assurance, efficiency and scale.
- .2 The CM shall provide;
  - .1 Construction management services throughout the project phases and demonstrate leadership,
  - .2 Delivery of the project according to the Project Milestones and within the approved budget and on scope,
  - .3 A continuous risk management program to address the risks associated with designing and renovating facilities in an occupied facility,
  - .4 A quality management plan that includes quality reviews on a construction management project delivery approach, and
  - .5 Contingency plans to mitigate potential delays arising from logistic and weather related challenges.

#### 1.3.2 DESIGN PHASE

- .1 For the design phase of this Project, an Architectural and Engineering firm (referred to herein as the Consultant) is being engaged to complete the design and will direct and co-ordinate all phases of the design work for this Project.
- .2 During design phase,
  - .1 Architectural and Engineering services including all cross discipline coordination work has been provided by the Consultant Team.
  - .2 The CM shall provide advisory and support services to the design team and provide quality reviews on the constructability of proposed designs and tender ready packages. Written comments shall be submitted before any construction work begins.



- .3 The Consultant Team will work closely with the CM to develop the design and ensure that all information is made available to the CM. The CM shall provide advice on CM activities:
  - .1 Construction costs;
  - .2 Material delivery & construction schedules;
  - .3 Constructability;
  - .4 Suitability and availability of materials and components;
  - .5 Sustainable design, construction, and operation principles and practices;
  - .6 Risk Management Report.

### **1.3.3 CONSTRUCTION PHASE**

- .1 The CM shall provide services as the General Contractor during the construction phase of the project.
  - .1 The CM shall provide the Crown with flexibility to implement and coordinate multiple tender packages, and phases and shall expedite the schedule of completion of the Work.
  - .2 The CM shall oversee all construction tender packages on the building site and provide coordination, quality assurance and efficiency.
  - .3 The CM, in consultation with the Consultant Team and Departmental Representative, will help determine the number of tender packages required for the project. This is to enable the Consultant Team to prepare the tender packages in a timely manner and ensure full co-ordination of the work of all disciplines.

### **1.3.4 WORK PACKAGES**

- .1 Work packages will be determined upon completion of the Building Condition Assessment report by the Consultant.

## **1.4 SUMMARY OF PERSONNEL AND QUALIFICATIONS**

### **1.4.1 GENERAL**

- .1 The CM shall provide a Construction Management team with the following specialists / subject matter experts:
  - .1 Risk Management Specialist;
  - .2 Schedule Management Specialist;
  - .3 Budgeting Specialist;
  - .4 Waste Management Specialist;
  - .5 Quantity Surveying Specialist;
  - .6 Commissioning Process Manager;
  - .7 Construction Project Manager;
  - .8 Construction Site Superintendent;
  - .9 Construction Quality Management Specialist.
- .2 The CM shall report directly to the PWGSC Departmental Representative.

## **1.5 PROJECT SCHEDULE**

### **1.5.1 GENERAL**

- .1 Time is of the essence. Project is required to be substantially complete, commissioned and ready for occupancy in accordance with the milestone list identified below.
- .2 Completion dates shown are relative to an assumed start date of October 06, 2015 for the CM scope of work.



.3 Prepare a Project Schedule, in accordance with the milestone list.

### 1.5.2 ANTICIPATED MILESTONE DATES

Project Phase	Milestone Completion Date	Number of Weeks
Consultant Contract Award	June 16, 2015	
Building Condition Assessment	July 30, 2015	6 weeks
PWGSC Quality Assurance Review	August 7, 2015	2 weeks
Pre-Design (including functional programming)	September 4, 2015	4 weeks
PWGSC Quality Assurance Review	September 18, 2015	2 weeks
Construction Manager Contract Award	October 30, 2015	
Schematic Design	October 30, 2015	6 weeks
PWGSC Quality Assurance Review	November 6, 2015	2 weeks
Design Development	December 4, 2015	4 weeks
PWGSC Quality Assurance Review	December 18, 2015	2 weeks
50% Construction Documents	February 19, 2016	9 weeks
PWGSC Quality Assurance Review	March 4, 2016	2 weeks
99% Construction Documents	April 29, 2016	8 weeks
PWGSC Quality Assurance Review	May 13, 2016	2 weeks
Tender Documents	May 20, 2016	1 week
Begin Tender for Construction (Sub-Contractors)	May 27, 2016	1 week
Substantial Completion of Construction	March 3, 2017	40 weeks
Final Completion (Commissioning, Final Inspection and Acceptance)	March 31, 2017	4 weeks
Post Construction Deliverables	1 month past Final Completion date	
Post Construction Warranty Evaluation	9 months past Final Completion date	
Begin Construction for new Heritage Presentation (not in Consultant contract)	April 7, 2017	

## 1.6 PROJECT BUDGET

### 1.6.1 ESTIMATED CONSTRUCTION COSTS

- .1 The total construction cost estimate for the project is **\$2,000,000**.
  - .1 The construction cost estimates do not include Administration costs; Project Management fees; Design Consultant or CM fees; Risk Allowance or GST.
  - .2 The construction cost estimate is in 'Budget-Year (Current)' dollars and it includes General Contractor Services and an allowance for escalation and contingencies.
- .2 The Crown will not accept scope creep or cost escalation of selected Proponent's proposal, except in the limited situations as stipulated in the terms of the contract.



## 1.6.2 CASH FLOW

- .1 It is anticipated that the cash flow expenditures will be:
  - .1 \$100,000 for Fiscal Year 2015/2016;
  - .2 \$1,900,000 for Fiscal Year 2016/17.

## 1.7 EXISTING DOCUMENTATION

### 1.7.1 DISCLAIMER

- .1 Reference information will be available in the language in which it is written.
- .2 Construction tender documents, as prepared by the Consultant are for reference only. This Request for Proposal is for construction management services.

### 1.7.2 DOCUMENTS AVAILABLE TO THE SUCCESSFUL PROPONENT IN ENGLISH ONLY;

- .1 Copies of all pertinent documentation will be made available to the CM.
- .2 Limited as-built drawings and Operation & Maintenance Manuals will be available on the project site and the CM will be responsible for verifying the accuracy of the information incorporated into the design.
- .3 Digitized reproductions of scanned drawings of the original building construction are available.

## 1.8 CODES, ACTS, STANDARDS, GUIDELINES AND REGULATIONS

### 1.8.1 GENERAL

- .1 A listing of Codes, Acts, Standards and Guidelines applicable to this project are referenced in the Consultant's TOR document.
- .2 The Authorities Having Jurisdiction (AHJ) on this project are:
  - .1 The local AHJs;
  - .2 Treasury Board of Canada;
  - .3 Parks Canada Agency (PCA).
- .3 The CM must identify, analyze and manage the construction of the project in accordance with the requirements of all AHJs and all applicable Codes, Acts, Standards and Guidelines and Legislation.
  - .1 The applicability of various Codes, Acts, Standards and Guidelines listed in the Consultant's TOR document arise out of direct and indirect references in documents which apply to Federal buildings, such as the Canada Labour Code.



## 2. REQUIRED SERVICES

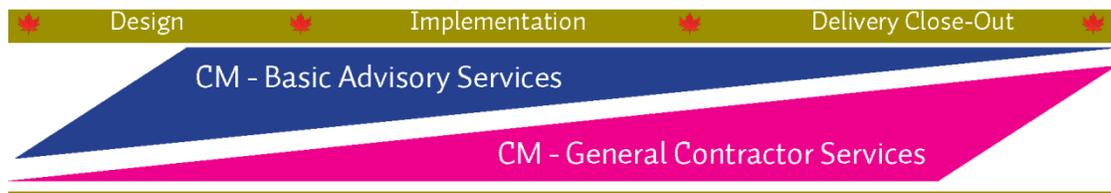
### 2.1 GENERAL REQUIREMENTS

#### 2.1.1 GENERAL

- .1 The CM, in consultation with the Departmental Representative shall:
  - .1 Perform the role of CM for the Project respecting the approved scope, quality, budget and schedule; and
  - .2 Develop partnership and communication between all members of the project delivery team and stakeholders throughout all phases of the project life.
- .2 All Services and duties listed and allocated to the CM throughout the Required Services section are:
  - .1 The full responsibility of the CM; and
  - .2 Are not exhaustive and do not preclude alternative or supplementary approaches as may be suggested by the CM for consideration by the Departmental Representative and vice versa.

#### 2.1.2 SUMMARY OF SERVICES

- .1 Level of effort associated with the Required Services will vary as per the project delivery life cycle (simplified) diagram below.



- .2
- .3 Services required for this project as follows:
  - .1 Provided as required in Advisory Support Services or Construction Support Services;
    - .1 Scope Management Services,
    - .2 Cost Management Services,
    - .3 Schedule Management Services,
    - .4 Risk Management Services,
    - .5 Quality Management Services,
    - .6 Cost Control Services,
    - .7 Schedule Control Services,
    - .8 Risk Control Services,
    - .9 Quality Control Services,
    - .10 Commissioning Services,
    - .11 CM Tendering Services,
    - .12 CM General Contractor Services, and
    - .13 CM General Construction and Contract Administration Services.

### 2.2 ADVISORY SUPPORT SERVICES

#### 2.2.1 GENERAL

- .1 The CM, as expert in matters of construction, counsels PWGSC and the Consultant Team by providing advisory and support services throughout the design and construction phases of the project.

#### 2.2.2 SCOPE AND ACTIVITIES



- .1 The CM shall:
  - .1 Analyze and become familiar with all the Project background documents and reports;
  - .2 Review site conditions, with respect to technical and implementation issues affecting this project;
  - .3 Review the program for all potential tender packages included in the project;
  - .4 Prepare a construction schedule;
  - .5 Develop a list of recommended construction trades and tender packages;
  - .6 Prepare estimates for each tender package;
  - .7 Prepare a detailed construction budget;
  - .8 Participate in all integrated design sessions and provide advice on;
    - .1 Constructability of the design and details contained in the contract documents,
    - .2 Scheduling of the Work, and
    - .3 Costing, pricing and bid suitability.
  - .9 Assist in providing liaison and coordination with Government Authorities for various reviews and approvals;
  - .10 Develop and maintain the Project Procedures Manual (PPM) and all documents triggered by the PPM;
  - .11 Advise on construction related matters for the Departmental Representative, the User Department, the Consultant Team and members of the CM's Project Delivery Team;
  - .12 Effective control measures and management of;
    - .1 Project costs and expenditures,
    - .2 Project schedule and progress,
    - .3 Scope & quality of the Work,
    - .4 Change management and change order control, and
    - .5 Risk management and claims avoidance.
  - .13 Mitigate potential conflict and overlap, with respect to;
    - .1 The design services performed by the Consultant Team, and
    - .2 The work to be performed by the various Sub-Trades.
  - .14 Provide quality control methodologies with respect to;
    - .1 Availability and cost comparisons of construction materials,
    - .2 Methods of construction and constructability,
    - .3 Scope and quality of construction materials and systems,
    - .4 Alternative approaches to completing the Work,
    - .5 Risk Management,
    - .6 Life Cycle Cost analysis,
    - .7 Sustainability, and
    - .8 Value Engineering.
  - .15 Develop procurement strategies and construction implementation phasing;
  - .16 Determine appropriate construction tender packages;
  - .17 Determine the potential impact to the Project of applicable labour conditions and availability of materials;
  - .18 Prepare a Commission Plan and Schedules for commissioning of all operating building components, systems and integrated systems at the appropriate phases of construction, so as to ensure coordinated, effective and efficient building operation (in conformance with the Commissioning Process);



- .19 Obtain and administer project guarantees Warrantees and manufacturer's guarantees; and
- .20 Provide advice on methods of construction as may be required from time to time by the Consultant Team.
- .2 The above listing of Services is neither complete nor exhaustive and the full scope of Advisory Services required shall include the entire content of the TOR, in concert with the terms and General Conditions of the Contract.

### 2.2.3 DOCUMENT DELIVERABLES

- .1 Project Procedures Manual
  - .1 The CM shall develop a Project Procedures Manual in consultation with the Departmental Representative for the execution of Project activities.
  - .2 The Manual will provide a description of procedures, roles, responsibilities, levels of authority and the documentation for the execution of the Project, including details of the processes and sample outlines.
  - .3 The Manual will include the process and methods to:
    - .1 Maintain Project records;
    - .2 Implement a quality assurance program;
    - .3 Prepare, update, monitor and maintain the Master Schedule;
    - .4 Update, monitor and maintain the Cost Plan, Progress Payments, Change Orders and Cash Flow;
    - .5 Manage communications as directed by the Departmental Representative between Project Delivery Team participants based upon the documented roles, responsibilities and authority of Team members, and maintain a listing of meetings, frequency, type, etc.;
    - .6 Manage correspondence, reports and performance records;
    - .7 Distribute correspondence electronically;
    - .8 Process Shop Drawings;
    - .9 Document the process for reviews and approvals of Tender Package Contracts and change orders; and
    - .10 Maintain a decision log during the construction of the project, recording participants, date and place of all decisions affecting schedule, budget, scope, or quality.
- .2 Project Monitoring and Reporting
  - .1 Provide a system for documentation and project monitoring and reporting through each stage of project delivery, for review and acceptance by the Departmental Representative.
  - .2 Prepare and submit, at the start of the project, a sample of the report outline for all reports for review by the Departmental Representative. Sample report outline is contained in Part 6 of the GP&S document.
    - .1 Resubmit as may be required.
    - .2 The date of issue of the CM Monthly Report shall be established.
    - .3 The structure of the CM Monthly Report shall be used for all subsequent project stages.
  - .3 Prepare and submit quarterly reports to address:
    - .1 Milestone reporting on Estimating and Cost Planning;
    - .2 Updated Project Procedures Manual; and
  - .4 Prepare and submit monthly progress reports during the Design Development and Construction Document Stages, in an outline approved by the Departmental Representative.



- .1 The purpose of the report shall be to review and monitor the progress of the Services by the CM. The report shall:
  - .1 Identify the progress of Advisory Support and Construction Support Services;
  - .2 Identify Progress Claims and Payments to date (including change orders) in a form that compares the original budgets for each Tender Package with the expected costs;
  - .3 Identify all instances where the schedule is not being met and identify impact on scheduled completion date;
    - .1 Outline remedial measures being taken or planned to be undertaken to ensure the scheduled completion date; and
  - .4 Identify any anticipated or potential problems to be addressed.
- .5 Prepare and submit monthly reports during construction to address status and variances with respect to schedule, budget, quality, and scope:
  - .1 The actual report outline shall be acceptable to the Departmental Representative, and shall provide the following;
    - .1 An executive summary of key points,
    - .2 General progress of the Work and modifications to reflect changes in project parameters as may be identified throughout the project life,
    - .3 Construction Cost Plan Report including an overview of cost issues as outlined in this TOR,
    - .4 Master Schedule Update and narrative report including an overview of schedule issues as outlined in this TOR,
      - .1 Monitor changes to the Master Schedule at least once a month and submit written reports to the Departmental Representative on any deviations or delays from the master schedule, and identify possible remediation measures required to maintain the Master Schedule Completion date.
      - .2 Monthly reports must identify not only reasons for delay but also offer suggestions, where possible, on how to bring the project back on track.
    - .5 Identification of risks and proposed strategies for mitigation, including scope creep as well as quality control outlined in this TOR,
    - .6 Waste Management Report as including an overview of Waste Management Strategies for construction,
    - .7 Health and Safety status Report, including narrative on the application or adjustment to the CM's Health and Safety Plans as well as any incidents and resulting actions, and
    - .8 Commissioning Plan progress report.

## **2.3 COST MANAGEMENT SERVICES**

### **2.3.1 GENERAL**

- .1 PWGSC manages all funding for the Project, including budgeting, expenditures and Progress Payment approvals.
  - .1 General information regarding Cost Management applicable to this project is contained in Part 2 of the GP&S document.

### **2.3.2 SCOPE AND ACTIVITIES**

- .1 The CM shall:
  - .1 Provide advice and recommendations on;



- .1 Costs related to construction feasibility, availability of materials and labour, time requirements for installation and construction,
- .2 Budget costs of systems, assemblies, equipment, materials and specialty labour,
- .3 Current pricing levels and trends in associated activities relating to the project,
- .4 The selection, availability and pricing of goods and services,
- .5 Insurance and bonding requirements.
- .2 Provide suggestions and/or alternatives for cost reductions or acceleration of the Construction Schedule if requested by the PWGSC Departmental Representative.
  - .1 Evaluate costs for alternative materials, construction techniques and installation methods.
- .3 Revise and refine the initially approved Master Cost Plan as the project progresses, incorporate approved changes as they occur and develop cash flow reports and forecasts as required by the Departmental Representative.
- .4 Advise of deviations from the Master Cost Plan and obtain written authorization from the Departmental Representative. Seek and report on authorization as per the Departmental Representatives change process.
- .5 Monitor Project costs and expenditures against the approved Construction Cost Limit and identify variances between actual and budgeted or estimated costs.
  - .1 Notify the Departmental Representative in the event that the CM considers that the Construction Cost Estimate will exceed the Construction Cost Limit.
  - .2 Provide recommendations for remedial action to maintain and keep the estimates within the Construction Cost Limit.
- .6 Track costs so that PWGSC can manage the budget.

### 2.3.3 DELIVERABLES

- .1 Prepare and submit to the Departmental Representative for review and acceptance, a Master Cost Plan within 14 calendar days of award of contract and maintain the Plan throughout the life of the Project.
  - .1 Include all CM projected costs, Construction Cost Estimates and Construction Cost Limits.
  - .2 Develop budgets for the work of each work package.
    - .1 Prepare tender package budgets as soon as major project requirements have been identified.
    - .2 Update at the milestone review stages for PWGSC acceptance.
  - .3 Address all costs in Federal Fiscal Year (FY) format (April 01 to March 31 of the following year).
  - .4 Prepare estimated costs, (including summary plus full back-up showing items of work, quantities, unit prices and amounts) at:
    - .1 The Schematic Design Stage (Class C);
    - .2 The Design Development Stage (Class B); and
    - .3 The time of tendering each tender package (Class A).
- .2 Update at monthly intervals as agreed with the Departmental Representative.

## 2.4 SCHEDULE MANAGEMENT SERVICES

### 2.4.1 GENERAL

- .1 The CM shall provide Schedule Management Services for the project.



- .1 General information regarding Schedule Management applicable to this project is contained in GP&S document.

### 2.4.2 SCOPE AND ACTIVITIES

- .1 The CM must:
  - .1 Provide advice and recommendations on;
    - .1 A procurement strategy for any equipment or materials, which should be pre-ordered to meet the Master Schedule, and
    - .2 Means to minimize disruption to PCA during construction.
  - .2 If changes to the Schedule become necessary, indicate the impact and the reasons for such changes and submit proposed amendments to the Departmental Representative for review and acceptance.

### 2.4.3 DELIVERABLES

- .1 Prepare and submit to the Departmental Representative for review and acceptance, a draft Master Schedule (within 14 calendar days of contract award) and maintain the Plan throughout the life of the Project.
  - .1 Prepare the Schedule using Microsoft Project to develop detailed network diagrams, with work breakdown structures and Key milestones listings.
  - .2 Develop Critical Paths for all key activities, with key milestone dates and lead times for each activity.
  - .3 Identify anticipated start and completion dates for all design and construction activities, linked by interdependence on activities that must be completed prior to the start of a subsequent activity.
  - .4 Prepare separate schedules for each tender package and incorporated into the Master Schedule.
- .2 Ensure that the schedule has the capability of tracking changes

## 2.5 RISK MANAGEMENT SERVICES

### 2.5.1 GENERAL

- .1 PWGSC's Departmental Representative prepares the Risk Management Plan for the Project.

### 2.5.2 SCOPE AND SERVICES

- .1 The CM must:
  - .1 Review, comment and advise on the PWGSC Risk Management Plan;
  - .2 Advise on Project Risks specific to the project and recommend mitigation options to the Departmental Representative;
  - .3 Advise on issues of risk that integrate project planning with procurement planning and construction;
  - .4 Identify and implement methodologies aimed at mitigating and minimizing the impact of construction activities on occupants and user department operations during construction; and
  - .5 Implement a claims avoidance program.
  - .6 Monitor risk as outlined in the risk management plan.

### 2.5.3 DELIVERABLES

- .1 Submit a monthly report on Project Risks to the Departmental Representative.



## 2.6 QUALITY CONTROL SERVICES

### 2.6.1 GENERAL

- .1 The responsibility for construction quality control remains with the CM.
- .2 The CM's Team shall work to:
  - .1 Adopt project delivery processes such as Risk Management and advising on methods to obtain best value;
  - .2 Ensure that Health, Safety, Security and Sustainable Development requirements are adhered to;
  - .3 Report all site health and safety incidents to Departmental Representative.

### 2.6.2 SCOPE AND SERVICES

- .1 The CM shall apply quality assurance reviews during the design and construction phases, including participation in reviews of the systems, components, construction tools and techniques of the proposed design.
- .2 The CM shall be responsible for ensuring that the CM's Subcontractors adhere to:
  - .1 Industry standard practices following the requirements of the Construction Documents; and
  - .2 Professional conduct in all phases of the project, employing best practices for budget, schedule, quality, and scope management.
- .3 The CM shall Participate in Integrated Design Process (IDP) Workshops.
  - .1 The Consultant Team shall facilitate IDP Workshops through the design stage. The CM's Construction Project Manager shall attend 3 IDP workshops for the purpose of providing advice to the Consultant Team on Constructability of various options that the Consultant Team is considering including:
    - .1 Selection of materials, building systems and equipment;
    - .2 Constructability; and
    - .3 Coordination between all design disciplines.
- .4 Review construction drawings and specifications for each tender package at various stages acceptable to the Departmental representative.
  - .1 Normally, reviews are conducted at 50% and 99% stages, however, some tender packages may require fewer reviews, due to the nature of the work involved.

### 2.6.3 DELIVERABLES

- .1 Submit to the Departmental representative within fourteen (14) calendar days of award of contract a Quality Control Plan including, but not limited to:
  - .1 Identification and definition of key activities and deliverables;
  - .2 Description of internal controls;
  - .3 Methodologies and procedures to be utilized to deliver a quality project that meets the established Standards; and
  - .4 Deliverable verification plan.
- .2 Submit a written summary of the design and construction document reviews to the Departmental Representative.



## 2.7 COMMISSIONING SERVICES

### 2.7.1 GENERAL

- .1 Refer to Part 4 of the GP&S document for Roles and Responsibilities Matrix.
- .2 The CM is expected to provide, unless noted otherwise, a total integrated building commissioning service on the basis of CSA Z320-11, Canadian Standards Association, Building Commissioning Standard and Check Sheets.
- .3 The CM shall provide a Commissioning Process Manager (CPM).
- .4 Implement the Commissioning Plan developed by the Consultant. Assist the Consultant team throughout the project to ensure that all building systems work with one another to produce a functional and integrated facility.

### 2.7.2 SCOPE AND SERVICES

- .1 Schematic Design.
- .2 Design Development.
- .3 Construction.
- .4 Occupancy and Operations.

### 2.7.3 SCHEMATIC STAGES

- .1 **Overview**
  - .1 The Owner Project Requirements (OPR) and the Basis of Design (BOD) are dynamic, continuously updated document serving as commissioning benchmarks.
    - .1 Assist the Design Consultant and Owner in determining the BOD document.
  - .2 Participate in a commissioning focused review of schematic designs including;
    - .1 Risks associated with level of commissioning and project complexity.
- .2 **Reviews and Workshops**
  - .1 Arrange for a project start-up meeting, including the Design Consultant, to discuss the roles and responsibilities of the Commissioning Team during design and construction
  - .2 Participate in a commissioning focused Owner Project Requirements (OPR). Workshop with the project Design Consultants and User Department ("Owner") representatives to:
    - .1 Review all preliminary design documents provided to the Design Consultants;
  - .3 Participate in a Cx focused Workshop to review:
    - .1 Schematic Design documents in related Report;
    - .2 Design Consultant's Basis of Design (BOD); and
    - .3 Preliminary Commissioning Plan.

### 2.7.4 DESIGN STAGE

- .1 **Overview**
  - .1 Review and comment/evaluate throughout the design phases on the Design Consultant's BOD updates for conformance to the OPR and the original Owner's design goals.
  - .2 In collaboration with the Design Consultant outline O&M Manual and training requirements for Owner's review.



## **.2 Reviews and Workshops**

- .1 Participate in regularly scheduled bi-weekly design meetings via teleconference, web conferencing or in person as required.
- .2 Review Consultant's updated BOD.
- .3 Facilitate integrated controls meetings with the design team to ensure;
  - .1 Sequences of operations are compatible, and
  - .2 Responsibilities for associated work are specified.
- .4 Tender period.
  - .1 Participate in developing addenda as may be required.
  - .2 Update and co-ordinate with Prime Consultant Cx Plan and Specifications resulting from addenda.

### **2.7.5 CONSTRUCTION PHASE**

#### **.1 Overview**

- .1 Coordinate and direct the Commissioning Activities in a logical, sequential and efficient manner.
- .2 Provide on-going consultation with design and construction teams in support of their specified commissioning deliverables.
- .3 Conduct site visits and attend site construction meetings to assist in identifying discrepancies and remedies.
- .4 Review request for information and change order for impact on commissioning.
- .5 Document all reviews and submit to Departmental Representative:
  - .1 Updated Cx Issues Log.
- .6 As a lead member of the Commissioning Team assist the Team:
  - .1 On a construction phase basis, where systems and areas are required to be operational, provide assistance to the Design Consultant, in certifying that installations have been completed and function as per the Cx Plan;
  - .2 As per the Cx Plan assist Design Consultant with managing the Contactor's execution and contract closeout submissions, such as, manuals, warranties, extended warranties, and manufacturer's guarantees - dependent on the construction phase;
  - .3 Contractor's submittals,
    - .1 CPM will be copied on submittals concurrently, with the Design Consultant,
    - .2 Verify submittals such as,
      - .1 Coordination drawings, shop drawings, O&M Manuals, product samples, schedules and any other project submittals.
      - .3 Co-ordinate review comments with the Design Consultant.
    - .4 100% of the equipment must be tested and inspected. Representative sampling for equipment commissioning is not acceptable.
    - .5 Provide, as per CSA Z320-11, Interim Acceptance and Facility Turnover recommendation document.

#### **.2 Review and Meetings**

- .1 Conduct an on-site pre-construction commissioning meeting with the Cx Team including the consultant team and appropriate contractors. Agenda to include:
  - .1 Cx Plan;
    - .1 Compare CPM's schedule with the Contractor's schedule, and
    - .2 Updated Commissioning Issues Log.
  - .2 Detailed Roles and responsibilities matrix; and



- .1 OPR, and
  - .2 BOD.
- .2 Coincidental with construction meetings, organize and lead regularly scheduled on-site bi-weekly commissioning meetings including:
  - .1 Field reviews complete with reports verifying installation of systems and assemblies in accordance with OPR and Cx Plan;
  - .2 Conduct on-site bi-weekly commissioning meetings as per the CPM's Commissioning Plan; and
  - .3 Review with the Design Consultant the Contractor's standard submittals for enhanced commissioning.
- .3 Testing and Verification**
  - .1 Oversee, in collaboration with the Design Consultant, Contractor's coordination of all equipment, systems and assembly site testing and verification processes.
    - .1 Ensure activities are in accordance with the Cx Plan and the Cx Schedule.
  - .2 Provide testing and verification services such as:
    - .1 Witness all site commissioning tests for all equipment, systems and assemblies identified in the Commissioning Plan;
    - .2 Review all factory test reports and data for compliance with the Owner's Project Requirements and the Commissioning Plan;
    - .3 Review and verify all commissioning test results and reports;
    - .4 Ensure all test procedures and results are recorded and documented in compliance with the Commissioning Plan;
    - .5 In collaboration with Design Consultant, support Contractor, as may be deemed suitable, to organize and lead testing and balancing activities;
    - .6 Verify submittals from Contractor, at each construction phase;
    - .7 Provide verification of final reports upon completion of the entire project; and
    - .8 Coordinate seasonal commissioning for those systems that have been functionally tested and/or handed over in seasons where retesting and commissioning will be required during the opposite season.
- .4 Training**
  - .1 In collaboration with the User Department ("Owner"), Design Consultant and Contractor co-ordinate a training plan and training schedule. Incorporate a complete system and assembly review of operational procedures, set points and maintenance requirements.
  - .2 Assist the coordination between the Design Consultant and the Contractor with their provision of draft O&M Manuals (or complete Manuals as available) for the purposes of the training sessions.
  - .3 In collaboration with the PWGSC Cx Advisor oversee and evaluate the Contractor's, training sessions between the Contractor and the Owner's facility management and operations personnel.
    - .1 Ensure attendees sign an attendance sign-in sheet.
    - .2 Verify that training is provided by the appropriate equipment manufacturer's representative.
    - .3 Verify the training requirements have been met.
  - .4 Oversee, in collaboration with the Design Consultant, the Contractor's development of a training manual (electronic & hard copy) including applicable videos and photos for existing and future personnel to use for future training seminars.



- .1 Material to be user friendly, electronically searchable, contain indexes and provide component, system and interrelated system references including the necessary maintenance requirements.
- .5 Substantial Completion**
  - .1 Lead and facilitate Cx Team's Interim Acceptance Report sign off, at the minimum, on items, such as, those outlined in CSA Z320-11.
    - .1 Include control sequence documentation.
  - .2 For expected number of commissioned Partial Interim Acceptances refer to Construction Options Analysis Report, Option 3. Partial Substantial Completion must coordinate with the completed and occupied Work phases.
- .6 Facility Turnover**
  - .1 Lead and facilitate Cx Team's Facility Turnover recommendation sign off, at the minimum, on items, such as, those outlined in CSA Z320-11.
- .7 Substantial Cx Report**
  - .1 Provide a Commissioning Report documenting all of the commissioning work, testing, and results achieved during the project construction. Commissioning Report must at a minimum contain:
    - .1 Identification of any systems or assemblies that do not perform in accordance with the OPR;
    - .2 Test procedures and results;
    - .3 Deferred tests complete with schedule;
    - .4 Static Verification/Field Review check lists for all equipment, systems and assemblies;
    - .5 Start-up check lists for all equipment, systems and assemblies;
    - .6 Functional Performance check lists for all systems, inter-related systems and assemblies;
    - .7 Factory test reports complete with CPM review comments;
    - .8 All commissioning Site Inspection review reports;
    - .9 All commissioning Issues Logs and Progress Reports;
    - .10 Training records and training material submittals;
    - .11 Substantial Completion version of the Commissioning Plan;
    - .12 Final version of the commissioning related OPR;
    - .13 Submit draft version of the Interim Acceptance Commissioning Report for review and comment; and
    - .14 Submit final version of the Interim Acceptance Commissioning Report.
- .8 Deliverables**
  - .1 Provide the following updated monthly documents resulting from changes due to addenda and construction contract amendments:
    - .1 OPR – related to commissioning;
    - .2 Cx Plan; and
    - .3 Cx Issues Log.
  - .2 Provide Cx meeting minutes.
  - .3 Distribute minutes to Departmental Representative and Design Consultant for any further redistribution as may be required.
  - .4 Provide construction checklists for commissioned equipment and systems.
  - .5 Provide Commissioning Schedule updates.
  - .6 Publish, in MS Project, regularly updated schedule of commissioning activities as part of the regular monthly report on the Cx Plan. Notwithstanding CSA Z320-11 Cx Plan definition, the Cx Schedule must include:



- .1 Cx Team meetings;
  - .2 Start and substantial/interim completion of each construction phase;
  - .3 Systems and related assembly completion and testing;
  - .4 Training sessions;
  - .5 Deferred Cx testing;
  - .6 Warranty start date(s);
  - .7 Occupancy dates for each construction phase;
  - .8 Schedule, planned vs. actual.
- .7 Provide Interim Acceptance Cx Report.
    - .1 Outline and content as per CSA Z320-1.

## 2.7.6 OCCUPANCY OPERATIONS AND ACCEPTANCE PHASE

### .1 Overview

- .1 Oversee and document deferred seasonal testing by the Contractor.
- .2 In collaboration with the Design Consultant coordinate corrections and re-testing as necessary until performance is in compliance with construction documents.
- .3 Throughout the occupancy and acceptance phase consult with Owner's operational personnel at appropriate intervals to determine that commissioned systems are operating properly and evaluate if additional personnel training may be required.
- .4 Oversee the Design Consultants and Contractors post-occupancy Functional Performance Testing to evaluate and document energy and operational performance as compared to designed performance defined in the BOD and Construction Documents. Evaluations will occur at:
  - .1 Three (3) months; and
  - .2 Ten (10) months of warranty expiration.
- .5 Oversee resolution of any warranty issues on commissioned systems during the warranty period.
- .6 Prepare Final Commissioning Process Report for use by Owner and Design Team at end of warranty period. Final Commissioning Report shall incorporate review comments by Owner and Design Team on Commissioning Report, the results of all post-occupancy testing and evaluations, and document resolutions to all items on the Commissioning Issues and Tracking Log.
- .7 Collaborate with the PWGSC Cx Advisor on the development of the PWGSC Cx Evaluation Report.

### .2 Ongoing Consultation

- .1 Provide ongoing consultation with the design and construction teams in support of their project closeout activities and submittals related to systems and assemblies commissioning specific deliverables in compliance to the Commissioning Plan, Commissioning Specifications and Owner's Project Requirements (OPR).
- .2 Attend regularly scheduled proposed bi-weekly construction closeout meetings including consultants, contractors, subcontractors and suppliers.
- .3 Finalize the Commissioning Report based on;
  - .1 Final training sessions,
  - .2 Post occupancy changes,
  - .3 Deferred commissioning, and
  - .4 Information not available or incomplete at Interim Acceptance.



- .4 Provide assistance to the Prime Consultant in certifying that all installations have been completed and function in accordance with the Cx Plan, OPR and the Prime Consultant's Basis of Design (BOD).
  - .1 Design Consultant will update BOD as required.
- .5 As per the Commissioning Plan, assist Design Consultant in ensuring that all completed operating and maintenance manuals, warranties, guarantees and other required submittals are turned over to the User Department (Owner).
- .6 Update the OPR and the Commissioning Plan to record any final changes or adjustments after occupancy, for inclusion in the final Commissioning Report.
- .7 Submit final Commissioning Manual with, at the minimum, updated contents as outlined in CSA Z320-11.
- .3 Deferred Testing**
  - .1 Coordinate deferred commissioning for those systems that have been functionally tested and/or turned over where retesting and commissioning is required.
  - .2 Witness on site deferred testing as per the Commissioning Plan.
- .4 Deferred Training**
  - .1 As per the training plan and in consultation with the User Department, coordinate post occupancy training for any systems and assemblies where there are for example seasonal differences in operating parameters and/or where deferred testing is required.
  - .2 Incorporate into the Training plan a complete system and assembly review of operational procedures, set-points and maintenance.
  - .3 Confirm training sessions are co-ordinated between the Design Consultant, Contractor and the Owner's facility managers and operations personnel.
  - .4 Ensure attendees sign an attendance sheet.
  - .5 Verify that training is provided by the appropriate equipment manufacturer's representative.
  - .6 Verify the training requirements have been met.
- .5 Lessons Learned**
  - .1 Collaborate with Design Consultant to arrange a Lessons Learned work shop.
  - .2 Develop and present Cx related material.
  - .3 Attend and assist facilitating and on-site Work Shop.
    - .1 Design Consultant remains accountable for Work Shop deliverables.
- .6 Commissioning Manual;**
  - .1 Prepare final Cx Manual, at the minimum, those items outlined in CSA Z320-11 and in addition:
    - .1 Contractor's project "as-built" documents; and
    - .2 All necessary documentation to permit a Re-commissioning of the entire facility in future and a return to all original "as-commissioned" operating parameters.
- .7 Deliverables**
  - .1 Final Cx Manual that contains the Final Commissioning Report.
  - .2 Final Commissioning Plan - updated from the Interim submission outline is to also include:
    - .1 OPR;
    - .2 Compilation of the following items
      - .1 BOD,
      - .2 TAB Reports,



- .3 All system schematics (single line drawings),
- .4 Control strategies and set points,
- .5 Final post-occupancy energy and operational performance results, including variances, and
- .6 Guidelines for energy accounting.

## 2.8 CM TENDERING SERVICES

### 2.8.1 GENERAL

- .1 The CM shall review the method of tendering with the Departmental Representative to select the most appropriate method to achieve value for money. This shall include an invitation to three-five bidders experienced in the work or public advertisement to the industry using provincially acceptable advertisement methods.
  - .1 Provide Departmental Representative with advance copies of CM/Subcontractors contracts.

### 2.8.2 SCOPE AND SERVICES

- .1 The CM shall:
  - .1 Develop the list of specific Tender Packages with the Departmental Representative and the Consultant Team;
  - .2 Review and provide commentary to the scope of all tender packages to avoid any gaps or conflicts between tender packages, the Work of the CM's Own Forces and between the Work all of the CM's Sub-Trades;
  - .3 Undertake tendering of Sub-Trade packages in accordance with the General Conditions of the contract, and as agreed upon by the Departmental representative;
    - .1 Tender all Sub-Trade tender contracts, using the agreed upon Construction Association Bid Depository, unless otherwise specified,
    - .2 Coordinate the preparation of Specifications Division 01 work and services for each tender package,
    - .3 Ensure that facilities and services being provided to Sub-Trades are clearly identified in the tender documents,
    - .4 Endeavour to ensure that a minimum of three bids are received for every tender package issued, and
    - .5 In the event that fewer than three bid are received on any tender package, PWGSC reserves the right to require the CM to re-tender the respective tender package, unless prior acceptance has been issued by the Departmental Representative.
  - .4 Issue all addenda in writing (no information is to be issued orally);
    - .1 Addenda to Tender Documents are to be issued through the Bid Depository to all recipients of the Tender Documents,
    - .2 Ensure that Sub-Trade bidders receive all addenda, and
    - .3 Endeavour to issue addenda no later than seven calendar days before the tenders close.
  - .5 Receive Tenders, to be opened at the agreed upon location in the presence of the Departmental Representative;
    - .1 Analyze the bids for each tender package to determine if the work should be awarded or if changes are required to keep costs within the budget, and
    - .2 Make recommendations for alternate strategies, in the event that the low bid exceeds the budgeted amount.



- .6 If the low bid of a Sub-Trade package exceeds the CM's Construction accepted Cost Estimate (Class 'A' level) by more than 5%;
  - .1 Re-tender the Tender package if,
    - .1 No satisfactory reduction can be negotiated with the low bidder, or
    - .2 If the desired price reduction entails significant changes in the scope of work or the character of the design.
  - .7 If re-tendering is required, the CM shall;
    - .1 Re-issue the package for tender.
- .2 Pre-Ordered equipment or items:
  - .1 Review all tender packages for long delivery items which may warrant pre-ordering; and
  - .2 All pre-ordered equipment or items shall be specified by the Consultant.

### 2.8.3 DELIVERABLES

- .1 Provide a tender summary for each package including:
  - .1 Names of all sub-contractors invited and participating;
  - .2 List of all tender documents including addenda; and
  - .3 Detailed breakdown of results including labour & hours, materials, overhead and profit on bids.

## 2.9 CM GENERAL CONTRACTOR SERVICES

### 2.9.1 GENERAL

- .1 The CM must:
  - .1 Perform all the duties of a Construction General Contractor, manage the Work of the CM's Own Forces and Sub-Trades and ensure that the Work is carried out in accordance with the requirements;
    - .1 of the General Conditions of the Contract,
    - .2 of Division 01,
    - .3 contained in the Construction Documents, and
    - .4 Included herein, in these Terms of Reference.

### 2.9.2 SCOPE AND SERVICES

- .1 For Work other than Work by Own Forces, the work shall be tendered to Sub-Trades and enter into subcontract agreements that comply with industry recommended practices and PWGSC contract administration practices (copy will be made available to the CM).
- .2 Provide and maintain full-time staff at the project site to:
  - .1 Coordinate and provide general direction of the project and progress of the Sub-Trades on the project;
  - .2 Provide quality assurance, monitoring and reporting throughout the construction stage of the project;
    - .1 Rectify issues identified by through either the CM QA process or identified by the Consultant Team.
  - .3 Coordinate access as required to the existing facility to facilitate the work and assist in the coordination of access to the various parts of the facility by the contractors, working closely with Departmental Representative or designate;
  - .4 Coordinate work of this project with the Departmental Representative to ensure that daily operations of the specific site conditions are not compromised or affected;



- .5 Establish on-site organization and lines of communications in order to carry out the work of the project as directed by the Departmental Representative;
- .6 Ensure green demolition techniques and waste diversion reporting are utilized and met to the extent required in consultant's tender documents.
- .3 CM's "Own Forces" work.
  - .1 The CM shall identify labour and material, which is beyond bid depository trade scopes.
  - .2 This work shall be included in the Sub-Trade tenders as "Not Withstanding Clauses" only.
  - .3 The CM shall take responsibility for:
    - .1 The completeness of these tender package descriptions; and
    - .2 Delivery of the Sub-Trade packages, the generic Division 01 attached to the RFP, and construction phase responsibilities identified within this document.
  - .4 There will be no "Own Forces Work" extra to the CM's Contract.

### **2.9.3 DIVISION 01 - GENERAL REQUIREMENTS**

- .1 In addition to adhering to the project administration requirements contained in this TOR, the CM must comply with the general requirements contained in the Division 01 Document. These requirements are necessary for the smooth and safe operation and coordination of the site.

## **2.10 CM GENERAL CONSTRUCTION AND CONTRACT ADMINISTRATION SERVICES**

### **2.10.1 GENERAL**

- .1 Fulfill the obligations as General Contractor, responsible for all Sub-Trade Contractors, Suppliers and any maintenance or operational requirement contractors that require access to the site; and "Constructor" in accordance with the Provincial Health and Safety Act.
- .2 The CM's own forces shall only be permitted for individual work package coordination activities less than \$25,000 value with the specific approval of the Departmental Representative where there is fair value to Canada.

### **2.10.2 SCOPE AND SERVICES**

- .1 Construction Work.
  - .1 When construction Work is duly authorized and assigned to the CM's contract agreement, the CM must:
    - .1 Provide and be responsible for the development, coordination and management of all work and services included in Division 01 in the CM Agreement;
    - .2 Provide all necessary equipment to the Project and all other resources required to perform these duties and services;
    - .3 Procure, coordinate, administer and manage all construction work and contracts in a holistic fashion;
    - .4 Prepare and execute contracts with the successful Sub-Trades;
      - .1 Coordinate and manage the respective contracts in an integrated manner to avoid any conflicts between the Work of the Sub-Trades,
      - .2 Coordinate, manage and complete all the Work of each Sub-Trade tender package in adherence to the approved drawings and



- specifications of each tender package, including all addenda and authorized change orders,
- .3 Deliver the sub-projects to be ready for occupancy by the agreed upon completion dates,
- .4 Develop and implement a procedure for review, certification, processing and payment of Sub-Trades in accordance with the terms and conditions of the CM Agreement,
- .5 Schedule and conduct bi-weekly progress meetings every other meeting on site at which Sub-Trades, PWGSC, Consultant Team, the User Department and the CM can jointly discuss such matters as procedures, progress, problems and scheduling,
- .6 Provide timely response to correct issues, as they occur,
- .7 Prepare a deficiency list for review and acceptance by the Departmental Representative,
- .8 Arrange for and correct all identified deficiencies in accordance with the schedule and advise when all items have been properly corrected.
- .5 Complete the Work of the CM's Own Forces in adherence to Division 01 and / or in accordance with the approved scope of Work.
- .2 Cost Management.
  - .1 Provide updated cost information for monthly reports, as outlined in "Cost Management Services".
- .3 Schedule Management.
  - .1 Provide updated schedule information for monthly reports, as outlined in "Schedule Management Services".
- .4 Quality Control.
  - .1 The CM shall ensure that quality assurance measures are implemented and that impacts on existing operations are minimized.
- .5 Health and Safety.
  - .1 The CM is responsible for maintaining a Healthy and Safe site at all times and shall:
    - .1 Ensure full compliance with the applicable Occupational Health and Safety Regulations in effect in the Province of Saskatchewan;
      - .1 The CM shall be the "constructor" as defined in the Occupational Health and Safety Act of the Province of Saskatchewan.
    - .2 Ensure the full health and safety protection afforded under the Canada Labour Code to all visitors to the site, including workers, staff, contractors and the general public;
    - .3 Implement a safety program on site;
    - .4 Provide appropriate safeguards to ensure safe protection and security of materials and holdings on the site;
    - .5 Comply with Workplace Hazardous Materials Information System (WHMIS) and all other applicable regulations with respect to hazardous materials to ensure that;
      - .1 All designated hazardous materials are properly treated, handled and stored,
      - .2 Workers' exposure to fumes, is within acceptable health and safety limits,
      - .3 Temporary ventilation or protection, as required for products utilized, is properly provided,



- .4 Construction dust is controlled such that workers and occupants are not adversely impacted by dust from construction activities within the building or on the site, and
- .5 Ensure that shop-drawing submissions include Manufacturers Standard Data (MSD) Sheets.
- .6 Shop Drawings.
  - .1 Provide a schedule of shop drawing submissions for each tender package.
  - .2 Shop drawings must be checked and certified correct for construction by the CM and reviewed by the Consultant Team before forwarding to PWGSC for review and return to the subcontractor.
    - .1 Shop drawings must be stamped “Checked and Certified Correct for Construction” by the CM and “Reviewed” by the Consultant Team.
  - .3 The CM must:
    - .1 Review, discuss, record problems and identify agreed remedial action;
    - .2 Monitor and record the progress of shop drawing review. Record parties designated for action and follow up;
    - .3 On completion of project, forward reviewed shop drawings to the Departmental representative;
    - .4 Verify that shop drawings include the project number and are recorded in sequence;
    - .5 Verify the number of copies of shop drawings required; and
      - .1 Provide additional copies for User Department.
    - .6 Expedite the processing of Shop Drawings in a timely manner.
- .7 Information Technology (IT)
  - .1 The Client will confirm requirements describing IT for temporary accommodations (cabling, voice, data).
  - .2 The CM must:
    - .1 Review the Tender Documents for IT issues (i.e. Maintaining IT service during relocation of equipment, security aspects specific to the User, role and responsibility/capacity of the User Departments to participate in implementation);
    - .2 Have a clear understanding of the constraints of the User departments and ensure these requirements are planned for in the overall delivery;
      - .1 This will involve attendance at Integrated Design Process (IDP) meetings and close coordination with the Consultant and User Departments as required.
    - .3 Provide a detailed Report following consultation with Departmental Representative and User Departments;
    - .4 Have a clear understanding of the User Department Service Provider Agreements describing how Service Providers must be involved in the sub-project; and
    - .5 Develop a detailed schedule and Delivery Plan which will clarify roles and responsibilities, critical milestones, logistics and coordination with the overall delivery.
- .8 Sustainable Development.
  - .1 The CM must:
    - .1 Co-operate with all members of the Project team in contributing to the achievement of the sustainable construction requirements.
- .9 Permits and Approvals.



- .1 The CM shall be responsible for coordinating, paying for and obtaining all permits and approvals from local and statutory authorities and shall:
  - .1 Liaise with local and statutory authorities with respect to hoarding, traffic restrictions, services and associated diversions and/or connections;
  - .2 Inform Departmental Representative of their requirements to inform any statutory body via applications or orders;
  - .3 Ensure that all applications are filed and executed successfully;
  - .4 Verify that all necessary approvals have been obtained.
- .10 During the Post Construction and Warranty Stage the CM must:
  - .1 Coordinate Sub-Trade activity to provide final Record Documents (Operations and Maintenance Manuals, As-built drawings and specifications) as required for each sub-trade;
    - .1 Assemble Record Documents in whole packages per sub-project or as directed by the Departmental Representative, and
    - .2 Provide copies of Record Documents and updated records to PWGSC as directed by the Departmental Representative including compliance to PWGSC AutoCAD Standards.
  - .2 Review and verify the accuracy of warranties and guarantees;
    - .1 Before completion of work, collect all manufacturer's guarantees, and warranties, complete with relevant contract numbers, and submit to the Departmental Representative for review and approval, and
    - .2 Ensure that warranties and guarantees are included in the Operation and Maintenance Manuals.
  - .3 Within ten (10) months of the commencement of the warranty period, arrange for an inspection of the facility to determine all deficiencies to be corrected;
    - .1 Prepare a deficiency list for review and acceptance by the Departmental Representative,
    - .2 Provide a schedule indicating when correction of all deficiencies covered under the warranty will be corrected and submit to the Departmental Representative for review and acceptance,
    - .3 Arrange for and correct all identified deficiencies in accordance with the schedule and advise when all deficiencies have been properly corrected, and
    - .4 Ensure that all warranty deficiencies are properly corrected in a timely manner.
  - .4 Provide information and advice during the post construction evaluation sessions.
- .11 Arrange for of all key CM staff and representatives from the CM's key Sub-Trades to attend a one-day Post Construction Evaluation session, at a time and place to be determined with the Departmental Representative.

### 2.10.3 DELIVERABLES

- .1 Maintain on a current basis and make available to the Departmental Representative, all construction related documents, including:
  - .1 A daily log listing, as a minimum: weather conditions, visitors, workforce, by trade and number of employees, safety issues, and any other major issues;
  - .2 Records of all project contracts and drawings;
  - .3 Copies of all project related correspondence;
  - .4 Samples, purchases, materials and equipment;
  - .5 All data from sub-trades;



- .6 Maintenance instructions and operating manuals; and
  - .7 A current set of project record documents for the purpose of recording all approved changes that occur during construction and for completing as-built documents
- .2 The CM must:
- .1 Arrange with the Departmental Representative for the issuance of necessary forms respecting interim and final completion of the work;
  - .2 Prepare lists of incomplete and deficient items;
  - .3 Schedule completion of these items with the Sub-Trades and distribute all lists as appropriate; and
  - .4 Distribute interim and final completion certificates.



### 3. Appendix A

#### 3.1 PARKS CANADA AGENCY INSPECTION REPORT

**To:** Michael Caswell, Asset Manager  
WLNP Western Region - **Waterton,**

**Security:**  
**Your Ref:**  
**Our Ref:** u:\pr\ftwalsh\vrcli2711rm

**From:** Bob Merchant, AAA, Regional Architect,  
PCA, Western & Northern Regions - **Calgary,**

**Date:** November 2007

**Subject:** **Fort Walsh National Historic Site; Visitor Reception Centre Draft**

**Issue:** The FWNHS has a modern VRC building that requires some re-planning with staff and has some detail design issues. Michael Caswell met with me on site to discuss the issues in and with the building. We toured the building, met with staff, toured the site, visited the Maintenance building, and discussed options for reorganizing the VRC space.

**Time:** 9:00 AM, October 30th.

**Weather:** Mild, -4 C, sunny, light wind.

**Workers on Site:**

Most of the FTWHS were on site finishing up the season. The building was not really open to the public, and the space is being shut down for the winter.

**Attending inspection:**

Michael Caswell, David Rohantensky, Howard Perrin, Glenda Parsonage, Clay Yarshenko, Francois ?.

**General Comments:**

A copy of the Fort Walsh management plan was provided. The site is quite interesting as there are several heritage facilities and different commemorative themes. The VRC is the key operational building, providing introduction to all the themes as well as office, visitor amenities, and storage space. The site has the Fort which has a series of active spaces in "heritage" buildings providing programme activities. There is also the trading posts which also have active programme spaces and sales opportunities, and the Wolfer's massacre site. The landscape is spectacular, with open hills, cliffs, valleys, wind protected tree cover, and winding river valley.

The site is basically only operational from late May to Early October. There is a bit of a change in visitation with more seniors arriving in the shoulder season (May and September).

The site is accessed by a gentle curving and climbing paved road to the Park entry, and then well graded gravel roads with the park. There is a split to public parking and to staff and barrier free access parking. The immediate parking area is asphalted, but not the visitor parking area. The path to the VRC building is asphalted as are the immediate walkways to and around the building. Most access to the heritage parts of the site are by a school bus type vehicle. 90% of visitors take the tours. The Fort is not immediately visible from the VRC, so there is some visitor confusion about the proximity of the sites



and accessibility for a walking or hiking tours.

The VRC is a modern curvilinear wood clad steel and wood frame building set spectacularly against the hills and valley overlooking the Fort Walsh valley. The building has a very nice initial impression, and has a very simple and flexible structural system. The basic finishes and detailing is simple and economical, but with materials and details that have durability and maintenance limitations. An open deck with trellis roof has been added to the west side where there is a very nice view. Three larger fixed windows have been added to this elevation providing a protected view of the site.

The roof has a low cross slope all to the north side where a large rain gutter picks up the drainage with two large down spouts to below grade and away from structure.

The building is combustible construction, assembly function, but with a sprinkler system, including an exterior roof mount system to assist if there is a grass or forest fire.

#### **Review of Issues:**

I have noted each of the issues identified on site, and immediately following provide a quick analysis or referral to future work.

#### **VRC Building Maintenance Issues:**

##### **Exterior Cladding:**

The building is clad in tan stained vertical 1x4 channel clear cedar siding to facilitate the building curves. The cedar is being attacked by woodpeckers, much like the buildings at Waterton's Chief Mountain border crossing, or Jasper's staff housing.

The solution to the problems at those sites was to replace the cedar with a cementitious wood siding nearly identical in appearance and shape, but both unappetizing to woodpeckers (or other like-minded varmints) and fire resistant. The product used at these sites was a product called Hardi-board, produced by J. M. Hardy Corp. A similar product also used is Canexel cement/wood siding. This type of product has proven very successful. The products also do not absorb water and are very dimensionally stable compared to wood so there is less stress on caulking and nailing or other sealants and fasteners. Installations 8 years ago still look fresh and weather tight.

##### **Crawlspace Cladding:**

The building is also built on concrete piles, elevated well above grade, on large steel beams, with wood floors walls and roof system. The crawl space appears to be meant to be open and ventilated, but the skirting has been clad with an insulated wood faced panel, and a round cobble stone used to create a bracing base for the cladding. Base of skirting is held in place by simple wood stakes. On two sides the grade is asphalted right to the wood siding. The crawl space is nearly 1.5 m clear with a dirt floor. There is clear evidence of water flow through or into the crawl space. The exterior fill has displaced the skirting in places and changed the exterior grades.

The crawlspace I believe was designed to be externally vented and not heated. Storage would not be permitted in the space. If the space is heated and sealed to the exterior, codes required the space to have a fire rated floor above, dampers in the ducts at the floor level, a sealed floor for vapour and radon gas control, and insulated and permanent crawlspace exterior walls.

The exterior grade has also subsided slightly where drainage water is now directed into the crawlspace areas rather than away from it. While a short term solution is to build up the grade again for positive drainage away from the building, the ground will continue to subside with frost pressure and freeze thaw cycling, so a more permanent solution is a rigid structural crawlspace wall.



#### Insect Infestation:

There is a problem with fly infestation, often found in wood buildings in semi-remote areas. Insects seem to migrate into the building envelop and then breed or multiple due to warmth and isolation.

A key issue is often finding the route of the insects into the building. In wood construction there are usually air leaks around doors, windows, building sills, or ceiling/roof overlaps. These gaps allow the bugs continual access to warm breeding areas. If these can be sealed, the problem can be minimized.

However, once inside the structure system, often a fumigation is required to remove them semi-permanently, even after proper sealing. The locations of the woodpecker damage is likely where the flies are accessing the building envelop.

#### Finishes:

The building has a continuous T-bar acoustic tile ceiling at a uniform height through the space, a prefab interior wall system with vinyl surface and vinyl edge battens, a sheet vinyl flooring, vinyl wall bases, commercial carpet in offices, and a combination of track light pots (for displays), dimmer controlled recessed pots (reception, food service and theatre), and t-bar mounted fluorescent lights (offices, kitchen and bathrooms). While this is a cost effective initial installation, it provides little character or Park Canada feel to the space, and does not add to the visitors understanding or expectations for the Fort Walsh experience.

A key issue is the nature of the lighting which does little to highlight the spaces or create a sense of movement or direction. The uniformity of finishes also does not differentiate the activities or visitor expectations. If exhibits are redone, the lighting needs to be integrated better into the experience, energy costs reduced, and wall and flooring finishes upgraded to reflect the experience. For example the theatre ceiling should be darker, with pot lights more edge and exit located. The projection screen technology needs to be updated with more active and quality fixed screen and digital technology. The food service area needs to have more relaxing furnishings, tables and chairs, even benches. More natural or natural like materials should be used to reflect the site and heritage messages.

#### VRC Building Planning Issues:

##### General Evaluation:

The VRC building is quite isolated and a 30 minute drive from services, located at Maple Creek. A visitor to the site has few options to amenities other than what is presented at the VRC and on site. This is both an opportunity but also an obligation to provide for public visitor expectations. The building has public washrooms, a public reception, an interpretive display, a small theatre and a food service. The food service area doubles as a meeting space, and also has access to an exterior deck with a lovely view of the site. There also are limited gift shop items as part of the food service area. Also in the building is the reception counter, staff office areas, a staff lunch room, staff washrooms & lockers, and various janitorial and storage rooms.

A replanning of the space needs to be undertaken. Options include relocation of entry and exit, relocation of theatre, different interpretive display concepts, building addition to address problem, separate external public washroom to reduce pressure on interior circulation and perhaps free area, new location for food service and gift functions.

##### Storage Space Shortage:

There is a shortage of storage spaces for both office functions and supplies but mostly for items related to visitor services, heritage interpretation and presentation.

Need to programme activities and identify functional requirements and related space needed to support that function.

There is an opportunity to add space to the building. One option could be to enlarge and enclose the crawlspace as a basement area, using the existing structure and pouring a new floor and permanent walls. Access to the space



would be critical, and exterior stairs may be the cost effective solution. If the space is to also become work area, natural light, ventilation systems, exiting, and finishes all become important standards to provide.

There is a shortage of space for visitor storage, back packs, lunches, boots.

**Circulation Conflicts:**

There also is a circulation conflict with visitor service spaces located on the opposite end of the building from the entry and reception area. There is a logical circulation through the interpretive displays, but the theatre is actually a bit hidden further into the food service and gift counter area. The link from the theatre and food service area is a long and rather sterile corridor back to the main entry. Washrooms and storage areas are also accessed off this corridor. The logical lounging and waiting area for tours and bus rides is the food service area and exterior deck, but this is actually located opposite to the main access and bus pick up areas. There could be up to 45 minutes between tours so there needs to be active programmes for this "wait" time.

See general evaluation.

**Wider Appeal is Missing:**

The displays and exhibits tend to be text heavy and not kid friendly. Society is more use to electronic system interaction, and everything at the site is analog -.

There is a missing element of entertainment, especially when site access is limited by schedule, bad weather, disabilities, or lack of awareness.

Alternative activities, such as recreational use of the site is not fully explored.

This could include kids playgrounds, bicycling, geo-caching, camping, nature based (rather than heritage) hiking, archeological dig participation, etc.

Possible partnerships with Provincial Parks (Saskatchewan and Alberta Cypress Hills?).

Partnerships with oil & gas industry, much exploration in area with a lot of capital investment.

Some staffing limitations to provide language alternatives. French is mandated, but 20% of Canada's current and growing population has another 100 languages.

Possibility of electronic self guiding tours?

**Partnerships:** The lack of an immediate community limits the nature of local partnerships. There is a co-operative agreement with the concessions operator including books, maps, art, etc.

**Security:** There is a need for ongoing security at the site, especially in the closed season. Cameras for key sites with remote feeds would help.

**VRC Interpretive Displays:**

The displays are a bit dated, and a bit crammed together with a lot of detail, small print and photo elements in very small space. The information is quite good, but is missing the dynamic connections to the site and the grandeur of the space immediately behind the exterior walls.

This is a specialized area that requires input from commemorative integrity and media specialists.

There are missing elements from the site interpretation including the history of the RCMP ranch, the cypress Hill ecosystem (unique), the previous townsite near the fort. There is very limited capacity for museum quality artifacts to be included in the site due to seasonal shutdown and security issues.

**Theatre:** The theatre is big enough fo about 30 people, but is quite shallow and limited in dynamic



appearance. The technology of theatre presentations is changes rapidly, an smaller but more focussed flat screen presentations are becoming common. However, there also still is an important place for the personal presentations and vignette formats that Parks Canada is famous for.

Space needs to be reprogrammed to consider potential and actual use.

### **Public Washrooms:**

Currently the public washrooms are in the centre of the building, located halfway between the entry reception and the food services and gift sales area. Often the first thing a visitor is looking for after a ½ hour or more drive (with few other services available), is the washrooms. When these are located deep into the interpretive facility, it is difficult to collect fees and make presentations, as well as creating congestion and cross flows.

A key alternative discussed was to try what some other sites have done (Kluane VRC, RMH VRC) is to locate a group of public washrooms between the public parking lot and the main entrance to the building. This intercepts a lot of the visitors for a key function, potentially frees up some interior space for other uses, and helps to redefine the circulation patterns inside the building. The new washroom approach plaza also creates a new opportunity to provide site maps, building information, and other orientation material.

The washrooms are in reasonable condition though there is some water staining on the fixtures. The vanities are plastic laminate clad plywood with some edge wear and deterioration. Waste cans are freestanding which can and do obstruct barrier free access. Fluorescent lighting is a bit low and poor colour rendition.

Washrooms could use an upgrade, mostly for appearance, but also for better sanitation and ease of cleaning.

Often there are lines of ladies waiting for washroom access, but no similar line for men. In 1995 the National Building Codes final recognized physical reality and required women's washrooms to have nearly twice as many toilets as men's washrooms. This building has the older code, identical washroom fixtures for each sex. Thus in reality you have half the capacity for women (code standard) as you have for men.

New washrooms can rectify this imbalance.

### **Staff Washrooms and Facilities:**

Currently the staff washrooms are tucked off the staff lunch room area, adjacent to staff lockers, and near the back door. The washrooms are adequate for staff needs with toilet, sink, and small showers. The washrooms are a bit tired, some staining and shortage of space for items like towels, hangers, personal products.

Solution to washroom congestion is to have more staff locker space.

The lunch room is also adequate given the number of staff. However, it is in the midst of key circulation, and space has become used for a combination of other functions such as waste bins, recycling centres, and very overcrowded staff areas.

The lunch room is adequate, but assigned space is required for waste and recycled products. This area needs to be cleanable and sanitary.

Office and electronic equipment supplies need to be stored elsewhere to free up this space.

The key problem in the area is the staff lockers that are both too small and too few. Staff require complete range of clothing due to remote location and variable weather conditions. They also require clothing changes for interpretive roles, and other supporting activities.

There is no location on site for a large range of staff clothing and equipment alternatives. There easily needs to be two or three times the locker space and number of lockers for staff. Perhaps if the public washrooms were removed, additional locker space could be created.



### **Mechanical Rooms and Services:**

There are two rooms for mechanical and electrical services. The first room is primarily for electrical service and distribution, but is also used for building equipment, supplies, and trades tools. The second space is primarily the furnaces and the water systems. There are four furnaces, all propane fired downflow units with independent flues and duct systems. There are also two large water tanks and treatment systems for filtering and supplying domestic water. In the mechanical room there is a large and heavy hatch in the room for access into the crawlspace. A rigid steel ladder with had guides is provided.

Do not know if water reservoir is matched to sprinkler system demand, or if emergency power generation is available.

**Site Services:** I'm not familiar with the details of the site servicing or locations. This was not discussed as part of the visit. Septic Field Permit is unknown.

No cell phone coverage for several miles from the site. Perceived as a safety issue by many visitors.

There is a problem with communication systems to and from the site. There basically is only one six pair line to the site with fairly slow internet capability. It is a major IT issue for file transfers. Lines are assigned to Park Canada info and office, to alarm security, IT, concessionaire, credit card charging. This means two phone calls and the system is busy.

Investigate either high speed line, or Telus doubling the system capacity.

**Landscaping:** The site is quite natural, rolling natural field grass, with scattered trees located in wind sheltered coulees and slopes. Public parking is located above the building about 50 m, with a sweeping paved path down to the building. The service and barrier free access is at the entry level. There are defined trails and activity areas near the building including picnic tables, a monument, and scenic look outs along the trail. There is a water line to the picnic site.



### **Fire Separations:**

These are required and provided at the mechanical and electrical room, the storage room, and the janitors room. However, the doors on these rooms are often propped open.

### **Exiting:**

The building currently has four exits. There are a pair .915 m double doors at each end of the public spaces meant primarily for public use, one to the SE corner, and one to the SW corner. There is a single door from the staff lunch room/office area, and a door from the electrical service room to exterior, both on the north side. These 915 doors are meant for staff or service access.

### **Workman's Compensation, Occupational Health & Safety:**

Unknown.

OSH standards usually require a first aid room on site for both public and staff potential use.

**CEAA Issues:** Unknown.

### **Other Items:**

#### **Maintenance Compound:**

This building is an all purpose trades facility, with a large open bay used for everything from painting to vehicle repairs, but mostly carpentry and storage. There is a mechanical room, a paint and fuel storage area, a washroom, and two small offices. There is a steep ladder to a low height mezzanine above the office washroom area that is used for lumber and other rough supplies. However, there is a large central steel beam across the centre of the space which severely restricts access. The height is less than 1.5 m already.

The mezzanine does not meet OSH standards for access or storage. Items can not be properly carried on the mezzanine and the ladder is too steep without guards.

Some additional space is required for an added staff, better lighting and better storage of records.

Alternatives included carving off space inside the building, but I would recommend a clean and simple addition on the exterior of the building with an independent heating and ventilation system.

There also is a similar problem with insect infestation. Huge numbers are getting into the space and breeding, creating a health concern. I believe the warmth of the building, and the leakage around the large overhead doors is providing access and environment for them to flourish.

### **Recommendation:**

A key change for the site would be to add a free standing washroom between the public parking lot and the entrance to the building. Then the public washrooms could be reduced to one or two smaller barrier free units, freeing space for more storage and staff lockers. This would also provide improve to interior circulation by reducing interior conflicts.

I would estimate a small self contained washroom building with heat, lights, water, ventilation, mens with two sinks, t toilet and 1 urinal, and womens with two sinks and three toilets or 400 sf total.

Costs? Potentially \$80.0 to \$100.0 k, plus landscaping.

At some point soon the building will require re-cladding. The image and character of the building is good so I would use a similar appear material, Hardi board channel lap 1x4 selected to emulate cedar. 3.6 m wall 80 m long = 290 m2.



Costs ? \$300/m2 installed \$90,000, plus miscellaneous repairs of envelope and caulking.

A re-planning of the interior spaces is required, but needs to be done in conjunction with commemorative interpretation and media specialists. It is expected that the entries interpretive displays and theatre locations may change within the existing structure.

Lighting and finishes within the building could be upgraded and include better colour schemes for all public areas.

Excavating and lowering the crawl space for a combination of storage and workshop space should be investigated.

**Required Action:**

Further action depends on staff feedback on above observations and priorities for action. Scope of project and costs will need to be defined as part of the next steps.

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