Part 1 General

1.1 GENERAL CONDITIONS

.1 All sections of Division 1, as applicable, shall form part of this summary and scope of work and of the contract.

.2 Each Contractor shall examine and become familiar with the work, specifications and drawings.

.3 This Summary and Scope of Work shall be read in conjunction with and form part of this Contract, and is intended to indicate the extent of the work and responsibilities to be undertaken by this Contractor.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 The area of work shall include:

- .1 North Berm.
- .2 Center Berm
- .3 South Berm
- .4 Concrete dam and Spillway

.2 Work of this Contract includes the following items of work:

- .1 Crack injection work within localized areas on the top and down stream face of the concrete dam. The Contractor shall carry a 15 meter allowance for this work which shall be designated by the Consultant at the time of work.
- .2 Localized concrete repair on the down stream face of the concrete dam. The Contractor shall carry an allowance of 2 square meters to be designated by the Consultant at the time of work.
- .3 Installation of eight (8) survey monuments within the earthen berms and concrete dam. Survey monuments to be installed within the earthen berms will also include the installation of steel piles set in concrete.
- .4 Installation of eleven (11) sensor data monitoring stations within the North, Center and South berms, and the concrete dam. This work shall include the purchase and installation of the data logger equipment, cabling and piezometers to be installed within the monitoring stations.
- .5 Installation of one (1) water depth sensor and housing on the upstream face of the concrete dam.

.3 The Contractor shall prohibit or limit access to banks or areas adjacent to waterbody, to the extent necessary to protect the structural integrity of berms, banks and shorelines.

.4 The Contractor shall supply, install and maintain all required sediment and erosion controls necessary to mitigate erosion of exposed soils to adjacent waterbody including erosion control fencing and fabrics. The Contractor shall reference the requirements and recommendations outlined within the Fisheries and Oceans Canada (DFO), Mitigation Guide for the Protection of Fishes and Fish Habitat.

.5 The berms and concrete dam are located at the south / west corner of the reservoir.

.6 The Contractor shall include all costs related to compliance with COVID-19 protocols and procedures necessary to complete the work of this contract.

.7 Submit product shop drawings, MSDS and data sheets as outlined in Section 01 33 00 - Submittal Procedures.

.8 The Contractor's bid amount shall include all costs and fees necessary to supply, install and maintain temporary protection on site. The Contractor shall supply and install all required temporary safety measures and systems including:

.1 Temporary guard rails and barriers.

.2 Temporary fencing, minimum 8' high, around the perimeter of the set up and storage areas as required by the City of Iqaluit.

.3 Barriers and signage, in all three official languages of Nunavut.

.9 Provide all necessary vertical hoisting / lift equipment and cranes required to facilitate the work of this Contract.

.10 Provide all necessary temporary power required to facilitate the work of this Contract.

.11 The Contractor's bid amount shall include all costs and fees related to and associated with the transportation from site and disposal of all construction waste and debris at a site authorized to receive construction waste.

1.3 COOPERATION AND COORDINATION ON SITE

.1 The City of Iqaluit has two additional projects that may be occurring at the same time that work of this contract is being completed. This work includes:

.1 Installation of power poles and electrical cabling along the down stream face of the dam and earthen berms. This work shall be completed by QEC.

.2 Removal and replacement of sealant material within the concrete dam. This work is scheduled to be completed by Tower Construction during the month of June 2022.

.2 The Contractor awarded the work of this contract shall be required to coordinate their activities on site with the work of the other contractors.

1.4 CONTRACT METHOD

.1 See Instructions to Tenderers and Tender Form

1.5 CONTRACTOR USE OF SITE

.1 Unrestricted use of site until Total Completion of Work.

.2 Co-ordinate use of site under direction of City of Iqaluit and the Consultant.

.3 Remove or alter existing work to prevent injury or damage to portions of existing work which are to remain.

.4 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.

.5 At completion of operations, condition of existing work return the site to equal or better than that which existed before new work started.

1.6 DOCUMENTS REQUIRED

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

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Change Orders.
.5 Other Modifications to Contract.
.6 Copy of Approved Work Schedule.
.7 Health and Safety Plan and Other Safety Related Documents.
.8 Other documents as specified.
.9 Product data and MSDS sheets.
.10 Shop drawings.

.2 Consultant may furnish additional drawings to clarify work. Such documents become part of Contract Documents.

1.7 COVID-19

.1 All members of the Contractors work force working on site must comply with all COVID-19 prevention and control measures in force at the time of work. This shall include measures, controls, directives and policies from:

.1 Nunavut Department of Health.
.2 Orders or Directives issued under the authority of the Chief Public Health Officer.
.3 Other authorities having jurisdiction.

.2 The Contractor shall maintain a list of workers, including sub-trades employed on site each day and have it available for reference by the City of Iqaluit if requested.

.3 The Contractor should note that COVID-19 policies, procedures and measurers may change prior to the start of work and or throughout the duration of the work. The Contractor shall include for this requirement in their bid submission.

.4 The Contractor shall include all costs to supply, implement and maintain personal protection equipment (PPE) and COVID-19 control measures on site within the area of work.

.5 The Contractor shall supply their staff with all required PPE required to comply with COVID-19 measures in place. The cost of PPE required for each member of the work force shall be included in their bid submission.

.6 The City of Iqaluit reserves the right to delay the start of work and/or suspend work currently underway due to a declared outbreak. The Contractor shall include for this requirement in their bid submission.

.7 All of the Contractors staff working or visiting the site shall be subject to:

.1 Anyone showing symptoms of COVID-19 must not be allowed to work on site and shall be advised to go home immediately, to self-isolate, and be encouraged to be tested. If the affected member has a positive test for COVID-19, the infected member shall immediately notify their supervisor/manager or occupational health and safety representative. The Contractor shall contact and advise the City of Iqaluit Project Manager and Consultant that a member of their work force has failed a screening test.

.2 Additional measures or policies in place at the time of work.

1.8 OWNER OCCUPANCY

.1 The City of Iqaluit will continue to operate the site during the full duration of the Contract. The Contractor shall co-operate and coordinate operations on site with the City of Iqaluit and their designated representatives.

.2 The Contractor shall be required to accommodate the Work of this project and the City of Iqaluit's scheduling requirements, to minimize conflict, facilitate efficient and safe operation of the facility and access by members of the public.

.3 The Contractor shall ensure safe passage into and from the area of work is maintained at all times.

.4 The Contractor must comply with the City of Iqaluit's Security, Health and Safety policies and procedures.

.5 Work within this project must be scheduled and co-ordinated with the City of Iqaluit and facility operators.

1.9 EXISTING SERVICES

.1 All utilities and services shall be protected against damage or interruption. Notify, the Owner and utility companies of intended interruption of services and obtain all required permits and authorizations prior to undertaking the work.

.2 Where Work involves breaking into or connecting to existing services, give the Owner 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimized duration of interruptions. Carry out work at times as directed by the Owner and the authorities having jurisdiction. Complete with a minimum impact on the operations of the dam and the supply of potable water to the City of Iqaluit.

.3 The Contractor shall maintain existing services in occupied areas unless alternative arrangements have been made with and approved by the Owner.

.4 Make good any alterations or changes made to the existing services.

1.10 MINIMUM STANDARDS

.1 Execute work to meet or exceed:

.1 National Building Code (Latest Edition), including all amendments up to project date.

.2 National Fire Code (Latest Edition), including all amendments up to project date.

.3 Canadian Construction Safety Code (Latest Edition), including all amendments up to project date.

.4 Bylaws, rules, acts and regulations of authorities having jurisdiction.

.2 All references to codes and standards within the design documents shall be understood as meaning the most current with amendments.

1.11 OVERTIME

.1 Overtime costs shall be included in the Stipulated Prices provided in the bid amount. No extra costs will be paid by the Owner for work which must be performed outside normal working hours.

.2 Hours of work: 7:00 a.m. - 5:00 p.m, Monday to Friday.

.3 Work outside of the specified hours of work must be approved by the City. Contractor to provide 48 hour notice to the City and Consultant.

1.12 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

.1 Bidders shall carefully examine and study the contract specifications, drawings and the site of the work in order to understand and identify conditions affecting the contract, the detailed requirements of the construction and extent of work involved.

.2 No tenderer may claim at any time after submission of a tender that there was any misunderstanding of the terms and conditions of the contract relating to the site conditions. Submission of a bid shall serve as confirmation by the Contractor that all conditions, terms and items of the Work were understood.

.3 The Contractor shall verify all dimensions and the existing sub-assemblies prior to preparation of work, generation of shop drawings, fabrication and start of work.

.4 Dimensions shown on the design drawings were taken from the as-built documentation made available to the Consultant, and on site observations. The drawings are intended to convey the scope and magnitude of work, absolute accuracy of dimensions is not guaranteed. No claim for extra payment on account of differences between actual and estimate dimensions will be allowed.

.5 Large scale details shall govern over small scale details.

.6 Specifications shall govern over Drawings.

.7 The specifications for the work shall be considered as an integral part of the drawings which accompany them, and neither the drawings nor the specifications shall be considered alone. Any item which is omitted from one but which is mentioned or reasonably implied in the other, shall be considered as properly and sufficiently specified, and must be therefore supplied and installed. All items not specifically mentioned in the drawings or specifications, but which are necessary to make and or complete the Work, shall be included in the Contractor's bid amount.

.8 Where details shown on the drawing or in the specification are not in accordance with manufacturer's requirement, Contractor to notify Consultant and for clarification.

.9 When General Requirement clauses are repeated in the specifications, it shall be understood as drawing particular attention thereto or as further qualification thereof and not to be assumed as waiving or omitting any other clauses therein.

1.13 TAXES

.1 Pay applicable Federal, Territorial and Municipal taxes.

1.14 INSPECTION, FEES, CERTIFICATES AND PERMITS

.1 Provide authorities having jurisdiction with information requested.

.2 The contractor shall obtain and pay fees for all required certificates and permits necessary to complete the Work.

.3 Contractor shall obtain and pay for all required 3rd party inspections required by jurisdictions having authority.

.4 Furnish inspections, certificates and permits when requested.

1.15 WORKERS' SAFETY & COMPENSATION COMMISSION (WSCC)

.1 The contractor shall, at the time of entering into any contract with the City of Iqaluit, at such intervals as required to demonstrate good standing, and at substantial performance, provide a valid clearance certificate from the Workers' Safety and Compensation Commission (WSCC).

.2 The bidder whose tender has been recommended to the City of Iqaluit for acceptance shall submit a copy of their current WSCC clearance certificate to the City of Iqaluit and Consultant.

.3 A contractor must meet its registration, reporting and payment obligations throughout the duration of the Work and maintain their account with the Workers' Safety and Compensation Commission in good standing.

1.16 AS-BUILT DRAWINGS AND PROJECT DOCUMENTATION

.1 The Contractor shall maintain two (2) sets of drawings for purpose of recording changes and deviations to work as-built.

.2 Maintain these prints and make available to trades so that all changes and deviations may be recorded promptly as they occur. Be responsible for ensuring that such record of all changes is up to date at all times. Upon completion of work, return these drawings complete and in good condition to the Owner and Consultant, so that a record of the changes, location of all services and equipment is documented.

.3 The Contractor shall provide 3 bound copies of all project documentation. Project documentation shall include:

.1 Specifications.
.2 Design and As-built drawings.
.3 Shop drawings.
.4 Product data sheets.
.5 Change orders and change directives.
.6 Invoices and payment documentation.
.7 Inspection reports

1.17 SUBMITTALS

.1 Submit all documents in accordance with Section 01 33 00 - Submittal Procedures.

1.18 CONTRACT ADMINISTRATION AND ROLE OF THE CONSULTANT

.1 The Consultant will have authority to act on behalf of the City of Iqaluit, only to the extent provided in the agreement between the Consultant and the City of Iqaluit.

.2 The Consultant will provide site review and administration of the Contract on behalf of the City of Iqaluit. The Consultant will visit the place of the work at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work, and to determine if Contractor is proceeding in general conformity with the Contract Documents.

.3 The Consultant will not be responsible for and will not have control, charge or supervision of the Contractor's work force, construction means, methods, techniques, sequence, procedures, or for safety equipment and measures required to undertake and complete the Work.

.4 The Consultant's interpretations and findings on site will be given in writing to the parties within a reasonable time.

.5 The Consultant will have the authority to reject work which in the Consultant's opinion does not conform to the requirements of the Contract Documents.

.6 Whenever the Consultant considers it necessary or advisable, the Consultant will have the authority to require inspection or testing of the work, whether or not such work is fabricated, installed or completed.

.7 The authority of the Consultant to act, nor any decision either to exercise or not to exercise such authority shall not give rise to any duty or responsibility of the Consultant to the Contractor, Sub-contractors, Suppliers, or their agents, employees, or other persons performing any of the Work.

1.19 CONTRACTOR'S ROLE AND RESPONSIBILITIES

.1 The Contractor is responsible for the control and applicable of construction safety measures on site and its conformance with the current legislation, acts, and other regulations in effect or required.

.2 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work to ensure conformity with the Contract Documents. The Contractor shall have a competent and qualified person supervising the work on site at all times.

.3 The Contractor shall have a competent person for emergency calls after construction hours and during weekends. It shall be the Contractor's responsibility to supply the Owner and Consultant with the name and telephone number of the person to be contacted during these periods.

.4 The Contractor shall have control over, charge of and be responsible for the acts or omissions of the Contractor's work force, subcontractor's, suppliers, their agents, employees, or any other persons performing portions of the Work therein.

.5 The Contractor shall be solely responsible for the construction schedule, methods, techniques, sequences, procedures and for coordination and supervision of their sub-trades and all parts of the Work under the Contract.

1.20 COORDINATION AND CO-OPERATION

.1 Execute work with minimum disturbance to the building operations, occupants, public and normal use of site. Maintain access and exits to the building and site. Where security has been reduced by work of contract, provide temporary means to maintain security.

.2 The work shall be inspected and tested on behalf of the Owner by the Consultant. The Contractor must keep the Consultant informed when the Contractor is on site and work is being completed.

.3 A minimum 48 hours noticed shall be given by the Contractor to the Consultant prior to the required inspection unless agreed upon otherwise.

.4 Any work not accepted by the Consultant shall be immediately corrected by the Contractor to the Consultant's satisfaction. Frequency of the tests and inspections will be determined by the Consultant.

.5 Work requiring the shutdown of any of existing facility services or equipment on site must be done with prior written approval, and according with the agreed construction schedule, and approved by the Owner. Changes to the approved schedule and equipment and system shutdowns must be approved by the Owner.

1.21 PROTECTION AND SAFETY

.1 Comply with site security protocols and access requirements.

.2 Undertake and complete the work in a safe manner that will not endanger the building, equipment on site, the Contractor's work force, and occupants of the building or members of the public. Cease any work or operations that may endanger the health and safety of the Contractor's work force, occupants of the building or members of the public. Do not commence Work until adequate safety measures have been completed.

.3 Be responsible for the safe completion of the Work and implementation of all required safety measures necessary to protect the building and occupants therein for the duration of the Work, commencing with the Contractor's mobilization on site.

.4 Protect surfaces and finishes of the structure, services, equipment, vehicles and landscaping within and adjacent to the area of Work. Repair any damage with material and finish to match original.

.5 Prevent extraneous materials from contaminating air beyond work area, by providing temporary enclosures during demolition work.

.6 At end of each day's work, leave work in safe, secure and stable condition protected from the elements and access by un-authorized people.

.7 At end of each day's work or when stoppage of work occurs due to inclement weather, provide protection for completed and incomplete Work. Contractor shall be responsible for inspection and securement of all materials, equipment and building systems at the roof level. Contractor shall inspect the site on a daily basis during periods of severe weather or prolonged work stoppage due to weather or other factors.

.8 Contractor shall implement measures necessary to prevent vandalism, tampering or ignition of combustible materials such as propane or gas on site. If necessary, remove all combustible materials from site at the end of each work day.

1.22 DELIVERY AND STORAGE

.1 Store equipment and materials in location designated and approved by the Owner.

.2 Use designated routes approved by the City of Iqaluit for the delivery and removal of material and debris.

.3 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and sealant materials.

.4 Store components and materials in accordance with manufacturer's recommendations and protect from elements and damage.

.5 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standards and any other specification or reference accepted as standard.

.6 Protect and store all materials in a dry, well ventilated and weatherproof location. During winter, store materials in a heated location with a +5 C minimum temperature. Remove only as needed for immediate use. Keep materials away from open flame or welding sparks.

.7 Avoid stockpiling materials in a way which could cause overloading or damage to the assemblies or structure.

1.23 WASTE MANAGEMENT AND DISPOSAL

.1 Removal and disposal of the designated materials including transportation and disposal of all construction waste and debris at an approved facility authorized to receive construction waste.

.2 Store garbage and waste containers in location designated by the City to ensure there are out of public view.

.3 Divert unused building materials and packaging from landfill to recycling facilities.

.4 Remove from site, transport and dispose of packaging materials at appropriate recycling facilities.

.5 Handle and dispose of hazardous materials in accordance with the Canadian Environmental Protection Act (CEPA), Transportation of Dangerous Goods Act (TDGA), Federal, Provincial and Municipal regulations or other authorities having jurisdiction therein. Place materials defined as hazardous or toxic waste in designated containers, transport and dispose at an authorized site approved to receive hazardous or toxic waste.

.6 Ensure emptied containers are sealed and stored safely prior to disposal.

.7 Unused paint, sealants, and sealing compound materials must not be disposed of into water courses, onto ground or in other location where it will pose health or environmental hazard.

.8 Prevent debris from blockage of drainage systems and damage to existing mechanical and electrical systems which must remain in operation.

.9 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into reservoir, watercourses or land features. Ensure proper disposal procedures are maintained throughout the project.

.10 Do not pump water containing suspended materials into reservoir, watercourses or onto adjacent properties. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.

1.24 FIRE SAFETY REQUIREMENTS

.1 Comply with requirements of the National Fire Code (latest edition).

.2 Flammable liquids having a flash point below 110°F, (except when in use as fuel in operating equipment), and other explosives, shall not be brought to, used, or disposed of at the site without permission of the Owner. All such flammable liquids shall be confined

either to safety containers approved by Underwriters Laboratories Inc., or the fuel tanks of operating equipment.

.3 The Contractor shall keep the site of Work free of waste materials, rubbish and debris. No burning operations shall be performed on site.

.4 Have at a minimum of five (5) serviceable Size: 13.6 kg (30 lb), 'A-B-C' fire extinguisher in the area of work.

.5 Fire extinguishers are to be inspected prior to the start of work each day by the Contractor's site supervisor, damaged or discharged fire extinguishers are to be removed from site and replaced immediately and prior to the start of work.

1.25 DEFINITIONS

.1 The following Definitions shall apply to all Contract Documents.

.2 Change Directive: A Change Directive is a written instruction prepared by the Consultant and signed by the Owner directing the Contractor to proceed with a change in the Work within the general scope of the Contract Documents prior to the City of Iqaluit and the Contractor agreeing upon adjustments in the contract price and the contract time.

.3 Change Order: A Change Order is a written amendment to the Contract prepared by the Consultant and signed by the City of Iqaluit and the Contractor stating their agreement upon:

.1 A change in the Work;

.2 The method of adjustment or the amount of the adjustment in the contract price, if any; and

.3 The extent of the adjustment in the contract time, if any.

.4 The Owner: Corporation of the City of Iqaluit or authorized representative as designated to the Contractor in writing, to act on behalf of the Owner.

.5 The Owner Representative: The person, agent or representative as designated to the Contractor in writing, authorized to act on behalf of the City of Iqaluit, but does not include the Consultant.

.6 Consultant: The Consultant is the person or entity engaged by the City of Iqaluit and identified as such in the Agreement. The Consultant is the Engineer or entity licensed to practise in the province of the place of the work. The term Consultant means the Consultant or the Consultant's authorized representative.

.7 Contract: The Contract is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the Contract Documents and represents the entire agreement between the parties.

.8 Contract Documents: The Contract Documents consist of the drawing and specifications included within the tendered design and amendments agreed upon between the parties.

.9 Contractor: The Contractor is the person or entity identified as such in the Agreement. The term Contractor means the Contractor or the Contractor's authorized agent or representative.

.10 Drawings: The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, and diagrams.

.11 Owner: The Owner is the Owner. The term Owner means the City of Iqaluit or the City of Iqaluit's authorized representative or agent as designated to the Contractor in writing, but does not include the Consultant.

.12 Place of the Work: The Place of the Work is the designated site or location of the Work identified in the Contract Documents.

.13 Project: The Project means the total construction contemplated of which the Work may be the whole or a part.

.14 Provide: Provide means to supply and install.

.15 Shop Drawings: Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, product data sheets, and information other which the Contractor provides to illustrate details of portions of the Work.

.16 Specifications: The Specifications are that portion of the Contract Documents, wherever located and whenever issued, consisting of the written requirements, administration and standards for products, systems, workmanship, quality, and the services necessary for the performance of the Work.

.17 Subcontractor: A Subcontractor is a person or entity having a direct contract with the Contractor to supply materials, labour or perform a part or parts of the Work, at the Place of the Work.

.18 Supplemental Instruction: A Supplemental Instruction is an instruction, not involving adjustment in the Contract Price or Contract Time, in the form of Specifications, Drawings, schedules, samples, models or written instructions, consistent with the intent of the Contract Documents. It is to be issued by the Consultant to supplement the Contract Documents as required for the performance of the Work.

.19 Supplier: A Supplier is a person or entity having a direct contract with the Contractor to supply finished products or materials.

.20 Temporary Work: Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding Construction Equipment, required for the execution of the Work but not incorporated into the Work.

.21 Work: The Work means the total construction and related services required by the Contract Documents.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies requirements for a detailed Construction Progress Schedule.

1.2 REQUIREMENTS

.1 Prepare and submit a Construction Progress Schedule detailing Substantial Performance of the Work within the time period stated in the Bid Form.

.2 Construction Progress Schedule to include dates for:

- .1 Mobilization on-site.
- .2 Provide site protection, hoarding, signage, fencing, etc.
- .3 Concrete repair.
- .4 Installation injection epoxy.
- .5 Installation of survey monuments and monitoring stations.
- .6 Substantial completion.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Consultant and schedule updated by Contractor in conjunction with and to approval of Consultant.

1.3 FORMAT

.1 The Contractor shall submit initial schedule within (7) seven days after award of Contract.

.2 Provide schedule in the form of a horizontal bar chart.

.3 Include the dates for the commencement and completion of each major elements of construction.

.4 The Consultant and Contractor will meet to review the proposed Work Schedule and the Contractor will make necessary changes until a satisfactory schedule is arrived at. Deviation from the approved schedule must be approved by the Consultant.

.5 The modified schedule, as approved in writing by the Consultant required during the execution of the contract to reflect changes in the estimated quantity of work, shall form an integral part of the contract documents.

1.4 SUBMITALS

.1 Submit one opaque reproduction, plus two copies to be retained by the Consultant.

.2 Consultant will review schedule and return reviewed copy within five days after receipt.

1.5 PROJECT MEETING

.1 Meet with Consultant within 7 working days of Award of Contract date, to establish scope of Work and approach to project construction operations.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies the requirements for submittals of information by the Contractor for review by the Consultant.

.2 Additional specific requirements for submittals may also be included in individual Sections of Divisions 1 through 33.

1.2 ADMINISTRATIVE

.1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Make submittal submissions to Consultant, with additional submissions to other parties involved with construction of the Project as directed by the Consultant. Other parties may be one of the following, but shall not be restricted to, consultants, authorities, Contractors whose work must be coordinated with work related to submittals, or other organization as determined by the Consultant.

.3 Do not proceed with Work affected by submittal until review is complete.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Review submittals prior to submission to Consultant. This review represents that necessary requirement 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 Verify field measurements and affected adjacent Work is coordinated.

.7 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.

.8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant’s review.

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

1.3 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 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.

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

.4 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.

.5 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.

.6 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Contractor
  - .2 Subcontractor.
  - .3 Supplier.
  - .4 Manufacturer.
  - .5 Other pertinent detail.
- .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.

.7 After Consultant's review, distribute copies.

.8 Submit 3 prints and electronic copy (if available) of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.9 Submit 3 prints or electronic copy (if available) of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.10 Submit 3 prints or electronic copy of test reports for requirements requested in specification Sections and as requested by Consultant.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project and must conform to all current applicable code requirements.

.11 Submit 3 prints or electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.

.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.

.12 Submit 3 prints or electronic copy of manufacturer’s instructions for requirements requested in specification Sections and as requested by Consultant.

.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.

.13 Submit 3 prints or electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.14 Submit 3 prints or electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested Consultant.

.15 Delete information not applicable to project.

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

.17 If upon review by Consultant, no errors or omissions are discovered, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.18 Review of shop drawings prior to submission to the Consultant. Review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the work and the Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

.19 Resubmit immediately Drawings noted "see comments" if requested by the Consultant, to ensure that corrections have been made.

.20 Drawings requiring resubmissions to be either corrected or resubmitted or to be superseded by other submitted Drawings.

.21 Do not make any changes to Shop Drawings after final review without written permission of the Consultant.

.22 Where necessary and required, shop drawings shall be stamped and signed by a professional engineer licensed in the territory of Nunavut.

1.4 SAMPLES

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

.2 Deliver samples prepaid to Consultant.

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

.6 Make changes in samples which Consultant 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.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION 01 33 00

Part 1 General

1.1 REFERENCES

.1 Manual of Uniform Traffic Control Devices for Streets and Highways - 2002.

1.2 PROTECTION OF PUBLIC TRAFFIC

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

.2 When working on travelled way:

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

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

.3 Do not leave equipment on travelled way overnight.

.3 Do not close any lanes of road without approval of Consultant. Before re-routing traffic, erect suitable signs and devices in accordance with instructions contained in Part D of UTCD.

.4 Contractor to ensure the access gates on the North and South access roads are closed and secured when their forces are not on site.

1.3 INFORMATIONAL AND WARNING DEVICES

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

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of UTCD manual.

.3 Place signs and other devices in locations recommended in UTCD manual.

.4 Continually maintain traffic control devices in use by:

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990.

1.2 FILING OF NOTICE

.1 File Notice of Project with Territorial authorities prior to beginning of Work.

1.3 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.4 GENERAL REQUIREMENTS

.1 Develop site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address existing site conditions and the requirements specified within the project specifications.

.2 Observe and enforce construction safety measures required by Code, The Occupational Health and Safety Act, and Regulations for Construction Projects WORKERS' COMPENSATION ACT, S.N.W.T. 2007, in force April 1, 2008 with latest amendments and the Northwest Territory & Nunavut Code of Practice, Personal Protective Equipment, Respiratory Protection.

.3 Contractor to check and verify the securement and performance of all safety systems and guard rail systems prior to the start of work each day.

1.5 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, a competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have working knowledge of occupational safety and health regulations.

.2 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.7 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Work shall conform to the requirements of the all local, Municipal, Territorial, and Federal building by-laws and ordinances.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosures as required by relevant national, territorial and municipal safety regulations.

1.4 GUARD RAILS AND BARRICADES

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

.2 Inspect guard rail systems prior to the start of work each day.

1.5 ACCESS TO SITE

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

1.6 PUBLIC TRAFFIC FLOW

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

1.7 FIRE ROUTES

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

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 In instances where more than one code, regulation or specification requirement may exist, the more restrictive requirement shall govern. Contractor shall provide written notification to the City of Iqaluit where clarification is required or conflict in governance exists.

.2 The specifications for this part of the work shall be considered as an integral part of the drawings which accompany them, and neither the drawings nor the specifications shall be considered alone. Any item which is omitted from one but which is mentioned or reasonably implied in the other, shall be considered as properly and sufficiently specified, and must be therefore provided. All items not specifically mentioned in the drawings or specifications, but which are necessary to make and or complete the work specified, shall be included in the scope of work and the Contractors bid amount.

1.2 CONTRACTOR'S DAILY WORK LOG BOOK

.1 The Contractor shall maintain a Daily Work Log Book on site.

.2 The Contractor shall be responsible for the documentation of work completed and events on site each day. The Daily Work Log Book shall be updated at the end of each work day.

.3 The Contractor shall be responsible for circulation of the daily records of work on site no later than Monday at 10:00 a.m. for the preceding seven (5 work and two weekend days) days or as requested by the City of Iqaluit.

.4 The log book shall be maintained on site and be available for review by the City of Iqaluit.

.5 The log book shall form part of the project record which shall be included in the closeout documentation to be submitted to the City of Iqaluit upon completion of work.

.6 The log book shall document the progression of the project each day. The daily logs shall include:

- .1 Date and description of the weather conditions, including average air temperature.
- .2 Area and quantity of repair.
- .3 Area and quantity of material installation.
- .4 Number and trades of staff on site.
- .5 Batch numbers of the material used in each day.
- .6 Notes of any unusual conditions or events encountered that day.
- .7 Delivery of material and equipment on site.

1.3 ALTERNATE MATERIALS

.1 Each Section establishes the standard of quality required for the materials to be used on site and incorporated into the building envelope. Proposed substitutions or alternate material or techniques must meet this standard, and will be considered as follows:

.1 Any request for the use of a substitute or alternate material must be submitted in writing to the City of Iqaluit.

.2 The written request for approval of a substitution or alternate material is received no less than ten (10) days prior to tender closing.

.3 The request shall include a complete item-by-item description showing how the alternative material meets or exceeds the requirements set out in the specification. Only products which meet the meet the requirements of the specifications will be considered. Submissions must include:

.1 Manufacturer's literature, technical data sheet, samples, test data, engineering standards and performance evaluation indicating comparable performance equal or better than the performance standards specified.

.2 Provide proof that the products that have been tested, found suitable, and documented as such by the manufacturer for the particular substrates to which they will be applied.

.3 Proof of testing and material properties in accordance with CSA, CGSB and ASTM standards specified, by a recognized authority located on North America.

.4 Performance evaluation from a firm accredited in Canada, indicating compliance with the specified standards and material properties.

.4 Proposed material substitutions will be rejected if the Contractor fails to provide all of the required literature and technical data to allow an evaluation by the City of Iqaluit prior to the ten (10) day before tender closing.

.5 Allow 4 working days for review by the City of Iqaluit.

1.4 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection by the City of Iqaluit is a precaution against oversight or error on the part of the Contractor. Inspection by the City of Iqaluit or Consultant does not relieve the Contractors' of their responsibility to complete the work as specified within the contract documents. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with the City of Iqaluit based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify the City of Iqaluit of such no less than 20 working days prior to the start of work to allow substitutions of equivalent materials or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify the City of Iqaluit at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the City of Iqaluit reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 USE OF SITE FACILITIES

.1 The site is an operational facility and the Contractor must coordinate all access and work on site with the City of Iqaluit.

.2 The Contractor shall provide access to and about the site to ensure continuous and efficient delivery and movement of people, materials and equipment by the City of Iqaluit‘s forces. Arrange routes so that they do not conflict with operations and access to the building.

.3 At the completion of the work, all temporary connections, safety systems and equipment shall be removed and the services and finishes shall be made good by the Contractor to the satisfaction of the City of Iqaluit.

.4 The Contractor shall provide and maintain temporary enclosures and interior building temperature required to prevent moisture damage to the work, the building or the contents therein.

.5 Restrict all personnel employed in connection with the work to the area(s) approved for access by the Contractor.

1.7 STORAGE, HANDLING AND PROTECTION

.1 The Contractor shall undertake additional measures to ensure that any fuel or propane bottles stored on site are protected from vandalism, ignition or accidental damage. The Contractor shall ensure that any fuel or propane gas cannot be released, moved or vandalized by unauthorized persons.

.2 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions where applicable.

.3 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.4 Store products subject to damage from weather in weatherproof enclosures.

.5 Remove and replace damaged products at own expense and to satisfaction of the City of Iqaluit.

.6 Touch-up damaged factory finished surfaces to the City of Iqaluit’s satisfaction. Use touch-up materials to match original. Do not paint over name plates.

.7 The Contractor shall assume all liability for, and be responsible for loss of or damage to, all equipment and materials stored on site, and for any equipment or materials delivered from whatever source to the site of the work.

.8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.9 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standards and any other specification or reference accepted as standard.

.10 Protect and store all materials in a dry, wall ventilated and weatherproof location. During winter, store materials in a heated location with a 5 degree C minimum temperature. Remove only as needed for immediate use. Keep materials away from open flame or high temperatures.

.11 Avoid stockpiling materials on site in a manner which could cause overloading or damage to the building assemblies.

.12 Store all materials in a manner that does create a hazard to the building or public safety.

.13 Storage and Handling Requirements

.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of all products and materials used on site.

.2 Provide and maintain dry, off-ground weatherproof storage and protect from freezing, moisture, water and contact with ground or floor

.3 Store components and materials in accordance with panel manufacturer’s recommendations and protect from elements and damage.

.4 Remove only in quantities required for same day use.

.5 Store sealants at +5 degrees C minimum.

1.8 TRANSPORTATION

.1 Pay costs of transportation of materials and products required in performance of Work.

1.9 MANUFACTURER INSTRUCTION

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

.2 Notify the City of Iqaluit in writing, of conflicts between specifications and manufacturer's instructions, so that the City of Iqaluit will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the City of Iqaluit to require removal and re-installation at no increase in Contract Price or Contract Time.

1.10 QUALITY OF WORK

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

.2 Do not employ anyone unskilled in their required duties. The City of Iqaluit reserves right to require dismissal from site, workers deemed incompetent or careless.

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

.4 The Contractor is responsible for the control and application of construction safety measures on site and it's conformance with the current legislation, acts, and other regulations in effect or required.

.5 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work to ensure conformity with the Contract Documents. The Contractor shall have a competent and qualified person supervising the work on site at all times.

.6 The Contractor shall have a competent person for emergency calls after construction hours and during weekends. It shall be the Contractor's responsibility to supply the City of Iqaluit with the name and telephone number of the person to be contacted during these periods.

.7 The Contractor shall have control over, charge of and be responsible for the acts or omissions of the Contractor, Subcontractor's, Suppliers, or their agents, employees, or any other persons performing portions of the Work therein.

.8 The Contractor shall be solely responsible for the construction, schedule, methods, techniques, sequences, procedures and for coordination and supervision of their sub-trades and all parts of the Work under the Contract.

1.11 COORDINATION AND COOPERATION

.1 Execute work with minimum disturbance to the building operations, occupants, public and normal use of site. Maintain access and exits to the building and site. Where security has been reduced by work of contract, provide temporary means to maintain security.

.2 The work shall be inspected and tested by the City of Iqaluit. The Contractor must keep the City of Iqaluit and Consultant informed at all time when work is being carried out.

.3 A minimum seven (7) days noticed shall be given by the Contractor prior to the required inspection unless agreed upon otherwise.

.4 Any work not accepted by the City of Iqaluit shall be immediately corrected by the Contractor to the City of Iqaluit's satisfaction. Frequency of the tests will be determined by the City of Iqaluit.

1.12 CONCEALMENT

.1 Before installation inform the City of Iqaluit if there is interference. Install as directed by the City of Iqaluit.

1.13 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.14 LOCATION OF FIXTURES

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

.2 Inform the City of Iqaluit of conflicting installation. Install as directed.

1.15 FASTENING

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

.2 Prevent electrolytic action between dissimilar metals and materials.

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

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

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

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

1.16 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of the City of Iqaluit.

1.17 EXISTING UTILITIES

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

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

1.18 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse or recycling in accordance with Section 01 74 11 - Material Disposal.

Part 2 Products

2.1 Not Used

.1 Not Used.

Part 3 Execution

3.1 Not Used

.1 Not Used.

END OF SECTION 01 61 00

Part 1 General

1.1 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Consultant.

.2 Unless specified otherwise, materials for removal do not 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 Protect surface drainage, mechanical and electrical from damage and blockage.

.6 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.

1.2 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at regularly scheduled frequencies.

.3 No waste material shall be permitted within the reservoir, any material that falls into the reservoir must be removed by the Contractor.

.4 Provide on-site waste containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris at designated dumping waste handling locations.

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

.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 of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste into waterways, storm, or sanitary sewers.

.3 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

1.4 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 and leave Work clean and suitable for occupancy.

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

.4 Remove waste materials from site at regularly scheduled frequencies. Do not burn waste materials on site.

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

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

.7 Remove dirt and other disfiguration from exterior surfaces.

.8 Sweep and wash clean paved areas. Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Conduct meeting with the City of Iqaluit representatives to:

.1 Verify Project requirements.

.2 Review warranty requirements and manufacturer's installation instructions where applicable.

.2 The Owner to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contractor to provide contact information for bonded and 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.

1.2 ACTION AND INFORMATION SUBMITTALS

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

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

.3 Copy will be returned after final review with the Owner’s comments.

.4 Revise content of documents as required prior to final submittal.

.5 Submit to the Owner four final copies of operating and maintenance manuals in English.

.6 Furnish evidence, if requested, for type, source and quality of products provided.

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

.8 Pay costs of transportation.

1.3 FORMAT

.1 O and M manuals are to be assembled as follows:

.1 The Contractor to provide three (3) hard copy binders and 1 CD copy of Operations and Maintenance (O&M) Manuals upon project completion.

.2 O and M Manuals are to be assembled in a 1” or greater 3 ring binder labelled on the front cover and on the binder edge with the:

.1 Building name and address, project name, project number project number, and completed date

.3 O and M Manuals are to include:

.1 A title page with building name, address, date, general contractor information: name, address, and phone numbers, consultant: name, address, and phone number, table of contents each binder's content.

.2 Index and tabs are to have dividers with permanently marked tabs to separate each section and sub section, tab labels typed – not hand written, main tab for each specification section.

.4 O and M Manuals are to be formatted and tabbed in accordance with the Owner's O&M guidelines, information to be included:

.1 Signed Letter of warranty: Dated to date of substantial completion as determined by the Owner, identifying project by name, project number project number, building location as well as warranty period. All warranties to be included from all contractors in this sections and extended warranties.

.2 Contact information for all sub-contractors and suppliers, including: name, address, telephone number of manufacturer, installing contractor.

.3 All test results, inspection reports, and permits.

.4 As built drawings – to be marked in "red" by contractor and provided to the Owner.

.5 Copy of reviewed shop drawings.

.6 Copy of specific service and maintenance manuals, including preventative and corrective maintenance, with service procedures and schedules for preventative maintenance in a printed format and electronic format compatible with the Owner's system, recommended frequency of performance for each preventive maintenance task, inspection and scheduled overhauls or reconditioning, Cleaning: Instructions and schedules for all routine cleaning and inspection recommended, including recommended cleaners and lubricants, Repairs: Instructions for minor repairs or adjustments required for preventative maintenance routines.

.7 Health and Safety submittals including: site specific hazard assessment, safety manual TOC and company safety policy, MSDS sheets (if applicable) signed site orientations for worker, copy of first aid certificate, copy of emergency plan and muster location.

.8 Copy of all product data sheets.

.9 Copy of the Contractor daily work log.

1.4 CONTENTS – PROJECT RECORD DOCUMENTS

.1 Title Page: Provide building name, address, date, general contractor information (name, address and phone numbers) and consultant information (name, address and phone numbers).

.2 Table of Contents for Each Volume: provide title of project; date of submission; and include:

.1 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

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

.3 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.2 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

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

.4 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.5 AS- BUILT DOCUMENTATION AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions at site for the Owner 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.

.9 Daily work log.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

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

.5 Keep record documents and samples available for inspection by the Owner.

1.6 RECORD INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of drawings provided by the Owner.

.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 foundation in relation to finish first floor datum.

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

.3 Field changes of dimension and detail.

.4 Changes made by change orders.

.5 Details not on original Contract Drawings.

.6 Referenced Standards 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 Provide digital photos, if requested, for site records.

1.7 MATERIAL AND FINISHES

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

.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.

1.8 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to the Owner for approval.

.3 Warranty management plan to include required actions and documents to assure that the Owner 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 the Owner 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 or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with the Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct 11 month warranty inspection, measured from time of acceptance, by the Owner. Repair any deficiencies observed in the completed work.

.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 Provide list for each warranted equipment, item, and 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.

.10 Cross-Reference to specific 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.

.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 Owner to proceed with action against Contractor.

Part 2 Products

2.1 Not Used

Part 3 Execution

3.1 Not Used

END OF SECTION 01 78 00

Part 1 General

1.1 SCOPE OF WORK

.1 Supply all materials, labour, plant tools and equipment necessary to complete concrete repairs as specified within the design documents and as directed by the Consultant.

.2 Repair of deteriorated concrete materials as specified:

.1 Chipping and breaking out all deteriorated, spalled and delaminated concrete, defective cold joints, and the subsequent filling of voids, cracks and rebuilding of exterior surface profiles. This work shall be directed by the Consultant at the time of work.

.2 General surface preparation of the existing concrete and rebar at the locations designated by the Consultant.

.3 Contractor shall carry a 2 square meter allowance to complete the removal and replacement of the existing concrete material to a average depth of 100 mm.

.4 Removal and replacement will be undertaken at multiple locations as designated by the Consultant.

.3 Installation of survey monuments and sensor monitoring stations.

.1 Data logger (sensor) monitoring stations as directed by the Consultant and as specified. The contractor shall include the installation of 9 monitoring stations.

.2 Survey monuments, the Contractor shall include the installation of:

.1 Three (3) monuments to be installed atop and within the concrete dam.

.2 Five (5) survey monuments to be installed atop steel piles. set in and filled with concrete.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.2 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

1.3 CERTIFICATES

.1 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

.2 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA-A23.1.

1.4 MEASUREMENTS AND PAYMENTS

.1 Measurement Procedures:

.1 Concrete repair will be measured in square metres.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical properties, finish and limitations.

.3 Submit WHMIS Safety Data Sheet (SDS).

.1 Submit 2 copies of WHMIS SDS.

.4 Submit a proposed work plan for approval by Consultant. Work plan to include a list of materials and proposed plan to be implemented to perform the work.

1.6 EXISTING CONDITIONS

.1 Examine Site conditions and existing surfaces to be repaired.

.2 Place and set new concrete materials in conformance with the temperature limitations specified by the manufacturer.

.3 Provide heated enclosures if necessary to allow the new concrete material to cure.

1.7 MEASUREMENT FOR PAYMENT

.1 Payment shall be based upon the unit rate stipulated in the Contractor’s bid amount. Locations for individual repair shall be designated by the Consultant at the start of work.

.2 Unit rate payment shall be based on a lineal measurement of the area repairs. Concrete repairs shall be measured by the Consultants in the presence of the Contractor to the nearest 0.01 metre. The Contractor shall not exceed beyond the limits of the repair areas which have been agreed upon without prior authorization by the Consultant.

.3 The stipulated unit prices for concrete repair shall be full compensation for the, removal of the existing concrete material, surface preparation of the concrete and steel reinforcement bars and any other items required to complete the work which shall include the supply and installation of the concrete repair materials.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate facilities.

.2 Do not dispose of unused chemical additive materials into water supply systems, into lakes, streams, onto ground or in any other location where it will pose health or environmental hazard.

Part 2 Materials

2.1 MATERIALS

.1 Concrete materials: specialized concrete repair media, rapid-setting, cementitious repair mortar containing hydraulic cements for use near potable water. Minimum requirements:

.1 Compressive strength:
- .1 7 Day 30 MPa (4350 psi)
- .2 28 Day 35 MPa (5075 psi)

.2 High resistance to freeze-thaw.

.3 Suitable for use in vertical applications.

.2 Approved material:

.1 Duro-Crete manufactured by King

.2 Speed Crete as manufactured by W.R.Meadows

.3 Or approved equivalent.

Part 3 Execution

3.1 GENERAL

.1 Contractor to ensure all required shoring is in place prior to start of concrete demolition and repair.

3.2 CONCRETE REMOVAL

.1 No larger than 7kg class chipping hammers shall be used for removal of concrete around and behind reinforcing steel.

.2 The concrete in the repair area shall be removed until sound concrete is reached or to a minimum depth of 1” (25mm) below the reinforcing steel. Concrete shall not be removed beyond the 100 mm limit except where authorized by the Consultants.

.3 Removal of concrete shall extend (25mm) beyond visible signs of corrosion along all reinforcing bars exposed in the area of repair.

.4 Upon completion of initial chipping, the concrete surface immediately surrounding the repair area should be sounded for local delaminations. Chip additional delaminated areas as required.

.5 The perimeter of the patches shall be saw cut to a minimum of 1/2" (13mm) deep to provide a vertical surface.

3.3 FORMWORK

.1 The Contractor shall construct all formwork including shoring and bracing to resist loads due to the weight of wet concrete, self-weight of forms and fluid pressure of concrete.

.2 Formwork shall be constructed with joints sufficiently tight to prevent leakage of grout or concrete.

.3 The edges of all plywood sheets shall be backed or supported to prevent separation or opening.

.4 Ensure that all steel reinforcement is tied and/or secured properly so that sufficient cover to the forms is provided. Use plastic or prefabricated chairs.

.5 Formwork shall remain in place until concrete has reached 75 percent of its 28-day strength or 4 days minimum or as directed by Consultant.

3.4 CONCRETE PREPARATION

.1 Clean reinforcement to SSPC-SP-3 (power tool cleaning).

.2 The prepared concrete surface shall be thoroughly wetted down with potable water.

.3 The approved bonding agent shall be applied to the concrete surface prior to the placement of the repair mortar. The bonding agent shall be scrubbed into the surface, fully filling all voids and irregularities.

.4 Apply concrete mix when bonding agent is still wet. If bonding agent is allowed to dry, then an additional coat of bonding agent will be required.

3.5 CONCRETE PLACEMENT

.1 Apply concrete when bonding agent is still wet. If bonding agent is allowed to dry, then an additional coat of bonding agent will be required. Pencil vibrators shall be used for consolidation.

.2 Pre-bagged concrete shall be mixed and placed in accordance with manufacturing recommendations.

3.6 FINISHING AND CURING

.1 Finish and cure concrete in accordance with CAN/CSA-A23.1.

.2 Finish and cure pre-bagged concrete in accordance with manufacturer's instructions.

.3 Repair surfaces shall be finished to the same level as the surrounding surfaces unless instructed otherwise.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Supply all labour, plant, tools, equipment and materials necessary to carry out crack injection repairs within the concrete dam.

.2 Locations to be designated by the Consultant at the time of work.

.3 The Contractor shall carry an allowance of 15 linear meters.

1.2 APPROVALS

.1 The products listed in Clause 2.1 of this specification Section are approved for use on this project. If the contractor or subcontractor responsible for the crack injection is aware that any of the products listed in Clause 2.1 do not meet the requirements as listed, then the Contractor shall advise the Consultant in writing during the tender and the Consultant will instruct the Contractor on acceptable procedures. If no such written document is submitted then it will be accepted that the contractor warrants that any product used meets the requirement of the specifications and application.

.2 Obtain Consultants written approval prior to use of any crack injection product not specifically listed in this section. Proposals for use of alternate products will be considered, however, the stipulated price submitted must include one of the approved systems and shall show the alternate systems as a separate price.

.3 Obtain on-site direction from manufacturer regarding proper preparation and installation of injection products. Provide Consultant with a letter of approval from manufacturer for polyurethane injection installation.

1.3 SUBMISSION AND DESIGN REQUIREMENTS

.1 The Contractor shall submit two copies of manufacturer's specifications for all products incorporated into the crack injection process.

1.4 MATERIAL AND INSTALLATION REQUIREMENTS

.1 The spacing of the injection ports shall be designed to achieve full penetration of the cracks.

.2 The temperature of the exterior concrete and the ambient temperature shall be a minimum of 5°C during preparation injection and curing.

.3 All installation procedures and details shall be completed in full accordance with manufacturer’s instructions.

.4 Where details shown on the drawings or in the specification are not in accordance with manufacturers requirements, notify Consultant.

1.5 RELATED BY-LAWS AND STANDARD SPECIFICATIONS

.1 Execute work to meet or exceed:

.1 National Building Code of Canada 1995 and all local, Municipal and Territorial building by-laws and ordinances including all amendments up to project date.

.2 Occupational Health and Safety Act and Regulations for Construction Projects.

.3 Canadian Construction Safety Code (latest edition).

.4 Canadian Environmental Assessment Act (CEAA), 1995.

.5 Rules and regulations of authorities having jurisdiction.

1.6 MEASUREMENT FOR PAYMENT

.1 Payment shall be a combination of stipulated price and unit rate for areas as indicated on the contract drawings.

.2 Unit rate payment shall be based on a lineal measurement of cracks injected. Crack injection shall be measured by the Consultants in the presence of the Contractor to the nearest 0.1 metre. The Contractor shall not exceed beyond the limits of the repair areas which have been agreed upon without prior authorization by the Consultant.

.3 The stipulated price and unit prices for crack injection shall be full compensation for the, surface preparation, port installation, port removal and any other items required to accommodate the work and for the supply and installation of the crack injection material of the type as specified.

1.7 WARRANTY

.1 The Contractor shall provide a written warranty for a period of 3 years from the date of final completion of the project as certified by the Consultants. The Contractor shall warrant that the crack injection repairs will be free of leakage and or defects related to workmanship or material deficiency. Any repair required under the warranty will be carried out in accordance with the recommendations of the Consultant and material manufacturer.

Part 2 Materials

2.1 POLYURETHANE INJECTION

.1 Flexible Water Reactive Polyurethane Resin as manufactured by MME Multiurethanes Ltd. Acceptable product: Flexible Resin Polyurethane, manufactured by Multiurethanes (MME) Ltd., 5245 Creekbank Rd, Mississauga, ON, L4W 1N3

Flexible polyurethane resin: One-component, water-activated type flexible foam, hydrophobic and solvent-free, non-flammable.

Fast-acting with variable curing rates.

Cured product shall not shrink, MDI-based polyurethane prepolymer with accelerator suitable for cold temperature use above 0deg. C, viscosity - 600 cps at 20 degrees C.

.2 Rapid H100 Water Activated Polyurethane Resin as manufactured by Specton Construction Products Ltd.

.3 Resfoam HB 45 as manufactured by Mapei

.4 Or approved equivalent.

2.2 INJECTION PORTS

.1 The injection ports shall be approved plastic inserts. Surface mounted ports are not acceptable.

Part 3 Execution

3.1 AREAS OF REPAIR

.1 The general areas requiring repair are identified on the drawings. Contractor to confirm with Consultant the exact areas requiring repair prior to commencing work.

.2 Contractor will delineate and mark areas indicated by the Consultant.

3.2 POLYURETHANE ELASTOMER GROUT

.1 Grind the exterior surface areas of the repair areas to remove mineral deposits prior to installation of the repair material.

.2 Drill inclined holes at 60° through concrete in order that the holes penetrate the crack at roughly mid depth. Spacing of the holes shall not exceed 300mm along the crack. Holes should be of sufficient diameter to correspond to the size requirements of the injection ports.

.3 Epoxy the injection ports in place and seal between the cracks using containment epoxy if necessary to achieve proper resin material injection into the repair area.

.4 Carry out injection of all cracks using water to flush out all debris to ensure free flow of injection material.

.5 Commence injection (using a hand gun, pressure pot or injection machine, the pressure shall not exceed 0.2 MPa, or as stipulated by the injection material.

.6 Commence work at the lowest port on a vertical face. Continue injection until pure uncontaminated material flows from the adjacent port. The volume of polyurethane material to be used per injection shall equal 1/3 of the volume of the crack to be filled over a 300mm interval.

.7 Where there is insufficient moisture present in the crack to facilitate the proper reaction with the polyurethane resin, inject a suitable amount of water into each hole to ensure adequate reaction prior to injection of the resin material.

.8 Pump resin material into injection port until resin material starts to come out of the adjacent port.

.9 Close the adjacent injection port.

.10 Repeat steps for all remaining ports.

.11 The contractor shall re-inspect all repaired locations after 30 day, any areas with continued moisture leakage shall be re-done by the Contractor.

3.3 FINAL CLEANUP

.1 Upon completion remove all debris and excess material from the site.

.2 Grind excess material from the surface of the repaired cracks.

.3 Wash with water all surfaces, including concrete slab, wall, signage, doors, etc., to remove dust. Use high pressure washing except at areas adjacent to exposed lights or sprinkler head, etc., which may be damaged. Low pressure cleansing and brushing as necessary will be required in these areas.

.4 Prior to leaving the site accompany the Consultant in a final inspection of all work areas.

End of Section 03 07 05

Part 1 General

1.1 SCOPE OF WORK

.1 Work of this section includes the purchase, installation, setup and testing of monitoring equipment for the concrete dam and earthen berms at the Lake Geraldine Dam and Reservoir, Iqaluit, Nunavut.

.2 The Contractor shall note that the temperature sensor strings have been installed, only extension cables, data loggers and specified accessories are required as stipulated below.

.3 This work shall include:

.1 Type 1, Sensor and datalogger Casings (earthen berms): Supply and installation of 8” diameter steel casings set into concrete at 9 locations in the North, Center and South berms.

.2 Type 2, Sensor and datalogger Casings (downstream face of concrete dam): Supply and installation of 8” diameter steel casings installed atop the concrete dam at the base of the spillway at 2 locations. Cut base on an angle to accommodate the slope concrete surface.

.3 Supply, installation and setup of 11 (10 installed and 1 spare) temperature data loggers, cables and accessories.

.4 Supply, installation and setup of 6 (5 installed and 1 spare) piezometers (pressure) sensors.

.5 Supply, installation and setup of 6 (5 installed and 1 spare) pressure data loggers and accessories.

.6 Supply and installation of one water level (WL-1) sensor and data logger on the upstream face of the concrete dam. This work shall include 2” conduit, waterproof metal enclosure, stand and protective galvanized metal cover.

.7 Supply and installation of 2” diameter conduit casings and pull boxes at three (3) existing borehole locations (BH#3, 106 & 109).

.8 Supply and installation of temperature string extension cables at three (3) locations (BH#103, 106 & 109). Contractor to verify length required at each of the three locations.

.9 Supply and installation of 1.5 m temperature string extension cables at three (7) locations (BH#3, 106 & 109).

1.2 RELATED REQUIREMENTS

.1 Section 03 01 37 Concrete.

1.3 EXISTING MONITORING EQUIPMENT

.1 Ten temperature monitoring strings have been installed on the downstream (west) side of the dam at 7 (existing) bore hole locations. Some bore holes have two temperature strings installed.

.2 Four piezometers monitoring wells have been installed on the downstream (west) side of the dam. These four BH locations do not have instruments installed, Contractor to supply 6 piezometers (5 to be installed and one spare).

Table 1, Borehole summary:

Borehole Number	Sensor Number	Sensor Type	Sensor Quantity	Data Logger Type	Datalogger Quantity	Location
BH101	P101-1	Piezometer	1	NX5C	1	North berm
BH102	T102-1	Temperature	2	TSR16	2	North berm
BH103	T103-1	Temperature	1	TSR16	1	North berm
BH105	T105-1	Temperature	2	TSR16	2	Center berm
BH106	T106-1	Temperature	1	TSR16	1	Center berm
BH107	P107-1	Piezometer	1	NX5C	1	Center berm
BH108	T108-1	Temperature	2	TSR16	2	Center berm
BH109	T109-1	Temperature	1	TSR16	1	Center berm
BH112	P112-1	Piezometer	1	NX5C	1	Concrete dam
BH113	P113-1 P113-2	Piezometer	2	NX5C	2	Concrete dam
BH115	T115-1	Temperature	1	TSR16	1	South Berm
Top of Dam	WL-1	Water Level (piezometer)	1	NX5C	1	Upstream face of dam.

1.4 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CAN/CSA-C22.3 No. 7-10, Underground Systems.

.2 Rigid PVC conduit: to CSA C22.2 No. 211.2.

.3 CSA C22.2 NO 211.1, Rigid types EB1 and DB2/ES2 PVC conduit.

Part 2 Products

2.1 TYPE I CASINGS

.1 Eight-inch diameter, length as indicated:

.2 Acceptable material:

.1 Primed and painted with two coats of exterior grade paint.

.2 Steel, 203 mm diameter and lockable cap.

.3 Fabricate with lockable, cover.

.4 Quantity required: 9

2.2 TYPE 2 CASINGS

.1 Eight-inch diameter, 12” length with welded baseplate:

.2 Acceptable material:

.1 Primed and painted with two coats of exterior grade paint.

.2 Steel, 203 mm diameter with baseplate and lockable cap.

.3 Fabricate with lockable, cover.

.4 Mechanically fastened to concrete dam.

.5 Quantity required: 2

.6 Contractor to cut base of casing to match slope of concrete at base of the spillway.

2.3 PIEZOMETERS (PORUS WATER PRESSURE)

.1 Strain gauge Piezometer

.1 To be installed in boreholes BH101,107,112 and113(qty 2).

.2 Performance requirements:

.1 Accuracy: ±0.1% FS

.2 Standard Pressure Ranges: 0 – 10 m Piezometer Nose with sintered stainless steel porous filter.

.3 Compensated Temp. Range: -20°C to 80°C

.4 Resolution: <0.025% FS

.5 Pressure Output: 4 to 20 mA

.6 Acceptable Product: RST Instruments, model number VW2100-m strain gauge piezometer

.3 Quantity required: 6

2.4 PIEZOMETERS (WATER DEPTH)

.1 Strain gauge Piezometer

.1 To be installed in boreholes WL-1.

.2 Performance requirements:

.1 Measurement Range: 0 - 10 m

.2 Pressure sensor (capacitive pressure sensor): Ceramic

.3 Pressure Output: 4 to 20 mA

.4 Temperature measurement

.1 Measuring range: –25 °C … +70 °C

.2 Resolution: 0.1 °C / 0.1 °F

.3 Accuracy: ±0.5 °C / ±0.9 °F

.4 Units: °C, °F

.5 Dimensions L x Ø: 195 mm x 22 mm

.6 Acceptable Product: OTT PLS, available for Hoskin Scientific.

.3 Quantity required: 2

2.5 TEMPERATURE DATA LOGGER

.1 TSR16 Thermister string Data Logger, complete with.

.1 Ring tight metal case.

.2 1 USB mini communications cable.

.3 17 conductor metal thermistor string connector.

.4 Quantity required: 11

.2 Power: 4AA, Ultimate lithium batteries per data logger.

.1 Quantity required: 52

.3 Supplied by Lakewood Systems Ltd., #112-9704-39 Avenue, Edmonton, Alberta, Phone number: 780-462-9110.

2.6 NANO PRESSURE (PIEZOMETER) DATA LOGGER

.1 NX5C Data Logger complete with:

.1 4 analog channel (0-2.5 or 4-20 mA)

.2 1 strobe (RG) channel

.3 USB communications port and cable.

.4 9v battery clip

.5 Ethernet type input plug.

.6 Optional internal temperature and voltage channel.

.7 Quantity required: 7

.2 Power: 1 x 9v, lithium batteries per data logger.

.1 Quantity required: 14

.3 Supplied by Lakewood Systems Ltd., #112-9704-39 Avenue, Edmonton, Alberta, Phone number: 780-462-9110.

2.7 COMMUNICATIONS CABLE FOR REMOTE DATALOGGER HOUSING

.1 Communication cable for remote data logger housing.

.2 Model number: CCRDH

.3 Quantity required: 16

.4 Supplied by Lakewood Systems Ltd., #112-9704-39 Avenue, Edmonton, Alberta, Phone number: 780-462-9110.

2.8 COMMUNICATION CABLE FOR DATA RETRIEVAL

.1 Model number: SP

.2 Quantity required: 4

.3 Supplied by Lakewood Systems Ltd., #112-9704-39 Avenue, Edmonton, Alberta, Phone number: 780-462-9110.

2.9 DATA LOGGER SOFTWARE

.1 ProLog4 Datalogger software, Windows operating system.

.2 Quantity: Two License

2.10 TEMPERATURE STRING EXTENSION

.1 Extension cable for (existing) temperature string data retrieval, complete:

.1 Male and female connectors (MS3106E 20-29P style connector).

.2 Pin M is common connection.

.3 Remaining pins are wired from Pin A to Pin T.

.4 Quantity required: 3, contractor to verify length on site.

.5 Quantity required: 7 @ 1.5 meters in length.

.6 Manufactured by: M^2

2.11 WATER LEVEL ENCLOSURE

.1 Lockable, exterior grade, waterproof metal enclosure with access door.

.2 Contractor to provide steel base to secure enclosure to concrete dam.

.3 Minimum dimensions: 310 mm x 310 mm

2.12 WATER SENSOR PROTECTIVE ENCLOSURE:

.1 18 Ga, galvanized metal cover for new water level sensor and conduit.

.2 Secure with corrosion resistant, concrete fasteners to side of concrete dam at 310 mm OC.

2.13 CONDUIT

.1 Type: DB-60 direct burial, PVC rigid conduit.

.2 Inside Diameter: 2”

.3 Connectors and accessories as required.

2.14 BENTONITE SEAL

.1 Install bentonite seal in each of the designated borehole locations on the downstream side of the dame.

.2 Borehole numbers:

.1 BH101, qty 1.

.2 BH107, qty 1.

.3 BH112, qty 1.

.4 BH113, qty 2.

Part 3 Execution

3.1 INSTALLATION

3.2 GENERAL

.1 Do complete installation in accordance with requirements of:

.1 CSA 22.1 Canadian Electrical Code.

.2 Do underground installation to CAN/CSA-C22.3 No.7, except where otherwise specified.

.3 Conform to manufacturer's recommendations for storage, handling and installation.

3.3 CONDUIT SYSTEM

.1 Conduit enclosures for temperature string sensors shall be provided at bore hole numbers BH103, BH106, BH109 and WL-1.

.2 Temperature string extension cable shall be installed in 2” rigid PVC conduit.

.3 Provide complete conduit system to link temperature strings to data logger in casings.

.4 Design drawings show approximate bore hole, conduit and casing installation layout.

.5 Install 2” conduits between 12” – 16” below grade.

.6 Install conduits, and casings prior to pouring of concrete.

.7 Bend conduit so that diameter is reduced by less than 1/10th original diameter.

.8 Leave polypropylene fish cord in conduits for future use.

.9 Pull boxes:

.1 Install at junction of thermistor string cable and temperature string extension cable.

.2 Provide correct size of openings.

.3 Mark location of pull boxes on record drawings.

3.4 CASING INSTALLATION

.1 Type I Casing

.1 Install at thirteen (9) locations identified within the design drawings.

.2 Install as indicated in the design drawings.

.3 Install casing for bore holes BH103, BH106 and BH109 at top of berm.

.4 Install casing with top of casing 24” above grade.

.5 Install base of metal casings to a depth of 48” below grade.

.6 Install casing level and plum.

.7 Contractor to fabricate lockable cap for each data logger.

3.5 TEMPERATURE STRING EXTENSION CABLE

.1 Install temperature string extension cables and rigid PVC conduits at bore hole locations:

.1 BH103, BH106 and BH109. Length of conduit and extension cable to be verified on site by the contractor.

.2 Supply and install 1.5 meter long extension cables at all remaining temperature string monitoring stations, quantity required: 7.

.2 Do not put spliced wiring inside conduits.

.3 Connect female end of temperature string extension cable to male end of temperature string data cable installed within existing bore hole (3) locations.

.4 Use CSA certified lubricants of type compatible with insulation to reduce pulling tension.

3.6 SENSORS AND DATA LOGGER

.1 Contractor to deliver all sensors, data loggers and accessories to the Consultant for testing and configuration. The Consultant will ship the equipment to the Contractor in Iqaluit after testing and configuration.

3.7 PIEZOMETER INSTALLATION

.1 Install piezometer in locations specified. Boreholes numbered:

.1 BH101, qty 1.

.2 BH107, qty 1.

.3 BH112, qty 1.

.4 BH113, qty 2.

.2 Contractor to test piezometer function after installation within each borehole.

.3 Contractor to install a 300 mm (12”) bentonite seal above the piezometer after installation and testing of the piezometer.

.4 Fill remainder of bore hole with clear sand.

3.8 DATA LOGGER INSTALLATION

.1 Install one data logger per sensor, this shall include:

.1 Quantity 10: TSR16 temperature data loggers.

.2 Quantity 6, NX5C pressure data loggers.

.2 Install data loggers within casing vertically with one or two data loggers per casing. See design drawings for type and quantity of data loggers to be installed at each location.

.3 Connect sensor data cable to data logger in conformance with the manufacturer’s installation instructions.

.4 Install USB communication cable and connect one end to the data logger, the second end shall be mounted through the communications port opening within the side of the metal casing to allow data collection. Contractor to drill data cable port in each casing.

.5 Test data logger and communication cabling and verify data collection of the data logger.

.6 Data logger setup and configuration to be completed by the Consultant.

.7 Once data logger functionality has been tested install cap and secure with locks. Provide Three keys per lock to the City of Iqaluit representative.

.8 Provide software and license key to City of Iqaluit representatives and Consultant.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Supply, installation and surveying of new survey monuments to be install within the earthen berms and concrete dam. This work shall include:

.1 Five (5) monuments to be installed within the earthen berms.

.2 Three (3) survey monuments to be installed within the concrete dam.

.3 Survey of datum points for each survey monument relative to the geodetic survey of Canada bench mark.

1.2 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM A252, Standard Specification for Welded and Seamless Steel Pipe Piles.

.2 CSA Group (CSA)

.1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.3 The Master Painters Institute (MPI)/Architectural Painting Specification Manual, (ASM).

.4 The Society for Protective Coatings (SSPC)

.1 SSPC-SP5/NACE No.1, White Metal Blast Cleaning Joint Surface Preparation Standard.

1.3 SYSTEM DESCRIPTION

.1 Survey monuments to be installed within the earthen berms shall consist of the following:

.1 140 mm diameter, steel piles filled with and set within concrete.

.2 Installation of a brass survey markers.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.

.1 Include product characteristics, performance criteria, and limitations.

.3 Submit shop drawings and indicate following items:

.1 Materials.

Part 2 Products

2.1 MATERIALS

.1 Eight-inch diameter, length as indicated:

.2 Acceptable material:

.1 Primed and painted with two coats of exterior grade paint.

.2 Steel, 146 mm diameter and lockable cap.

.3 Quantity required: 9

.3 Concrete:

.1 30 MPa with air entrainment

.4 Brass Monument.

.1 Material: Brass

.2 Size:

.1 50 to 75 mm diameter with raised datum point and small center dimple.

.2 Minimum 64 mm shaft

.3 Each survey monument shall be numbered BM-1 through BM-8, as indicated in the design drawings.

Part 3 Execution

3.1 INSTALLATION

.1 Install new survey monuments as indicated within the design drawings.

.2 Ensure survey monuments are positioned where indicated in design drawings prior to placement of concrete around the base of the steel casing.

.3 Survey monument must be plumb within 3 mm at the top of the monument in both the X and Y axis.

.4 Position and anchor the brass survey marker in the center of the survey monument. Ensure brass marker is level.

3.2 SURVEY DATA

.1 Once the survey monuments have been placed and the concrete has cured, survey each data point relative to the Geodetic Survey of Canada bench mark on the hill west of the dam.

.2 Information to be recorded shall include:

.1 Surveyor Firm.

.2 Surveyor.

.3 Surveyor assistant.

.4 Date

.5 Instrument make.

.6 Instrument model.

.7 Instrument serial number.

.3 Information to be obtained for each survey monument installed shall include:

.1 Monument ID number.
.2 Northing
.3 Easting.
.4 Elevation.
.5 Azimuth to Monument.
.6 Distance to Monument.

.4 Information obtained shall be recorded in the form provided by the Consultant.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section describes requirements that apply to construction involving work in waterbodies and waterbody banks.

1.2 REFERENCE STANDARDS

.1 Department of Fisheries and Oceans

.1 Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat.

1.3 REQUIREMENTS

.1 Two copies of a written strategy shall be submitted to the Consultant for review and for permission to proceed with the work. This strategy shall be submitted a minimum of 10 Working Days prior to the commencement of work.

.2 The strategy shall provide descriptions, working drawings, and schedules that fully describe the sequence of the work, the associated waterbody and fish habitat protection, and the related contingency measures associated with each stage of the work. The schedule shall include approximate date of installation, removal, and site restoration. Such information shall be provided at a level of detail, which addresses materials, equipment, methods employed, and procedures to be followed to provide effective waterbody and fish habitat protection and to comply with statutory authorizations, approvals and permits. The submission shall also include a schedule of checking and monitoring the work to ensure compliance with the strategy.

.3 The strategy shall apply to:

.1 Phases of the work, and transitions between phases of the work;

.2 The installation, operation, and removal of waterbody and fish habitat protection measures, and transitions between any adjacent environmental protection including temporary erosion and sediment control measures;

.3 The interfaces between waterbodies and temporary water passage systems;

.4 The containment or stabilization of disturbed earth material, including during the winter period and other shutdown periods, to prevent entry of such materials into waterbodies.

.4 The Consultant shall respond within 10 Working Days to each submission or resubmission by either giving permission to proceed, or returning the submission marked "Revise and Resubmit", and giving reasons.

.5 Permission to proceed shall not constitute acceptance of the technical adequacy of the strategy.

.6 Written notification shall be submitted to the Consultant two days prior to the actual date of installing or removing protection measures.

.7 The contractor shall ensure the site lead (superintendent, foreman or otherwise in-charge person) fully understands the requirements of the EPP and acknowledges this awareness with in writing.

.8 The Contractor shall provide environmental awareness training for all personnel working on the site.

.9 The Contractor shall ensure the project work is carried out in strict accordance with the requirements of the approving authorities and the EPP.

1.4 EQUIPMENT

.1 Equipment used for work in waterbodies, on waterbody banks, watercourse relocations, and temporary waterbody crossings shall be free of earth material, and excess, loose or leaking fuel, lubricants, coolant and other contaminates that could enter the waterbody.

1.5 CONSTRUCTION

.1 General Requirements

.1 The work shall be controlled to provide effective waterbody and fish habitat protection. The work shall be monitored, and whenever such protection is found to be ineffective, the Engineer shall be advised. Changes to the work shall be made immediately to ensure waterbody and fish habitat protection, and an amendment to the strategy shall be submitted within 10 calendar days.

.2 Staff on site shall be briefed about the strategy required in Section 1.2 (Requirements) and their role in its implementation

.3 Unless specified in the Contract Documents, watercourses shall not be diverted, relocated, or blocked, waterbodies shall not be filled, and temporary waterbody crossings shall neither be constructed nor utilized.

.4 Unless work is specified in waterbodies or on waterbody banks, vehicles and equipment shall not enter or be operated within such areas.

.5 Temporary erosion and sediment control measures shall be installed prior to commencing the associated work including the removal of vegetative cover, and shall remain effective at all times, including shut down periods.

.6 Vehicular maintenance, washing and refuelling shall be conducted away from waterbodies and waterbody banks. All equipment maintenance and refuelling shall be controlled to prevent any discharge of equipment fuels and fluids onto the ground or into waterbodies.

.7 Storage of fuel, other materials required for vehicles, and waste oils/lubricants will be stored in leak-proof containers in a secured area and as far away from the water as practicable to prevent any spills or leaks from impacting the water body.

.8 An emergency spill kit should be kept on-site in case of fluid leaks or spills from machinery.

.9 Excess materials, construction debris, containers, and stockpiles of erodible materials shall be stored to prevent them from entering a waterbody. Such storage areas shall be a minimum of 30 m from a waterbody or temporary watercourses channels.

.10 Pumping water that contains suspended materials into the water course is prohibited.

.11 Waste bins designated for general refuse should be placed on-site.

.12 When working in waterbodies or on waterbody banks:

.1 The work area shall be isolated from those portions of the waterbody or waterbody banks wherein work is not specified.

.2 The extent of disturbance to waterbody bed and banks shall be kept to the minimum necessary for the construction specified in the Contract Documents.

.3 The limit of the area to be disturbed shall be clearly marked prior to commencement of the work. The markings shall be maintained for the duration of the Contract.

.4 The work shall not commence while flows are in flood stage

.5 Construction shall be halted during periods of heavy precipitation and/or runoff.

.6 Vegetation shall be preserved where possible.

.7 The operation of equipment within such areas, shall be kept to the minimum necessary to perform the specified work.

.8 The number of entry and exit points, and the distance from the entry point to the work area, shall be kept to the minimum necessary to perform the specified work. Access to the site should wherever possible, be restricted to existing roads and trails.

.9 The work and all subsequent site completion and restoration activities shall proceed in a continuous fashion so as to minimize its duration.

.10 A shroud shall be installed beneath the bridge to trap and prevent construction materials from entering the water course.

.11 Effective bank erosion control measures such as filter cloth, rock, matting or polyethylene etc. must be installed prior to start of work.

.12 Eroded sediment shall be contained on-site using devices such as silt fences or sediment traps.

.13 The work shall be conducted so as to prevent harm to fish and aquatic wildlife and to allow fish passage.

1.6 SITE RESTORATION

.1 The waterbody and waterbody banks shall be restored to their original conditions if disturbance occurs.

1.7 CONTINGENCY MEASURES

.1 A standby supply of pre-fabricated silt fence barrier, or an equivalent ready-to-install sediment control device, sufficient to extend a linear distance of 200 m, shall be maintained at the contract site at all times, including shut down periods, for immediate deployment.

END OF SECTION 35 42 19