SPECIFICATIONS FOR

DRAINAGE IMPROVEMENTS & SHORE PROTECTION

PANGNIRTUNG, NUNAVUT

Department of Fisheries & Oceans
Small Craft Harbours Branch
Winnipeg, Manitoba

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01 11 05 – GENERAL INSTRUCTIONS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 DESCRIPTION OF WORK

.1 The work site described in this specification as located at Pangnirtung, NU. Pangnirtung is located on the southeast side of Baffin Island in Cumberland Sound. Pangnirtung is accessible year round via commercial airlines and NEAS Sealift during open water.

.2 The work under this contract covers:

- .1 Drainage Improvements:
  - .1 Realign and re-grade existing drainage ditch
  - .2 Replace existing culverts in drainage ditch and upgrade road over new culverts
  - .3 Realign and ugrade existing harbour access road and upper road
  - .4 Demolish decommissioned existing culverts, backfill parking area with new granular and install shore protection
  - .5 Install erosion control in re-graded drainage ditch
- .2 Breakwater Upgrades:
  - .1 Supply and install armour stone in areas indicated
  - .2 Supply and install compacted granular fill on fixed wharves where indicated
  - .3 Supply & install shore protection rip-rap on inner basin side slope

.3 The work to be done by the Contractor under this Contract shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, insurance, and all things necessary for and incidental to the satisfactory performance and completion of all work as specified herein. All work to be done in accordance with details shown on the accompanying plans and as specified herein.

1.3 DEFINITIONS

.1 The word "provide" means "supply and install".

.2 For purposes of this contract, "Departmental Representative", "Architect/Engineer" and "Engineer" shall have the same meaning.

1.4 WORK SCHEDULE

.1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by contract documents.

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

.3 Work under this contract is to be performed in a timely manner. Commence planning and preparatory work immediately upon receipt of official notification of acceptance of Contract and schedule the work so that the project will be complete by **October 9, 2019.**

.4 Work sequence:

.1 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.

.2 No area to be renovated shall be placed out of service until it is confirmed that there shall be no need to stop the work waiting for receipt of materials, equipment or labour.

1.5 CERTIFICATES AND TRANSCRIPTS

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

1.6 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and work permits required.

.3 Furnish certificates and permits when requested.

1.7 MEASUREMENT FOR PAYMENT

.1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.

.2 Submit to Engineer, at least 14 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by Engineer, cost breakdown will be used as basis for progress payments.

1.8 INTERPRETATION OF DOCUMENTS

.1 In the event of discrepancies or conflicts in interpreting the Plans (drawings) and Specifications, Specifications take precedence over drawings bound with specifications.

.2 Drawings and specifications are complementary. When work is shown or mentioned on the drawings but is not indicated in the specifications, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall nevertheless be included in the Contract.

.3 The sub-division of the Specification into sections, identified by title and number, is for convenience only and does not modify the singularity of the document, nor does it operate to make or imply that the Engineer is an arbiter to establish the limits or extent of contract between Contractor and Subcontractors or to determine the limits or extents of work that may be decided by trade unions or Contractors' organizations. Extras to the Contract will not be considered on the grounds of differences in interpretation of the Specification and/or Drawings as to which trade performs the work.

1.9 CONTRACTOR'S USE OF SITE

.1 Co-ordinate use of premises under direction of the Engineer.

.2 Be familiar with vessel movements and activities in areas adjacent to the Work. Plan and execute work in a manner that will not interfere with vessel movements and harbour activities.

.3 At no time shall the Harbour Access Road be completely closed to traffic. Plan work to allow for uninterrupted access to the existing sealift ramp and existing float wharfs, by either the East, West or Center intersections at the Upper Road.

.4 Do not unreasonably encumber the site with materials and equipment.

.5 Assume full responsibility for protection and safekeeping of products under this Contract.

.6 Move stored products or equipment which interfere with operations of Engineer or other harbour users.

.7 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

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

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

.10 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.10 EXISTING SERVICES

.1 Notify Engineer and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.

.3 Establish location and extent of service lines in area of work before starting Work. Notify Engineer of findings.

.4 Submit schedule to and obtain approval from Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.5 Where unknown services are encountered, immediately advise Engineer and confirm findings in writing.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.7 Record locations of maintained, re-routed and abandoned service lines.

1.11 DOCUMENTS REQUIRED

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

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

1.12 CONTRACT METHOD

.1 Construct Work under a combined price contract. All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.

1.13 CODES AND STANDARDS

.1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Work to meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

1.14 PROJECT MEETINGS

.1 Engineer will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.15 SETTING OUT OF WORK

.1 Engineer will provide only those survey control points and set such stakes as necessary to define general location, alignment and elevations of work. Give engineer reasonable notice of requirements for such control points and stakes.

.2 Contractor to protect survey control points and stakes established by Engineer. Contractor will be responsible for re-establishing the Engineer provided control points and stakes if damaged or removed from site.

.3 Set grades and lay out work in detail from control points and grades established by Engineer.

.4 Provide devices needed to lay out and construct work.

.5 Supply such devices needed to lay out and construct work.

.6 Supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.

.7 Supply stakes and other survey markers required for laying out work.

1.16 ADDITIONAL DRAWINGS

.1 Engineer may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

.2 When additional drawings and instructions are required by the Contractor, provide reasonable notice in writing to the Engineer in advance of the date they are required.

1.17 EXAMINATION

.1 Before submitting tender, examine existing conditions and determine conditions affecting work.

.2 Obtain all information which may be necessary for proper execution of Contract.

1.18 SITE INSPECTION

.1 The submission of a tender is deemed to be a confirmation of the fact that the Tenderer has inspected the site and is fully conversant with all the conditions under which the work is to be carried out.

1.19 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.

.3 When material or equipment specified by standard performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.20 SECURING WORK AREA

.1 Secure the work areas in each stage in an approved manner. This includes fencing or barricades to prevent public access to any areas where construction activities occur and construction materials are stored.

1.21 VEHICLE AND PEDESTRIAN PROTECTION

.1 Provide snow fencing, wooden barriers, or other approved barriers to prevent vehicles and pedestrians from accessing the site during construction.

.2 Contractor shall provide appropriate signage for vehicle and pedestrian protection.

.3 All barriers shall include delineation and reflectors to stand out at nightfall.

1.22 DRAWINGS

.1 The following drawings are to be read in conjunction with this specification:

.1 C-1 Site Plan
.2 C-2 Plan – Profile Realigned Drain
.3 C-3 Sections – Realigned Drain
.4 C-4 Typical Sections & Culvert Installation Details
.5 C-5 East Breakwater Upgrades & Shore Protection

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 35 29 – HEALTH AND SAFETY REQUIREMENTS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 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 Territory of Nunavut

.1 The Nunavut Workers Compensation Act

1.3 SUBMITTALS

.1 Submit site-specific Health and Safety Plan: Within 10 days after date of Notice to Proceed and prior to commencement of Work.

.2 Submit copies of incident and accident reports to Engineer.

.3 Submit WHMIS MSDS – Material Safety Data Sheets to Engineer.

.4 Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor after receipt of plan. Revise plan as appropriate and resubmit plan to Engineer within 5 days after receipt of comments from Engineer.

.5 Engineer's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.6 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

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

1.5 SAFETY ASSESSMENT

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

1.6 GENERAL REQUIREMENTS

.1 Develop written 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 project specifications.

.2 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Territorial Government, Worker’s Compensation Board and municipal statutes and authorities.

.3 In the event of a conflict between any provisions of above authorities having the most stringent provision will apply.

1.7 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, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province having jurisdiction and advise Engineer verbally and in writing.

1.9 HEALTH AND SAFETY CO-ORDINATOR

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

.1 Have site-related working experience specific to activities associated with dock reconstruction at an active harbour site.

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

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

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

.5 Be on site during execution of Work.

1.10 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province or Territorial Government having jurisdiction, and in consultation with Departmental Representative verbally and in writing.

1.11 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 35 43 – ENVIRONMENTAL PROCEDURES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section. Work is to be included in lump sum costs for project.

1.2 FIRES

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

1.3 DRAINAGE

.1 Provide temporary drainage and pumping required to keep excavations and site free from water.

.2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 WORK ADJACENT TO WATERWAYS

.1 Construction equipment will enter and leave the tidal flats at low tide at such a location and in such a manner that disturbance to the shoreline is minimized.

.2 No construction debris from work activities will be allowed to enter the waterbody. The work site must be cleaned daily. Every effort will be made to minimize the introduction of sediment to the waterbody during work activities.

.3 Do not use waterway beds for borrow material.

.4 Waterways to be free of excavated fill, waste material and debris.

.5 Design and construct temporary crossings to minimize erosion to waterways.

.6 Do not skid logs or construction materials across waterways.

.7 Avoid damage to shoreline.

.8 Any impacts below ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Engineer. Up to 30 days may be required for approval.

.9 Reclaim and restore disturbed areas to previous or better condition.

.10 Areas used for stockpiling construction materials, including fill or other equipment storage will be well back from the edge of the water body and, if possible, in areas which have already been disturbed or are devoid of vegetation.

.11 All required machinery should be supplied with appropriate spill containment kits as a precaution in the event of accidental fuel spills or hydraulic leaks. Additional kits should be available on site with the capacity to contain any spills of deleterious substances that may be reasonably expected to occur. Contractors should ensure that all personnel are familiar with the spill kits.

.12 The Contractor shall report spills of fuels or other contaminants to the Engineer.

.13 The Contractor shall not remove, destroy or disturb species pursuant to Provincial/Territorial Threatened Endangered and Extirpated Species regulation, or species listed in the federal Species at Risk Act.

.14 The Contractor shall not disturb migratory bird nests.

1.5 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

.2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Locate temporary fuel storage 100 metres from shore and comply with Provincial/Territorial Environmental Legislation.

.5 Refueling, servicing, or cleaning of equipment on ice or within 100 metres of shore is prohibited. Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.

.6 Contractor to contain all oil leaks from equipment working adjacent to waterways.

.7 No maintenance of vehicles or equipment in construction areas.

.8 Use drip pans to catch leaking oil from compressors, pumps, etc.

.9 Keep an emergency spill kit for in-water use on site during construction.

1.6 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways. Hazardous wastes including fuels, oils and lubricants to be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.

.3 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities.

.4 Do not allow debris of any type to enter waterway.

1.7 PLANT PROTECTION

.1 Protect plants on site and adjacent properties.

.2 Avoid disturbance of topsoil and vegetation unless otherwise specified. Contractor is responsible to restore all impacted areas to original state.

.3 The Contractor shall revegetate soil in areas exposed by construction with vegetation species native to the area. These areas shall be revegetated as quickly as possible following construction to prevent soil erosion and establishment of noxious weeds.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 45 00 – QUALITY CONTROL

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 INSPECTION

.1 Allow Engineer access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Engineer.

.3 Engineer will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by Engineer for purpose of inspecting and/or testing portions of Work.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Engineer at no cost to. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify Engineer in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

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

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Engineer.

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.8 MILL TESTS

.1 Submit mill test certificates as requested.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 77 00 – CLOSEOUT PROCEDURES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

- .1 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
- .2 Final Inspection:
  - .1 When completion tasks are done, request final inspection of Work by Engineer.
  - .2 When Work incomplete according to Engineer, complete outstanding items and request re-inspection.
- .3 Final Payment:
  - .1 When Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .4 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

1.4 RECORD DRAWINGS

.1 Maintain project “as-built” record drawings and record accurately significant deviations from Contract documents caused by site conditions and changes ordered by Engineer.

.2 Mark “as-built” changes in red coloured ink.

.3 Record the following information:

- .1 Field changes of dimension and detail.
- .2 Changes made by Change Order or Field Order.

.4 At completion of project and prior to final inspection, neatly transfer “as-built” notations to second set and submit both sets to Engineer.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

02 41 13 – SELECTIVE SITE DEMOLITION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Mobilization and demobilization is to be included in lump sum costs for project.

.2 Removal and disposal of existing culverts to be included in the lump sum costs for the project.

.3 Relocation of existing shacks to be included in the lump sum costs for the project.

1.2 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection.

- .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to Engineer.
- .2 Remove and store materials to be salvaged, in manner to prevent damage.
- .3 Store and protect in accordance with requirements for maximum preservation of material.
- .4 Handle salvaged materials as new materials.

1.3 SITE CONDITIONS

.1 Site Environmental Requirements:

- .1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .2 Ensure proper disposal procedures are maintained throughout the project.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

3.3 REMOVAL FROM SITE

.1 Dispose of materials not designated for salvage or re-use in work, off-site at location acceptable to Engineer.

3.4 RESTORATION

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

31 23 33 – EXCAVATING, TRENCHING AND BACKFILLING

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Excavation for the realignment and regrading of the existing drainage ditch, including culvert roadway crossings, shall be included in the lump sum costs for the project. The estimated quantity of excavated material is 430 cubic meters.

.2 Suitable excavated material shall be stockpiled and used for backfilling of the wash out area. The approximate quantity of material to be used for backfill is 50 cubic meters. These items shall be included in the lump sum costs for the project.

.3 Excess excavated material is to be hauled and placed in spoil location designated by the Engineer. All associated costs for hauling to spoil location to be included in the lump sum costs for the project. The approximate quantity of material to be placed in the spoil pile is 380 cubic meters.

.4 Dewatering works if used are considered incidental to the lump sum costs.

.5 Supply and installation of new 50 mm down granular fill shall be measured in cubic meters per truck box measure supplied and installed. Truck box measure will be established by the Contractor and the Departmental Representative to the nearest 0.1 m^3 using the Department Vehicle Measurement Form. The Contractor shall level all loads before they are measured by the Engineer. Measurements will not be made for material heaped above the water level capacity of the box and deductions will be made in 0.1 m^3 units for loads which do not contain full water level capacity.

.6 Contractor is responsible for ensuring a rock crusher is available for the production of crushed rock required for this project. The operational status of the rock crusher in the borrow pit east of the Hamlet of Pangnirtung is unknown at time of Tender. Contractor is responsible for confirming the status of the rock crusher and if required, costs associated with supplying a crusher to the borrow pit for the duration of the project to be included in the lump sum costs of the project.

.7 Contractor to make own arrangements with territorial authorities, municipalities and owners of private properties, for the quarrying and transportation of rock materials and machinery for work over their property, roads or streets.

1.2 DEFINITIONS

.1 Excavation classes: Two classes of excavation will be recognized; common excavation and rock excavation.

.1 Common excavations: excavated material of whatever nature, which are not included under definitions of rock excavations, this includes the excavation work required for the ditch realignment.

.2 Rock excavation: solid material in excess of 1.00 cu. M. and which cannot be removed my means of heavy duty mechanical/hydraulic excavation equipment having a bucket size of 0.95 to 1.15 cu. M. Frozen material is not classified as rock. Rock excavation requires pre-approval from Engineer prior to starting excavation to confirm the class of excavation.

.2 Excavate suitable portion of material from common excavation and place and compact this material as required on the new access road and turn around area construction in accordance with details shown on the accompanying plans and as specified herein.

.3 Grade: plane above which material is to be excavated.

.4 Estimated quantity:

.1 Volume of material calculated to be above grade and within specified side slopes unless otherwise specified.

.5 Side slope: inclined surface or plane from grade at side limit of excavated area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.

1.3 EXISTING CONDITIONS

.1 Before commencing work verify location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work.

Part 2 Products

2.1 MATERIALS

.1 All rock materials may be supplied from the borrow pit east of the Hamlet of Pangnirtung and shall be of a dense, hard, durable character, free of organic material, in-filled joints, seams, or other defects, resistant to breakdown by handling, frost action or weathering, and not subject to deterioration in sea water.

.2 Notify the Departmental Representative if the volume of source material available is not sufficient for the Project requirements.

.3 Granular fill in accordance with following requirements:

.1 Crushed, pit run or screened stone, or gravel.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

.3 The gradation and physical requirements to be as follows:

Sieve Designation	% Passing
50 mm	100
25 mm	50
10 mm	20

.4 Contractor to coordinate the material supply with the Hamlet and ensure permissions are granted to obtain the required material from only designated areas within the borrow pit.

Part 3 Execution

3.1 EXCAVATION

.1 Implement specified erosion and sediment control measures to prevent sediment release off construction boundaries and into water boundaries.

.2 Excavate to lines, grades, elevations and dimensions as directed by Engineer.

.3 Excavation must not interfere with bearing capacity of adjacent foundations.

.4 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Engineer.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Dispose of surplus and unsuitable excavated material off site in spoil location designated by engineer. Any public roads used as haul roads between the excavation area and the spoil area shall be kept free and clean of debris. Maintenance of these roads is to be Contractor's responsibility.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Notify Engineer when bottom of excavation is reached.

.9 Obtain Engineer approval of completed excavation.

3.2 BACKFILLING

.1 Do not commence backfilling until areas of work have been inspected and approved by Engineer.

.2 Ensure no frozen material is placed.

.3 Compact sub-grade of the new access road, turn around area and launch ramp prior to commencement of backfilling work.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place and compact the backfilled materials shown in the drawings in lifts not exceeding 150 mm.

.7 Place granular materials using methods which do not lead to segregation or degradation.

.9 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Engineer may authorize thicker lifts (layers) if specified compaction can be achieved.

.10 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.11 Remove and replace portion of layer in which material has become segregated during spreading.

3.3 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Each lift or layer to be thoroughly compacted by means of packers or mechanical tampers to a relative compaction of not less than 98% Standard Proctor Density for the backfill material at optimum moisture content.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 PROOF ROLLING

.1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.

.2 Obtain written approval from Engineer to use non-standard proof rolling equipment.

.3 Proof roll at level in granular base as indicated.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.5 Where proof rolling reveals areas of defective subgrade:

.1 Remove sub-base material and compact to depth and extent as directed by Departmental representative.

.2 Replace sub-base material and compact.

.6 Where proof rolling reveals areas of defective sub-base, remove and replace in accordance with this section at no extra cost.

3.5 SITE TOLERANCES

.1 Finished granular surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.6 PROTECTION

.1 Maintain finished granular surface in condition conforming to this section until granular surfacing is accepted by Engineer.

END OF SECTION

31 32 19 – GEOTEXTILES

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams or overlaps.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
- .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
  - .1 No.2-M85 Methods of Testing Geosynthetics - Mass per Unit Area.
  - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
  - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
  - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
  - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

.2 Ontario Provincial Standard Specifications (OPSS)

- .1 OPSS 1860-November 2010, Material Specification for Geotextiles.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

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

.2 Test and Evaluation Reports:

- .1 If requested, submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.4 SAMPLES

.1 Submit to the Engineer the following samples at least 1 week prior to commencing work:

- .1 Minimum of 1 m of roll width of geotextile

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect geotextiles from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIAL

.1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.

.1 Width: 3.8 m. minimum.

.2 Length: 110 m. minimum.

.3 Composed of minimum 85% by mass of polypropylene with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 30 days.

.2 Mass per Unit Area, ASTM D5261Test Method: 225 g/ m2

.3 Grab Tensile Strength, ASTM D4632 Test Method: 900 N.

.4 Grab Elongation, ASTM D4632 Test Method: 50%.

.5 Puncture Strength, ASTM D4833 Test Method: 490 N.

.6 Trapezoidal Tear Strength, ASTM D4533 Test Method: 356 N.

.7 Apparent Opening Size, ASTM D4751 Test Method: 0.180 mm.

.8 Permittivity, ASTM D4491 Test Method: 1.5 s^{-1}.

.9 Water Flow Rate, ASTM D4491 Test Method: 3255 l/min/m^2

.10 UV Resistance, ASTM D4355: 70% retained after 500 hours.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Engineer.

.2 Inform Engineer of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins and washers. Place on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Overlap each successive strip of geotextile 600 mm over previously laid strip.

.4 Pin successive strips of geotextile with securing pins at 2000 mm interval at midpoint of lap as indicated.

.5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.6 Do not use heavy equipment or vehicular traffic on geotextile without approved protection.

.7 After installation, cover with overlying layer within 4 hours of placement.

.8 Replace damaged or deteriorated geotextile to approval of Engineer.

.9 Place and compact soil layers in accordance with relevant specification sections.

3.3 CLEANING

.1 Progress Cleaning:

.2 Leave Work area clean at end of each day.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

33 42 13 – PIPE CULVERTS

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01- Excavating, Trenching and Backfilling

1.2 MEASUREMENT AND PAYMENT

.1 Measure excavation for culverts in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling.

.2 Measure supply of pipe culvert in metres for each size, type and class of pipe supplied.

.1 No separate measurement will be made for couplings and fittings for steel pipe culverts.

.2 Small Craft Harbours (SCH), Department of Fisheries and Oceans, has reserved space for the culverts and couplers on a sealift from the NEAS Shipping Terminal located in Salaberry-de-Valleyfield, Quebec to Pangnirtung, Nunavut for the fist scheduled sailing. Details of the reservation will be provided after Contract award. Contractor responsible for supplying culverts and couplers to the shipping terminal including any special packaging required for sealift transport. The cost of the sealift transport of the culvert and couplers will be paid by SCH.

.3 Measure installation of pipe culvert in metres in place for each size, type and class of pipe.

.1 No separate measurement will be made for couplings and fittings for steel pipe culverts.

.4 Measure culvert granular material for culvert bedding and backfill in cubic metres supplied and installed per truck box measure to excavation limits authorized by the Departmental Representative in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling. Truck box measure will be established by the Contractor and the Departmental Representative to the nearest 0.1 m3 using the Department Vehicle Measurement Form. The Contractor shall level all loads before they are measured by the Engineer. Measurements will not be made for material heaped above the water level capacity of the box and deductions will be made in 0.1 m3 units for loads which do not contain full water level capacity.

.5 Contractor is responsible for ensuring a rock crusher is available for the production of crushed rock required for this project. The operational status of the rock crusher in the borrow pit east of the Hamlet of Pangnirtung is unknown at time of Tender. Contractor is responsible for confirming the status of the rock crusher and if required, costs associated with supplying a crusher to the borrow pit for the duration of the project to be included in the lump sum costs of the project.

1.3 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3(600 kN-m/m3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 CSA International

.1 CAN/CSA G401-07, Corrugated Steel Pipe Products.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.3 Samples:

.1 Inform Departmental Representative at least 8weeks before beginning Work, of proposed source of bedding materials and provide access for sampling.

.4 Certification: to be marked on pipe.

.5 Test and Evaluation Reports:

.1 Submit manufacturer's test data and certification at least 8weeks prior to beginning Work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address, in good condition.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and handle in manner to protect pipe culverts from damage.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 CORRUGATED STEEL PIPE

.1 Corrugated steel pipe: to CAN/CSA-G401.

.2 Water-tight cut-off collars: as indicated.

2.2 CULVERT GRANULAR

.1 Culvert granular bedding and backfill material to following requirements:

.1 Crushed pit run or screened stone, gravel or sand.

.2 All rock materials may be supplied from the borrow pit east of the Hamlet of Pangnirtung and shall be of a dense, hard, durable character, free of organic material, in-filled joints, seams, or other defects, resistant to breakdown by handling, frost action or weathering, and not subject to deterioration in sea water.

.3 Gradations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.

.4 Contractor to coordinate the material supply with the Hamlet and ensure permissions are granted to obtain the required material from only designated areas within the borrow pit.

.2 Table – Gradation Requirements:

Sieve Designation	% Passing
37.5 mm	100
4.75 mm	25-80
0.425 mm	15-40
0.075 mm	6-18

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe culvert installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 TRENCHING

.1 Do trenching Work in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling.

.2 Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.3 BEDDING

.1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place 200 mm minimum thickness of approved culvert granular material on bottom of excavation and compact to 95% minimum of AASHTO standard dry density at optimum moisture content.

.3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.

.4 Place bedding in unfrozen condition.

3.4 LAYING CORRUGATED STEEL PIPE CULVERTS

.1 Begin pipe placing at downstream end.

.2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

.3 Lay pipe with outside circumferential laps facing upstream. Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

3.5 JOINTS: CORRUGATED STEEL CULVERTS

.1 Corrugated steel pipe:

.1 Match corrugations or indentations of coupler with pipe sections before tightening.

.2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.

.3 Insert and tighten bolts.

.4 Repair spots where damage has occurred to aluminum coating by applying two coats of zinc rich paint approved in writing by Departmental Representative

3.6 BACKFILLING

.1 Backfill around and over culverts as indicated or as directed by Departmental Representative.

.2 Place backfill material, approved in writing by Departmental Representative, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% AASHTO Standard Dry Density taking special care to obtain required density under haunches.

.4 Place backfill in unfrozen condition.

3.7 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

35 31 22 – RIP-RAP

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Supply and installation of rip-rap to be measured in cubic meters of material supplied and installed per truck box measure. Truck box measure will be established by the Contractor and the Departmental Representative to the nearest 0.1 m^3 using the Department Vehicle Measurement Form. The Contractor shall level all loads before they are measured by the Engineer. Measurements will not be made for material heaped above the water level capacity of the box and deductions will be made in 0.1 m^3 units for loads which do not contain full water level capacity.

.2 Maintenance of haul roads to be incidental to this work.

.3 Contractor is responsible for ensuring a rock crusher is available for the production of crushed rock required for this project. The operational status of the rock crusher in the borrow pit east of the Hamlet of Pangnirtung is unknown at time of Tender. Contractor is responsible for confirming the status of the rock crusher and if required, costs associated with supplying a crusher to the borrow pit for the duration of the project to be included in the lump sum costs of the project.

.4 Contractor to make own arrangements with Provincial authorities, municipalities and owners of private properties, for the quarrying and transportation of rock materials and machinery for work over their property, roads or streets.

Part 2 Products

2.1 MATERIALS

.1 Rock materials:

.1 Rip-rap:

.1 Greatest dimension of each stone not to exceed two times least dimension.

.2 Clean stone sizes to be in range of 100 mm to 350 mm. Rip-rap to be quarried crushed rock or well graded picked field stone from the borrow pit east of Pangnirtung.

.3 All rock materials may be supplied from the borrow pit east of the Hamlet of Pangnirtung and shall be of a dense, hard, durable character, free of organic material, in-filled joints, seams, or other defects, resistant to breakdown by handling, frost action or weathering, and not subject to deterioration in sea water.

.4 Notify the Departmental Representative if the volume of source material available is not sufficient for the Project requirements.

.5 Provide the Departmental Representative with high-quality, high-resolution, images of the stockpiles. In visible locations within the stockpiles, place four 0.350m diameter round disks painted with high visibility paint. Photograph the stockpiles from four different angles, moving the discs to suit.

.6 Remove unsuitable stones from the stockpiles.

.7 Oversized stones may be used if broken down to a suitable size.

.8 Table – Gradation Requirements:

Sieve Designation	% Passing
350 mm	100
200 mm	50
100 mm	20

.9 Contractor to coordinate the material supply with the Hamlet and ensure permissions are granted to obtain the required material from only designated areas within the borrow pit.

Part 3 Execution

3.1 RIP-RAP

.1 Place rip-rap to lines, grades and dimensions as indicated.

.2 Place rip-rap to thickness as indicated on drawings.

.3 Place stones in manner approved by Engineer to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.4 Finish surface evenly, free of large openings and neat in appearance.

3.2 TOLERANCES

.1 Completed component layers to be within following tolerances of lines and grades as indicated:

.1 Rip-rap: plus or minus 100 mm.

3.3 HAUL ROADS

.1 Be solely responsible for construction and maintenance of haul roads. Remove haul roads from site upon completion of project. No separate payment to be made for construction, maintenance and removal of haul roads.

.2 Contractor to be responsible for obtaining approval from applicable agencies for using access roads to site. Contractor is not to use existing launch ramp as a haul road.

.3 Contractor to repair any damage caused to roads or property as a result of hauling operations.

END OF SECTION

35 31 23.13 – RUBBLE MOUND BREAKWATERS

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Measure armour stone in cubic meters of material supplied and installed per truck box measure. Truck box measure will be established by the Contractor and the Departmental Representative to the nearest 1.0 m^3 using the Department Vehicle Measurement Form. The Contractor shall level all loads before they are measured by the Engineer. Measurements will not be made for material heaped above the water level capacity of the box and deductions will be made in 0.1 m^3 units for loads which do not contain full water level capacity.

.2 Maintenance of haul roads to be incidental to this work.

.3 Contractor to make own arrangements with Provincial/Territorial authorities, municipalities, hamlets, and owners of private properties, for the quarrying and transportation of rock materials and machinery for work over their property, roads or streets.

Part 2 Products

2.1 MATERIALS

.1 Rock materials:

.1 Contractor to provide all materials.

.2 Armour stone:

.1 Greatest dimension of each stone not to exceed two times least dimension.

.2 Stone sizes to be in range of 350mm to 1000mm. Armour stone to be picked stone from the borrow pit east of Pangnirtung.

.3 All rock materials may be supplied from the borrow pit east of the Hamlet of Pangnirtung and shall be of a dense, hard, durable character, free of organic material, in-filled joints, seams, or other defects, resistant to breakdown by handling, frost action or weathering, and not subject to deterioration in sea water.

.4 Notify the Departmental Representative if the volume of source material available is not sufficient for the Project requirements.

.5 Provide the Departmental Representative with high-quality, high-resolution, images of the stockpiles. In visible locations within the stockpiles, place four 1.00m diameter round disks painted with high visibility paint. Photograph the stockpiles from four different angles, moving the discs to suit.

.6 Remove unsuitable stones from the stockpiles.

.7 Oversized stones may be used if broken down to a suitable size.

.8 Contractor to coordinate the material supply with the Hamlet and ensure permissions are granted to obtain the required material from only designated areas within the borrow pit.

Part 3 Execution

3.1 ARMOUR STONE

.1 Place armour stone to lines, grades and dimensions as indicated.

.2 Place armour stone in thickness courses to total layer thickness as shown on the drawing.

.3 Place armour each stone in stable position.

.4 For placement on existing breakwater: remove ice from sides of breakwater prior to installing stone.

3.2 TOLERANCES

.1 Completed component layers to be within following tolerances of lines and grades as indicated:

.1 Armour stone: plus or minus 200 mm.

3.3 HAUL ROADS

.1 Be solely responsible for construction and maintenance of haul roads. Remove haul roads from site upon completion of project. No separate payment to be made for construction, maintenance and removal of haul roads.

.2 Contractor to be responsible for obtaining approval from applicable agencies for using access roads to site.

.3 Contractor to repair any damage caused to roads or property as a result of hauling operations.

END OF SECTION