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Architectural & Engineering Services **TERMS OF REFERENCE**

Dock Feasibility Study

For:
**Fisheries and Oceans
Canada (DFO)**
Rankin Inlet, Nunavut

September 24, 2021



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1 PROJECT DESCRIPTION

1.1 GENERAL

1.1.1 PURPOSE OF THE TERMS OF REFERENCE (TOR)

- .1 Public Works & Government Services Canada (PWGSC) requires the services of a Coastal engineering firm (Consultant), acting as the Prime Consultant with a multi-disciplinary team of sub-consultants for the delivery of services required for this project.

1.1.2 THE TOR AND THE DOING BUSINESS WITH PWGSC DOCUMENTATION AND DELIVERABLES MANUAL

- .1 The TOR describes the project specific requirements, services and deliverables while the *Doing Business with PWGSC Documentation and Deliverables Manual* outlines the standards and procedures for construction documents, cost estimating and project scheduling.
- .2 Document precedence:
 - .1 In the event of a document conflict the TOR takes precedence.

1.1.3 PROJECT INFORMATION

Project Information	
Project Title:	Dock Feasibility Study
Project Address:	Rankin Inlet, Nunavut
PWGSC Project Number:	R.116918
PWGSC Departmental Representative:	Michael Steinborn

1.2 BACKGROUND INFORMATION

1.2.1 USER DEPARTMENT

- .1 The User Department referred to throughout the TOR is Fisheries and Oceans Canada (DFO).
 - .1 DFO manages Canada’s fisheries and safeguards its waters.

1.2.2 USER DEPARTMENT’S NEED

- .1 The user department requires an assessment of the Melvin Bay area in Rankin Inlet, Nunavut to support the eventual construction of a dock (with appropriate parking and access) for their Inshore Rescue Boat (IRB) program. A floating dock is anticipated, however the assessment may make other recommendations.
 - .1 This particular area has several different stakeholders and environmental factors that will effect the eventual location along the Melvin Bay, as well as the design and orientation of the dock. Intensive and involving consultation and clear documentation of these factors will be critical for this report.

1.2.3 EXISTING CONDITIONS

- .1 There are several potential sites along Melvin Bay to meet the needs of this project (refer to Appendix A).



1.2.4 CHALLENGES AND CONSTRAINTS

- .1 The approval process for a dock will require extensive engagement with a number of stakeholders.
- .2 All site visits must be arranged through the Departmental Representative.
 - .1 Visits to the Work site may be affected by Territorial Public Health measures implemented as a result of the COVID-19 pandemic. Access may be restricted or completely prohibited at any time and alternate means of gathering the information relevant to the design may be required.

1.3 OUTLINE OF WORK

1.3.1 STUDY

- .1 The scope of the work for this phase is to conduct feasibility study to inform decisions for eventual construction of a dock under a separate contract. This includes consideration for parking, appropriate power, a 10,000L fuel storage tank and access road to the site for Search and Rescue boat program.

1.4 OBJECTIVES

1.4.1 GENERAL GOALS

- .1 Quality study through the:
 - .1 Appropriateness of the real property solution for its use and location;
 - .2 Collaborative Project Delivery process – refer to Definitions;
 - .3 Economic viability of the real property solution considered and/or developed;
 - .4 Successful incorporation of environmentally sustainable solutions;
- .2 Provide an investigation and process involving:
 - .1 Interdisciplinary collaboration, including all stakeholders as identified, design professionals and authorities having jurisdiction;
 - .2 Agreed upon decision making protocols.
- .3 Consider the User Department’s changing needs and future uses to create solutions that are flexible and that are able to evolve over time;

1.4.2 PROJECT DELIVERY

- .1 Provide fully integrated and coordinated professional services for the delivery of a project in accordance with the requirements in the TOR and as contained herein.
- .2 Obtain written authorization from the Departmental Representative before proceeding from one project milestone to another.
- .3 Coordinate all services with the Departmental Representative.
- .4 Establish and maintain a Project Management Plan.
- .5 Maintain continuity of key personnel and a dedicated working team for the life of the project.
- .6 Deliver the project to be within:



- .1 The Budget established during preliminary project approval, and;
- .2 The Project Milestones in this TOR.
- .7 Conduct Quality Assurance reviews during the Project Milestones,

1.5 SUMMARY OF SERVICES AND SPECIALTIES

1.5.1 GENERAL SERVICES

- .1 Provide a full Consultant Team including the following specialist services:
 - .1 Professional/Registered Engineering Services:
 - .1 Civil Engineering;
 - .2 Coastal Engineering;
 - .3 Marine Structural Engineering;
 - .4 Geotechnical- Arctic geotechnical and permafrost experiences are required;
 - .2 Environmental specialist;
 - .3 Permit Specialist;
 - .1 Experienced with regulatory processes in Nunavut.
 - .4 Schedule Management specialist;
 - .5 Cost Estimating specialist;
 - .1 Certified by the Canadian Institute of Quantity Surveyors.

1.6 SCHEDULE

1.6.1 GENERAL

- .1 Deliver the feasibility study report in accordance with the project milestone listing identified below. Milestone Completion Dates are estimated only, and may fluctuate pending on actual Consultant Contract Award date.
- .2 Prepare a Project Schedule in accordance with the milestone list.

1.6.2 ANTICIPATED MILESTONE DATES

Project Phase	Milestone Completion Date	Number of Weeks
Consultant Contract Award	December 15, 2021	
Feasibility Study - Draft	February 23, 2022	10 weeks
PWGSC Quality Assurance Review	March 9, 2022	2 weeks
Feasibility Study - Final	March 30, 2022	3 weeks

1.7 EXISTING DOCUMENTATION

1.7.1 AVAILABLE FOR THE CONSULTANT

- .1 Limited Site Plan and Survey information (Appendix A and B);
- .2 Preliminary permitting process information (Appendix C).

1.7.2 DISCLAIMER



- .1 Reference information will be available in the language in which it is written.
- .2 The documentation may be unreliable and is offered, "as is" for the information of the Consultant.
- .3 The Consultant is responsible for verifying the accuracy of the information incorporated into the final design.

1.8 CODES, ACTS, STANDARDS, REGULATIONS

1.8.1 GENERAL

- .1 In addition to Provincial/Territorial and Municipal Acts, Codes, By-laws and Regulations appropriate to the area of concern, the following Codes, Acts, Standards and Guidelines are applicable to this project (in the event of a conflict between codes, the more stringent shall take precedence):
 - .1 DFO Harbour Accommodation Guideline. 2015
 - .2 NRC National Building Code of Canada 2015;
 - .3 NRC National Fire Code of Canada 2015;
 - .4 NRC National Plumbing Code of Canada 2015;
 - .5 NRC National Energy Code of Canada for Buildings 2017;
 - .6 CSA/B561-18, Accessible Design for the Built Environment;
 - .7 The Canada Labour Code (CLC);
 - .8 The Canada Occupational Health and Safety Regulations;
 - .1 Maritime Occupational Health and Safety Regulations (SOR/2010-120)
 - .9 PWGSC Mechanical Document (MD) Standards;
 - .1 The Departmental Representative will provide electronic copies on request.
 - .10 PSPC Seismic Standard bulletin, 2018-03-02;
 - .11 Transportation Association of Canada (TAC) Guide for Canadian Roads;
 - .12 CSA A23.3-04 (2010) Design of Concrete Structures;
 - .13 CAN/CSA-23.1-04 and CAN/CSA-A23.2-04 Concrete materials and methods of concrete construction; and Methods of test and standard practice for concrete.
 - .14 Transportation Association of Canada (TAC) Guide for Canadian Roads;
 - .15 Manual of Uniform Traffic Control Devices (MUTCD);
 - .16 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations under CEPA (SOR/2008-197);
 - .17 CCME Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (2003);
 - .18 CSA C282-09 Emergency Electrical Power Supply for Buildings;
 - .19 Transportation of Dangerous Goods Regulations (SOR-2017-253).



- .2 At the start-up meeting the Departmental Representative will provide additional codes and standards unique and not published by the Federal Government.
- .3 The Authorities Having Jurisdiction (AHJ) on this project are:
 - .1 The local municipal AHJs;
 - .2 Refer to Appendix C for more information.
- .4 Identify, analyse and design the project in accordance with the requirements of all AHJs and all applicable Codes, Acts, Standards and Guidelines and Legislation:
 - .1 Be versed with the legislation and requirements that are unique to Federal Government buildings in Canada;
 - .1 Standard Operation Procedures to meet CLC.
 - .2 Be versed with the legislation and requirements that are unique to Federal Government projects tendered through Public Works and Government Services Canada.



2 REQUIRED SERVICES

2.1 GENERAL REQUIREMENTS

2.1.1 SERVICES

- .1 Feasibility Study.

2.2 PROJECT REVIEW AND ACCEPTANCE

2.2.1 GENERAL

- .1 Comply with all applicable laws and regulatory requirements as required by the General Conditions of the Contract.

2.2.2 QUALITY ASSURANCE REVIEWS, ACCEPTANCE AND PRESENTATIONS

- .1 Each submission at each Project Milestone is subject to reviews by the Departmental Representative, the User Department, PWGSC Architecture and Engineering Centre of Expertise (AECOE) and other project stakeholders.
- .2 The federal government generally defers to provincial and municipal authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.
- .3 At each submission:
 - .1 Review submissions to be posted on the project FTP site (e.g. AutoDesk BIM 360 Docs) in searchable PDF format;
 - .2 Expected turnaround time for each review is ten (10) working days;
 - .3 The Consultant Team will receive review comments in the form of an editable MS Word document or MS Excel document;
 - .1 Provide a single coordinated written response within five (5) working days of receiving review comments;
 - .2 The purpose of this review is information and awareness for PWGSC and not quality control for the Consultants. The Consultant Team must employ their own quality control program and remain fully responsible for the design and services provided.

2.3 RISK MANAGEMENT

2.3.1 CONTEXT

- .1 The Departmental Representative prepares the Risk Management Plan.
- .2 Assist the Departmental Representative with the identification of risk items and factors arising from the technical requirements of the project.

2.4 FEASIBILITY STUDY SERVICE

2.4.1 GENERAL

- .1 The feasibility will be a compilation of various necessary studies and investigation as well as documentation of stakeholder engagement.

2.4.2 SCOPE AND ACTIVITIES

- .1 Participate in meetings, prepare agenda, minutes and decision logs.
- .2 Visit the project site, analyse site conditions and document any conditions that will impact project delivery and design. The site visit will



include an in person Community Consultation, which should include gathering of Traditional Knowledge, feedback on the dock location and access, and assessing the labour potential, including local community Contractors to assist in the construction of, or to execute the project as General Contractor.

- .3 Review:
 - .1 Existing reports, documents and material related to the project;
 - .2 Site features and restrictions (i.e. landscape features, topographical feature, climatic influences, setback requirements, easements, existing buildings, and/or structures);
 - .3 Municipal infrastructure, subsurface and above grade services, including capacities and limitations (i.e. storm water drainage, fire protection, power, and/or telecommunications);
 - .4 Historical/archaeological features as well as previous uses;
- .4 Document any variance between provided documents and existing site conditions;
 - .1 Revise record drawings as required.
- .5 Compile Bathymetric and Topographic survey information of feasible site options, to document conditions in sufficient detail to complete the scope of this project.
- .6 Complete desktop geotechnical and permafrost assessments of site for parking and dock infrastructure, and include recommended locations for future Geotechnical drilling programs.
- .7 Confirm:
 - .1 Project specific goals and objectives;
 - .2 All the program information and project requirements to identify any conflicts or potential additional Work and indicate the impact on project scope, schedule and costs;
 - .3 If seismic hazard is applicable to this project;
 - .4 All additional information that will be required to deliver the project;
 - .5 Preliminary summaries of regulatory and statutory requirements, AHJ, codes, regulations and standards;
 - .6 Fuel storage tank size is appropriate for proposed use;
 - .7 Sustainable development strategies;
 - .1 Proposed policy for the project to minimize environmental impacts consistent with the project objectives and economic constraints, including;
- .8 Coordinate and Prepare:
 - .1 Regulatory roadmap identifying all documents and permitting applications required for the complete NIRB submission for the recommended dock option.
 - .2 Site analysis, options and selection (including consideration for protected berthage of the program vessels, vehicle access and parking).



- .1 Documenting the review and analysis of a minimum of three (3) viable and distinct multi-disciplinary options.
 - .1 Develop, for the Departmental Representative's Acceptance, the evaluation parameters.
 - .2 Conduct design option feasibility studies exploring possible technical and environmental strategies which are viable and have potential for development.
 - .3 Confirm compliance with applicable codes, acts and regulations for each option. If applicable, present alternate for consideration by both the Departmental Representative and the AHJ.
 - .4 Identify and document risks for each option and recommend corrective measures.
- .2 Recommend one option to proceed.
- .3 List of all project relevant stakeholders and AHJs (ie. adjacent wharf, municipalities, agencies, neighbouring users etc.)
 - .1 Engage with all stakeholders to confirm and clearly document all of specific concerns/restrictions/constraints on the location and operation of the dock.
 - .2 Preliminary list of stakeholders:

Hamlet of Rankin Inlet
867.645.2895
Senior Admin. Officer
sao@rankinlet.ca

Government of Nunavut
Department of Economic Development & Transportation
(EDT)
Transportation Policy and Planning
Matt Bowler, Director
PO Box 1000 Station # 1500
Iqaluit, NU X0A 0H0
MBowler@gov.nu.ca
t: 867.975.7867

Nunavut Airports (EDT; NU AP)
PO Box 560
Rankin Inlet, NU X0C 0G0
Director: Darrin Nichol
867.645.8203
DNichol@gov.nu.ca

Canadian Coast Guard



Steve Thompson
Superintendent, Maritime Search and Rescue | Arctic
Region
c: 438-993-4622
Email : steve.thompson2@dfo-mpo.gc.ca

Canadian Armed Forces (DND barracks)
LCol Tom Gardner
Tom.Gardner@forces.gc.ca
COS Rp Ops North
t: 613.998.4357

Agnico Eagle (Meliadine Mine)
93 rue Arsenault, suite 202,
Val-d'Or, Quebec, J9P 0E9
t: 1.819.759.3555
aemnunavut@agnicoeagle.com

110 Arvinngak Ave
PO Box 879
Rankin Inlet, NU X0C 0G0
Karen Tutanuak
RankinInlet@agnicoeagle.com
t: 867.645.2920 #4603199

Kangiqliniq Hunters and Trappers Organization (HTO)
Rankin Inlet, NU X0C 0G0
867.645.2350

Kivalliq Inuit Association
32-4 Sivulliq Ave.
P.O. Box 340
Rankin Inlet, NU X0C 0G0
867.645.5725
info@kivalliqinuit.ca

Nunavut Impact Review Board (NIRB)
29 Mitik Street
P.O. Box 1360
Cambridge Bay, NU X0B 0C0
1-866-233-3033
info@nirb.ca



- .4 Coastal Engineer study
- .5 Environmental study
 - .1 Phase I ESA to identify if potential hazardous and/or contaminated materials may be present on site.
 - .2 Does not require soil sampling, but some input based on high level investigating.
- .6 Species at Risk and/or Critical Habitat Investigation,
 - .1 High level desktop review of the site.
- .9 Civil:
 - .1 Describe the overall impact on the site systems infrastructure;
 - .2 Verify all site services information;
 - .3 Provide a site plan showing the existing site infrastructure, and proposed site services, site drainage, roads, parking and gasoline tank w/ vessel fueling equipment;
 - .4 Investigate the existing service roads to each site option.
 - .1 Determine design vehicle for construction equipment for dock construction and for use as service road.
 - .2 Describe the condition of existing road. Determine who owns the road. Outline any agreement or permission that will be required to use the service road.
 - .3 Outline any upgrade that will be required for road to carry construction equipment and/or for general use;
- .10 Electrical
 - .1 120 volts, 30 amp Shore power at the site will be required including cursory lighting for the walkways and vessel connections.
 - .1 Outline electrical strategy to meet these requirements including, but not limited to:
 - .1 Light level requirements;
 - .2 Path for connection to existing power;
 - .3 Methods for power line protection (ie, buried or protected cables);
 - .4 Safety precautions due to electrical so close to water.
- .11 Coastal Engineering
 - .1 Study extreme water level, wave climate, in-harbour wave agitation, hydrodynamics, sediment transport and morphological changes through model development, calibration and and verification as would be required for proposed developments.
 - .2 Evaluate potential options in regards to wave agitation, sediment transport, bed level changes, and dredging requirements, and provide with recommended option(s) for the proposed development.
 - .3 Present model results on wave heights distributions and bed level changes under existing condition and with potential options in aerial maps.



- .4 Provide wave parameters, wave forces and other coastal design parameters at key locations as would be required for final design of the recommended wharfs and/or breakwaters options.
 - .5 Investigate ice condition and provide ice design criteria and potential ice impacts/loads on the proposed dock.
 - .6 Prepare a report presenting the coastal study, option analysis and recommended options with clear conclusions and recommendations. Wave modeling results should be presented in maps showing wave height distributions of the model domain.
- .12 Structural:
- .1 New marine infrastructure components to be worked into the concepts must include floating wharves and supporting infrastructures (piles, etc), gangways to access the floats from the land and vehicle access to the ramps.
 - .2 Consult with users to confirm requirements for the new marine infrastructure and access, and incorporate findings into development of options for the site. As a minimum, this will include confirmation of:
 - .1 Design vessels including length, beam, required draft and mooring line arrangements. As a preliminary consideration (to be confirmed) users have identified the need to berth two vessels at the facility concurrently. These design vessels include the following:
 - .1 Rosborough (LOA: 9.11 m, Beam: 3.2 m, Draft: 1.07 m, Gross Tonnage: 5 Tonnes);
 - .2 Fast Response Craft (FRC).
 - .2 Operational loading and geometrical restrictions for access ramps including clear width and maximum slope;
 - .3 Operational loading and geometrical requirements for floats including length, width, and required freeboard;
 - .4 Site operational considerations including seasonal strategies and limits of equipment for removing and launching components of the wharf system (as applicable);
 - .5 Required design life of all components, and historical performance of similar systems and components at similar facilities.
 - .3 Describe the potential impact on the existing site infrastructure and include any required structural modifications and/or upgrades;
 - .4 Provide a general description of the structures, including systems considered and benefits/disadvantages;
 - .5 Discuss site features and suitability of proposed infrastructure included in all options (consideration of geotechnical conditions, ice conditions, etc);
 - .6 Include design loads for all load cases, and;



- .7 Prepare concept drawings of structural systems proposed, including, floats, supporting infrastructure, fuel tank pad and access infrastructure.
 - .1 Include pad size (considering working room around valves), curbing requirements and non-slip surface recommendations.
- .8 Consider all environmental loading conditions as appropriate for the infrastructure including berthing, mooring, waves, wind, ice, snow, and seismic loading.
- .13 Provide a Class D Cost Estimate.
 - .1 CSC/CSI UniFormat™ 2010;
 - .2 Indicative (+/- 20%-25%), Uniformat™ Level 2 detail is required.

2.4.3 DELIVERABLES

- .1 Feasibility Study documenting the Feasibility Study Scope and Activities.
 - .1 Submit a Draft and Final Study
 - .1 Revise as required.
 - .2 Provide one (1) electronic searchable PDF copy on the project FTP site.



3 PROJECT ADMINISTRATION

3.1 GENERAL REQUIREMENTS

- .1 The administration requirements outlined in this section are applicable to all PWGSC projects in the Western Region, unless otherwise indicated in the TOR.

3.2 LANGUAGE

- .1 Construction documents must be prepared in English.

3.3 MEDIA

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

3.4 PROJECT MANAGEMENT

3.4.1 GENERAL

- .1 PWGSC administers the project on behalf of Canada and exercises continual control over the project during all phases of development.
- .2 The PWGSC project management team, the Consultant Team and the User Department teams are to work cooperatively at every stage of the design and construction process in order to assure the creation of a successful project.

3.5 LINES OF COMMUNICATION

- .1 All communications will be through the Departmental Representative, unless directed otherwise.
 - .1 This includes formal contact between the Consultant Team, the PWGSC Project Team and the User Department.
- .2 Direct communication between members of the PWGSC Project Team on routine matters may be required for resolution of technical issues.
 - .1 However, this shall not alter project scope, Budget or schedules, unless confirmed in writing by the Departmental Representative.
- .3 During construction tender call, PWGSC will conduct all correspondence with bidders and award the contract.

3.6 MEETINGS

3.6.1 GENERAL

- .1 The Departmental Representative will arrange meetings throughout the project, with representatives from:
 - .1 The User Department;
 - .2 PWGSC;
 - .3 The Consultant Team, and;
- .2 Standing agenda items shall include:
 - .1 Project Schedule;
 - .2 Cost;
 - .3 Risk;
 - .4 Quality, and;



- .5 Health and Safety.
- .3 Project Start-up Meeting:
 - .1 Shall be arranged and facilitated by the Departmental Representative, and;
 - .2 Includes the PWGSC AECOE Design Manager, User Department Representatives and the Consultant Team.

3.6.2 FEASIBILITY STUDY PHASE:

- .1 Bi-weekly meetings with PWGSC and the Consultant Team will normally be held via teleconference.

3.7 CONSULTANT RESPONSIBILITIES

- .1 The Consultant Team includes the Consultant's staff, sub-consultants and specialists.
 - .1 This team must maintain the same, or better, level of expertise, as presented in their proposal, for the duration of the project;
 - .2 The team must include qualified registered architectural and engineering professionals with extensive relevant experience and who are capable of providing all required services;
 - .1 Professional registrations / certifications must remain current.
 - .3 Team members may be qualified to provide services in more than one discipline, and;
 - .4 The Consultant may expand the team to include additional disciplines.
- .2 The Consultant is responsible for:
 - .1 Obtaining Departmental Representative Acceptance for each project phase before proceeding to the next phase;
 - .2 Accurately communicating design, Budget, and scheduling issues to staff, sub-consultants and specialists;
 - .3 Coordinating input for the Departmental Representative's Risk Management Plan, and;
 - .4 Developing and coordinating a comprehensive quality assurance process to ensure that submissions are accurate, complete and meet TOR requirements.

3.7.2 FEASIBILITY STUDY PROJECT MILESTONES

- .1 Attend meetings.
- .2 Record the issues and decisions.
- .3 Prepare and distribute minutes within two (2) working days of the meeting.
- .4 Ensure sub-consultants attend all required meetings.
- .5 The Consultant is responsible for:
 - .1 Coordinating and directing the Work of all team activities, sub-consultants and specialists;
 - .2 Preparing a feasibility study report that meets project requirements, and;



- .3 Obtaining approvals on behalf of the Departmental Representative from the User Department and other levels of government such as provincial and municipal governments.
 - .1 The Consultant shall adjust the documentation to meet the requirements of these authorities.

3.8 PWGSC RESPONSIBILITIES

3.8.1 ADMINISTRATION

- .1 PWGSC administers the project and exercises continual control over the project during all phases of development.
- .2 The following administrative requirements apply during all phases of the project delivery.

3.8.2 REVIEWS

- .1 PWGSC will review the Work at various stages and reserves the right to reject unsatisfactory Work at any stage.

3.8.3 ACCEPTANCE

- .1 PWGSC Acceptance of submissions from the Consultant simply indicates that - based on a general review - the material complies with governmental objectives and practices, and meets overall project objectives.
- .2 Acceptance does not relieve the Consultant of professional responsibility for the Work or compliance with the contract.

3.8.4 PWGSC PROJECT MANAGEMENT

- .1 The Project Manager assigned to the project is the Departmental Representative.
- .2 The Departmental Representative is directly responsible for:
 - .1 The progress and administration of the project, on behalf of PWGSC;
 - .2 Day-to-day project management and is the Consultant's single point of contact for project direction, and;
 - .3 Providing authorizations to the Consultant on various tasks throughout the project.
- .3 Unless directed otherwise by the Departmental Representative, the Consultant obtains all Federal approvals necessary for the Work.

3.8.5 PWGSC ARCHITECTURE AND ENGINEERING CENTRE OF EXPERTISE (AECOE)

- .1 Provides advisory services and Quality Assurance Reviews of Consultant deliverables.
- .2 Participates regularly in design and construction Project Milestones and may attend meetings as and when required.
- .3 Provides a Design Manager for the project who will coordinate the services of AECOE.

3.9 USER DEPARTMENT RESPONSIBILITIES

3.9.1 USER DEPARTMENT PROJECT LEADER



- .1 Is accountable for the expenditure of public funds and delivery of the project in accordance with the terms accepted by the Treasury Board.
- .2 Reports to the senior User Department executive management.
- .3 Will play several critical roles for the successful implementation of the project, including:
 - .1 Coordination of the quality, timing and completeness of information and decisions relating to issues related to the functional performance of the facility.

3.10 TECHNICAL REPORTS

- .1 Technical Reports are official government documents, which are used to support an application for approval or to obtain authorization or Acceptance. Technical Reports must:
 - .1 Be complete, clear and professional in appearance and organization, with proper reference to related parts and contents in the report;
 - .2 Clearly outline the intent, objectives, process, results and recommendations;
 - .3 Present the flow of information and conclusions in a logical, easy to follow sequence;
 - .4 Be in written narrative, graphic, model (traditional and/or computer generated), and photographic format, which can be web enabled;
 - .5 Have all pages are numbered in sequence, and;
 - .6 Be printed double-sided, if hard copies are produced.
- .2 Standard practice for the organization of technical reports include:
 - .1 A cover page, clearly indicating the nature of the report, the date, the PWGSC project number and who prepared the report;
 - .2 A Table of Contents;
 - .3 An Executive Summary;
 - .1 A true condensed version of the report following the identical structure, including only key points and results/recommendations requiring review and/or approval;
 - .4 The body of the report is to be structured such that the reader can easily review the document and locate, respond to and/or reference related information contained elsewhere in the report easily;
 - .5 Appendices are to be used for lengthy segments of the report, supplementary and supporting information and/or for separate related documents.
- .3 The report content must:
 - .1 Use a proper numbering system (preferably legal numbering), for ease of reference and cross-reference;
 - .1 The use of 'bullet points' are to be avoided.
 - .2 Use proper grammar, including using complete sentences, for clarity, to avoid ambiguity and facilitate easy translation into French, if required;
 - .1 The use of undefined technical terms, industry jargon and cryptic phrases are to be avoided.



-
- .3 Be written as efficiently as possible, with only essential information included in the body of the report and supporting information in an appendix if needed.



4 APPENDIX A

4.1 POTENTIAL SITE LOCATIONS



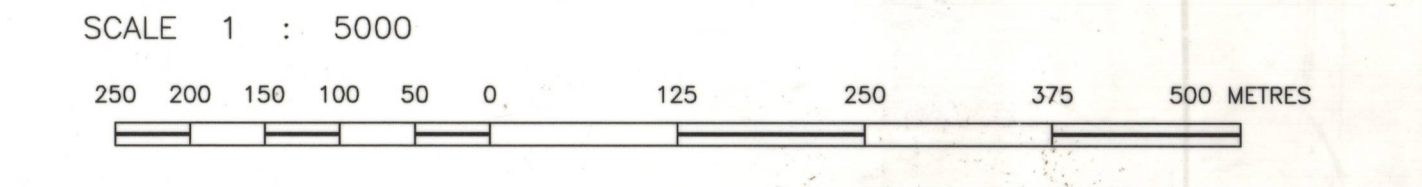
5 APPENDIX B

5.1 ADJACENT SURVEY

PLAN OF LOTS 879 AND 880 AND FIELD NOTES OF SURVEY OF LOT 880 AND THE O.H.W.M. OF LOT 879

RANKIN INLET COORDINATED SURVEY AREA
 RANKIN INLET, NUNAVUT

NOTE: LANDS DEALT WITH BY THIS PLAN SUPERSEDE LOT 1001 REMAINDER, QUAD 55 K/16, PLAN 68913 C.L.S.R., NO. 1614 L.T.O.
 THE SURVEY OF LOTS 912 TO 920 WAS CONDUCTED DURING THE SAME TIME PERIOD AS THE ABOVE NOTED LOTS.
 THE PLAN OF LOT 879 IS COMPILED FROM THE ABOVE SURVEY AND THE FOLLOWING SURVEYS: PLAN 68913 C.L.S.R., NO. 1614 L.T.O. SURVEYED BY C.B. AIRD, C.L.S. IN 1982; PLAN 78659 C.L.S.R., NO. 2942 L.T.O. SURVEYED BY BRUCE HEWILKO, C.L.S. IN 1994; PLAN 73854 C.L.S.R., NO. 2222 L.T.O. SURVEYED BY W.T. VOLHOVATKUE, C.L.S. IN 1990.
 THIS SURVEY WAS EXECUTED DURING THE PERIOD OCT. 23 TO OCT. 27, 2006, BY BRUCE HEWILKO, C.L.S.



LEGEND
 BEARINGS ARE GRID AND ARE REFERRED TO THE CENTRAL MERIDIAN OF U.T.M. ZONE 15 (93° WEST). DISTANCES SHOWN ARE EXPRESSED IN METRES AND ARE HORIZONTAL AT GENERAL GROUND LEVEL. ALL POSTS PLACED IN THE COURSE OF THIS SURVEY ARE MARKED WITH APPROPRIATE LOT NUMBERS AND THE YEAR 2006.
 TO COMPUTE U.T.M. COORDINATES, DISTANCES HAVE BEEN REDUCED TO SEA LEVEL AND PROJECTION PLANE BY APPLYING A COMBINED SCALE FACTOR OF 0.999629
 THE SURVEY REPORT FOR THIS PROJECT IS RECORDED UNDER FIELD BOOK NO. 35990 C.L.S.R.

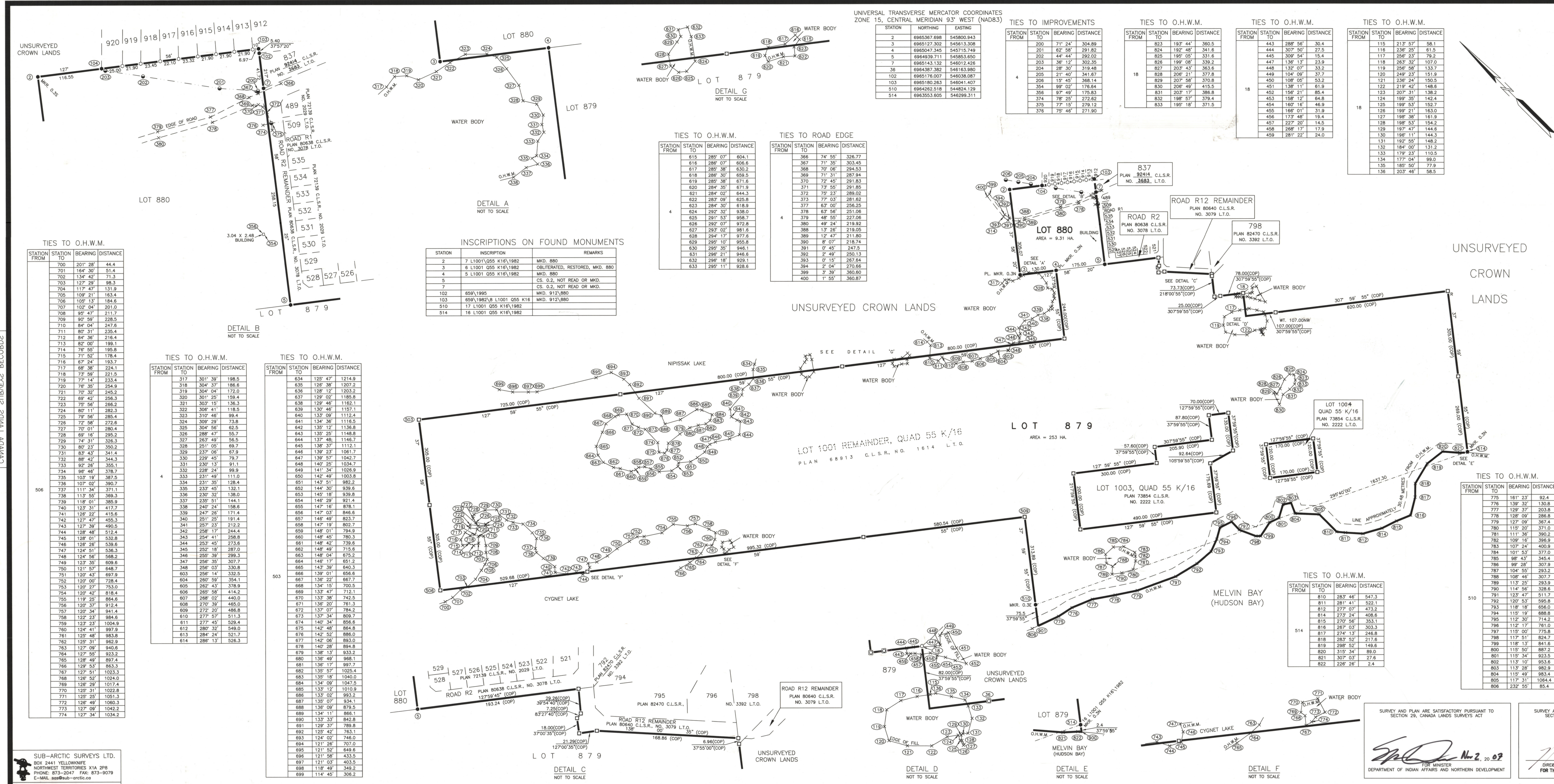
COORDINATE CONTROL MONUMENT FOUND

STATION FROM	STATION TO	BEARING	DISTANCE
		C.L.S. '77 POST PLACED	
		C.L.S. '77 POST FOUND	
		C.L.S. '77 POST COPIED	
		POWER POLE AND GUY WIRE(S)	
		TRAVERSE LINES	
		EDGE OF EXISTING ROAD SHOWN THUS	
		OVERHEAD POWER LINES SHOWN THUS	
		LANDS DEALT WITH BY THIS PLAN ARE BOUNDED THUS	
		BUILDINGS SHOWN THUS	
		O.H.W.M. IS SHOWN THUS	
		CS. STANDS FOR COUNTER SUNK.	
		COP. STANDS FOR COPIED.	
		MARKER POSTS ARE RIGHT ANGLE TYPE METAL POSTS 3CM X 3CM X 1.8M LONG.	

CERTIFIED CORRECT

 BRUCE HEWILKO
 CANADA LANDS SURVEYOR
 DATE: Mar. 2/07

SURVEY AND PLAN ARE SATISFACTORY PURSUANT TO SECTION 29, CANADA LANDS SURVEYS ACT
 SURVEY AND PLAN ARE SATISFACTORY PURSUANT TO SECTION 29, CANADA LANDS SURVEYS ACT
 DEPARTMENT OF NATURAL RESOURCES SECTION 29, CANADA LANDS SURVEYS ACT CONFIRMED
 Andrew Fisher
 Andrew C. Fisher, C.L.S.
 DEPUTY SURVEYOR GENERAL, NORTH CANADA CENTRE FOR CADASTRAL MANAGEMENT
 DATE: MAR. 13, 2008



TIES TO O.H.W.M.

STATION FROM	STATION TO	BEARING	DISTANCE
700	201' 28"	44.4	
701	164' 30"	51.4	
702	134' 42"	71.3	
703	127' 29"	98.3	
704	117' 47"	131.9	
705	109' 21"	163.4	
706	105' 13"	184.6	
707	102' 04"	201.0	
708	95' 47"	217.7	
709	90' 59"	228.5	
710	84' 04"	247.6	
711	80' 31"	235.4	
712	84' 36"	216.4	
713	82' 00"	199.1	
714	78' 55"	195.8	
715	71' 52"	178.4	
716	67' 24"	193.7	
717	88' 38"	224.1	
718	73' 59"	221.5	
719	77' 14"	233.4	
720	76' 35"	254.9	
721	70' 32"	245.2	
722	69' 42"	256.3	
723	75' 56"	266.2	
724	80' 11"	282.3	
725	79' 56"	285.4	
726	72' 58"	272.6	
727	70' 01"	280.4	
728	69' 16"	295.2	
729	74' 31"	326.3	
730	80' 23"	350.2	
731	83' 43"	341.4	
732	88' 42"	344.3	
733	92' 26"	355.1	
734	96' 48"	378.7	
735	103' 19"	367.5	
736	107' 02"	390.7	
737	111' 34"	371.1	
738	127' 47"	451.5	
739	118' 01"	385.9	
740	123' 31"	417.7	
741	128' 22"	415.6	
742	127' 47"	451.5	
743	127' 39"	490.5	
744	128' 48"	512.4	
745	128' 01"	532.8	
746	129' 28"	536.6	
747	124' 51"	536.3	
748	124' 58"	568.2	
749	123' 35"	609.6	
750	121' 57"	648.7	
751	120' 43"	697.9	
752	120' 00"	728.4	
753	120' 27"	783.0	
754	120' 42"	818.4	
755	119' 25"	864.6	
756	120' 37"	912.4	
757	120' 34"	941.4	
758	122' 23"	984.6	
759	123' 23"	1004.9	
760	124' 41"	997.9	
761	125' 48"	983.8	
762	125' 31"	962.9	
763	127' 09"	840.6	
764	127' 55"	823.2	
765	128' 49"	897.4	
766	129' 53"	863.3	
767	127' 51"	1023.3	
768	128' 52"	1024.0	
769	128' 28"	1017.4	
770	129' 31"	1022.8	
771	129' 25"	1051.3	
772	129' 49"	1060.3	
773	127' 09"	1042.2	
774	127' 34"	1034.2	

TIES TO O.H.W.M.

STATION FROM	STATION TO	BEARING	DISTANCE
317	301' 39"	198.5	
318	304' 37"	186.6	
319	304' 04"	172.0	
320	301' 25"	159.4	
321	303' 15"	136.3	
322	306' 41"	118.5	
323	310' 46"	99.4	
324	309' 29"	73.8	
325	304' 56"	62.5	
326	288' 47"	55.7	
327	263' 49"	56.5	
328	251' 05"	69.7	
329	237' 06"	67.9	
330	229' 45"	79.7	
331	230' 13"	91.1	
332	228' 24"	99.9	
333	231' 49"	111.0	
334	231' 35"	128.4	
335	233' 45"	132.1	
336	230' 32"	138.0	
337	235' 51"	144.1	
338	240' 24"	158.6	
339	247' 26"	171.4	
340	251' 25"	191.4	
341	257' 23"	212.2	
342	258' 17"	244.4	
343	254' 41"	258.8	
344	253' 45"	273.6	
345	252' 18"	287.0	
346	255' 39"	299.3	
347	256' 35"	307.2	
348	256' 03"	330.8	
349	256' 14"	332.5	
350	260' 59"	354.1	
351	262' 43"	379.8	
352	265' 58"	414.2	
353	268' 02"	440.0	
354	270' 39"	465.0	
355	272' 20"	486.6	
356	277' 57"	511.3	
357	277' 45"	529.4	
358	280' 32"	549.0	
359	282' 52"	586.0	
360	284' 15"	609.5	
361	283' 47"	712.1	
362	283' 38"	742.5	
363	280' 20"	781.3	
364	277' 07"	784.2	
365	277' 07"	784.2	
366	273' 34"	809.7	
367	270' 34"	856.6	
368	267' 32"	894.8	
369	264' 48"	933.3	
370	262' 52"	986.0	
371	261' 06"	1033.0	
372	258' 17"	1079.8	
373	255' 17"	1121.2	
374	252' 45"	1167.8	
375	250' 32"	1218.8	
376	248' 09"	1274.2	
377	245' 57"	1323.0	
378	243' 57"	1374.2	
379	241' 57"	1428.8	
380	239' 57"	1486.8	
381	237' 57"	1548.2	
382	235' 57"	1613.0	
383	233' 57"	1681.2	
384	231' 57"	1752.8	
385	229' 57"	1827.8	
386	227' 57"	1906.2	
387	225' 57"	1988.0	
388	223' 57"	2073.2	
389	221' 57"	2161.8	
390	219' 57"	2254.0	
391	217' 57"	2349.8	
392	215' 57"	2449.2	
393	213' 57"	2552.2	
394	211' 57"	2658.8	
395	209' 57"	2769.0	
396	207' 57"	2882.8	
397	205' 57"	2999.2	
398	203' 57"	3118.2	
399	201' 57"	3240.0	
400	199' 57"	3364.8	

TIES TO O.H.W.M.

STATION FROM	STATION TO	BEARING	DISTANCE
615	285' 07"	604.1	
616	286' 07"	606.6	
617	285' 38"	630.2	
618	286' 30"	659.5	
619	285' 38"	671.6	
620	284' 35"	671.9	
621	284' 02"	644.3	
622	283' 09"	625.8	
623	284' 30"	618.9	
624	282' 32"	938.0	
625	291' 53"	958.7	
626	292' 07"	972.8	
627	293' 02"	981.6	
628	294' 17"	977.6	
629	295' 10"	955.8	
630	295' 35"	946.1	
631	296' 21"	946.6	
632	296' 18"	929.1	
633	295' 11"	928.6	

TIES TO O.H.W.M.

STATION FROM	STATION TO	BEARING	DISTANCE
837	193' 24"	304.89	
824	192' 48"	341.6	
825	195' 09"	331.6	
826	199' 08"	339.2	
827	203' 43"	319.48	
828	206' 21"	377.8	
829	207' 56"	370.8	
830	208' 49"	415.5	
831	207' 17"	386.8	
832	198' 57"	379.4	
833	195' 18"	371.5	

TIES TO O.H.W.M.

STATION FROM	STATION TO	BEARING	DISTANCE
529	201' 28"	44.4	
527	134' 42"	71.3	
526	127' 29"	98.3	
525	117' 47"	131.9	
524	109' 21"	163.4	
523	105' 13"	184.6	
522	102' 04"	201.0	
521	95' 47"	217.7	
520	90' 59"	228.5	
519	84' 04"	247.6	
518	80' 31"	235.4	
517	84' 36"	216.4	
516	82' 00"	199.1	
515	78' 55"	195.8	
514	71' 52"	178.4	
513	67' 24"	193.7	
512	88' 38"	224.1	
511	73' 59"	221.5	
510	77' 14"	233.4	
509	76' 35"	254.9	
508	70' 32"	245.2	
507	69' 42"	256.3	
506	75' 56"	266.2	
505	80' 11"	282.3	
504	79' 56"	285.4	
503	72' 58"	272.6	
502	70' 01"	280.4	
501	69' 16"	295.2	
500	74' 31"	326.3	
499	80' 23"	350.2	
498	83' 43"	341.4	
497	88' 42"	344.3	
496	92' 26"	355.1	
495	96' 48"	378.7	
494	103' 19"	367.5	
493	107' 02"	390.7	
492	111' 34"	371.1	
491	127' 47"	451.5	
490	118' 01"	385.9	
489	123' 31"	417.7	
488	128' 22"	415.6	
487	127' 47"	451.5	
486	127' 39"	490.5	
485	128' 48"	512.4	
484	128' 01"	532.8	
483	129' 28"	536.6	
482	124' 51"	536.3	
481	124' 58"	568.2	
480	123' 35"	609.6	
479	121' 57"	648.7	
478	120' 43"	697.9	
477	120' 00"	728.4	
476	120' 27"	783.0	
475	120' 42"	818.4	
474	119' 25"	864.6	
473	120' 37"	912.4	
472	120' 34"	941.4	
471	122' 23"	984.6	
470	123' 23"	1004.9	
469	124' 41"	997.9	
468	125' 48"	983.8	
467	125' 31"	962.9	
466	127' 09"	840.6	
465	127' 55"	823.2	
464	128' 49"	897.4	
463	129' 53"	863.3	
462	127' 51"	1023.3	
461	128' 52"	1024.0	
460	128' 28"	101	



6 APPENDIX C

6.1 SMALL CRAFT HARBOUR – PERMIT PROCESS

ARCTIC BAY SMALL CRAFT HARBOUR - PERMIT PROCESS



NUNAVUT IMPACT REVIEW BOARD (NIRB):

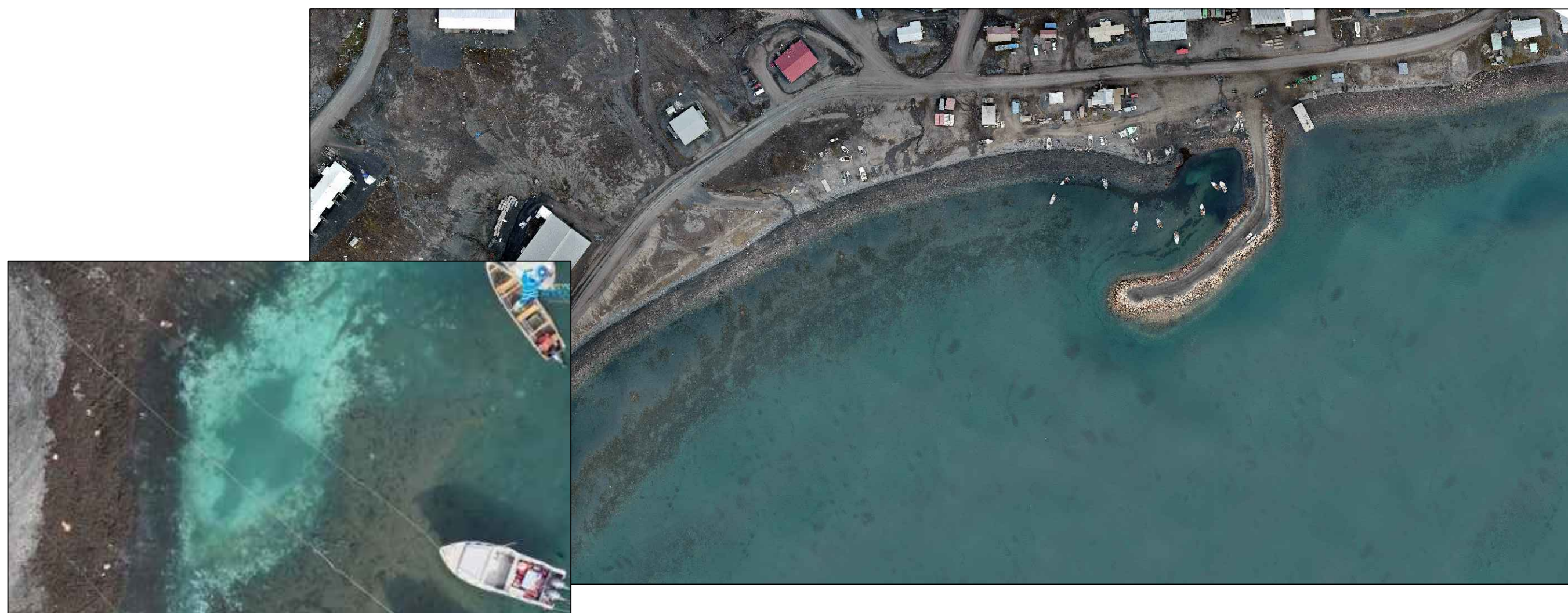
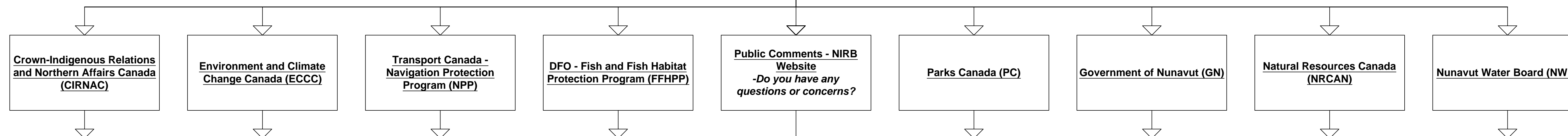
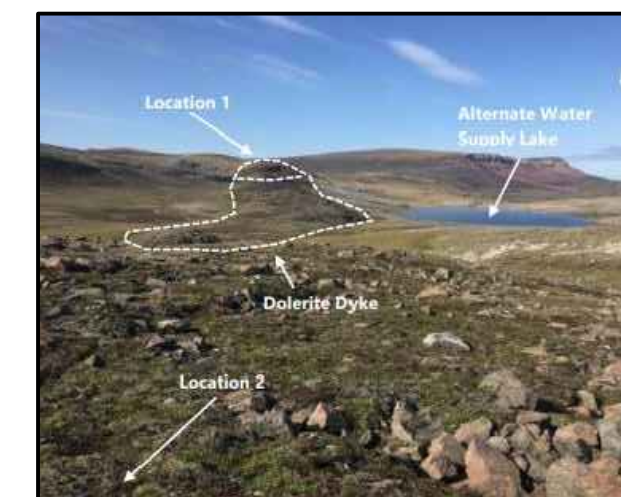
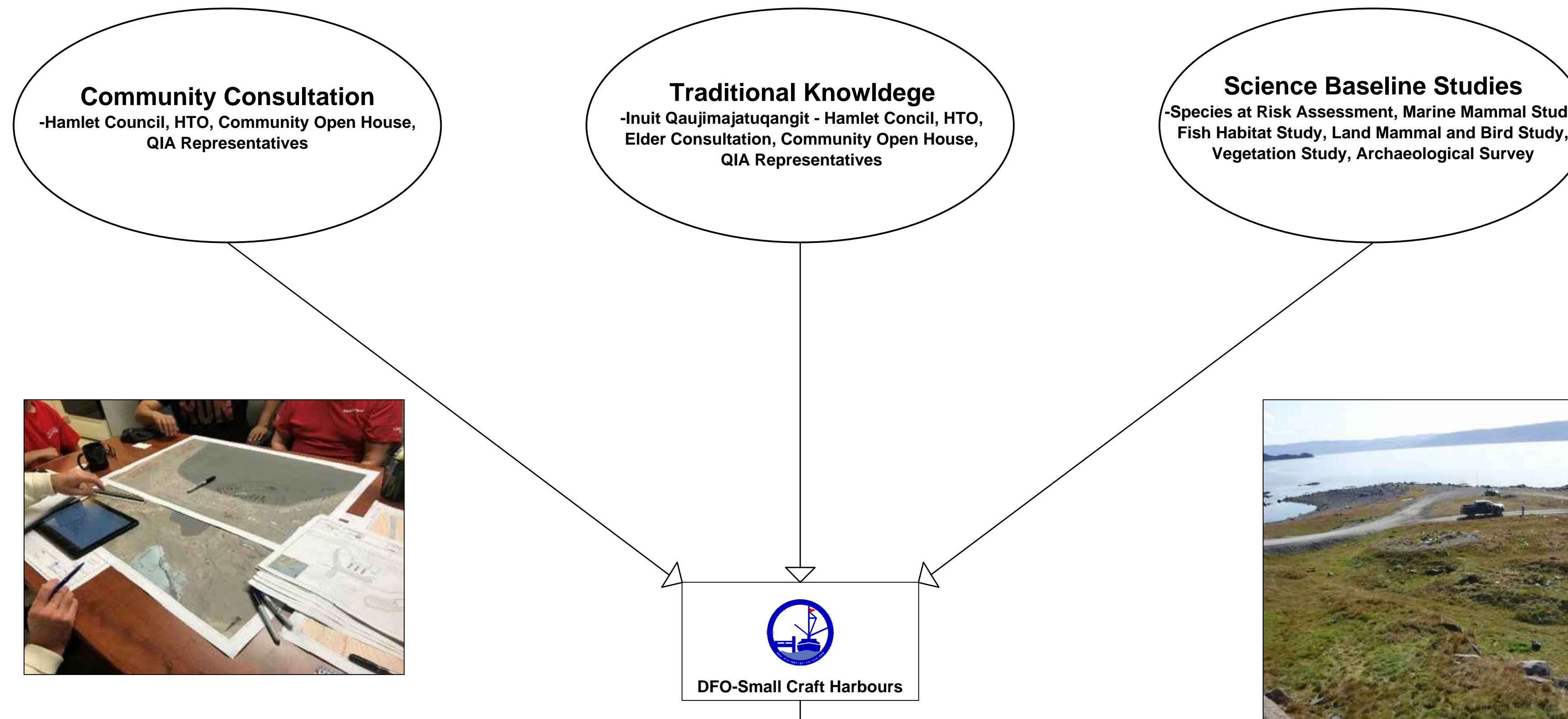
- Government Institution created by the Nunavut Agreement
- Assesses impacts of proposed developments in Nunavut
- Grants or denies project approval

How does NIRB assess Project Impacts?

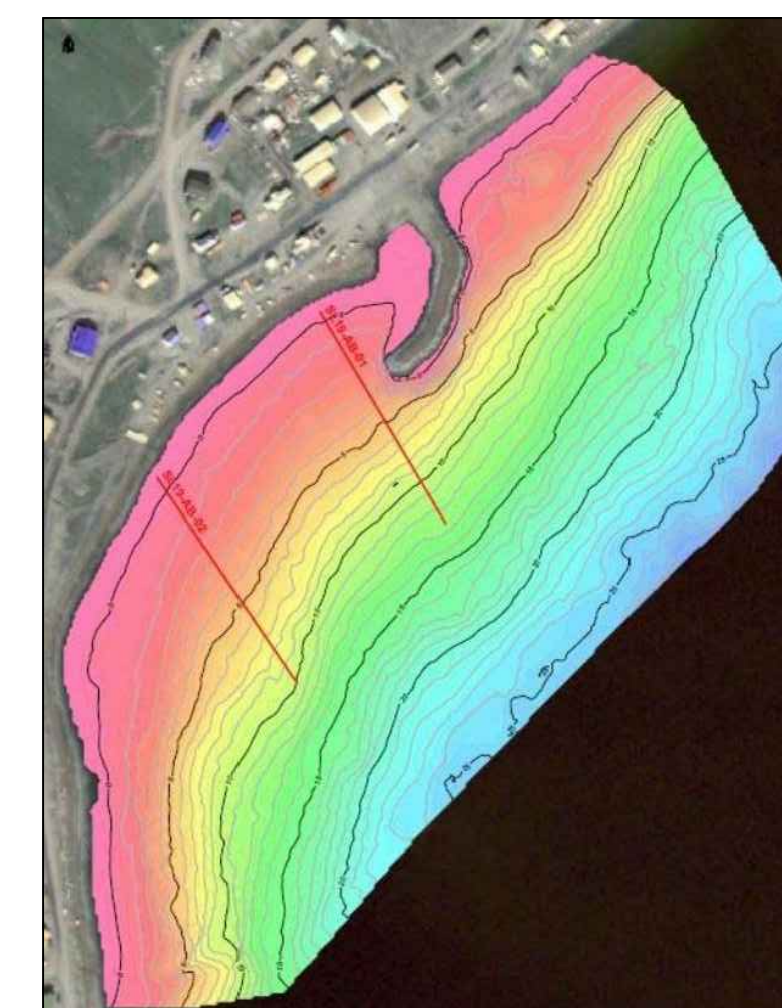
1. Traditional Knowledge - Community Consultation
2. Scientific Methods - Government Regulatory Agencies

What are the project effects NIRB Assesses?

1. Biological Impacts - Examples: Effects on marine mammals, water, fish, birds, plants
2. Socio-Economic Impacts - Examples: Effects on community hunting, community fishing, community benefits and impacts



NIRB Screening Decision - can the project proceed to construction?



PERMITS REQUIRED BY SCH FOR THE HARBOUR PROJECTS:

1. Nunavut Research Institute Licence
2. Nunavut Planning Commission Approval (NPC)
3. Nunavut Impact Review Board Screening (NIRB)
4. Nunavut Water Board Licence (NWB)
5. Nunavut Territory Archaeologist Permit (GN)
6. Land Use Permit (CIRNAC)
7. Land Use Permit (GN)
8. Fisheries Act Authorization (DFO-FFHPP)
9. Disposal at Sea Permit (ECCC)
10. Navigation Protection Program - Notice of Works Application for Approval (TC)
11. Land Transfer (PSPC)
12. Authorization of Explosives (NRCAN)



7 DEFINITIONS

7.1 PURPOSE

7.1.1 DOCUMENT DEFINITIONS:

- .1 Definition of words and phrases in the Terms of Reference (TOR), and *Doing Business with PWGSC – Documentation and Deliverables Manual* to:
 - .1 Expand the detail associated with the services and deliverables addressed in the above Documents, and;
 - .2 Provide a clear understanding of the project scope, procedures, and quality performance requirements.

7.2 DEFINITIONS

7.2.1 ACCEPTANCE

- .1 A formal action taken by an assigned person with authority (contractual or otherwise) to declare some aspect of the project is permitted to proceed.

7.2.2 BASE BUILDING

- .1 As per Government of Canada Workplace Fit-Up standards.

7.2.3 BASIS OF DESIGN (BOD)

- .1 Refer to CSA Z320 Article 3, Definitions.
 - .1 For further detail refer to ASHRAE 202, Article 8 – Basis of Design, Article 8.2 – Requirements.
- .2 A dynamic narrative document throughout the Project Milestones, recording the rationale for decisions and confirming to the Project Team design conformance to the ideas, concepts and criteria considered important to the owner as contained in the Owner Project Requirements (OPR) - for OPR see Definition;
 - .1 As the Consultant BOD also outlines the intended systems for the project, the Consultant's Cx Process Manager/Cx Authority, using a compliance evaluation/tracking matrix, confirms the BOD's compliance to the OPR.
- .3 Documents the primary thought processes and assumptions behind design and implementation decisions.
- .4 Text and graphics are organized to facilitate future use as a building reference document.
 - .1 The O&M Manual describes "what" components/systems have been selected, the BOD describes "why" and "how" the design achieves the performance requirements of the OPR, and;
 - .2 BOD and OPR are components of the Cx Manual.
 - .1 OPR - refer to Definition for further information.
- .5 Includes:
 - .1 A Summary:
 - .1 Project's conceptual framework;



- .2 Compliance with OPR statement (including new Owner directives);
- .3 Compliance with the Functional Program, and;
- .4 Rationale for decisions made throughout the specific Project Milestone.
- .2 Design assumptions, such as:
 - .1 Anticipated future changes not included in the project, and;
 - .2 Selected assembly and system performance requirements.
- .3 A Unifomat™ Level 3 detail narrative description and statement on the purpose of the selected components, assemblies, systems and methods – see PPDFormat™ Definition, including:
 - .1 Areas served by the respective components, assemblies and systems, and;
 - .2 Illustrations of system configurations, including single line and plan drawings of each system.
- .4 Design options and analysis considered during the:
 - .1 Life Cycle Costing and Value Engineering workshops, and;
 - .2 Development of sustainable features and strategies.
- .5 Calculations and option analysis matrixes, organized by discipline, including:
 - .1 Connected or related loads and system capacities, and;
 - .2 Design criteria and the applicable codes/standards used in the calculations.
- .6 Special features or unique supply items/sources, general control strategies, sequences, and reset schedules, such as:
 - .1 Building components and connectivity;
 - .2 Seasonal switch-over procedures, and;
 - .3 Emergency procedures during a fire condition, power or equipment failure, including:
 - .1 Reference to Standard Operating Procedures requirements and definition.
- .7 Interfaces with existing systems, and;
- .8 Maintenance issues.

7.2.4 BASIS OF ESTIMATE (BOE)

- .1 A “living” document throughout the project design, construction process and project life cycle.
- .2 Provides a framework for progress monitoring and reporting.
- .3 Prepared and updated to facilitate the understanding, assessment and validation of the estimated value breakdowns, independent of any other supporting documentation.
- .4 Includes:
 - .1 Level of consensus between concurrent/third party estimates;
 - .2 Estimate methodology;
 - .3 Basis of pricing - cost data sources, and allowances;



- .4 Description of information obtained and used in the estimate including the date received;
- .5 Notable assumptions, exclusions and inclusions;
- .6 Listing of items/issues carrying notable risks;
- .7 Opportunities, and any deviations from standard practices;
- .8 Record of pertinent communications and agreements that have been made between the estimator and other project stakeholders;
- .9 Major changes relative to previous estimates;
- .10 Significant market events that may have an effect on the costs, and;
- .11 Estimate reconciliation.
- .5 With the last submission include:
 - .1 Variances related to:
 - .1 Change Orders;
 - .2 Work Package estimate, and;
 - .3 Estimate Construction Cost.
 - .2 And, any additional relevant information.
- .6 Refer also to the "Cost Estimate" Definition.

7.2.5 BUDGET

- .1 Developed using Cost Estimates and the Project Schedule.
- .2 Provides a view of how much the project is estimated to cost both in total and periodic terms.
- .3 Determines the cost performance baseline for use in cost management variance analysis such as, determining earned performance value.
- .4 Is aligned with funding limits to confirm funding availability/appropriation.
- .5 Also refer to - Estimated Construction Cost definition.

7.2.6 "CANADA", "CROWN"/"HER MAJESTY"

- .1 Her Majesty the Queen in right of Canada.

7.2.7 COLLABORATIVE PROJECT DELIVERY

- .1 The Collaborative Project Delivery approach promotes and facilitates knowledge collaboration between design and construction professionals and subject matter experts to create optimal design and construction solutions and methodologies in order to achieve an appropriate, timely and fiscally responsible Quality project delivery.
 - .1 Recognizes that project success is tied to all Project Team members' success in the integrated process.
 - .1 The Collaborative Project Delivery process starts at the Pre-Design with Departmental Representative as Lead Partnering Session and the Consultant, as Lead, project start-up meeting early in Schematic Design.
 - .1 Collaborative Project Delivery is an interactive process which continues throughout the project life cycle.
- .2 Joint Project Team goals include:



- .1 Ownership and focus on Quality including, Owner Project Requirements (OPR), Basis of Design (BOD) as well as Budget and schedule performance;
- .2 Focus on optimizing the design and construction as a whole to fulfill the PWGSC Quality expectations;
- .3 Mutual support for the project procedures and management;
- .4 Leveraging Value Engineering, Life Cycle Costing and commissioning skills, and;
- .5 Creation of an innovative learning environment.

7.2.8 COMMISSIONING AUTHORITY

- .1 Refer to the:
 - .1 Commissioning Process Manager (CPM) Definition for description of Cx Authority and part of the Consultant Team;
 - .2 CSA Z 320, Article 3 Definitions for Third Party description;
 - .3 TOR for the requirement of a Cx Authority as a part of the Consultant Team membership or of an independent third party Cx Authority to be separately engaged by PWGSC.

7.2.9 COMMISSIONING EVALUATION REPORT

- .1 A Cx Manual component.
- .2 Includes a debriefing report, with aspects such as:
 - .1 A complete assessment of the project;
 - .2 Lessons learned;
 - .3 Variances between the actual and planned levels of performance;
 - .4 A listing of components and systems not commissioned and the reasons;
 - .5 Recommended follow-up actions including Re-commissioning.

7.2.10 COMMISSIONING (Cx) MANUAL

- .1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 Contains the following:
 - .1 Updated Owner Project Requirements (OPR);
 - .2 Updated Basis of Design (BOD);
 - .3 Updated Commissioning Plan;
 - .4 Static Verification, start-up and Functional Performance Testing reports;
 - .5 Commissioning Report;
 - .6 User and operator training reports;
 - .7 Occupancy and operations evaluation reports;
 - .8 All relevant project reports and correspondence, and;
 - .9 Recommendations for Re-commissioning and frequency by equipment type and system.
- .3 Requires Cx Process Manager/Cx Authority sign-off at a Construction Contract Substantial Performance and Completion (final) milestones.



7.2.11 COMMISSIONING (Cx) PLAN

- .1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 Refer to CSA Z320 Article 4.2.3 Commissioning Plan.
 - .1 For further detail refer to the following ASHRAE 202 Articles:
 - .1 Article 7 – Commissioning Plan, Article 7.2 – Requirements;
 - .2 Article 10 – Design Review, Article 10.2 – Requirements;
 - .3 Article 11 – Commissioning Submittal Review – Article 11.2 Requirements;
 - .4 Article 15 – Training, Article 15.2 Requirements.
 - .3 A dynamic document throughout the project life cycle.
 - .4 Outlines a Plan to execute the scope of Work.
 - .1 The ongoing Plan development is carried out through iterative reviews, workshops, and meetings to ultimately become the complete plan including construction and occupancy milestones of the project.
 - .5 "Design Phase" (Pre-Design) Cx Plan:
 - .1 Cx Plan is based on the Programming, OPR and Acceptance of risk and Budget;
 - .1 Outlines a preliminary execution plan including activities, Cx Team roles and responsibilities, schedules and deliverables for pre design and subsequent design and BOD ultimately be updated and completed during the construction and occupancy milestones.
 - .6 "Design Phase" (Schematic Design, Design Development and Construction Documents) Cx Plan:
 - .1 Cx Plan is updated to address the remaining Project Milestones including construction documentation, construction and occupancy. The Cx Plan includes;
 - .1 Detailed tasks, roles and responsibilities, schedule, work flow processes and a list of the systems to be commissioned, and;
 - .2 Coincides with the design documents such as the specifications so that the Commissioning Team is clear on the goals and process.
 - .3 Refer to CSA Z320 Article 4.3. – Design Phase, Article 4.3.1, General.
 - .1 For further detail refer to ASHRAE 202, Article 10 Design Review – Article 10.2 Requirements.
 - .7 "Construction Phase" Cx Plan:
 - .1 During the Construction milestone, the updated Cx Plan continues to outline the Cx Team's roles and responsibilities, implementation of issues resolution protocol, the procedures and forms for documenting commissioning activities and the schedules for commissioning activities, reporting and deliverables.
 - .2 Refer to CSA Z320 Article 4.4 – Construction Phase, Article 4.4.1, General.



- .1 Add the following requirements:
 - .1 Cx schedule, and Installation start-up lists.
 - .2 For further detail refer to ASHRAE 202, Article 11 Commissioning Submittal Review –Article 11.2 Requirements.

7.2.12 COMMISSIONING (Cx) PROCESS

- .1 Refer to CSA Z320 Article 4, Commissioning Process.
- .2 A dynamic document throughout the project life cycle.
- .3 The process by which the design and construction documents (plans, sections, specifications, BOD, etc.) are confirmed to be consistent with each other; includes the commissioning requirements and the OPR.
- .4 During the Cx design reviews the Consultant is ultimately responsible for the project design and final decisions regarding the design expected performance.
 - .1 Supporting the Cx Process may also be the Consultant's Commissioning Process Manager/Cx Authority to lead the Cx Team in the design and implementation of the Process that may involve, for example either;
 - .1 A third party Cx Provider company, procured by PWGSC) or,
 - .2 A Contractor's Cx Agent.

7.2.13 COMMISSIONING PROCESS MANAGER (CPM)

- .1 Cx functional entity:
 - .1 May also be identified as Cx Authority entity.
- .2 Member of the Consultant Team.
- .3 Overall functional responsibilities is to lead the Commissioning Team in the:
 - .1 Design of the Commissioning Process so that it begins with commissioning of individual components and progresses to commissioning the complete integrated building system as a whole, and;
 - .2 Update of the BOD and OPR during design and construction.
- .4 Dependent the requirement for independence from the design and construction management, the CPM may include the functional role and be identified as a functional Commissioning Authority entity in, for example, the Cx Plan Specification, article - Roles and Responsibilities of the Cx Team:
 - .1 Regarding "independent Commissioning Authority" requirements, refer to Canada Green Building Council (CGBC).
- .5 Requires 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 and controls.
- .6 Responsible for Cx deliverables, such as:



- .1 Sequencing;
 - .2 Means and methods;
 - .3 Verification of installation and performance to BOD and OPR;
 - .4 Documentation and related sign-offs, and;
 - .5 Manuals.
- .7 Cx Process Manager/Cx Authority, unless otherwise stated, will only make recommendations, and observations during the design review.

7.2.14 COMMISSIONING RECORD CHECKLIST

- .1 Refer to CSA Z320 Article 4.9, Final Documentation.
 - .1 Add to Article 4.9.3, Additional Commissioning Documentation, the following requirements:
 - .1 Certificate of Interim Acceptance;
 - .2 Final Certificate of Completion;
 - .3 Deferred Cx Test Report;
 - .4 System and Environmental Check Reports e.g. Storage Tanks;
 - .5 Final Cx Report;
 - .6 Cx Evaluation Report, and;
 - .7 Final Standard Operation Procedures.
 - .2 Cx Record Checklist outlines the deliverables to be assembled and updated over the course of the Design, Construction and Delivery Close Out.
 - .3 Cx Record Checklist may include sections such as:
 - .1 Commissioning Plan;
 - .2 Commissioning Schedule;
 - .3 Owner's Project Requirements (OPR);
 - .4 Basis of Design (BOD);
 - .5 Project Team, complete with functional entity titles;
 - .6 Design QA Review compiled reports;
 - .7 Project Issues/Resolutions Logs;
 - .8 Cx Issues/Resolutions Logs;
 - .9 Commissioning meeting minutes;
 - .10 Commissioning specifications;
 - .11 Commissioning forms and check sheets;
 - .12 Commissioning site reports;
 - .13 Coordination drawings;
 - .14 Testing and inspection procedures;
 - .15 System start-up plans;
 - .16 Construction Checklists;
 - .17 Inspection reports;
 - .18 Test reports;
 - .19 Commissioning test certifications;
 - .20 Training plans;
 - .21 Training documentation – electronic and hard copy;



- .22 Deferred testing documentation;
- .23 Post-construction review/re-inspection report;
- .24 Systems Manual;
- .25 Operations and Maintenance Manual; and
- .26 Re-commissioning Manual.

7.2.15 COMMISSIONING REPORT

- .1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 A Cx Manual Component (at Construction Contract Substantial Performance and Completion – final/post Warranty) milestone.
 - .1 Requires CPM/Cx Authority sign-off and Consultant verification at Substantial Performance and Completion.
- .3 The Cx Report (at Substantial Performance) is based on:
 - .1 Final BOD and OPR;
 - .2 System components list requiring commissioning;
 - .3 Final performance verification forms and check sheets: component, systems and integrated systems - design values to actuals;
 - .1 Static, installation, start-up, functional performance and integrated system verification;
 - .4 All commissioning site review reports;
 - .5 Commissioning issue logs and progress reports;
 - .6 Final training sessions;
 - .7 Post occupancy changes;
 - .8 Deferred commissioning; and
 - .9 Current information not available or incomplete at Interim Acceptance/Substantial Performance.
- .4 A Final Commissioning Report (prior to end of Warranty Period), which includes:
 - .1 Final Cx Evaluation Report;
 - .2 Updated Cx Report from Substantial Performance;
 - .3 Post-Occupancy test results and evaluations; and
 - .4 Updated Issues/Resolutions Log – highlighting documented Cx resolutions.
- .5 All progressive/interim Acceptances requiring all Project Team members to sign-off.

7.2.16 COMMISSIONING RISK ASSESSMENT

- .1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 The Cx Risk Assessment aligns the rigor of the Commissioning Process with the following 2 risk items associated with Architectural and Engineering systems:
 - .1 Building: The function and performance; and
 - .2 Deliverables: The deficiencies, such as, inaccurate as-built documentation, ineffective owner/occupant training, lack of documented system performance testing, and lack of comprehensive systems manuals.



- .3 The Cx Risk Assessment is often summarized in a matrix and accompanied by a basis of assessment narrative.
- .4 The premise of the Cx Risk Assessment is to identify:
 - .1 Building type and the intended use as a guide for Cx risk associated with the intended building systems; and
 - .2 How the performance of each system will affect the performance of all other systems, and how non-performance in the building may have a negative impact on function and operational confidence.

7.2.17 COMMISSIONING SCOPE

- .1 Facilitated deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 Conducted by a Cx Team.
- .3 An integrated developmental process for determining the level of Cx effort based on the scope, rigor, OPR, building operation and function, including:
 - .1 Cx prioritization; and
 - .2 Cx Risk Assessment.

7.2.18 COMMISSIONING TEAM (CX TEAM)

- .1 The objective of the team is to encourage interdisciplinary collaboration to confirm the Cx Process is completed and the facility criteria has been achieved.
- .2 Cx Team composition is first identified and defined at the Pre-Design milestone, followed by an integrated development of a Cx Process and the assignment of the Cx roles and responsibilities and corresponding services and deliverables.
- .3 Size and membership varies depending on the project size, complexity and phase of design and construction.
- .4 Team make-up may consist of a:
 - .1 Departmental Representative – including PWGSC Cx Manager;
 - .2 User Department – O&M Personnel;
 - .3 Consultant(s) (dependant on the TOR, including Consultant's Cx Authority);
 - .4 Contractor's Agent; and
 - .5 Contractor's Agencies.

7.2.19 CONTRACTOR'S COMMISSIONING AGENCIES

- .1 To be identified as the in the specifications as the "Contractor's Sub-Contractor Commissioning Agency/Agencies" (CS-CCxA) functional entity/entities, in the Cx Plan Specifications, article - Roles and Responsibilities of the Cx Team. Includes Agencies, such as:
 - .1 Installing contractor/sub-contractor;
 - .2 Equipment manufacturers, such as, elevators, emergency generators;
 - .3 Specialist Cx Agency, Cx Work outside the scope or expertise of other Cx Agencies, Work such, as environmental space condition, air quality; and



- .4 TAB Agency, such as adjusting flow rated and pressure related to ducted air and hydronic systems, fans and pumps.
- .2 Available for emergency and troubleshooting service during the first year of occupancy and modification outside the responsibilities of the O&M personnel.

7.2.20 CONTRACTOR'S COMMISSIONING AGENT

- .1 Responsibilities are distinct from the Contractor's site supervisor.
- .2 To be identified in the specifications (Cx Plan Section, article – Roles and Responsibilities of the Cx Team,) as the "Contractor's Commissioning Agent" (CCxA) functional entity.
- .3 Responsible for the implementation of all commissioning activities required by the specifications, including demonstrations, training, testing, preparation and submission of testing reports.
- .4 Available for emergency and troubleshooting service during the first year of occupancy and modification outside the responsibilities of the O&M personnel.

7.2.21 CONSTRUCTABILITY

- .1 The extent to which the design of the building facilitates the ease of construction, which is 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 project goals and building performance at the optimal level by:
 - .1 Implementing a Quality project delivery process which also meets the project objectives in the best possible time and accuracy at the most cost-effective levels; and
 - .2 A balance of various project, environmental and market constraints.

7.2.22 CONSTRUCTION CHECKLIST – CHECKS AND TESTS

- .1 Also known as Contractor's Cx "systems readiness checklist".
- .2 Confirms specified equipment is provided, undergone Static Verification, properly installed, initially Started-up and checked out in preparation for full operation and Functional Performance Testing.
- .3 Refer to CSA Z320 Article 4.4 – Construction Phase.
 - .1 Add to Article 4.4.2 – Pre-construction the following requirements:
 - .1 Cx schedule, and Installation start-up lists.

7.2.23 CONSULTANT

- .1 Architectural/Interior Design/Engineering firm acting in the capacity of Prime Consultant and professional of record for the provision of services described in the TOR.
 - .1 The Consultant manages and coordinates the Consultant Team (refer to Definition).



7.2.24 CONSULTANT TEAM

- .1 The Consultant (architectural/interior design/engineering firm and Prime Consultant) and their sub-consultants including professionals and advisors with whom PWGSC has contracted to provide other services described in this TOR.

7.2.25 COST ESTIMATE

- .1 Refer to the *Doing Business with PWGSC Documentation and Deliverables Manual*, Section 3 - Cost Estimates for further Cost Estimate details.
- .2 Cost Estimate as compared to the Budget – see Definition.
- .3 Estimates cost of the Work associated with the overall project at each Project Milestone, and tender packages, Division 01 General Requirements and other supporting activities within the project lifecycle.
- .4 Cost breakdown estimating is formatted as per PPDFormat™ and MasterFormat™ National Master Specifications:
 - .1 During Schematic Design (SD) – Uniformat™ Level 3 detail;
 - .1 For further detail refer to Preliminary Project Description (PPD/PPDFormat™) Definition.
 - .2 During Design Development (DD) – as per Uniformat™ Level 4 detail;
 - .1 For further detail refer to Preliminary Project Description (PPD/PPDFormat™) Definition, and;
 - .3 During Construction Documentation (CD) – as per Uniformat™ Level 5 detail and as per MasterFormat™ - Divisional and Sectional details;
 - .1 National Master Specifications (NMS) is the basis for construction specifications.
- .5 For all Cost Estimates include the Basis of Estimate (BOE) – refer to Definition.

7.2.26 CONSTANT DOLLAR ESTIMATE

- .1 This is an estimate expressed in terms of the dollars of a particular base fiscal year.
- .2 It includes no provisions for inflation.
- .3 Cash Flow 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.
 - .1 For Current Dollar Estimates – see Definitions.

7.2.27 CURRENT DOLLAR ESTIMATE

- .1 Budget Year Dollars is also to be referred to as Nominal dollars.
- .2 An estimate based on costs arising in each Fiscal Year (FY - ending March 31) of the project schedule.
- .3 Escalated to account for inflation and other economic factors affecting the period covered by the estimate.
- .4 Costs and benefits across all periods should initially be tabulated in Budget Year Dollars for the following reasons:



- .1 It is the form in which financial data is usually available;
- .2 Tax adjustments are accurately and easily made in Budget year dollars; and
- .3 It enables during analysis, the construction a realistic picture which takes into account changes in relative prices.
- .5 Constant Dollar Estimate – see Definitions.

7.2.28 DEPARTMENTAL REPRESENTATIVE (DR)

- .1 The person designated in the Contract, or by written notice to the Contractor/Consultant, to act as the Departmental Representative for the purposes of being a Contract entity.

7.2.29 ESTIMATED CONSTRUCTION COST

- .1 The Budget identified in the TOR or subsequently in writing by the Departmental Representative:
 - .1 Also stated as “Cost Estimate”.

7.2.30 FACILITY TURNOVER

- .1 Refer to CSA Z320 Article 4.7, Facility Turnover Activities.
 - .1 Add to Article 4.7 the following review requirements:
 - .1 Review signatories, client/stakeholder, of a document agreeing to accept project outcomes and/or on the condition that all recorded deficiencies are to be addressed as appended;
 - .1 Facility Turnover Activities are required where the project or part of the project (“partial interim occupancy”) is being turned over.

7.2.31 FIT-UP STANDARDS

- .1 Space and cost (funding) allocation and workplace configuration and furnishing as per Framework for Office Accommodation and Accommodation Services – Government of Canada Workplace Fit-Up Standards, GCworkplace Design Guide and the GCworkplace Space Planning Workbook.
 - .1 Departmental Representative will provide electronic copies.

7.2.32 FUNCTIONAL PERFORMANCE TESTING

- .1 Refer to CSA Z320 Article 4.5, Functional Performance Testing.
 - .1 For further detail refer to ASHRAE 202, Article 13 Issues and Resolution Documentation – Article 13.2 Requirements.
 - .1 Review Functional Performance Testing data entry in the Issues and Resolutions log according to ASHRAE 202, Section 13, including:
 - .1 Tests at peak load conditions as identified in the Cx Plan.

7.2.33 FUNCTIONAL PROGRAM

- .1 May be included in the RFP or may be a Pre-Design deliverable stating the end state functional and operational goals.
 - .1 The term “Functional Programming” is only one component of a “Programming” service which may also include technical



- programming, Master Schedules and program requirement cost estimates.
- .2 Functional Programming documentation and supporting templates (e.g. questionnaires, workshops) are included in the GCworkplace documents for office accommodation projects (fit-ups).
- .2 Defines the design problem by determining the details for achieving the goals. Goals may include, but are not limited to, design considerations regarding:
 - .1 Architecture/Interior Design: Area needs, adjacencies, circulation, acoustics, health and safety, personnel forecasts, user characteristics, organizational structure, Budget and costs and project schedule;
 - .2 Engineering: HVAC, plumbing, electrical, security, and communications.
- .3 One of Three Program Levels of effort are use based on complexity and risk:
 - .1 Level 1 Program is used for small, relatively simple or repetitive types of projects where the standard requirements are well understood, includes;
 - .1 A summary of required useable spaces, along with net areas and general notes outlining specific space requirements;
 - .2 The approximate gross useable area required to accommodate the program;
 - .3 A description, in general terms, of the relationships between spaces and groups of spaces, in sufficient detail to commence the Schematic Design Stage;
 - .2 Level 2 Program is used for larger projects with some degree of complexity, includes;
 - .1 A summary of required useable spaces, along with net areas;
 - .2 An outline of specific technical and functional requirements for each space;
 - .3 The approximate gross area required to accommodate the program, determined by developing component diagrams;
 - .4 Relationship diagrams indicating adjacencies and flow patterns between spaces and groups of spaces, and;
 - .3 Level 3 Program is used for major projects and projects with a high degree of complexity, includes;
 - .1 A qualitative (functional) and quantitative (net area and gross area) description of all required spaces;
 - .2 Detailed Program Areas including;
 - .1 Net useable area requirements for each space;
 - .2 Component Gross area requirements for all component groups, and;
 - .3 Gross Area Summary needed to accommodate the program;



- .3 An outline of specific Technical Requirements, indicating general Architectural, Structural, Mechanical, Electrical and Security systems applicable to the entire building and/or to each similar space types;
 - .4 Room / Space Data Sheets, indicating specific requirements for each space type not covered in the technical requirements;
 - .5 Space Concept Plans, associated with each Space Data Sheet, indicating all fixed equipment and any special features;
 - .6 Component (Group or Department) concept planning diagrams indicating required relationships between all spaces in each component group;
 - .7 Component Relationship Diagrams, indicating relationships between all component groups;
 - .8 A Demonstration plan (to scale) to confirm that:
 - .1 Net to gross area ratios are reasonable; and
 - .2 Component group relationships can reasonably be achieved either within the established gross building area for new buildings or within the limitations of the building floor plate(s) for existing buildings.
 - .9 Mechanical Schematic Zoning and Directional Air Flow Diagrams for laboratory projects.
- .4 Program Level selection and the associated level of detail is also determined by the Cx complexity and risk, providing further supporting information to the OPR development.

7.2.34 INTERIM ACCEPTANCE

- .1 Refer to CSA Z320 Article 4.6, Interim Acceptance.
 - .1 Add to Article 4.6 (i) the following requirements:
 - .1 System Operations Manual and Standard Operating Procedures, including;
 - .1 Normal and emergency mode of operations, and;
 - .2 Life and Safety Compliance Report.
 - .2 Interim Acceptance will be synonymous with Substantial Completion as per GC's of the Construction and Consultant Contract.

7.2.35 ISSUES/RESOLUTION (I/R) LOG

- .1 The I/R Log contains description of project issues and/or variances ranging from specifics such as with the Owner Project Requirements (OPRs) to general design and construction and related processes and deliverables.
 - .1 On an ongoing basis the log maintains the status of current/ongoing and resolved issues;
 - .2 Issues are identified and tracked as encountered during all design phases, construction and operations of the facility.
- .2 I/R Log is also included as an item in:
 - .1 The meeting Design and Construction agenda; and
 - .2 The monthly construction phase report on the Cx Plan.



- .3 For more information on what needs to be documented also refer to ASHRAE Guideline, The Commissioning Process.

7.2.36 LIFE CYCLE COSTING (LCC)

- .1 LCC methodology, used during investment analysis and planning, design, construction and procurement, employs a comprehensive economic comparison of competing options.
- .2 Comparison of competing options is to be made between ideas similar in nature that are designed to satisfy the same basic function or set of functions.
- .3 LCC interpretation, as related to competing options assessment.
 - .1 The sum of the present values that are associated with investment costs, capital costs, installation costs, energy costs, operating costs, maintenance costs, and disposal costs, over the lifetime of the project.
 - .4 Refer to industry standard practices for measuring life cycle costs of the building and building systems such as, ASTM Standards.
 - .5 Also refer to Value Engineering (Assessment) Definition.

7.2.37 MASTER SCHEDULE (MASTER PROJECT SCHEDULE)

- .1 Refer to the *Doing Business with PWGSC Documentation and Deliverables Manual*.

7.2.38 MOVE PLAN

- .1 Identifies move tasks, dependencies, and task duration.
- .2 Explores potential move optimization and risk minimization.
- .3 Includes:
 - .1 Phasing, specific timeline/Gantt chart, order and process for relocations, hoteling (office) and final moves;
 - .2 Security protocols for interim and final moves;
 - .3 Drawings showing:
 - .1 All project furniture including new and reused, loose furniture, filing systems, equipment and appliances,
 - .2 Electrical and data services connections to furniture and interconnected panels (separate from electrical construction drawings).
 - .4 Swing space and interim storage requirements.

7.2.39 MOVE PROCESS

- .1 Requires coordination with the User Department's processes and protocols, including:
 - .1 Move specific resources and a Roles and Responsibilities matrix;
 - .2 Move activities and logistics associated with:
 - .1 Pre-Move - supply of boxes, packing, data labeling requirements, etc.
 - .2 Move Day - preventative operational downtime logistics,
 - .3 Post Move - unpacking and walkthroughs, and
 - .4 IT Moves - equipment/infrastructure disconnect/reconnect.



- .3 Meeting Schedule;
- .4 Checklists;
- .5 Occupational Health and Safety as per the Canada Labour Code;
and
- .6 Compliance with the Contractor's site specific safety plan.

7.2.40 OPERATION AND MAINTENANCE MANUAL(S) (O&M)

- .1 Developed throughout the project lifecycle.
- .2 Produced by the Construction Manager/Contractor and is part of the Collaborative Project Delivery integrated process and is supported by the Consultant and Departmental Representative.
- .3 Requires Cx Process Manager sign-off at contract Substantial Performance.
- .4 Prepared using product information report forms/data provided by Subcontractors, Own Forces and information from other sources as required.
- .5 Refer to NMS Division 01 General Requirements document for further detail.

7.2.41 OWNER PROJECT REQUIREMENTS (OPR)

- .1 Refer to CSA Z320 Article 3, Definitions.
 - .1 For further detail refer to ASHRAE 202, Article 6 - Owner's Project Requirements, Article 6.2 – Requirements.
- .2 Developed by the Consultant, in consultation with "the Owner" - PWGSC/User Department, during the Pre-Design Project Milestone.
- .3 Text and graphics are organized to facilitate future use as a building reference document.
 - .1 BOD and OPR are components of the Cx Manual.
- .4 A dynamic document throughout the project lifecycle that defines the Owner's values and end goals; their ideas, concepts and end state quantifiable and measurable performance benchmarks/criteria by usage, by systems and/or by occupancy classification associated with topics such as:
 - .1 Project Program – pertinent Functional (Space) Program extracts, such as;
 - .1 Basic facility data (such as, area, number of stories Occupancy and construction type(s)), user/area usage schedules, restrictions and limitations, expandability, flexibility and durability (life span).
 - .2 Environmental and Sustainability Goals including;
 - .1 LEED® certification, CO₂ monitoring, and resource reuse.
 - .3 Energy Efficiency Goals including;
 - .1 Measures affecting lighting and HVAC energy efficiency such as orientation shading, ventilation and renewable power.
 - .4 Indoor Environmental Quality Requirements regarding;



- .1 Lighting, temperature and humidity, acoustics, air quality, ventilation and filtration, controls adjustability, after hour's accommodations, natural daylighting, ventilation and views.
- .5 Equipment and system Expectations, such as;
 - .1 Levels of quality, reliability, flexibility, maintenance, complexity and target efficiencies, building system technologies regarding manufactures, acoustics, vibration, degree of integration, automation and functionality for controls load shedding and demand and response energy management.
- .6 Building Occupant and O&M Personnel Expectations;
 - .1 Building operation description and by whom and at what capability, level of training and orientation for occupants and O&M staff.
- .7 Cx Process Manager Information;
 - .1 Name of Agency/Firm and contact person(s) and address name, address and personnel contact.
- .5 Starting with the Pre-Design project milestone the OPR is the foundation of the Commissioning Process - an integral part of Commissioning and future Re-Commissioning.
 - .1 Working through the various other Project Milestones is supported by the BOD documenting that the various decisions, concepts, designs, calculations, and product selections to meet the OPR.

7.2.42 PARTNERING SESSION WORKSHOP(S)

- .1 Partnering is used in the architecture, engineering and construction industry and is intended to assist Project Teams with setting goals, resolving disputes and improving project outcomes.
- .2 Workshop(s) are facilitated by the Consultant or designate. Participants include the Owner/User Department, Project Team and other stakeholders. Initial workshops establish relationships and ground rules, and then draw out essential client needs and design requirements.
- .3 Topics include, but are not limited to:
 - .1 Role and responsibilities matrix;
 - .2 Rules of engagement;
 - .3 Communication plan;
 - .4 Project status, goals, objectives, elements, scope, funding, and preliminary schedule;
 - .5 Deliverables plan;
 - .6 Measures of percentage complete and delivered;
 - .7 Issues tracking and documentation systems;
 - .8 Project risks and the initial Risk Management Plan;
 - .9 Review of existing available documentation and project site conditions;
 - .10 Schedule of biweekly (or as otherwise determined by the Departmental Representative) project and milestone meetings; and
 - .11 Communication and document control plan.



7.2.43 PERMITS AND FEES

- .1 Refer to the Contract Documents, General Conditions (GCs).

7.2.44 PRELIMINARY PROJECT DESCRIPTION (PPD/PPDFORMAT™)

- .1 PPDFormat™ is a guideline document published by the Construction Specification Institute (CSI).
 - .1 A tool to evaluate the design practicality during the design phase.
 - .2 The guide assists with an appropriate level of documenting qualitative and quantitative descriptions of “functional elements” – Elements and their respective Elemental Components, systems and assemblies comprising the project during the Schematic Design (SD) and Design Development (DD) Project Milestones.
 - .1 Associated deliverables are integral documents of the SD and DD Reports.
 - .3 PPD is organized using the Uniformat™ hierarchical structure and corresponding Level of Detail (LoD) - levels 1–5.
 - .1 Elemental and Elemental Components LoD breakdowns parallel preliminary project cost estimating formats, providing corresponding quantitative cost estimates per functional element, elemental component and related qualitative descriptions.
 - .2 The Consultant and Departmental Representative are to agree on the LoD based on the required accuracy of the Cost Estimate to secure funding, manage cash flow or address risk.
 - .4 LoD may also be dependent on factors such as:
 - .1 How PPD may be used to throughout the design and documentation process to provide for opportunities, such as;
 - .1 Tracking decision progressions during design options development and final selection of preferred/optimum solution;
 - .2 Function elements complexities, and;
 - .3 Design decisions progression, such as, designing from the exterior into the interior.
 - .2 Preferred delivery format during the SD and DD Project Milestones is the “Outline Format Full Page Example” on page number 25 of the PPDFormat™ Guide.
 - .1 The Outline Format facilitates design progression tracking throughout the design phase Project Milestones.
 - .3 With reference to the “Outline Format Full Page Example” and the outlined Element Levels, the LoD during the SD and DD Project Milestones is as follows:
 - .1 SD, Level 3 detail, complete with a “Description” article providing a generic description of the Level 3 functional element supported by a Basis of Design narrative may also be substantiated by the OPR;
 - .1 Corresponding, per Level 3 detail, Cost Estimate – Class ‘C’, +/- 15%.



- .2 DD, Level 4 detail, complete with a "Description" article providing a generic description of the functional element supported by a Basis of Design narrative may also be substantiated by the OPR;
 - .1 Corresponding, per Level 4 detail, Cost Estimate – Class B, +/- 10%.
- .4 Construction Documents, Level 5 detail:
 - .1 While Levels 1-4 may be defined in PPDFormat™ for Levels 5 and beyond, UniFormat™ 2010 considers these Levels discretionary requiring user definition;
 - .2 Level 5 detail includes, as per "Outline Format Full Page Example", the following articles:
 - .1 Functional Requirements addressing Element overall requisite including;
 - .1 Performance Requirements of the assembly that are quantifiable, measurable and,
 - .2 Design Requirements that, for example, may affect cost or be related to design quality regarding aesthetic, utility, performance or impact, but are not directly component attributes.
 - .2 Components, a parts listing making up the functional element, complete with attributes that are prescriptive and/or performance based;
 - .1 Each Component is accompanied by a corresponding MasterFormat™ Section number to be the basis for Construction Documentation (CD) specifications.
 - .3 Additional outline headings to be considered include;
 - .1 Alternates, for consideration of their effect on cost or schedule,
 - .2 Material/equipment Location Schedules,
 - .3 Workmanship and Fabrication requirements affecting cost,
 - .4 Reports associated with Codes, fire and zoning searches.
 - .3 Corresponding, per Level 5 detail, Cost Estimate – Class 'A', +/- 5%.

7.2.45 PROJECT PROCEDURES PLAN

- .1 A dynamic and evolving Plan to establish how the design, construction and closeout process will be structured to deliver projects on time and within budget and scope.
- .2 A measure against which performance is evaluated and success is judged.
- .3 Includes items such as:
 - .1 Organization and communication charts;
 - .2 Master Project Schedule complete with a detailed Work Breakdown Structure;



- .3 Quality Management Plan, a procedures and documentation plan to determine for example documentation completeness and suitability, testing, inspection and submissions requirements;
- .4 Construction procurement options and /or number and sequence of tender packages;
- .5 Contracting/procurement strategies, bid packaging description, bidders' cost breakdowns;
- .6 Site mobilization;
- .7 Swing space;
- .8 Commissioning Plan;
- .9 Commissioning Issues Log;
- .10 Project Decision Log;
- .11 Risk issues log;
- .12 Record management plan (including e-mails) establishing procedure regarding collection recording, tracking, access and storage.

7.2.46 PROJECT MILESTONES

- .1 Pre-Design (PD)
 - .1 The Consultant Required Service includes activities such as:
 - .1 Analyse the Departmental Representative's information as may be presented at the time of Solicitation and the Project Start-up meeting; and
 - .2 Confirm, that based on the provided information, the Consultant is prepared to proceed with the Design Contract with regards to schedule, Cost Estimate, scope of Work and quality;
 - .1 Prior to proceeding with the design, the Consultant and the Departmental Representative may discuss additional services from the Consultant or Specialty Consultants,
 - .2 The TOR may pre-establish additional services, such as providing,
 - .1 OPR, and,
 - .2 Programming,
 - .3 Pre-Design documentation become the project delivery guiding documents, utilized throughout the project life cycle.
 - .2 Final Deliverable:
 - .1 Pre-Design Report.
 - .3 Progressive Deliverables, such as:
 - .1 OPR;
 - .2 Functional Program; and
 - .3 Response to PWGSC QA reviews.
- .2 Schematic Design (SD)
 - .1 The Consultant Required Service includes activities such as:
 - .1 Based on the project criteria established during PD, facilitate and provide conceptual design related documents, as per the pre-established number of required distinction options, to



- facilitate a decision on the preferred and/or optimum solution to proceed to Design Development;
- .1 Submit the analysis the different design options against the Owner's Project Requirements (OPR) and Functional Program (FP).
 - .2 Provide SD documents such as drawings, reports, and other documentation or media to illustrate general scope, scale and relationships of project components, including;
 - .1 Plan form and massing;
 - .2 Site plan and appearance of the project in relation to orientation, topography, land use and utilities;
 - .3 Preliminary selection of assemblies, systems and load calculations;
 - .4 Approach to structural, mechanical and electrical systems, and
 - .5 Elemental and Elemental Component descriptions and Cost Estimates to PPDFormat™, Uniformat™ respective Levels of Detail as agreed upon with the Departmental Representative for the development the Preliminary Project Description PPD);
 - .1 Preliminary Project Description (PPD/PPDFormat™) – refer to Definition for further detail.
 - .2 Final Deliverable:
 - .1 Schematic Design Report.
 - .3 Progressive Deliverables, such as:
 - .1 Updated BOD and OPR;
 - .2 Cx Plan; and
 - .3 Response to PWGSC QA reviews.
 - .3 Design Development (DD)
 - .1 The Consultant Required Service includes activities such as:
 - .1 Based on the SD design option selected, facilitate and provide documentation to define and describe all aspects of the project, with the purpose that all that remains is the formal Construction Documentation;
 - .2 Resolve any issues/coordination carried over from SD, refine design and coordinate all discipline details and finalize spatial, functional and operational performance requirements to minimize risk of modifications during Construction Documentation;
 - .3 Provide DD documents such as drawings, reports, and other documentation or media to illustrate and define the design concept in terms of, such as;
 - .1 Siting;
 - .2 Plan form and massing;
 - .3 Character and materials;



- .4 Structural, mechanical and electrical systems, and;
- .5 Elemental and Elemental Component descriptions and Cost Estimates to Unifomat™ Level of Detail 4;
 - .1 Refer to Preliminary Project Description (PPD/PPDFormat™) Definition for further detail;
- .6 Preliminary modeling and simulations (such as energy analysis and daylight simulation), and;
- .7 Cx Plan and Cx construction cost including testing procedures and check sheets/forms (as per CAN/CSA Z320) associated with;
 - .1 Static Verification;
 - .2 Start-up, and;
 - .3 Functional Performance Testing.
- .2 Final Deliverable:
 - .1 Design Development Report.
- .3 Progressive Deliverables, such as:
 - .1 Updated BOD and OPR;
 - .2 Cx Plan, and;
 - .3 Response to PWGSC QA reviews.
- .4 Construction Documentation:
 - .1 Refer to *Doing Business with PWGSC Documentation and Deliverables Manual*.
- .5 Tender:
 - .1 The Consultant Required Service includes activities such as;
 - .1 Provide assistance and advisory services as may be necessary to the Departmental Representative in, obtaining a competitive bid and in awarding a construction contract.
 - .2 Deliverables, such as;
 - .1 Addenda;
 - .2 Written responses to questions, and
 - .3 Bid analysis and/or recommendations.
- .6 Construction:
 - .1 The Consultant Required Services includes activities such as;
 - .1 Provide assistance and advisory contract administration services to the Departmental Representative to administer the construction contract as set out in the general conditions of the contract for construction;
 - .1 The Consultant is not an "Agent" of the Crown nor responsible for Contractor's performance.
 - .2 Act as Departmental Representative's professional advisor in interpreting the contract documents;
 - .3 Consult on the Contractor's performance, and;
 - .4 Review the construction.
 - .2 Deliverables;



- .1 Multiple deliverables as per;
 - .1 Consultant's contract general conditions, and;
 - .2 TOR specified Deliverables.
- .7 Close Out:
 - .1 The Consultant Required Service includes activities such as;
 - .1 Provide assistance in the use and occupancy of the facility.
 - .2 Assist and advise Departmental Representative with;
 - .1 The Contractor's performance and guarantees documentation;
 - .2 Prior to the 12 month warranty period, review defects or deficiencies observed by the Departmental Representative;
 - .1 Compile items that require the Contractor's attention to complete the terms of the Contract.
 - .2 Final Deliverable;
 - .1 Year End Warranty Review – defect status.
 - .3 Progressive Deliverables, such as;
 - .1 Lessons learned.

7.2.47 PROJECT TEAM

- .1 Typically includes entities, such as:
 - .1 Departmental Representative,
 - .2 Consultant Team;
 - .3 Independent third parties also in contract with PWGSC, and;
 - .4 User Department and Operational personnel.

7.2.48 PWGSC COMMISSIONING MANAGER (PWGSC Cx MGR)

- .1 Government commissioning liaison amongst all project stakeholders and reports to the Departmental Representative.
- .2 Undertakes Quality Assurance Reviews of Cx submissions.

7.2.49 QUALITY

- .1 The degree to which the Work meets or exceeds the Project requirements and expectations.

7.2.50 QUALITY ASSURANCE (QA) REVIEWS

- .1 PWGSC QA Reviews are an advisory service to the Project Team and stakeholders where respective submission/deliverable accountabilities remain in effect as per contractual conditions or other forms of commitment.
 - .1 The Consultant remains professionally accountable for the design validation and verification required of the Project Milestone submissions during the project life cycle.
- .2 QA Reviews, supported by commentary, conclude with a risk assessment associated with Quality of design and documentation deliverables, and include:
 - .1 Parameters to confirm at the onset of a review whether deliverables are appropriately scoped and detailed with respect to current Project Milestones or phase/progressive submissions.



- .3 QA Reviews focus on Quality Indicators (QI) parameters associated with Design Quality Indicators (DQI) and Quality Deliverable Indicators (QDI).
- .4 Design Quality Indicators (DQI):
 - .1 3 Aspects of DQI:
 - .1 Functionality – design utility;
 - .2 Build Quality – design performance, and;
 - .3 Impact – project contextual interactivity (such as cultural, market, environmental conditions/factors):
 - .1 Project impact on context, and vice versa;
 - .2 Context impact on project.
 - .2 Each DQI Aspect is considered against Good Design Protocols, such as;
 - .1 Creativity and Technical Competence;
 - .2 Functional Suitability;
 - .3 Whole-of-Life Performance;
 - .4 Health, Safety and Security;
 - .5 Inspiring and Attractive;
 - .6 Appropriate Innovation, and;
 - .7 Sustainable and Enduring.
 - .3 As each DQI Aspect is considered against Good Design Protocols, each Aspect is also assessed against the same Characteristics such as:
 - .1 Conceptual Integrity;
 - .2 Functionality;
 - .3 Operability;
 - .4 Constructability, and;
 - .5 Claims Prevention.
- .5 Quality Deliverable Indicators (QDI):
 - .1 Focus on documentation delivery.
 - .1 Submitted documentation is assessed against 6 characteristics:
 - .1 Clarity;
 - .2 Completeness;
 - .3 Compliance;
 - .4 Consistency;
 - .5 Correctness, and;
 - .6 Decision Traceability.

7.2.51 QUALITY MANAGEMENT PLAN

- .1 Quality Management goal is to assure:
 - .1 Design Quality;
 - .1 Confirmation design satisfies the Project Requirements,
 - .2 Complementary design principles,
 - .3 Planning/layout efficiency,



- .4 Accuracy, adequacy, conformance to standards of practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and function as per the TOR.
- .2 Construction Quality;
 - .1 Construction preparation – review schedule and check points,
 - .2 Follow-up of inspection and testing to confirm on-going performance compliance,
 - .3 Final acceptance.
- .3 Management Quality;
 - .1 Management assignments,
 - .1 Managers associated with design, project and construction,
 - .2 Quality process reporting and resolution forums,
 - .3 Decision making protocols.
 - .2 Document control,
 - .3 Risk management program.

7.2.52 RECOMMISSIONING MANUAL

- .1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
- .2 Refer to CSA Z320 Article 4.9.4, Recommissioning manual.

7.2.53 RISK MANAGEMENT PLAN

- .1 Departmental Representative (DR) initiates and maintains a PWGSC RM Program.
- .2 The objective of the Plan is to develop a methodology to improve risk management by:
 - .1 Establishing risk policies to confirm acceptable levels of non-compliance as per DR Risk Management Plan;
 - .2 Focusing on external and internal risk parameters, and;
 - .3 Articulating an approach/framework to identifying risk and its impact in advance and managing the risk with the goal of reducing, transferring or avoiding risk where appropriate.
- .3 Program and Plans are collaboratively monitored and amendments are proposed to the DR by the Project Team as required for an effective project delivery.

7.2.54 STANDARD OPERATING PROCEDURES

- .1 Systems Operations Manual component.
- .2 Procedures are to meet the Canada Labour Code requirement of "every employer" (User Department) by way of "a qualified person to set out, in writing, instructions for operations, inspections, testing, clearing and maintenance" of various components, systems and integrated systems.
 - .1 Updated throughout the building lifecycle for continued safety and consistent Work practices.
 - .2 Capable of being the basis for the development of Departmental policies.
- .3 Includes site specific:



- .1 Equipment, chemicals and other concerns such as life safety compliance, emergency provisions/procedures, security, access, sustainability and the environment.
- .2 Series of flow charts designed to model the actions, activities and network of interconnected activities associated with systems and related operations and maintenance.

7.2.55 STATIC VERIFICATION

- .1 Refer to CSA Z320 Article 4.4.4, Static Verification.
 - .1 Add to Article 4.4.4 the following review requirements:
 - .1 Review select equipment certificated of authenticity (such as, circuit breakers).

7.2.56 SUB-PROJECT

- .1 User Department/Departmental Representative project Work completed by a Departmental Service Provider requiring a coordinated delivery in a main capital Works project, for example:
 - .1 IT Works, Furniture delivery and installation;
- .2 If Work takes place in the same space and time as capital Works then capital Work's health and safety plan governs Sub-Project Work.

7.2.57 SYSTEMS

- .1 Refer to CSA Z320 Article 5, Specific systems.
 - .1 Require confirmation of other systems, such as those that may relate to, for example:
 - .1 Civil Engineering;
 - .1 CSA Z320 currently considers related systems outside the building foot print and therefore not included in the Standard;
 - .2 Sound Masking;
 - .1 As part of CSA Article, 5.1.3.4, Interior Space, Functional Performance Testing;
 - .3 Duct Pressure Tests and Indoor Air Quality (IAQ) Tests;
 - .1 As part of CSA Article, 5.4.3.4, Mechanical Systems, Functional Performance Testing.

7.2.58 SYSTEMS OPERATIONS MANUAL (SYSTEMS DESCRIPTIONS/SYSTEMS MANUAL)

- .1 Developed throughout the project lifecycle.
- .2 Refer to CSA Z320 Article 3, Definitions.
- .3 Extend the CSA Definition to include in emergency conditions as a mode of operation.
- .4 Normally produced by the Construction Manager/Contractor and as part of the Collaborative Project Delivery integrated process with Support by the Consultant and Departmental Representative.
 - .1 Requires Cx Process Manager sign-off at contract Substantial Performance.
- .5 Standard Operating Procedures document is a component of the Systems Operations Manual – see Definition.



7.2.59 UNIFORMAT™

- .1 A uniform, hierarchical classification structure of construction systems and assemblies.
 - .1 Current version – CSI/CSC Uniformat™, 2010 edition.
- .2 UniFormat™ organizational structure also guides the development and delivery of:
 - .1 Cost estimates – refer to Definition for further detail and;
 - .2 PPDFormat™, Preliminary Project Descriptions during the design phase – refer to Definition for further detail.

7.2.60 VALUE ENGINEERING (VE)

- .1 Value Engineering (Assessment) methodology, as related to competing options assessment, emphasizes the return-on-investment aspect of decision making in terms of LCC to maintain or improve the desired levels of capability and performance during planning, design, construction and procurement.
 - .1 When the options satisfy the required function, then the best value option is to be identified by comparing the first costs and life-cycle costs of each alternative.
- .2 Refer to industry standard practices for value methodologies associated with buildings and building systems such as, SAVE and ASTM Standards.
- .3 Also refer to Life-Cycle Costs definition.

7.2.61 WORK

- .1 Refer to Contract Documents: General Conditions (GCs).

7.2.62 WORK BREAKDOWN STRUCTURE (WBS)

- .1 Integral to schedules and project execution plans.

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