

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

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Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work within this Contract requires a proven design build contractor to design, fabricate and install floats, shore access ramps, grillage foundations and mooring booms as shown on the plans to provide a new three dock system for float planes that can be disassembled to be beached for ice conditions and re-launched for ice free conditions. A geotechnical site evaluation has taken place to develop recommendations for the buried grillage anchor system and a hydrotechnical evaluation has taken place to develop the load requirements for this system to withstand.
 - .2 The specific items included in this contract are the following:
 - .1 Design, supply and install floats to meet the following requirements;
 - .1 deck loading of 1 kPa (21 psf);
 - .2 floats to have a freeboard of 350 mm along the berth face for the planes to berth against;
 - .3 floats to have rubber tires on the berth faces only;
 - .4 floats to have deck framing made from structural aluminum to allow segments to be efficiently dis-assembled into weights of 454 kilograms (1,000 pounds) so that the framing acts as a spreader bar for helicopter hoisting to beach and launch each year;
 - .5 structural aluminum float frames to have tie connection points for helicopter hoisting;
 - .6 decking to be light weight and non-slip;
 - .7 aluminum cleats for tie up and pedestrian edge warning safety on the floats.
 - .2 Design, supply and install access ramps that shall be made from structural aluminum to meet the following;
 - .1 deck loading of 1 kPa and loadings from the mooring boom including moments and torsion for a proper ramp design so it may act as a stiff leg and ramp;
 - .2 no guard rails or above walkway obstructions;
 - .3 aluminum articulating transfer plates at each end;
 - .4 floatation tanks only at the float plane dock end to permit floating the ramp upon disconnection to allow tag line pulling the ramp to shore;
 - .5 The ramps may have to have bolted connections for transportable lengths and are to be designed for efficient annual re-installation and removal;
 - .6 the ramp shall have hinge type connections using the style shown on these drawings to permit articulation required and must be designed using the design forces shown on the mooring booms and structurally analyzed to design all ramp and grillage supports and float hinges to permit horizontal swing up to 200 mm to accommodate the 3.0 metre water level drop on the floats;
 - .7 decking to be non-slip and not hold water.
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- .3 Design, supply and install the mooring boom line and on-shore anchor grillages as described below and on the drawings and in the technical specifications;
 - .1 chain, shackles, chain links;
 - .2 high density polyethylene pipe with expanded polystyrene foam inside the pipe to float the chain;
 - .3 bolt on steel flanges and the high density polyethylene flanges fused to the pipe;
- .4 Design the chain and hardware and connections to the floats and grillage steel as the design shown is a suggested configuration only;
- .5 Design, supply and install the ramp abutment padeyes;
- .6 Design the grillage anchor steel framing based on a structural analysis of the boom, float, ramp and grillage system with required articulation;
- .3 Work to be carried out includes all labour, material, transport and equipment to design, supply, fabricate and install as required in the contract documents

1.2 WORK BY OTHERS

- .1 Co-ordinate work with that of Parks Canada (PC) crews.

1.3 WORK SEQUENCE

- .1 Co-ordinate Progress Schedule and co-ordinate with PC during construction.

1.4 CONTRACTOR RESPONSIBILITIES

- .1 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to PC Representative notifications of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Receive and unload products at the contractor's facility for off site fabrication and assembly for transport to site.
 - .4 Provide transportation to and from site and all loading and unloading of materials logistics.
 - .5 Provide food, lodging, and cooking facilities for own workers for the duration of the project; PC will provide camp sites, food storage and outhouses.
 - .6 Inspect deliveries jointly with PC; record shortages, and damaged or defective items.
 - .7 Handle all products at the contractor's facility including uncrating and storage in preparation for transport to site.
 - .8 Protect products from damage, and from exposure to elements.
 - .9 Assemble, install, connect, adjust, and finish products.
 - .10 Provide installation inspections required by public authorities.
 - .11 Repair or replace items damaged by Contractor or subcontractor at the contractor's facility or at site.

- .12 Provide food, lodging, and cooking facilities for own workforce while on site for the duration of the project; camp sites, food storage, and outhouses are available on site.

1.5 PROJECT MEETINGS

- .1 Meet with the PC representative every two weeks prior to transportation to site and cooperate with PC site crew on work activities so PC crew will be trained in dis-assembly and re-assembly for beaching and launching annually of docking system.
- .2 The Contractor will arrange project meetings both off site and on site, and will assume responsibility for setting meeting times.

1.6 INSPECTION AND ACCEPTANCE

- .1 At his discretion, PC may inspect materials and products at any stage of manufacture, transportation, and assembly. Satisfactory inspection at any stage does not preclude future rejection if the materials or products are subsequently found to lack uniformity or fail to conform to the specified requirements.
- .2 Additional costs incurred by PC that result from unsatisfactory materials or workmanship will be charged to the Contractor.

1.7 GENERAL INSTRUCTIONS

- .1 The Contractor shall obey all navigation regulations and conduct operations to not interfere with PC Operations on site.
- .2 The Contractor shall take special care to ensure his work is not damaged during construction and transportation.
- .3 The Contractor shall handle all materials appropriately to prevent their damage. The Contractor will be responsible for correcting any damage due to his mishandling at his own expense.
- .4 The Contractor shall submit design details and written work procedures to PC Representative for his approval prior to performance of the work. The written procedures shall be supplemented with diagrams so that the methods of the Contractor's project work are clear.
- .5 Any reference information provided by PC has been provided solely for the Contractor's convenience. PC makes no representations or warranties for the accuracy of any of the information provided.

1.8 DOCUMENTS REQUIRED

- .1 Maintain at the contractor's facility, one copy each document as follows:
 - .1 Contract documents and specifications;
 - .2 Contract Drawings
 - .3 Addenda to Contract documents;
 - .4 Change Orders;
 - .5 Reviewed shop drawings, product data, and samples;

- .6 Field test records;
- .7 Inspection certificates;
- .8 Manufacturer's certificates
- .9 Other modifications to Contract;
- .10 Copy of approved Construction Schedule;
- .11 Health and Safety Plan and Other Safety Related Documents;
- .12 Other documents as specified in this Contract.
- .2 Store record documents and samples in the contractor's office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label each record document as "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents and samples available for inspection by PC.

Part 2 Products (not applicable to this section)

Part 3 Execution (not applicable to this section)

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

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

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 For erection drawings and components of the work for which the Contractor assumes design responsibility, submit drawings stamped and signed by professional engineer registered or licensed in Northwest Territories.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

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

- .11 Submit 1 digital copy of product data sheets or brochures for requirements requested in specification Sections and as requested by PC Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 1 digital copy of test reports for requirements requested in specification Sections and as requested by PC Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accordance with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit 1 digital copy of certificates for requirements requested in specification Sections and as requested by PC Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit 1 digital copy of manufacturer's instructions for requirements requested in specification Sections and as requested by PC Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit 1 digital copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by PC Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit 1 digital copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by PC Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by PC Representative, no errors or omissions are discovered or if only minor corrections are made, fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.3 SAMPLES

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

1.4 MOCK-UPS

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

1.5 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement and as directed by PC Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints:
 - .1 Viewpoints and their location as determined by PC Representative.
- .4 Frequency of photographic documentation: weekly or as otherwise directed by PC Representative.

1.6 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

END OF SECTION

PART 1 GENERAL

1.1 SUBMITTALS

- .1** Submit to Parks Canada (PC) Representative copies of following documents, including updates issued:
 - .1** Health and Safety Program as described in paragraph 1.9 further in this section prior to commencement of work on the work site.
 - .2** Site Specific Safety Plan for while working on site including emergency response and communication plans.
 - .3** Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
 - .4** Accident or Incident Reports, within 24 hrs of occurrence while on PC property.
- .2** Submit other data, information and documentation upon request by PC Representative as stipulated elsewhere in this section.

1.2 COMPLIANCE REQUIREMENTS

- .1** Comply with the latest edition of the Northwest Territories Workers' Compensation Act and the Northwest Territories Occupational Health and Safety Regulations.
 - .1** The Contractor will be acting as "Prime Contractor" for this Contract and will certify this agreement in writing with PC Representative.
 - .2** Observe and enforce construction safety measures required by following:
 - .2** Municipal statutes and ordinances related to Work of Contract Documents.
 - .3** In event of conflict between any provisions of above authorities the most stringent provision will apply.
 - .1** Provide and maintain Workers' Safety and Compensation Commission coverage for all employees for the duration of the contract. Prior to commencement of the work, at the time of Interim Completion and prior to final payment, provide to PC Representative a certificate of Clearance from the Workers' Safety and Compensation Commission indicating that Contractor's account is in good standing.
 - .4** Should the Contractor be a sole proprietor, provide documented proof in a form acceptable to PC Representative, of an alternative means of personal coverage that meets or exceeds the requirements set out above for Workers' Safety and Compensation Commission coverage.
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1.3 RESPONSIBILITY

- .1** Contractor is responsible for safety of persons and property at off-site workplace and for protection of federal employees and the general public circulating adjacent to Work on PC property to extent that they may be affected by conduct of Work.
- .2** Contractor is responsible for all health and safety precautions associated with food logistics for own work force camp for the duration of the project.
- .3** Contractor to enforce compliance by workers and other persons granted access to off-site workplace and to PC property work site with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with the Contractor's Health and Safety Program.
- .4** Should an unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify the situation and prevent damage or harm. Advise PC Representative verbally and in writing of hazard or condition while on PC property.

1.4 SITE CONTROL AND ACCESS

- .1** Control access points to Work activities. Delineate and isolate Work from adjacent and surrounding areas by use of appropriate means to maintain control of all Work access points.
- .2** Make provisions for granting permission to access Work to all persons who require access. Procedures for granting permission to access are to be in accordance with Northwest Territories Workers' Compensation Act, Occupational Health and Safety Act, Regulations and the Contractor's Health and Safety Program.
- .3** Ensure that persons granted access to Work are in possession of and wear the minimum personal protective equipment (PPE) designated by Contractor's Health and Safety Program. Ensure that persons granted access to Work are provided with, trained in the use of and wear, appropriate PPE that are required above and beyond the designated minimums previously noted and as specifically related to work activity that they are involved in. Be responsible for the efficacy of the PPE that is provided above and beyond the designated minimums
- .4** Erect signage at Work access points and at other strategic locations around that clearly identify work areas as being "off-limits" to non-authorized persons. Signage must be professionally made with well understood graphic symbols and is not to be used as advertising but for the specific use as related to site safety and key contact information.
 - .1** Information to be provided on PC property work signage is as follows:

Project Name/Description:
Contractor Company Name:
Project Superintendent's Name/Phone No.
PC Point of Contact Name/Phone No.:

1.5 FILING OF NOTICE

- .1** File Notice of Project and any other required Notices with Provincial/Territorial Authorities prior to commencement of Work. Provide PC Representative with copy of filed Notice(s) prior to commencement of Work.

1.6 PERMITS

- .1** Obtain permits, licenses and compliance certificates at appropriate times and frequencies as required by authorities having jurisdiction.
- .2** Post all permits, licenses and compliance certificates on work sites and provide copies to PC Representative.

1.7 EXISTING CONDITIONS

- .1** Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include their tender price all work associated in working with, in and around the hazards.
 - .1** There are no known hazardous substances or conditions.
- .2** Do not construe above list as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during course of Work. Include above items in the hazard assessment program specified herein.

1.8 MEETINGS

- .1** Prior to commencement of work attend a pre-commencement meeting conducted by PC Representative. Ensure as a minimum attendance by Contractor's site superintendent and designated site health and safety representative. PC Representative will advise of time, date and location of meeting and will be responsible for recording and distributing minutes.
- .2** Conduct site specific occupational health and safety meetings as required by the Northwest Territories Workers' Compensation Act and Northwest Territories Occupational Health and Safety Regulations.
- .3** Record and post minutes of all meetings in plain view on the work site. Make copies available to PC Representative upon request

1.9 HEALTH AND SAFETY PROGRAM

- .1** Contractors are required under Northwest Territories Workers' Compensation Act and Occupational Health and Safety Regulations to have in place a Health and Safety Program. Compliance requirements for the content, detail and implementation of the program
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~~resides with the provincial/territorial authority. For the purpose of this contract the Health and Safety Program will include a work-specific Health and Safety Plan that acknowledges, assesses and addresses the hazardous substances and/or hazardous conditions known and identified in paragraph 7 Existing Conditions above and on-going~~

hazard assessments performed during the progress of Work identifying and documenting new or potential health risks and safety hazards not previously known and identified.

- .2 Provide one copy of the Health and Safety Program to PC Representative prior to commencement of Work. The copy provided to PC Representative is for the purpose of review against the contract requirements related to the known hazardous substances and/or hazardous conditions. The review is not to be construed to imply approval by PC Representative that the program is complete, accurate and legislatively compliant with the Northwest Territories Workers' Compensation Act and Occupational Health and Safety Regulations, and will not relieve Contractor of their legal obligations under such legislation.

1.10 ACCIDENT REPORTING

- .1 Investigate and report incidents and accidents as required by Northwest Territories Workers' Compensation Act and Occupational Health and Safety Regulations.
- .2 For the purpose of this contract immediately investigate and provide a report to PC Representative on incidents and accidents occurring on PC property that involve:
 - .1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
 - .2 Exposure to toxic chemicals or substances.
 - .3 Property damage.
 - .4 Interruption to adjacent and/or integral services and facility operations with potential loss implications.
- .3 In the investigation and reporting of incidents and accidents, the Contractor is required to respond in a timely fashion to correct the action that was deemed to have caused the incident and/or accident and advise in writing on the action taken to prevent a re-occurrence of the incident and/or accident

1.11 RECORDS ON SITE

- .1 Maintain on PC property and at off-site workplace a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from authorities having jurisdiction.
 - .2 Upon request, make copies available to PC Representative.
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PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 PRECEDENCE

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 MEASUREMENTS PROCEDURES

- .1 Preparation and implementation of an Environmental Protection Plan (EPP) in accordance with this Section 01 35 43 - Environmental Procedures will not be measured separately for payment will be considered incidental to the work.

1.4 NATIONAL PARK REGULATIONS

- .1 The Contractor shall ensure all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 The Contractor and any sub-contractors shall obtain a business license from the Parks Canada Administration Office in Fort Simpson, prior to commencement of the contract.

1.5 MACKENZIE VALLEY RESOURCE MANAGEMENT ACT

- .1 Execution of the work is subject to the provisions within the Mackenzie Valley Resource Management Act (MVRMA) and subsequent amendments. The Nailicho - Virginia Falls Float Plane Replacement Project has been subject to a Preliminary Screening - "Nailicho Rehabilitation Nahanni NPR August 23, 2017 for the Nailicho Virginia Falls Float Plan site", pursuant to the expectations of the MVRMA. Environmental Protection Plans are the next step to achieve the desired end results of minimal adverse environmental effect as the project is constructed.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of the problems.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

- .3 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .5 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Descriptions of environmental protection personnel training program.
 - .3 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan.
 - .4 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .5 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .6 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
 - .7 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Territorial, and Municipal laws and regulations for storage and handling of these materials.
 - .8 Waste Water Management Plan identifying methods and procedures for management.
 - .9 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

1.7 START-UP AND ENVIRONMENTAL BRIEFING

- .1 All staff employed at the construction site will be subject to a briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impact does not arise from their activities and personal choices. Employees must attend this briefing before beginning their work at the site. It is recognized new employees may join the Contractor's workforce after the initial round of "environmental briefing". In that case and as required, subsequent "environmental briefings" can be presented as numbers warrant, by arrangement with the Environmental Surveillance Officer (ESO) through the Departmental Representative. Also, some sub-trades may be present at the site for a short time, to perform once-only duties. In these cases, the "environmental briefing" will be replaced by the Contractor explaining the environmental sensitivity at the work location to the sub-trade worker(s), and reviewing highlights of personal conduct expected, with reference to a one-page briefing summary to be provided

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to the Contractor by the ESO. A copy of this summary will be provided to each sub-trade worker joining the workforce at the site.

- .2 Parks Canada may have an ESO or Departmental Representative attending the site to monitor the construction activity for conformance with the EPP. The ESO or alternate designated Parks Canada staff member will present the "environmental briefing". The ESO's main duties are to monitor the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through the Departmental Representative, in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of the Departmental Representative.

1.8 CONSTRUCTION SITE ACCESS

- .1 Access to the construction site will be by float plane to Nailicho Virginia Falls. Materials could be heli-slung on site. The Contractor shall review construction access requirements with the Departmental Representative. In consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work site.
- .2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by construction activities and shall instruct workers that the "footprint" of the project is kept within defined boundaries.

1.9 SITE MANAGEMENT

- .1 The Contractor is to prepare an EPP which details how the work limits shall be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative and the ESO.
- .2 The Contractor shall control blowing dust and debris generated from the construction site by means such as covering or wetting down materials and rubbish. The work site will be maintained in a clean and tidy condition, free from the accumulation of waste materials, debris and other litter.
- .3 Pets shall not be brought to or maintained at the construction site.
- .4 Work will be conducted during the period of 8:00- 18:00 to avoid excessive noise disturbance to wildlife and the visiting public.
- .5 Leave no trace principles will be followed.

1.10 FIRES, FIRE PREVENTION AND CONTROL

- .1 Fires and burning of rubbish on site are not permitted.
- .2 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented.

- .3 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental representative shall be notified of any fire immediately. If not available, the Duty Officer shall be contacted at (867) 695 3732.

1.11 EROSION CONTROL

- .1 Develop and submit Erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan and the EPP.
- .2 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired. The Departmental Representative and ESO also will monitor erosion control and performance.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 Backfill material will be stored and contained in an area already disturbed and will be covered to prevent erosion.

1.12 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

- .1 The Contractor shall ensure that all fluid leaks, soil and any debris attached to the construction equipment to be used on the project site shall be removed (e.g. power washing) outside Nahanni National Park Reserve before delivery to the work site.
- .2 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Fuelling sites will be located behind the work site, not between the work site and the Nahanni River. Refueling will be done carefully to avoid spillage. Machinery operation adjacent to the Nahanni River will require spill protection, and will not operate within the fishery window.
- .3 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of anywhere within Nahanni National Park Reserve.
- .4 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.
- .5 Fuel containers and lubricant products shall be stored only in secure locations specified by the Departmental Representative. Fuel containers or other potentially deleterious substance containers shall be secured

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to ensure they are tamperproof.

- .6 Should water pumps be required during excavation, outlet pipes will be directed into the vegetation on shore, pointed away from the Nahanni River and any drainage areas flowing into the Nahanni River.

1.13 OPERATION OF EQUIPMENT

- .1 Machinery will be operated on land only.
- .2 Equipment movements shall be restricted to the "footprint" of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over rivers or other water bodies, nor damage aquatic and riparian habitat or plant communities. Some construction shall require working close to watercourses or water bodies. In these instances, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and ESO. Work near the river will be conducted such that materials such as gasoline do not enter the river.
- .3 The Contractor shall instruct workers to prevent pushing, placement, leveling, storage or stockpiling of any materials in the trees bordering the right of way or into watercourses or water bodies.
- .4 When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and ESO.
- .5 Construction equipment will not be cleaned in any watercourse.

1.14 WILDLIFE

- .1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns. This briefing will include a bear-safety orientation and procedures.
- .2 If necessary, the construction activity may be scheduled around important wildlife windows. Specific windows involve fish. The Departmental Representative will advise if any apply.
- .3 Workers will carry bear-spray on the trail and at the work site and

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will watch for bird nests or and chicks so as not to step on them.

- .4 A respectful distance will be maintained from all large mammals: minimum 30m for ungulates and 100m for bears.
- .5 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Such encounters are to be immediately reported to the Duty Officer (867 695 3732). Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times (i.e. must be stored in bear-proof canisters). Cooking will not be permitted at the work site.
- .6 Notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses, bear activity or encounters on or around the site or crew accommodation (within 250m). Other wildlife related encounters are to be reported within 24 hours. If either the ESO or Departmental Representative are not available, NNPR Duty Officer will be contacted at (867) 695 3732.
- .7 The feeding, harassment or destruction of wildlife will be strictly prohibited and will be grounds for employee dismissal from the work.

1.15 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Hazardous or toxic products shall be stored no closer than 100 metres from the Nahanni River.
- .3 A Spill Response Plan will be prepared as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative and the ESO and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
- .4 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and territorial legislation.
- .5 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for on-site work by methods that are approved by

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the Departmental Representative or ESO.

- .6 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- .7 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. If not available, NNPR Duty Officer will be contacted at 867 695 3732.
- .8 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .9 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill condition), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

1.16 HISTORICAL/ ARCHAEOLOGICAL CONTROL

- .1 Artifacts, relics, antiquities and items of historical interest found on the work site shall be left undisturbed and reported to the ESO or Departmental Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.
- .2 All historical or archaeological objects found in Nahanni National Park Reserve are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Departmental Representative.

1.17 WASTE MATERIALS STORAGE AND REMOVAL

- .1 The Contractor and workers shall dispose of hazardous wastes in conformance with the Canadian Environmental Protection Act.
- .2 All wastes originating from construction, trade, hazardous and domestic source, shall not be mixed, but will be kept separate.
- .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried, or discarded at the construction site or elsewhere in Nahanni National Park Reserve. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site or recycler located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have lids, and waste loads shall be covered while being transported.

- .4 A concerted effort shall be made by the Contractor and Workers to reduce, reuse, and recycle materials.
- .5 All efforts to prevent wildlife from obtaining food, garbage, or other domestic wastes shall be made by the Contractor and contract staff while undertaking their work in Nahanni National Park Reserve. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily storage of food scraps, food wrappers, pop cans or other attractive products in bear proof containers is mandatory. Storage of food and domestic wastes (including work site waste) on the food cache at Nahanni River will be required. It is incumbent on the Contractor to have all domestic wastes removed from the park.
- .6 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or the Departmental Representative. If neither can be reached, the Contractor/worker shall immediately contact NNPR Duty Officer (867) 695 3732 and report the details.
- .7 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

3 EXECUTION

3.1 CLEARING AND GRUBBING

Clearing is not expected, but if it is required for placement of the north shore anchor, the following considerations will be met.

- .1 The Contractor shall ensure that the substrate of riparian area of streams, rivers or watercourses, whether open water or frozen over shall not be disturbed by tracked, wheeled, or self-propelled equipment. The ESO or Departmental Representative will provide direction in the case of work occurring near any wetland area or watercourses.
- .2 The Contractor shall take all measures to ensure trees do not fall into streams, rivers, wetlands or water bodies or outside the clearing limits as marked by coloured flagging. Generally, work within a 30 meter buffer of watercourses, water bodies or wetlands requires the close oversight of the ESO or the Departmental Representative.
- .3 Trees inadvertently felled into streams, rivers, watercourses or outside the clearing limits shall be removed by means so as to not

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damage the substrate or any standing trees left outside the clearing limits. Machinery shall not go outside the clearing limits, or into streams, rivers, watercourses or water bodies to remove felled trees.

- .4 Logs and other salvage materials are to be conveyed to and placed in the storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways, or water bodies. Felled trees will either remain on site for future use, and bucked, as directed by the Departmental Representative.
- .5 During the grubbing component, stumps, roots, embedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before being chopped up and distributed in the vegetation.
- .6 Topsoil removed for excavation at the anchor sites will be used to rehabilitate the grillage.
- .7 Existing areas or vegetation disturbed as a result of this contract shall be rehabilitated using approved topsoil from the park and a native grass seed mix as specified by the Departmental Representative or the ESO.
- .8 Any vegetation debris will be scattered flush to the ground out of sight in surrounding vegetation at least 5m from the trail and will be sufficiently scattered to avoid accumulations exceeding 5cm in depth.
- .9 Consideration will be given to ensure vegetation debris does not increase fire risks.

3.2 STRIPPING

- .1 A contingency plan for control of dust generated from the construction site shall be prepared, with materials availability arranged in the event of their need. In the event of a work program shutdown during inclement weather, erosion control of bared soils or excavated materials stockpiles will be required. The Contractor's EPP will describe measures to be implemented in such circumstance.
- .2 Stripping close to any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, fall or are eroded into the water or wetlands. Generally, work within a 30 meter buffer of waterways or wetlands require the close oversight of the ESO and the Departmental Representative.
- .3 No stripping shall occur outside of the designated area or within 1 meter of the drip line of existing forest.
- .4 Stripped soil materials shall be placed and stored at locations and in amounts and form as instructed by the Departmental Representative, for later reclamation use on graded slopes. Stripping piles may require erosion control, sedimentation protection or stabilization, depending on the location and anticipated duration of storage. At the Departmental Representatives direction, the Contractor shall prepare a plan for management of each stripping pile.

3.3 EXCAVATION AND PLACEMENT

- .1 Excavation will be undertaken to the construction drawings.
- .2 All sediment control measures shall be implemented by the Contractor prior to the commencement of work in the vicinity of any water bodies, watercourses or wetlands.
- .3 If a pump-out sump to dewater excavations will be required, the Contractor is to prepare an EPP which details how the dewatering shall be undertaken, to the satisfaction of the Departmental Representative and the ESO. Water containing suspended materials shall not be pumped into watercourses, drainage system or on to land, except with the permission of the Departmental Representative and ESO.

3.4 SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION

- .1 The Contractor shall prepare an Erosion and Sedimentation Management Plan for the components of the contract that are undertaken in proximity to watercourses, wetlands, or riparian environments. This plan shall be to the satisfaction of the Departmental Representative and ESO.
- .2 An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly, there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or hydraulic conditions.
- .3 Excavation at anchor and borrow sites will not exceed a 2m diameter or 1m depth and no holes or craters will be created. Natural contours of borrow sites will be maintained or returned to normal when work is completed.
- .4 Duff, topsoil and vegetation removed from the anchor sites will be used to rehabilitate the sites and grillage.
- .5 Backfill materials will not be sourced from river banks to prevent destabilization of the bank.

3.5 SPECIFIC CONCERNS RELATED TO FISH

- .1 In-stream works are not required and natural woody debris, rocks, sand or other materials will not be removed from the banks or shoreline of the Nahanni River below the ordinary high water mark.
- .2 Backfill material in addition to that excavated from anchor sites will be preferentially collected from the gravel bars and banks of inactive river channels to prevent impacts to fish and their habitat. The ESO or Departmental Representative will provide locations to the Contractor. Timing windows for fish species may apply in the event that backfill

needs to be sourced from dry gravel beds below the high water mark (July 16 - August 14).

- .3 Work will be scheduled to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- .4 Approaches to the Nahanni River will perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- .5 No rock, silt, sand, petroleum product, lumber, vegetation, debris, domestic waste, or any deleterious substance will be placed or dispersed into any water course or standing waterbody.
- .6 Construction equipment will not be cleaned in any watercourse.
- .7 Clearing of riparian vegetation will be avoided and no effect to shoreline vegetation is expected: existing trails and cleared areas will be used.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with requirements of Regulatory Authorities having jurisdiction and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
- .3 Perform Work in accordance with federal and provincial codes or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .4 Meet or exceed requirements of: Permits that have been obtained by Parks Canada (PC) and the Specifications. All other Project Permits are the sole responsibility of the Contractor to obtain prior to the start of the work to which the Project Permit applies.
- .5 Contractor is responsible for all Project Permits, with the exception of those provided as part of the Tender package by PC.
- .6 Obtain and pay for any additional permits, certificates, licenses, and other approvals that have not been provided by the PC Representative and that are required by the Laws and Regulations, and commercial facilities to be used to complete the work.
- .7 Documentation including traffic management plans, maps showing all routes, and Project Permits of approved trucking routes to and from the Contractor's Off-site Offload Facility and the Wastewater Treatment and Disposal Facility, Treatment Facility(ies) (if treatment is proposed), Disposal Facility(ies), Hazardous Waste Management Facility(ies), recycling or re-use facility, or any other authorized facility where materials are transported.
- .8 Contractor is responsible for preparing and signing all manifests and obtaining all approvals and Project Permits for the transportation of all materials.
- .9 Contractor must provide copies of permits, approvals, manifests and any other relevant documentation to PC Representative for review and record.

1.2 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.

Part 2 Part 2 Products

2.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 INSPECTION

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

1.2 INDEPENDENT INSPECTION AGENCIES

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

1.3 ACCESS TO WORK

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

1.4 PROCEDURES

- .1 Notify PC Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REJECTED WORK

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

1.6 REPORTS

- .1 Submit one (1) copy of inspection and test reports to PC Representative.
- .2 Provide copies to manufacturer or fabricator of material being inspected or tested.

1.7 TESTS AND MIX DESIGNS

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

1.8 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to PC Representative as specified in specific Section.
- .3 Prepare mock-ups for PC Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, PC Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to PC Representative.
- .7 Mock-ups may remain as part of Work.
- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 MILL TESTS

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

1.10 EQUIPMENT AND SYSTEMS

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

Part 2 Products (Not applicable to this section)

Part 3 Execution (not applicable to this section)

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Parks Canada (PC) Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction Waste Management and Disposal.
- .6 Dispose of waste materials and debris at designated dumping areas on Crown property off site.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8 Provide adequate ventilation during use of volatile or noxious substances.
- .9 Use only cleaning materials recommended by manufacturer on surface to be cleaned, and as recommended by cleaning material manufacturer.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not contaminate new or existing facilities.

1.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by PC Representative. Do not burn waste materials on site.

- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Remove stains, spots, marks and dirt from electrical and mechanical fixtures.
- .8 Clean lighting reflectors, lenses, and other lighting surfaces.
- .9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .10 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .11 Remove dirt and other disfiguration from exterior surfaces.
- .12 Sweep and wash clean paved/deck areas.
- .13 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

Part 2 Products (not applicable to this section)

Part 3 Execution (not applicable to this section)

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Parks Canada (PC) Representative to review and discuss Waste Management Plan and Goals.
- .2 Provide PC Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Inert Fill: inert waste - exclusively asphalt and concrete.
- .3 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .4 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from project, before demolition stage, for reuse on current project.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .9 Separate Condition: refers to waste sorted into individual types.
- .10 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .11 Waste Audit (WA): detailed inventory of materials. Involves quantifying by volume/weight amounts of materials and wastes generated during demolition and construction. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

- .12 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related submittal and reporting requirements.
- .13 Waste Reduction Work plan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.3 DOCUMENTS

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

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
 - .1 Submit two (2) copies of completed Waste Audit (WA): Schedule A.
 - .2 Submit two (2) copies of completed Waste Reduction Work plan (WRW): Schedule B.
 - .3 Submit two (2) copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project.
 - .1 Failure to submit could result in hold back of final payment.
 - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
 - .3 For each material reused, sold or recycled from project, include amount in tonnes, quantities by number, type and size of items and the destination.
 - .4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

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

1.6 WASTE REDUCTION WORKPLAN(WRW)

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

1.7 MATERIALS SOURCE SEPARATION PROGRAM(MSSP)

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

1.8 STORAGE, HANDLING AND PROTECTION

- .1 Store materials to be reused, recycled and salvaged in locations as directed by PC Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Support affected structures. If safety of building is endangered, cease operations and immediately notify PC Representative.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

1.9 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste into waterways, storm, or sanitary sewers.
- .3 All waste material to be flown out and disposed of in an appropriate waste facility at the end of the project.
- .4 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .5 Remove materials from the work site as deconstruction/disassembly Work progresses.
- .6 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-construction material audit.

1.10 USE OF SITE AND FACILITIES

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

- .2 Maintain security measures established by existing facility. Provide temporary security measures approved by PC Representative.

1.11 SCHEDULING

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

Part 2 Products

2.1 APPLICATION

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

2.2 CLEANING

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

2.3 WASTE AUDIT (WA)

- .1 Schedule A - Waste Audit (WA):

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

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quan tity of Waste (unit)	(5) Generation Point	(6) % Recycle d	(7) % Reused
Metal						
Other						

2.4 WASTE REDUCTION WORKPLAN(WRW)

.1 Schedule B:

(1) Material Category	(2) Person(s) Respon- sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destination
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic Packaging							
Card- board Packaging							
Other							
Doors and Windows Material Description							
Painted Frames							
Glass							
Wood							
Metal							
Other							

2.5 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Northwest Territories			

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Parks Canada (PC) Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request PC Representative inspection.
 - .2 PC Representative Inspection:
 - .1 PC Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted and fully operational.
 - .4 Operation of systems: demonstrated to Owner's personnel.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by PC Representative, and Contractor.
 - .2 When Work incomplete according to PC Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when PC Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Provide transportation plan of the dock components to project site to PC Representative for review after deficiencies and defects have been corrected to the satisfaction of the PC Representative.
 - .7 Complete the delivery of the dock components to project site whereupon PC will carry out an acceptance inspection to take possession of the dock structure.
 - .8 Commencement of Warranty Period: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period.
 - .9 Final Payment:
 - .1 When PC Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .2 When Work deemed incomplete by PC Representative, complete outstanding items and request re-inspection.

- .10 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

Part 2 Products (Not Applicable to this Section)

Part 3 Execution (Not Applicable to this Section)

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Environmental Protection Act (CEPA)

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one (1) week prior to contract completion with Contractor's representative and Parks Canada (PC) Representative, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review manufacturer's installation and operation instructions and warranty requirements.
 - .2 PC Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two (2) weeks prior to Substantial Performance of the Work, submit to the PC Representative, four (1) final copies of operating and maintenance manuals.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

1.4 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.

- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content under Section numbers and sequence of Table of Contents. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .8 The full binder content shall also be provided on a disk (CD or DVD) and each binder copy to include a disk.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume provide:
 - .1 Title of project;
 - .2 Date of submission;
 - .3 Address and telephone number of Contractor with name of responsible party;
 - .4 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.6 AS-BUILT DOCUMENTS AND SAMPLES

- .1 In addition to requirements in General Conditions, maintain at site for PC Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.

- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by PC Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of blue line opaque drawings.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundations in relation to established project datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

- .7 Provide digital photos, for site records.

1.8 MATERIALS AND FINISHES

- .1 Applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.9 MAINTENANCE MATERIALS

- .1 Spare Parts:
- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed by PC Representative; place and store.
- .4 Receive and catalogue items.
- .1 Submit inventory listing to PC Representative.
- .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed by PC Representative; place and store.
- .4 Receive and catalogue items.
- .1 Submit inventory listing to PC Representative.
- .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 Special Tools:
- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue items.
- .1 Submit inventory listing to PC Representative.
- .2 Include approved listings in Maintenance Manual.

1.10 DELIVERY, STORAGE AND HANDLING

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Remove and replace damaged products at own expense and for review by PC Representative.

1.11 WARRANTIES

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, thirty (30) days before planned pre-warranty conference, to PC Representative for approval.
- .3 Warranty management plan to include required actions and documents to assure that PC Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to PC Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint four (4) month and nine (9) month warranty inspection, measured from time of acceptance, by PC Representative.

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

1.12 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by PC Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

- .1 Type of product/material.
- .2 Model number.
- .3 Serial number.
- .4 Contract number.
- .5 Warranty period.
- .6 Inspector's signature.
- .7 Construction Contractor.

Part 2 Products (Not Applicable to this Section)

Part 3 Execution (Not Applicable to this Section)

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.
- .2 Acronyms:
 - .1 Cx - Commissioning.
 - .2 EMCS - Energy Monitoring and Control Systems.
 - .3 O&M - Operation and Maintenance.
 - .4 PI - Product Information.
 - .5 PV - Performance Verification.
 - .6 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

- .1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:
 - .1 Verify installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and intent.
 - .2 Effectively train O&M staff.
- .2 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.
 - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactive with each other as intended in accordance with Contract Documents and design criteria.
 - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
- .3 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.

1.3 COMMISSIONING OVERVIEW

- .1 Section 01 91 41 - Commissioning Plan.
- .2 For Cx responsibilities refer to Section 01 91 41 - Commissioning Plan.
- .3 Cx to be a line item of Contractor's cost breakdown.
- .4 Cx activities supplement field quality and testing procedures described in relevant technical sections.

- .5 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities include transfer of critical knowledge to facility operational personnel.
- .6 Parks Canada (PC) Representative will issue Interim Acceptance Certificate when:
 - .1 Completed Cx documentation has been received, reviewed for suitability and approved by PC Representative.
 - .2 Equipment, components and systems have been commissioned.
 - .3 O&M training has been completed.

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the un-functional system, including related systems as deemed required by Parks Canada (PC) Representative, to ensure effective performance.
- .2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.5 PRE-CX REVIEW

- .1 Before Construction:
 - .1 Review contract documents, confirm by writing to PC Representative.
 - .1 Adequacy of provisions for Cx.
 - .2 Aspects of design and installation pertinent to success of Cx.
- .2 During Construction:
 - .1 Co-ordinate provision, location and installation of provisions for Cx.
- .3 Before start of Cx:
 - .1 Have completed Cx Plan up-to-date.
 - .2 Ensure installation of related components, equipment, sub-systems, systems is complete.
 - .3 Fully understand Cx requirements and procedures.
 - .4 Have Cx documentation shelf-ready.
 - .5 Understand completely design criteria and intent and special features.
 - .6 Submit complete start-up documentation to PC Representative.
 - .7 Have Cx schedules up-to-date.
 - .8 Ensure systems have been cleaned thoroughly.
 - .9 Complete TAB procedures on systems, submit TAB reports to PC Representative for review and approval.
 - .10 Ensure "As-Built" system schematics are available.

- .4 Inform PC Representative in writing of discrepancies and deficiencies on finished works.

1.6 CONFLICTS

- .1 Report conflicts between requirements of this section and other sections to PC Representative before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.7 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit no later than four (4) weeks after award of Contract:
 - .1 Name of Contractor's Cx agent.
 - .2 Draft Cx documentation.
 - .3 Preliminary Cx schedule.
 - .2 Request in writing to PC Representative for changes to submittals and obtain written approval at least eight (8) weeks prior to start of Cx.
 - .3 Submit proposed Cx procedures to PC Representative where not specified and obtain written approval at least eight (8) weeks prior to start of Cx.
 - .4 Provide additional documentation relating to Cx process required by PC Representative.

1.8 COMMISSIONING DOCUMENTATION

- .1 PC Representative to review and approve Cx documentation.
- .2 Provide completed and approved Cx documentation to PC Representative.

1.9 COMMISSIONING SCHEDULE

- .1 Provide detailed Cx schedule as part of construction schedule in accordance with Section 01 33 00 –Submittal Procedures.
- .2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
 - .1 Approval of Cx reports.
 - .2 Verification of reported results.
 - .3 Repairs, retesting, re-commissioning, re-verification.
 - .4 Training.

1.10 COMMISSIONING MEETINGS

- .1 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.
- .2 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
- .3 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.

- .4 Meeting will be chaired by PC Representative, who will record and distribute minutes.

1.11 STARTING AND TESTING

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

1.12 WITNESSING OF STARTING AND TESTING

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

1.13 MANUFACTURER'S INVOLVEMENT

- .1 Obtain manufacturers installation, start-up and operations instructions prior to start-up of components, equipment and systems and review with PC Representative:
 - .1 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.
 - .2 Modify procedures detrimental to equipment performance and review same with manufacturer before start-up.
- .2 Integrity of warranties:
 - .1 Use manufacturer's trained start-up personnel where specified elsewhere in other divisions or required to maintain integrity of warranty.
 - .2 Verify with manufacturer that testing as specified will not void warranties.
- .3 Qualifications of manufacturer's personnel:
 - .1 Experienced in design, installation and operation of equipment and systems.
 - .2 Ability to interpret test results accurately.
 - .3 To report results in clear, concise, logical manner.

1.14 PROCEDURES

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
- .2 Conduct start-up and testing in following distinct phases:
 - .1 Included in delivery and installation:
 - .1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.
 - .2 Visual inspection of quality of installation.
 - .2 Start-up: follow accepted start-up procedures.
 - .3 Operational testing: document equipment performance.
 - .4 System PV: include repetition of tests after correcting deficiencies.
 - .5 Post-substantial performance verification: to include fine-tuning.

- .3 Correct deficiencies and obtain approval from PC Representative after distinct phases have been completed and before commencing next phase.
- .4 Document required tests on approved PV forms.
- .5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by PC Representative. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:
 - .1 Minor equipment/systems: implement corrective measures approved by PC Representative.
 - .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by PC Representative.
 - .3 If evaluation report concludes that major damage has occurred, PC Representative shall reject equipment.
 - .1 Rejected equipment to be remove from site and replace with new.
 - .2 Subject new equipment/systems to specified start-up procedures.

1.15 START-UP DOCUMENTATION

- .1 Assemble start-up documentation and submit to PC Representative for approval before commencement of commissioning.
- .2 Start-up documentation to include:
 - .1 Factory and on-site test certificates for specified equipment.
 - .2 Pre-start-up inspection reports.
 - .3 Signed installation/start-up check lists.
 - .4 Start-up reports,
 - .5 Step-by-step description of complete start-up procedures, to permit PC Representative to repeat start-up at any time.

1.16 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

- .1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 With assistance of manufacturer develop written maintenance program and submit PC Representative for approval before implementation.
- .3 Operate and maintain systems for length of time required for commissioning to be completed.
- .4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

1.17 TEST RESULTS

- .1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.
- .2 Provide manpower and materials, assume costs for re-commissioning.

1.18 START OF COMMISSIONING

- .1 Notify PC Representative at least twenty-one (21) days prior to start of Cx.
- .2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.

1.19 INSTRUMENTS / EQUIPMENT

- .1 Submit to PC Representative for review and approval:
 - .1 Complete list of instruments proposed to be used.
 - .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
- .2 Provide the following equipment as required:
 - .1 2-way radios.
 - .2 Ladders.
 - .3 Equipment as required to complete work.

1.20 COMMISSIONING PERFORMANCE VERIFICATION

- .1 Carry out Cx:
 - .1 Under actual or accepted simulated operating conditions, over entire operating range, in all modes.
 - .2 On independent systems and interacting systems.
- .2 Cx procedures to be repeatable and reported results are to be verifiable.
- .3 Follow equipment manufacturer's operating instructions.
- .4 EMCS trending to be available as supporting documentation for performance verification.

1.21 WITNESSING COMMISSIONING

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

1.22 AUTHORITIES HAVING JURISDICTION

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

1.23 COMMISSIONING CONSTRAINTS

- .1 Since access into secure or sensitive areas will be very difficult after occupancy it is necessary to complete Cx of occupancy, weather, and seasonal sensitive equipment and systems in these areas before issuance of the Interim Certificate, using, if necessary, simulated thermal loads.

1.24**EXTRAPOLATION OF RESULTS**

- .1 Where Cx of weather, occupancy, or seasonal-sensitive equipment or systems cannot be conducted under near-rated or near-design conditions, extrapolate part-load results to design conditions when approved by PC Representative in accordance with equipment manufacturer's instructions, using manufacturer's data, with manufacturer's assistance and using approved formulae.

1.25 EXTENT OF VERIFICATION

- .1 Laboratory areas:
 - .1 Provide manpower and instrumentation to verify up to one hundred percent (100%) of reported results.
- .2 Elsewhere:
 - .1 Provide manpower and instrumentation to verify up to thirty percent (30%) of reported results, unless specified otherwise in other sections.
- .3 Number and location to be at discretion of PC Representative.
- .4 Conduct tests repeated during verification under same conditions as original tests, using same test equipment, instrumentation.
- .5 Review and repeat commissioning of systems if inconsistencies found in more than twenty (20%) of reported results.
- .6 Perform additional commissioning until results are acceptable to PC Representative.

1.26 REPEAT VERIFICATIONS

- .1 Assume costs incurred by PC Representative for third and subsequent verifications where:
 - .1 Verification of reported results fail to receive PC Representative approval.
 - .2 Repetition of second verification again fails to receive approval.
 - .3 PC Representative deems Contractor's request for second verification was premature.

1.27 SUNDRY CHECKS AND ADJUSTMENTS

- .1 Make adjustments and changes which become apparent as Cx proceeds.
- .2 Perform static and operational checks as applicable and as required.

1.28 DEFICIENCIES, FAULTS, DEFECTS

- .1 Correct deficiencies found during start-up and Cx to satisfaction of PC Representative.
- .2 Report problems, faults or defects affecting Cx to PC Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from PC Representative.

1.29 COMPLETION OF COMMISSIONING

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.
- .3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by PC Representative.

1.30 ACTIVITIES UPON COMPLETION OF COMMISSIONING

- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.31 TRAINING

- .1 In accordance with Section 01 91 41 - Commissioning - Training.

1.32 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

- .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

1.33 INSTALLED INSTRUMENTATION

- .1 Use instruments installed under Contract for TAB and PV if:
 - .1 Accuracy complies with these specifications.
 - .2 Calibration certificates have been deposited with PC Representative.
- .2 Calibrated EMCS sensors may be used to obtain performance data provided that sensor calibration has been completed and accepted.

1.34 PERFORMANCE VERIFICATION TOLERANCES

- .1 Application tolerances:
 - .1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/- ten percent (10%) of specified values.

1.35 OWNER'S PERFORMANCE TESTING

- .1 Performance testing of equipment or system by PC Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

Part 2 Products (Not Applicable to this Section)

Part 3 Execution (Not Applicable to this Section)

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

- .1 This Section specifies roles and responsibilities of Commissioning Training.

1.2 TRAINEES

- .1 Trainees: personnel selected for operating and maintaining this facility. Includes Facility Manager, facility operators, maintenance staff, security staff, and technical specialists as required.
- .2 Trainees will be available for training during later stages of construction for purposes of familiarization with systems.

1.3 INSTRUCTORS

- .1 Parks Canada (PC) Representative will provide:
 - .1 Descriptions of systems.
 - .2 Instruction on design philosophy, design criteria, and design intent.
- .2 Contractor and certified factory-trained manufacturers' personnel: to provide instruction on the following:
 - .1 Start-Up, operation, maintenance and shut-down of equipment, they have certified installation, started up and carried out PV tests.

1.4 TRAINING OBJECTIVES

- .1 Training to be detailed and duration to ensure:
 - .1 Safe, reliable, cost-effective, energy-efficient operation of systems in normal and emergency modes under all conditions.
 - .2 Effective on-going inspection, measurements of system performance.
 - .3 Proper preventive maintenance, diagnosis and trouble-shooting.
 - .4 Ability to update documentation.
 - .5 Ability to operate equipment and systems under emergency conditions until appropriate qualified assistance arrives.

1.5 TRAINING MATERIALS

- .1 Instructors to be responsible for content and quality.
- .2 Training materials to include:
 - .1 "As-Built" Contract Documents.
 - .2 Maintenance Manual.

- .3 Management Manual.
- .4 TAB and PV Reports.
- .3 PC Representative will review training manuals.
- .4 Training materials to be in a format that permits future training procedures to same degree of detail.
- .5 Supplement training materials:
 - .1 Transparencies for overhead projectors.
 - .2 Multimedia presentations.
 - .3 Manufacturer's training videos.
 - .4 Equipment models.

1.6 SCHEDULING

- .1 Include in Commissioning Schedule time for training.
- .2 Deliver training during regular working hours, training sessions to be three (3) hours in length.
- .3 Deliver training on site for procedures and troubleshooting associated with launching and beaching of dock structures.
- .4 Training to be completed prior to acceptance of facility.

1.7 RESPONSIBILITIES

- .1 Be responsible for:
 - .1 Implementation of training activities,
 - .2 Coordination among instructors,
 - .3 Quality of training, training materials.
- .2 PC Representative will evaluate training and materials.
- .3 Upon completion of training, provide written report, signed by Instructors, witnessed by PC Representative.

1.8 TRAINING CONTENT

- .1 Training to include demonstrations by Instructors using the installed equipment and systems.
- .2 Content includes:
 - .1 Review of facility and occupancy profile.
 - .2 Functional requirements.
 - .3 System philosophy, limitations of systems and emergency procedures.
 - .4 Maintenance and servicing.
- .3 Provide specialized training as specified in relevant Technical Sections of the construction specifications.

1.9 TRAINING RESOURCES

- .1 Manufacturer's training resources to be used as a training tool with PC Representative review and written approval three (3) months prior to commencement of scheduled training.
- .2 On-Site training resources:
 - .1 Step by step procedure document supported with images for training sessions for use during future training.
 - .2 To be performed after systems are fully commissioned.
 - .3 A hardcopy to be left on site for reference and a digital copy to make additional copies as required.
 - .4 Organize into several short modules to permit incorporation of changes.
- .3 Production methods to be professional high quality.

Part 2 Products (not applicable to this section)

Part 3 Execution (not applicable to this section)

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Aluminium framing on the floats and ramps complete with articulating hinge supports designed by the contractor.
- .2 Steel shapes and metal parts with proper isolation between aluminum parts and steel parts on the grillages.

1.2 RELATED REQUIREMENTS

- .1 Section 01 11 00 – Summary of Work
- .2 Section 31 32 19 – Geotextile Soil Stabilization
- .3 Section 35 51 23 – Pontoons
- .4 Section 35 59 29 – Mooring Devices

1.3 REFERENCES

- .1 General: latest Edition shall apply unless noted otherwise.
- .2 ASTM International
 - .1 ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269/269M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A325, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.
- .3 CSA International
 - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16, Design of Steel Structures.
 - .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
 - .5 CSA W59, Welded Steel Construction (Metal Arc Welding) Metric.
 - .6 CSA S157-05 Strength Design in Aluminium
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 ACTION AND INFORMATIONALSUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit mill certificates for steel products, bolts and manufactured products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 All mill certificates to be verified by a Canadian professional engineer to confirm the metallurgy and stated steel strengths comply with the specifications and that the steel in the supplier's yard has undergone the tests to provide verification that the steel to be shipped is the same as the mill certificates.
 - .3 The mill certificates supporting documentation shall include location of manufacturer and source of steel.
 - .4 Submit two copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety Requirements.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings that indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, and details.

1.5 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials to protect all products and include manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, and packaging materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A53/A53M.
- .3 Welding materials: to CSA W59.13
- .4 Welding electrodes: to CSA W48.13 Series.
- .5 Stainless steel bolts to AISI 316, yield strength 517 MPa, tensile strength 1,275 MPa.
- .6 Machine screws: to ASTM A194, Type 304 Stainless Steel.
- .7 Aluminium sections and products to CSA S157-05
- .8 Structural Aluminium sections to be 6061-T6
- .9 Aluminium ramp to be designed for pedestrian loading of 1 kPa and axial compression derived from the boom's axial design force of 50 kN to accommodate a 3.0 meter change in water level and horizontal swing of 200 mm. The ramp shall be in transportable sections to allow for efficient annual re-installation and removal and each section to be hoisted with the helicopter lift capacity of 454 kilograms (1,000 pounds).
- .10 Aluminium ramp decking to be grated or covered with rubber mat for non-slip surface.
- .11 Hot dipped galvanizing in accordance with CSA G164-M92 for Irregular Shaped Articles.
- .12 Field repair of galvanized coatings shall be required with thermal spray or approved method using cold liquid spay such as Galvacon.

2.2 DESIGN. SUPPLY AND FABRICATION

- .1 Perform a structural analysis of each mooring boom, mooring grillage, float, ramp and ramp grillage including the ramp grillages that also support a mooring boom such as docks number 1 and 2 as shown in the plan arrangement.
- .2 Design all parts required to provide a complete system for each dock system.
- .3 Supply all products required for a complete operating system.
- .4 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .5 Do welding in accordance with CSA W59.2 unless specified otherwise and welder qualifications to CSA W47.2.
- .6 Fit and shop assemble work, ready for field installation. Grease pins and hinges.
- .7 Ensure exposed welds are continuous for length of each joint.

- .8 Pack all hinges with lithium grease.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 732 g/m² to CAN/CSA-G164 for the abutment tower platform where aluminium products cannot be used.
- .2 Apply metalizing coating over field welds or an approved method of cold spray using three coats of Galvacon.

Part 3 Execution

3.1 INSTALLATION

- .1 The on-shore anchor grillages and mooring chain and boom shall be installed first as described in section 35 59 29 – Mooring Devices and section 31 32 19 – Geotextile Soil Stabilization.
- .2 The float units shall be bolted in sections that can be hoisted by a 454 kilogram lift helicopter and shall be designed to the loading and specifications in section 35 51 23 – Pontoons and section 35 59 29 – Mooring Devices.
- .3 Connect the floats for each dock in the water close to shore since they will draught less than a man's knee height almost resting on the bottom then connect the upstream mooring chain and boom.
- .4 Install the aluminum ramp to its on-shore grillage and rest the ramp on the ramp floats and push or pull the dock outwards with a small motorised inflatable boat to overcome river current until the ramp can be connected to the floats.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.3 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 Section Includes

- .1 Design, supply and installation of the on-shore anchors for the float dock system.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work
- .2 Section 05 50 00 – Metal Fabrications.
- .3 Section 35 51 23 – Pontoons
- .4 Section 35 59 29 – Mooring Devices.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
 - .2 ASTM D4751, Standard Test Methods for Determining Apparent Opening Size of a Geotextile

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.
- .2 Collect and separate plastic, paper packaging, corrugated cardboard in accordance with Waste Management Plan.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Divert left over aggregate material from landfill to a local site as approved by Parks Canada (PC).
- .6 Divert left over metal materials to a local recycling facility as approved by PC.
- .7 Divert left over geotextiles from landfill to a local plastic recycling facility as approved by PC Representative.

Part 2 Products

2.1 MATERIALS

- .1 On-Shore Anchors:
 - .1 Grillages: in accordance with Section 05 50 00 Metal Fabrications.

- .2 Geosynthetics:
 - .1 Biaxial geogrid: composed of high molecular weight, high tenacity polyester multifilament yarns which are woven in tension and finished with a PVC coating and is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.
 - .2 Biaxial geogrid properties:
 - .1 Long term design strength: minimum 17 kN/m.
 - .3 Nonwoven geotextile: high tenacity monofilament polypropylene yarns that are woven into a stable network such that the yarns retain their relative position and are inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.
 - .4 Nonwoven geotextile properties:
 - .1 Tensile strength at 2% strain: minimum 7.9 kN/m.
 - .2 Maximum apparent opening size of 0.425 mm.
 - .5 Small mesh biaxial geogrid: high strength, high tenacity monofilament polypropylene yarns that are woven together to produce an open mesh, inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.
 - .6 Small mesh geogrid properties:
 - .1 Tensile strength at ultimate: minimum 21 kN/m.
 - .2 Aperture size of 2 mm by 2 mm.

Part 3 Execution

3.1 INSTALLATION

- .1 Locate each grillage footprint and clear brush with PC guidance and as shown on plan arrangement. The grillage is to be a minimum 1,000 mm horizontally set back from the edge of exposed mineral soil at the river bank.
- .2 Remove vegetation cover and organic surface soils from the anchor excavation footprint and stockpile for later use. Excavate native sandy silty or silty sandy soil to a maximum 1,200 mm depth. Actual depth to be determined on site and in conjunction with PC staff. Stockpile native soil separately for later use as backfill.
- .3 Place biaxial geogrid at the bottom of the excavation prior to assembly and/or installation of the grillage.
- .4 Install the grillage in the footing excavation. The grillage may be constructed on site or transported to site prefabricated with a medium lift helicopter.
- .5 Backfill should be comprised of native excavated sandy silty soils. Alternatively or in conjunction with native backfill, imported silt, sand, or granular soil and/or steel ballast or similar may be used to backfill grillage. All backfill should be placed and compacted in lifts not exceeding 100 mm.
 - .1 Biaxial geogrid is to be placed horizontally every 300 mm of backfill and vertically on all four sides of grillage.

- .2 Biaxial geogrids should be fastened with a bodkin bar or similar together and to the grillage frame.
- .3 Completed height of backfill including grillage is to be 1,500 mm.
- .4 A nonwoven geotextile should be wrapped around the top and four sides of the grillage and backfill and fastened to the grillage in order to prevent erosion of fine soils during seasonal flooding events.
- .5 A fine mesh geogrid is to be wrapped overtop of the grillage and soil backfill and secured to the grillage to provide a suitable mesh platform for vegetation growth.
- .5 Re-vegetate buried grillage anchor backfill. Spread previously removed vegetation cover and organic surface soils over geogrid wrapped buried grillage anchor and re-seed with appropriate local seed or vegetation with PC guidance.

3.2 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.

3.1 Field Quality Control

- .1 The contractor shall keep detail records for the PC Representative during the excavation, installation, backfill, and revegetation of on-shore grillage anchors.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Design, supply and installation of the float units to form the pontoons that make up the full dock system.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work
- .2 Section 05 50 00 – Metal Fabrication
- .3 Section 31 32 19 – Geotextile Soil Stabilization
- .4 Section 35 59 29 – Mooring Devices.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures for the following:
 - .1 Design Drawings
 - .2 Transportation.
 - .3 Float Joining.
- .2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.
- .3 Submit reports as described in Part 3 - Field Quality Control
- .4 Manufacturer's Instructions: submit manufacturer's installation directions with their data sheets where required.

Part 2 Products

2.1 MATERIALS

- .1 High density polyethylene plastic buoyancy tanks foam filled.
- .2 Aluminum sections and shapes to CSA S157-05 and 6061-T6.
- .3 Stainless steel AISI 316 material for bolts, hinges and pins.
- .4 Decking to be durable, light weight and non-slip designed for 1 kPa live loading.
- .5 Rubber tire fenders.

2.2 PONTOON

- .1 The pontoon that forms each dock shall be designed to resist the 50 kN tensile pull from the upstream mooring boom and the boom bridle connections to the floats.

- .2 The floats and ramp shall be designed to the structural analysis from the boom to the grillage.
- .3 The floats for the plane docks shall be designed for a freeboard of 350 mm.
- .4 Transfer plates between the floats shall be provided for safe walking and articulation.
- .5 The dock shall be in transportable sections with quick release to assemble/disassemble the dock in the water and each section to be hoisted with the helicopter lift capacity of 454 kilograms (1,000 pounds).

2.1 FABRICATION /INSTALLATION

- .1 Fabricate the floats in transportable sizes or parts that may be assembled on site.
- .2 Assemble the individual floats on shore and slip them into the water close to shore and secure them against the rivercurrent.
- .3 Secure the ramp to the on-shore grillage padeyes and secure the mooring boom to the upstream grillage and rest the ramp river end on the pontoon close to shore supported by timbers to permit sliding the pontoon under the ramp as the pontoon is pulled riverward against the river current.
- .4 Take up or slack off the mooring chain to the upstream grillage when the pontoon is in design location. The motorized boat will have to hold the pontoon during this operation.
- .5 The motorized boat will continue holding the pontoon to complete the connections between the ramp and pontoon.
- .6 Parks Canada (PC) to provide authorization for the use of one or two small motorized inflatables or boats for the above operation.
- .7 Prepare a document after installation for PC to use to dis-assemble for beaching and re-assemble for launching.

2.2 FIELD QUALITY CONTROL

- .1 The contractor shall keep detail records with the PC representative during the assembly and installation.

2.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Design, supply and installation of upstream mooring chain and high density polyethylene pipe;
- .2 Design, supply and installation of on-shore grillage padeyes and grillage steel framing;
- .3 Design, supply and installation mooring chain, hardware and hinges and padeyes;
- .4 Design, supply and installation of rubber tire fenders;
- .5 Design, supply and installation of cleats and / or aluminum pipe bull rails on the floats.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work
- .2 Section 05 50 00 – Metal Fabrication
- .3 Section 31 32 19 – Geotextile Soil Stabilization
- .4 Section 35 51 23 – Pontoons.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A27/A27M-05, Standard Specification for Steel Castings, Carbon, for General Application.
 - .2 ASTM A48/A148M-05, Standard Specification for Steel Castings, High-Strength, for Structural Purposes.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA G40.20/G40.21-2004, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S6-06, Canadian Highway Bridge Design Code.

1.4 SYSTEM DESCRIPTION

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit mill test certificates for each heat number; certificate of performance for line pull rating; manufacturer's printed product literature, specifications and datasheet.

- .3 Submit shop drawings, indicating following items:
 - .1 Assembly arrangement complete with all details to install and coordinate with the design drawings and specifications, and ancillary equipment with dimensions, clearance locations and direction of assemblies as installed on structures.
 - .2 Locations, sizes and installation tolerances of anchor bolts.

Part 2 Products

1.6 MATERIALS

- .1 High density polyethylene pipe 300 mm diameter DR 26 with wall 12.45 mm;
- .2 High density polyethylene flange adapter 300 mm nominal DR 26 to AWWA C906-99 with flange outside diameter of 393.7 mm and adapter length of 304.8 mm and flange thickness of 33.02 mm;
- .3 Steel flange 393.7 mm outside diameter by 12.7 mm thick with inside 75 mm diameter hole for the chain to pass through and four bolt holes for 16 mm diameter A307 galvanized bolts;
- .4 Marine Mooring chain with W.L.L. equal to 50% of breaking strength;
- .5 Expanded polystyrene foam at 16 kg / M³ density to fill the pipe to float the chain.
- .6 Marine Fenders:
 - .1 Rubber tires approximately 458 mm in diameter secured to the floats with synthetic UV resistant rope to be easily demounted for beaching and launching.
- .7 Mooring cleats
 - .1 Performance as follows:
 - .1 Factored resistance of no less than 1 Tonne line pull horizontally from planes.

Part 3 Execution

1.7 INSTALLATION

- .1 Cleats
 - .1 Bolt on cleats to permit change out.
- .2 Fenders
 - .1 Secure the rubber tires to the berth face or river side face of the floats entire length with 12.7 mm diameter synthetic rope with UV resistance property.
 - .2 The tires should be easily disconnected to prevent excessive weight for helicopter hoisting.
- .3 Mooring

- .1 Assemble the chain boom fabricated in transportable segments. The pipe sleeve will float the chain.
- .2 Connect the boom chain to the pontoon when the pontoon has been fully assembled in shallow water and secured against the river current.

1.8 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION