SPECIFICATION

Wharf Construction

Dover, NL

DFO File # FP802-160056

Prepared for: Fisheries and Oceans Canada

LIST OF DRAWINGS

Wharf Construction
Dover, NL
P/N: 714114

2016-02-01

DRAWING NO	TITLE
C1 of 7	Existing Site Plan
C2 of 7	New Site Plan
C3 of 7	Wharf Plan and Construction Plan
C4 of 7	Elevations
C5 of 7	Sections
C6 of 7	Details
C7 of 7	Boreholes

1.1 SCOPE

.1 The work consists of the furnishing of all plant, labour, equipment and material for wharf construction at Dover, NL, in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of the Contract.

1.2 DESCRIPTION OF WORK

.1 In general, work under this contract consist of but will not necessarily be limited to the following:

.1 Removal of the existing armour stone to accommodate the new work, as noted on the drawings.
.2 Construction of a new treated timber crib wharf, complete with reinforced concrete deck, to the dimensions as indicated on the drawings.
.3 Dredging of the harbour bottom, prior to installation of new rock mattress and scour protection, as indicated on the drawings.
.4 Supply and installation of mooring cleats, structural timber for coping, wheelguard, wheelguard blocking, fenders, ladders and associated hardware for new wharf construction.
.5 Supply and installation of a new electrical conduit as per the drawings.
.6 Uplands rock and gravel fill placement, topped with granulars, as noted on the drawings.
.7 Supply and installation of rock fill core, filter stone and armour stone, as noted on the drawings.

1.3 SITE OF WORK

.1 Work will be carried out at Dover, NL, in the location as shown on the accompanying drawings.

1.4 DATUM

.1 Datum used for this project is Lowest Normal Tides (LNT) and is assumed to be 4.13 metres below PWC 2-2001. Confirm with Departmental Representative prior to construction.

.2 Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.

1.5 FAMILIARIZATION WITH SITE

.1 Before submitting a bid, it is recommended that bidders visit the site and its surroundings to review and verify the form, nature and extent of the work, materials needed for the completion of the work, the means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid or costs to do the work. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply.

.2 Contractors, bidders or those they invite to site are to review specification Section 01 35 29 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.

.3 Obtain prior permission from the Departmental Representative before carrying out such site inspection.

1.6 CODES AND STANDARDS

.1 Perform work in accordance with the latest edition of the National Building Code of Canada, FCC Standard 373 - Standard for Piers and Wharves (http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/373/page00.shtml), and any other code of provincial or local application including all amendments up to project bid closing date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.7 TERM ENGINEER

.1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.8 SETTING OUT WORK

.1 Set grades and layout work in detail from control points and grades established by Departmental Representative.

.2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.

.3 Provide devices needed to layout and construct work.

.4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.

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

1.9 COST BREAKDOWN

.1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price.

.2 Provide cost breakdown in same format as the numerical and subject title system used in this specification project manual and thereafter sub-divided into major work components as directed by Departmental Representative.

.3 Upon approval by Departmental Representative, cost breakdown will be used as basis for progress payment.

.4 All work items not designated in the unit price table as a measurement for payment, are to be included in the lump sum arrangement, as noted on the Bid and Acceptance Form.

1.10 WORK SCHEDULE

.1 Submit within 7 work days of notification of acceptance of bid, a construction schedule showing commencement and completion of all work within the time stated on the Bid and Acceptance Form and the date stated in the bid acceptance letter.

.2 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.

.3 As a minimum, work schedule to be prepared and submitted in the form of Bar (GANTT) Charts, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for achieving key activities and major project milestones provided in sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time, e.g., show target dates for the placement of each crib, if applicable. Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.

.4 Submit schedule updates on a minimum monthly basis and more often, when requested by Departmental Representative, due to frequent changing project conditions. Provide a narrative explanation of necessary changes and schedule revisions at each update.

.5 The schedule, including all updates, shall be to Departmental Representative's approval. Take necessary measures to complete work within approved time. Do not change schedule without Departmental Representative's approval.

.6 All work on the project will be completed within the time indicated on the Bid and Acceptance Form.

1.11 ABBREVIATIONS

.1 Following abbreviations of standard specifications have been used in this specification and on the drawings:

CGSB - Canadian Government Specifications Board

CSA - Canadian Standards Association
NLGA - National Lumber Grades Authority
ASTM - American Society for Testing and Materials

.2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

1.12 QUARRY AND EXPLOSIVES

.1 Make own arrangements with Provincial authorities and owners of private properties, for the quarrying and transportation of rock and all materials and machinery necessary for work over their property, roads or streets as case may be.

1.13 SITE OPERATIONS

.1 Arrange for sufficient space adjacent to project site for conduct of operations, storage of materials and so on. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor.

.2 Remove snow and ice as required to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.

1.14 PROJECT MEETINGS

.1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording minutes.

.2 Project meetings will take place on site of work unless so directed by the Departmental Representative.

.3 Departmental Representative will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at the meetings.

.4 Have a responsible member of firm present at all project meetings.

1.15 PROTECTION

.1 Store all materials and equipment to be incorporated into work to prevent damage by any means.

.2 Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of Departmental Representative and at no cost to Canada.

1.16 EXISTING SERVICES

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to site operations, pedestrian, vehicular traffic and tenant operations.

.2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.

.3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. This includes disconnection of electrical power and communication services to tenant's operational areas. Adhere to approved schedule and provide notice to affected parties.

.4 Provide temporary services when directed by Departmental Representative to maintain critical facility systems.

.5 Provide adequate bridging over trenches which cross walkways or roads to permit normal traffic.

.6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.7 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

1.17 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of the following:

.1 Contract Drawings
.2 Specifications
.3 Addenda
.4 Reviewed Shop Drawings
.5 List of outstanding shop drawings
.6 Change Orders
.7 Other modifications to Contract
.8 Field Test Reports
.9 Copy of Approved Work Schedule
.10 Site specific Health and Safety Plan and other safety related documents
.11 Other documents as stipulated elsewhere in the Contract Documents.

1.18 PERMITS

.1 Obtain and pay for all permits, certificates and licenses as required by Municipal, Provincial, Federal and other Authorities.

.2 Provide appropriate notifications of project to municipal and provincial inspection authorities.

.3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.

.4 Submit to Departmental Representative, copy of application submissions and approval documents received for above referenced authorities.

.5 Submit to Departmental Representative, copy of quarry permit, if applicable, prior to start of quarry operations.

.6 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.

1.19 CUTTING, FITTING AND PATCHING

.1 Execute cutting, including excavation, fitting and patching required to make work fit properly.

.2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work. This includes patching of openings in existing work resulting from removal of existing services.

.3 Do not cut, bore, or sleeve load-bearing members.

.4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.20 EXISTING SUB-SURFACE CONDITIONS

.1 Information pertaining to the existing sub-surface conditions are shown on the drawings.

.2 Contractors are cautioned that any previous investigations that may be available for review, were intended to provide general site information only. Any interpolation and/or assumptions made relative to any previous investigations is the Contractor's responsibility.

1.21 LOCATION OF EQUIPMENT

.1 Location of work shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable. Obtain approval of Departmental Representative.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.22 FISH HABITAT

.1 This work is being conducted in an area where fish habitat may be affected. Perform work to conform with rules and regulations governing fish habitat and in accordance with authorization for work or undertakings affecting fish habitat.

.2 Contact the local Department of Fisheries and Oceans detachment at least 48 hours in advance of starting any work on site. Submit confirmation to the Departmental Representative that DFO have been contacted.

1.23 NOTICE TO SHIPPING/MARINERS

.1 Notify the Marine Communications and Traffic Services' Centre, of Fisheries and Oceans Canada, at (709) 772-2083, ten (10) days prior to commencement and upon completion of the work, in order to allow for the issuance of Notices to Shipping/Mariners.

.2 During construction any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.

1.24 ACCEPTANCE

.1 Prior to the issuance of the Certificate of Substantial Performance, in company with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.

1.25 WORKS COORDINATION

.1 Responsible for coordinating the work of the various trades, where the work of such trades interfaces with each other.

.2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.

.3 Canada will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out

coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor and shall be resolved at no extra cost to Canada.

1.26 CONTRACTOR'S USE OF SITE

.1 Construction operations, including storage of materials for this contract, not to interfere with the fishing activity and/or operations at this harbour facility.

.2 Responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative.

.3 Contractor will take adequate precautions to protect existing concrete decks and asphalt when operating tracked equipment.

.4 Exercise care so as not to obstruct or damage public or private property in the area.

.5 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.

1.27 WORK COMMENCEMENT

.1 Mobilization to project site is to commence immediately after acceptance of bid and submission of Site Specific Safety Plan and insurance documentation, unless otherwise agreed by Departmental

Representative.

.2 Project work on site is to commence as soon as possible, with a continuous reasonable work force, unless otherwise agreed by Departmental Representative.

.3 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional work force to complete the project within the specified completion time.

.4 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

1.28 FACILITY SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

1.29 WORKING ADJACENT TO COMMUNITY ROADS

1. The Contractor will be responsible to restore any damage to existing roadways.

1.1 GENERAL

.1 Canada will supply certain materials in the Contract for installation and incorporation into the Work by the Contractor.

1.2 MATERIAL SUPPLIED

.1 Canada will supply the following:

- 550 pieces of 200mm X 200mm crib timbers at 6.1m lengths. Note that the crib timbers supplied by Canada is not a complete list of crib timber required to complete the work, as shown on the drawings.
- 240 pieces of 100mm X 150mm fenders at 3.6m lengths. Note that the fenders supplied by Canada is not a complete list of fenders required to complete the work, as shown on the drawings.

.2 The location of all Canada supplied materials to be picked-up, is the DFO Storage Facility located on Glencoe Drive, Donovan's Industrial Park, Mount Pearl, NL. Contact Dion Upward, DFO, at 763-5689 to arrange for pick-up times.

1.3 DELIVERY REQUIREMENTS

.1 Materials supplied by Canada will be available for pick-up following acceptance of Bid. Once turned over to the Contractor, the Contractor is to make a complete check of the timber and report discrepancies to the Departmental Representative.

.2 Failure of the Contractor to make a complete check of the Canada-supplied material and to acknowledge receipt of same shall not relieve him of this contractual responsibility to replace or repair any item subsequently found to be missing or damaged.

.3 Departmental Representative will make final determination as to whether an item can be repaired or must be replaced.

1.4 CONTRACTOR'S DUTIES

.1 Pick-up Canada-supplied material, at the DFO Storage Facility located on Glencoe Drive, Donovan's Industrial Park, Mount Pearl, NL.

.2 Take possession of Canada-supplied material immediately upon pick-up and be responsible for transportation to site. Obtain and pay for services to load and transport to site. Handle at site, including lifting, uncrating etc.

.3 Provide protection against inclement weather and site damage by use of appropriate covers.

.4 Be responsible for the protection of such material against damage, loss, theft and fire from date of receipt until final installation of work is accepted by the Departmental Representative.

.5 Any damage or loss of such material shall result in the Contractor being responsible for replacement or repair of timber at no cost to Canada.

.6 The decision as to whether damaged items may be repaired or must be replaced with new materials shall be the Departmental Representative's decision.

.7 Install such material and incorporate into the work. Perform assembly and make all connections as required to make item functional.

.8 Dispose of containers, crating and protective covering off site as directed by the Departmental Representative.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Inspecting and testing by inspecting firms or testing laboratories designated by Departmental Representative.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.3 APPOINTMENT AND PAYMENT

.1 Departmental Representative will appoint and pay for services of testing laboratory except for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Mill tests and certificates of compliance.

.4 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.

.5 Tests requested by Departmental Representative to confirm material specifications when the applicable manufacturer's documentation or test results are unavailable.

.6 Additional tests specified in the following paragraph.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.4 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:
.1 Provide access to Work to be inspected and tested.
.2 Facilitate inspections and tests.
.3 Make good Work disturbed by inspection and test.
.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples.

.3 Certificates.

1.2 SUBMITTAL GENERAL REQUIREMENTS

.1 Submit to Departmental Representative for review submittals listed, including shop drawings, samples, certificates and other data, as specified in other sections of the Specifications.

.2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.

.3 Do not proceed with work until relevant submissions are reviewed by Departmental Representative.

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

.5 Where items or information is not produced in SI Metric units, provide soft converted values.

.6 Review submittals prior to submission to Departmental Representative. Ensure during review that necessary requirements have been determined and verified, required field measurements or data have been taken, and that each submittal has been checked and

co-ordinated with requirements of Work and Contract Documents.

.1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.

.7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent work and coordinate.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.

.11 Submittal format: paper originals, or alternatively clear and fully legible photocopies of originals. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.

.12 Make changes or revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.13 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, product data, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Number of Shop Drawings: submit sufficient copies of shop drawings which are required by the General Contractor and sub-contractors plus 2 copies which will be retained by Departmental Representative. Ensure sufficient numbers are submitted to enable one complete set to be included in each of the maintenance manuals specified, if applicable.

.3 Shop Drawings Content and Format:

.1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.

.2 Shop Drawings Format:

.1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.

.2 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard

manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.

.3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.

.3 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.

.4 Delete information not applicable to project on all submittals.

.4 Allow 10 calendar days for Departmental Representative's review of each submission.

.5 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.

.6 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.

.7 Accompany each submission with transmittal letter, containing:

.1 Date.

.2 Project title and project number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.8 Submissions shall include:
.1 Date and revision dates.
.2 Project title and project number.
.3 Name and address of:
.1 Subcontractor.
.2 Supplier.
.3 Manufacturer.
.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
.5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.
.6 Details of appropriate portions of Work as applicable:
.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 The review of shop drawings by the Departmental Representative or their delegated representative is for sole purpose of ascertaining conformance with general concept. This review shall not mean that the

Departmental Representative approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and 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.

1.4 SCHEDULES, PERMITS AND CERTIFICATES

.1 Upon acceptance of bid, submit to Departmental Representative copy of Work Schedule and various other schedules, permits, certification documents and project management plans as specified in other sections of the Specifications.

.2 Submit copy of permits, notices, compliance Certificates received by Regulatory Agencies having jurisdiction and as applicable to the Work.

.3 Submission of above documents to be in accordance with Submittal General Requirements procedures specified in this section.

1.1 SECTION INCLUDES

.1 Fire Safety Requirements.

.2 Hot Work Permit.

1.2 RELATED WORK

.1 Section 01 35 25 - Special Procedures on Lockout Requirements.

.2 Section 01 35 29 - Health and Safety Requirements.

1.3 REFERENCES

.1 Fire Protection Standards issued by Fire Protection Services of Human Resources Development Canada as follows:
.1 FCC No. 301-June 1982 Standard for Construction Operations (http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/301/page00.shtml).
.2 FCC No. 302-June 1982 Standard for Welding and Cutting (http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/302/page00.shtml).
.3 FCC standards, may also be viewed at the Regional Fire Protection Services' office (previously known as the Fire Commissioner of Canada) located at 99 Wyse Road, 8th Floor, Dartmouth, NS, Tel: (902) 426-6053.

1.4 DEFINITIONS

.1 Hot Work defined as:
.1 Welding work.
.2 Cutting of materials by use of torch or other open flame devices.
.3 Grinding with equipment which produces sparks.

1.5 SUBMITTALS

.1 Submit copy of Hot Work Procedures and sample

of Hot Work permit to Departmental Representative for review, within 14 calendar days after notification of acceptance of bid.

.2 Submit in accordance with the Submittal General Requirements specified in Section 01 33 00.

1.6 FIRE SAFETY REQUIREMENTS

.1 Implement and follow fire safety measures during Work. Comply with following:
.1 National Fire Code, 2005
.2 Fire Protection Standards FCC 301 and FCC 302.
.3 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 29.

.2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.7 HOT WORK AUTHORIZATION

.1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot work on site.

.2 To obtain authorization submit to Departmental Representative:
.1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
.2 Description of the type and frequency of Hot Work required.
.3 Sample Hot Work Permit to be used.

.3 Upon review and confirmation that effective fire safety measures will be implemented

during performance of hot work, Departmental Representative will provide authorization to proceed as follows:

.1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;

.2 Separate work, or segregate certain parts of work, into individual entities. Each entity requiring a separately written "Authorization to Proceed" from Departmental Representative. Follow Departmental Representative's directives in this regard.

.4 Requirement for individual authorization based on:

.1 Nature or phasing of work;

.2 Risk to Facility operations;

.3 Quantity of various trades needing to perform hot work on project or;

.4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.

.5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.

.6 In tenant occupied Facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of Facility. Follow Departmental Representative's directives in this regard.

1.8 HOT WORK PROCEDURES

.1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.

.2 Procedures to include:

.1 Requirement to perform hazard assessment of site and immediate hot work area for each hot work event in accordance with Hazard Assessment and Safety Plan requirements of Section 01 35 29.
.2 Use of a Hot Work Permit system for each hot work event.
.3 The step by step process of how to prepare and issue permit.
.4 Permit shall be issued by Contractor's site Superintendent, or other authorized person designated by Contractor, granting permission to worker or subcontractor to proceed with hot work.
.5 Provision of a designated person to carryout a Fire Safety Watch for a minimum of 60 minutes immediately upon completion of the hot work.
.6 Compliance with fire safety codes and standards specified herein and occupational health and safety regulations specified in Section 01 35 29.

.3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Clearly label as being the Hot Work Procedures applicable to this contract.

.4 Hot Work Procedures shall clearly establish worker instructions and allocate responsibilities of:
.1 Worker(s),
.2 Authorized person issuing the Hot Work Permit,
.3 Fire Safety Watcher,
.4 Subcontractors and Contractor.

.5 Brief all workers and subcontractors on Hot Work Procedures and Permit system established for project. Stringently enforce compliance.
.1 Failure to comply with the established

procedures may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.

1.9 HOT WORK PERMIT

.1 Hot Work Permit to include, as a minimum, the following data:

.1 Project name and project number.

.2 Building name, address and specific room or area where hot work will be performed.

.3 Date when permit issued.

.4 Description of hot work type to be performed.

.5 Special precautions required, including type of fire extinguisher needed.

.6 Name and signature of person authorized to issue the permit.

.7 Name of worker (clearly printed) to which the permit is being issued.

.8 Time Duration that permit is valid (not to exceed 8 hours). Indicate start time and date, and completion time and date.

.9 Worker signature with date and time upon hot work termination.

.10 Specified time period requiring safety watch.

.11 Name and signature of designated Fire Safety Watcher, complete with time and date when safety watch terminated, certifying that surrounding area was under continual surveillance and inspection during the full watch time period specified in Permit and commenced immediately upon completion of Hot Work.

.2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.

.3 Each Hot Work Permit to be completed in full

and signed as follows:

.1 Authorized person issuing Permit before hot work commences.

.2 Worker upon completion of Hot Work.

.3 Fire Safety Watcher upon termination of safety watch.

.4 Returned to Contractor's Site Superintendent for safe keeping.

1.10 DOCUMENTS ON SITE

.1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.

.2 Upon request, make available to Departmental Representative or to authorized safety representative for inspection.

1.1 SECTION INCLUDES

.1 Procedures to isolate and lockout electrical facility or other equipment from energy source.

1.2 RELATED WORK

.1 Section 01 35 24 - Fire Safety Requirements.

.2 Section 01 35 29 - Health and Safety Requirements.

1.3 REFERENCES

.1 C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.

.2 CAN/CSA C22.3 No. 1-10 - Overhead Systems.

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

.4 COSH, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

1.4 DEFINITIONS

.1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.

.2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.

.3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).

.4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.

.5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.

.6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.5 COMPLIANCE REQUIREMENTS

.1 Perform lockouts in compliance with:
.1 Canadian Electrical Code.
.2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 29.
.3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
.4 Procedures specified herein.

.2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be

followed.

1.6 SUBMITTALS

.1 Submit copy of proposed Lockout Procedures and sample form of lockout permit or lockout tags for review.

.2 Submit documentation within 7 calendar days of acceptance of bid. Do not proceed with work until submittal has been reviewed by Departmental Representative.

.3 Submit above documents in accordance with the submittal requirements specified in Section 01 33 00.

.4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

1.7 ISOLATION OF EXISTING SERVICES

.1 Obtain Departmental Representative's written authorization prior to conducting work on an existing active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.

.2 To obtain authorization, submit to Departmental Representative the following documentation:
.1 Written Request for Isolation of the service or facility and;
.2 Copy of Contractor's Lockout Procedures.

.3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, and as follows:
.1 Fill-out standard forms in current use at the Facility when so directed by Departmental Representative or;
.2 Where no form exist at Facility, make

request in writing identifying:

.1 Identification of system or equipment to be isolated, including it's location;

.2 Time duration, indicating Start time and date, and Completion time and date when isolation will be in effect;

.3 Voltage of service feed to system or equipment being isolated;

.4 Name of person making the request.

.3 Document to be in typewritten format.

.4 Do not proceed until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the isolation of designated equipment or facility. Departmental Representative may designate other individual at the Facility as the person authorized to grant the Isolation Request.

.5 Conduct safe, orderly shut down of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.

.6 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of facility operations.

.7 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow Departmental Representative's directives in this regard.

.8 Conduct hazard assessment as part of the

planning process of isolating existing equipment and facilities. Hazard Assessments to conform with requirements of Health and Safety Section 01 35 29.

1.8 LOCKOUTS

.1 Isolate and lockout electrical facilities, mechanical equipment and machinery from all potential energy sources prior to starting work on such items.

.2 Develop and implement lockout procedures to be followed on site as an integral part of the Work.

.3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.

.4 Use industry standard lockout tags.

.5 Provide appropriate safety grounding and guards as required.

.6 Prepare Lockout Procedures in writing. Describe safe work practices, work functions and sequence of activities to be followed on site to safely isolate all potential energy sources and lockout/tagout facilities and equipment.

.7 Include within procedures a system of worker request and issuance of individual lockout permit by a person, employed by Contractor, designated to be "in-charge" and being responsible for:

.1 Controlling issuance of permits or tags to workers.

.2 Determining permit duration.

.3 Maintaining record of permits and tags issued.

.4 Submitting a Request for Isolation to

Departmental Representative when required in accordance with Clause 1.7 above.
.5 Designating a Safety Watcher, when one is required based on type of work.
.6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to worker(s) prior to proceeding with work.
.7 Collecting and safekeeping lockout tags, returned by workers, as a record of the event.

.8 Clearly establish, describe and allocate, within procedures, the responsibilities of:
.1 Workers.
.2 Designated person controlling issuance of lockout tags/permits.
.3 Safety Watcher.
.4 Subcontractors and General Contractor.

.9 Procedures shall meet the requirements of Codes and Regulations specified in clause 1.5 above.

.10 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the procedures applicable to this contract.
.1 Incorporate site specific rules and procedures established by Facility Manager and in force at site. Obtain such procedures through Departmental Representative.

.11 Procedures to be in typewritten format.

.12 Submit copy of Lockout Procedures to Departmental Representative, in accordance with submittal requirements of clause 1.6 herein, prior to commencement of work.

1.9 CONFORMANCE

.1 Ensure that lockout procedures, as established for project on site, are stringently followed. Enforce use and compliance by all workers.

.2 Brief all persons working on electrical facilities, mechanical and other equipment fed by an energy source on requirements of this section.

.3 Failure to perform lockouts in accordance with regulatory requirements or follow procedures specified herein may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.

1.10 DOCUMENTS ON SITE

.1 Post Lockout Procedures on site in common location for viewing by workers.

.2 Keep copies of Request for Isolation submitted to Departmental Representative and lockout permits or tags issued to workers during the course of work for full project duration.

.3 Upon request, make such data available to Departmental Representative or to authorized safety representative for inspection.

1.1 RELATED WORK

.1 Section 01 35 24 - Special Procedures on Fire Safety Requirements.

.2 Section 01 35 25 - Special Procedures on Lockout Requirements.

1.2 DEFINITIONS

.1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

.2 Competent Person: means a person who is:

.1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;

.2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;

.3 Knowledgeable about potential or actual danger to health or safety associated with the Work.

.3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.

.4 PPE: personal protective equipment.

.5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.3 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Submit site-specific Health and Safety Plan prior to commencement of Work.

.1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.

.2 Departmental Representative will review Health and Safety Plan and provide comments.

.3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.

.4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

.5 Submit revisions and updates made to the Plan during the course of Work.

.3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.

.4 Submit building permit, compliance certificates and other permits obtained.

.5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.

.1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.

.6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.7 Submit copies of incident reports.

.8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 COMPLIANCE REQUIREMENTS

.1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland and Labrador, and the Occupational Health and Safety Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code Part II, (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.

.1 The Canada Labour Code can be viewed at: www.http://laws.justice.gc.ca/en/L-2/

.2 COSH can be viewed at: www.http://laws.justice.gc.ca/eng/SOR-86-304/ne.html.

.3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F).

.3 Observe construction safety measures of:

.1 Part 8 of National Building Code.

.2 Municipal by-laws and ordinances.

.4 In case of conflict or discrepancy between any specified requirements, the more stringent shall apply.

.6 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter of Good Standing.

.7 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

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

.2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to work site with safety requirements of Contract Documents, applicable Federal, Provincial, and local by-laws, regulations, and ordinances, and with site specific Health and Safety Plan.

1.6 SITE CONTROL AND ACCESS

.1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.

.1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.

.2 Isolate Work Site from other areas of the premises by use of appropriate means.

.1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to

protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment.

.2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

.3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

.4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.7 PROTECTION

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

.2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 FILING OF NOTICE

.1 File Notice of Project with pertinent provincial health and safety authorities

prior to beginning of Work.
.1 Departmental Representative will assist in locating address if needed.

1.9 PERMITS

.1 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site.

.2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.10 HAZARD ASSESSMENTS

.1 Perform site specific health and safety hazard assessment of the Work and its site.

.2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.

.3 Record results and address in Health and Safety Plan.

.4 Keep documentation on site for entire duration of the Work.

1.11 PROJECT/SITE CONDITIONS

.1 The following are known or potential project related safety hazards at site:
.1 Working in close proximity of water.
.2 Use of water crafts and floating platforms.
.3 Wet and slippery conditions.
.4 Inclement weather.
.5 Potential structural weakness of existing structures.
.6 Heavy equipment activity in the area.

.7 Heavy lifting.
.8 Working at heights.
.9 Cutting tools and other construction power tools.
.10 Overhead power/utility lines.
.11 Risk of electric shock.
.12 Vehicular and pedestrian traffic.
.13 Confined spaces.

.2 Above items shall not be construed as being complete and inclusive of potential health, and safety hazards encountered during work.

.3 Include above items into hazard assessment process.

.4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

1.12 MEETINGS

.1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
.1 Superintendent of Work.
.2 Designated Health & Safety Site Representative.
.3 Subcontractors.

.2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.

.3 Keep documents on site.

1.13 HEALTH AND SAFETY PLAN

.1 Prior to commencement of Work, develop written Health and Safety Plan specific to the work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.

.2 Health and Safety Plan shall include the following components:
- .1 List of health risks and safety hazards identified by hazard assessment.
- .2 Control measures used to mitigate risks and hazards identified.
- .3 On-site Contingency and Emergency Response Plan as specified below.
- .4 On-site Communication Plan as specified below.
- .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
- .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

.3 On-site Contingency and Emergency Response Plan shall include:
- .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
- .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshaling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
- .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:
  .1 General Contractor and subcontractors.
  .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
  .3 Local emergency resource organizations.

.5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of Departmental Representative and Facility Management contacts.

.4 On-site Communication Plan:
  .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
  .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.

.5 Address all activities of the Work including those of subcontractors.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.

.7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

.8 Post copy of the Plan, and updates,

prominently on Work Site.

1.14 SAFETY SUPERVISION

.1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

.2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:

- .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
- .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
- .3 Conduct site safety orientation session to persons granted access to Work Site.
- .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
- .5 Stop the Work as deemed necessary for reasons of health and safety.

.3 Health & Safety Site Representative must:

- .1 Be qualified and competent person in occupational health and safety.
- .2 Have site-related working experience specific to activities of the Work.
- .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
  - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action

taken.

.2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.

.3 Follow-up and ensure corrective measures are taken.

.6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.

.7 Keep inspection reports and supervision related documentation on site.

1.15 TRAINING

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

.3 When unforeseen or peculiar safety-related 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 Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.16 MINIMUM SITE SAFETY RULES

.1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:

.1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being

hard hat, safety footwear, safety glasses and hearing protection.
.2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
.3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
.4 Obey warning signs and safety tags.

.2 Brief persons of disciplinary protocols to be taken for non compliance. Post rules on site.

1.17 COORECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by 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 will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.18 INCIDENT REPORTING

.1 Investigate and report the following incidents to Departmental Representative:
.1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
.2 Medical aid injuries.
.3 Property damage in excess of $10,000.00.
.4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of $5000.00.

.2 Submit report in writing.

1.19 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System WHMIS).

.2 Keep MSDS data sheets for all products delivered to site.
.1 Post on site.
.2 Submit copy to Departmental Representative.

1.20 BLASTING

.1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

.2 Do blasting operations in accordance with local and provincial codes.

1.21 POWDER ACTUATED DEVICES

.1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

1.22 CONFINED SPACES

.1 Abide by occupational health and safety regulations regarding work in confined spaces.

.2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
.1 Obtain permit from Facility Manager
.2 Keep copy of permit issued.
.3 Safety for Inspectors:
.1 Provide PPE and training to

Departmental Representative and other persons who require entry into confined space to perform inspections.

.2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.23 SITE RECORDS

.1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.

.2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.24 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.

.2 Post other documents as specified herein, including:
.1 Site specific Health and Safety Plan.
.2 WHMIS data sheets.

1.25 DIVING OPERATIONS

.1 All diving work to comply fully with the requirements of CSA Z275.2-04, "Occupational Safety Code for Diving Operations", CSA Z275.4-02, "Competency Standards for Diving Operations "and CSA Z180.1-00,"Compressed Breathing Air and Systems."

.2 Dive personnel must meet the minimum competency requirements of the CSA Z275.4-

02 (R2008) and all divers must possess a valid Category 1 Diving Certificate or an Unrestricted Surface-supplied Certificate.

.3 Diving in free-swim mode is not permitted at the work site.

.4 Divers must have a current(less than one year) validated medical examination certificate(s) from a licensed Diving Physician in Newfoundland and Labrador who is knowledgeable and competent in diving and hyperbaric medicine, for all dives.

1.1 RELATED WORK

.1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 DEFINITIONS

.1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

1.3 FIRES

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

1.4 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS

.1 Do not bury rubbish and waste materials on site. Dispose at approved landfill sites as specified in Section 01 74 21.

.2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.

.3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

.4 Dispose of construction waste materials and demolition debris, resulting from work, at approved landfill sites only. Carryout such disposal in strict accordance with provincial and municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.

.5 Establish methods and undertake construction practices which will minimize waste and

optimize use of construction materials. Separate at source all construction waste materials, demolition debris and product packaging and delivery containers into various waste categories in order to maximize recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a "mixed state". Where recycling firms, specializing in recycling of specific materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.

.6 Communicate with landfill operator prior to commencement of work, to determine what specific construction, demolition and renovation waste materials have been banned from disposal at the landfill and at transfer stations.

1.5 DRAINAGE

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

.2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.

.4 Pumped water must meet applicable federal, provincial, and municipal standards before it can be discharged to a surface water body. If regulatory guidelines exceedences are noted, the Departmental Representative has the right to issue stop pumping instructions

to the Contractor. Contractor will not be compensated for any delays associated with retrofitting equipment to meet guidelines.

.5 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good order for duration of work.

1.6 PERMITS

.1 All guidelines and instructions stated on permits must be strictly adhered to.

1.7 WORK ADJACENT TO WATERWAYS

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material.

.3 Do not dump excavated fill, waste material or debris in waterways.

.4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with provincial and federal environmental regulations.

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

.6 Avoid indicated spawning beds when constructing temporary crossings of waterways.

.7 Do not blast within 100 m of spawning beds.

.8 Do not refuel any type of equipment within 100 m of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.

1.8 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

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

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.

.5 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.

.6 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.

.7 Report, to Federal and Provincial Department of the Environment, spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment. Also notify Departmental Representative and submit a written spill report to Departmental Representative within 24 hours of occurrence.

.8 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating

debris.

1.9 WILDLIFE PROTECTION

.1 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.

.1 Do not disturb nest site and neighbouring vegetation until nesting is completed.

.2 Minimize work immediately adjacent to such areas until nesting is completed.

.3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Mill tests.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

1.3 INSPECTION

.1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.

.3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such Work.

.4 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Departmental Representative may engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.

.6 Additional tests specified in Clause 1.4.2.

.2 Where tests or inspections by designated Testing Agency reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.

.3 Employment of inspection and testing agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

1.5 ACCESS TO WORK

.1 Furnish labour and facility to provide access to the work being inspected and tested.

.2 Co-operate to facilitate such inspections and tests.

.3 Make good work disturbed by inspections and tests.

1.6 PROCEDURES

.1 Notify Departmental Representative sufficiently in advance of when work is ready for tests, in order for Departmental Representative to make attendance arrangements with Testing Agency. When directed by Departmental Representative, notify such Agency directly.

.2 Submit representative samples of materials specified to be tested. Deliver in required quantities to Testing Agency. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples on site. Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

1.7 REJECTED WORK

.1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.

.2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.

1.8 TESTING BY CONTRACTOR

.1 Provide all necessary instruments, equipment and qualified personnel to perform tests designated as Contractor's responsibilities herein or elsewhere in the Contract Documents.

.2 At completion of tests, turn over 2 copies of fully documented test reports to Departmental Representative.

.3 Submit mill test certificates and other certificates as specified in various sections.

.4 Furnish test results and mix designs as specified in various sections.

1.1 ACCESS

.1 Provide and maintain adequate access to project site.

.2 Maintain access roads for duration of contract and make good damage resulting from Contractors' use of roads.

1.2 CONTRACTOR'S SITE OFFICE

.1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

1.3 DEPARTMENTAL REPRESENTATIVE'S SITE OFFICE

.1 Provide or construct a separate site office for the use of the Departmental Representative and the Site Representative. The building must be in place prior to commencement of work.

.2 Provide heating system to maintain 22°C inside temperature at -20°C outside temperature.

.3 The building will be approximately 2400 mm x 3600 mm. It will have a suitable frame covered with a weatherproof siding and lined with plywood or other approved material. The floor will be of 19 mm thick material. It will be provided with suitable window with at least 1 m^2 of glass and arranged to provide at least 0.5 m^2 of screened opening. The door will be fitted with a lockset and 2 keys.

.4 The office will be equipped with a drafting chair and a 900 mm x 1500 mm table having a hinged, smooth wooden top suitable for drafting.

.5 Install electrical lighting system to provide minimum 750 lux using surface mounted,

shielded commercial fixtures with 10% upward light component.

.6 Maintain office in clean condition.

.7 Arrange and pay for telephone and facsimile machine in the Departmental Representative's Office for Site Representative's exclusive use. Long distance calls or faxes placed on this phone by the Departmental Representative or the Site Representative will be paid by the Departmental Representative.

.8 Contractor may, on approval of Departmental Representative, provide cellular or mobile phone. If approval to use cellular or mobile phone is granted, be responsible for all services, airtime, license and network access fees, and all other fees or charges required to utilize the phone as intended by the manufacturer.

1.4 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.5 POWER

.1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.2 Supply and install all temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

1.6 WATER SUPPLY

.1 Arrange, pay for and maintain temporary water supply in accordance with governing

regulations and ordinances.

1.7 SCAFFOLDING

.1 Design, construct and maintain scaffolding in rigid, secure and safe manner in accordance with CSA797-09.

.2 Erect scaffolding independent of walls. Remove when no longer required.

1.8 CONSTRUCTION SIGN AND NOTICES

.1 Contractor or subcontractor advertisement signboards are not permitted on site.

.2 Only notices of safety or instructions are permitted on site.

.3 Safety and Instruction Signs and Notices:
.1 Signs and notices for safety and instruction shall be in both official languages.

.4 Maintenance and Disposal of Site Signs:
.1 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.9 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by Departmental Representative.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Traffic Controls.

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 enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m centres. Provide one lockable truck gate. Maintain fence in good repair.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around open excavations.

.2 Provide barricades along wharf structure when wheelguard is removed.

.3 Provide as required by governing authorities.

1.5 ACCESS TO SITE

.1 Provide and maintain access to adjacent harbour facilities.

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 the 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.

1.1 DESCRIPTION

.1 This section specifies requirements for board, lodgings and related services to be provided by the Contractor for the Site Monitor.

.2 Due to the location of this site, it is a requirement of this contract that the Contractor provide and pay for all board and lodgings (within 5km of project site) for the Site Monitor's sole use for the duration of the project. Provide for and maintain acceptable living accommodations on site for the Site Monitor's sole use. The minimum requirement would be a self-contained unit with private sleeping accommodation and shower or bath or other arrangement approved by the Departmental Representative.

1.2 BOARD AND LODGINGS

.1 For the purpose of this contract board and lodgings shall include but not necessarily be limited to: sleeping accommodation, meals and dining facilities, washroom facilities, laundry facilities, electrical and heating service, linens and bedding, etc. and any reasonable service as directed by the Departmental Representative.

.2 Board and lodgings must be approved by the Departmental Representative and Contractor will cooperate in providing all services required to maintain an acceptable standard of living during construction period.

.3 The Contractor shall include all calendar days, including weekends and statutory holidays in determining the cost.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

.1 Comply with any or all applicable Agencies regulation of the Province of Newfoundland and Labrador, relating to the set up, servicing and maintenance of accommodations for the Site Monitor.

.2 Obtain and pay for any permits which may be required and comply to regulations of same.

1.1 GENERAL

.1 Use new material and equipment unless otherwise specified.

.2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
.1 name and address of manufacturer;
.2 trade name, model and catalogue number;
.3 performance, descriptive and test data;
.4 manufacturer's installation or application instructions;
.5 evidence of arrangements to procure.
.6 evidence of manufacturer delivery problems or unforseen delays.

.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.

.4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 PRODUCT QUALITY AND REFERENCED STANDARDS

.1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.

.2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative

in accordance with the General Conditions.

1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES

.1 Acceptable Materials: When materials specified include trade names or trade marks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.

.2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.

.3 Substitutions: After acceptance of bid, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

1.4 MANUFACTURERS INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental representative in writing of any conflict between these specifications and manufacturers instructions, so that Departmental Representative will designate which document is to be followed.

1.5 AVAILABILITY

.1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per Clause 1.1.2 above.

1.6 WORKMANSHIP

.1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

.2 Remove unsuitable or incompetent workers from site as stipulated in General Conditions.

.3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.

.4 Coordinate work between trades and subcontractors.

.5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS - GENERAL

.1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.

.2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.

.3 Keep exposed fastenings to minimum, space evenly and lay out neatly.

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

.5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See Section 01 35 29 on

Health and Safety in this regard.

1.8 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

1.9 STORAGE, HANDLING AND PROTECTION

.1 Deliver, handle and store materials in manner to prevent deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.

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

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope

to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Immediately remove damaged or rejected materials from site.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.10 CONSTRUCTION EQUIPMENT AND PLANT

.1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

.2 Maintain construction equipment and plant in good operating order. Prevent oil and other contaminant leaks. Should any contaminant leak onto ground or into the water, take immediate and appropriate measures to contain, cleanup and dispose in an environmentally responsible manner.

PART 1 - GENERAL

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.3 Prevent accumulation of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances.

1.2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 CLEANING DURING CONSTRUCTION

.1 Maintain project grounds and public properties in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.

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

.3 Remove waste materials and debris from site on a daily basis.

1.4 FINAL CLEANING

.1 In preparation for acceptance of the Work perform final cleaning.

.2 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.

.3 Broom clean exterior paved and concrete surfaces; rake clean other surfaces of grounds.

1.1 RELATED SECTIONS

.1 Section 01 35 43 - Environment Procedures.

.2 Section 02 41 16 - Sitework, Demolition and Removal.

.3 Section 03 30 00 - Cast-in-Place Concrete.

.4 Section 06 05 73 - Wood Treatment.

.5 Section 31 53 13 - Timber Cribwork.

.6 Section 31 53 16 - Structural Timber.

1.2 WASTE MANAGEMENT PLAN

.1 Prior to commencement of work, prepare waste Management Workplan.

.2 Workplan to include:
.1 Waste audit.
.2 Waste reduction practices.
.3 Material source separation process.
.4 Procedures for sending recyclables to recycling facilities.
.5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
.6 Training and supervising workforce on waste management at site.

.3 Workplan to incorporate waste management requirements specified herein and in other sections of the Specifications.

.4 Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.

.5 Submit copy of Workplan to Departmental Representative for review and approval.
.1 Make revisions to Plan as directed by Departmental Representative.

.6 Implement and manage all aspects of Waste Management Workplan for duration of work.

.7 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.

1.3 WASTE AUDIT

.1 At project start-up, conduct waste audit of:
.1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
.2 Projected waste resulting from product packaging and from material leftover after installation work.

.2 Develop written list. Record type, composition and quantity of various salvageable items and waste anticipated, reasons for waste generation and operational factors which contribute to waste.

1.4 WASTE REDUCTION

.1 Based on waste audit, develop waste reduction program.

.2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.

.3 Identify materials and equipment to be:
.1 Protected and turned over to Departmental Representative when indicated.
.2 Salvaged for resale by Contractor.
.3 Sent to recycling facility.
.4 Sent to waste processing/landfill site for their recycling effort.
.5 Disposed of in approved landfill site.

.4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of

new materials on site, such as:
.1 Use of a central cutting area to allow for easy access to off-cuts;
.2 Use of off-cuts for blocking and bridging elsewhere.
.3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials to allow for easy incorporation into work whenever possible avoiding unnecessary waste.

.5 Develop other strategies and innovative procedures to reduce waste such as minimizing the extent of packaging used for delivery of materials to site, etc.

1.5 MATERIAL SOURCE SEPARATION PROCESS

.1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.

.2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
.1 Use suitable containers for individual collection of items based on intended purpose.
.2 Locate to facilitate deposit but without hindering daily operations of existing building tenants.
.3 Clearly mark containers and stockpiles as to purpose and use.

.3 Perform demolition and removal of existing structure components and equipment following a systematic deconstruction process.
.1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
.1 Reinstallation into the work where

indicated.

.2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.

.3 Sending as many items as possible to locally available recycling facility.

.4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.

.4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.

.5 Send leftover material resulting from installation work for recycling whenever possible.

.6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.

.7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

1.6 WORKER TRAINING AND SUPERVISION

.1 Provide adequate training to workforce, through meetings and demonstrations, to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.

.2 Waste Management Coordinator: designate

full-time person on site, experienced in waste management and having knowledge of the purpose and content of Waste Management Plan to:

.1 Oversee and supervise waste management during work.

.2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.

.3 Post a copy of Plan in a prominent location on site for review by workers.

1.7 CERTIFICATION OF MATERIAL DIVERSION

.1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.

.2 Submit data at pre-determined project milestones as determined by Departmental Representative.

.3 Compare actual quantities diverted from landfill with projections made during waste audit.

1.8 DISPOSAL REQUIREMENTS

.1 Burying or burning of rubbish and waste materials is prohibited.

.2 Disposal of waste, volatile materials, mineral spirits, oil, paint, paint thinner or unused preservative material into waterways, storm, or sanitary sewers is prohibited.

.3 Do not dispose of preservative treated wood through incineration.

.4 Do not dispose of preservative treated wood

with other materials destined for recycling or reuse.

.5 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

.6 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.

.7 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.

.8 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.

.9 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.

.10 Sale of salvaged items by Contractor to other parties not permitted on site.

1.1 SECTION INCLUDES

.1 Project Record Documents as follows:
- .1 As-built drawings;
- .2 As-built specifications;
- .3 Reviewed shop drawings.

1.2 PROJECT RECORD DOCUMENTS

.1 Departmental Representative will provide two white print sets of contract drawings and two copies of Specifications Manual specifically for "as-built" purposes.

.2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.

.3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative at any time during construction.

.4 As-Built Drawings:

.1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of project and prior to final inspection, neatly transfer notations to second set (also by use of red ink). Submit both sets to Departmental Representative. All drawings of both sets shall be stamped "As-Built Drawings" and be signed and dated by Contractor.

.2 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.

.3 Record following information:

- .1 Horizontal and vertical location of various elements in relation to Geodetic Datum.
- .2 Field changes of dimension and detail.
- .3 All design elevations, sections, and details dimensioned and marked-up to consistently report finished

installation conditions.

.4 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings must also be marked-up and dimensioned to reflect final as-built conditions and appended to the as-built drawing document.

.5 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.

.5 As-built Specifications: legibly mark in red each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly items substituted from that specified.

.2 Changes made by Addenda and Change Orders.

.3 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.

.6 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Frequency of reviews will be subject to Departmental Representative's discretion. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

1.3 REVIEWED SHOP DRAWINGS	.1	Compile 2 full sets of all reviewed shop drawings.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for demolishing and removing wholly or in part various items designated to be removed or partially removed.

.2 Demolition and removal will consist of, but not necessarily be limited to, the following:

.1 Removal of the existing armour stone to accommodate the new work. Existing armour stone may be re-used in the new work, if approved by the Departmental Representative as meeting the size requirements indicated on the drawings.

1.2 GENERAL REQUIREMENTS

.1 A Notice to Shipping is to be issued prior to commencement and upon completion of work.

.2 During construction, any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.

.3 Upon completion of the project, a written Notice to Mariners must be issued.

1.3 PROTECTION

.1 Protect existing objects designated to remain. In event of damage, immediately replace or make repairs to approval of and at no additional cost to Canada.

.2 Place a floating boom around entire demolition site to prevent loss of any materials.

.3 Remove all floating debris from water on a

routine and timely basis.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 EXECUTION

.1 Inspect site and verify with Departmental Representative objects designated for removal.

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

3.2 REMOVAL

.1 Remove in their entirety all materials and objects specified for removal.

.2 Do not disturb adjacent work designated to remain in place.

3.3 DISPOSAL OF MATERIAL

.1 All demolished materials, except materials designated to be reused, will become property of contractor and will be removed from site and disposed of to satisfaction of Departmental Representative and in accordance with environmental guidelines. It is the sole responsibility of the contractor to dispose of all demolished materials at an approved disposal site. Ensure that disposal site is approved and willing to accommodate any materials disposed of from work site.

.2 Contractor shall obtain and pay for all necessary permits and disposal fees for use

of an approved waste disposal site.

3.4 RESTORATION

.1 Upon completion of work, remove debris, trim surfaces and leave work site in clean condition.

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

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 03 20 00 - Concrete Reinforcing.

.2 Section 03 30 00 - Cast-in-Place Concrete.

.3 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 Canadian Standards Association (CSA)
.1 CAN/CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.
.2 CAN/CSA-O86-09, Engineering Design in Wood.
.3 CSA O121-08, Douglas Fir Plywood.
.4 CSA O151-09, Canadian Softwood Plywood.
.5 CSA O153-M1980 (R2008), Poplar Plywood.
.6 CAN3-O188.0-M78, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
.7 CSA O437 Series-93 (R2006), Standards for OSB and Waferboard.
.8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
.9 CAN/CSA-S269.3-M92 (R2008), Concrete Formwork.

1.3 SHOP DRAWINGS

.1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings Comply with CAN/CSA-S269.3 for formwork drawings.

.3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

.4 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

.5 Each shop drawing submission shall bear stamp and signature of qualified Professional Engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Formwork materials:
.1 Use formwork materials to CAN/CSA-A23.1.

.2 Form ties:
.1 Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete

surface.

.3 Form release agent: non-toxic, chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.

.4 Falsework materials: to CSA-S269.1.
.1 Materials required to bear grade marks, or be accompanied with certificates, test reports or other proof of conformity.

.5 Premoulded joint fillers:
.1 Bituminous impregnated fibreboard to ASTM D1751.

.6 Bond Breaker:
.1 Impermeable tube formed of polyvinylchloride, rubber or similar material to the approval of the Departmental Representative. Internal diameter equal to dowels.

.7 Sealant: to Section 07 92 10 - Joint Sealing.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

.6 Align form joints and make watertight. Keep form joints to minimum.

.7 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.10 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.
.1 5 days for slabs, decks and other structural members, or 3 days when replaced immediately with adequate shoring to standard specified for falsework.

.2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace

immediately with adequate reshoring.

.3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000 mm apart.

.5 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

3.3 JOINT FILLERS

.1 Install joint filler in all joints.

3.4 JOINT SEALANT

.1 Fill control joints with sealer as per manufacturer instructions. Sealant to be suitable for application in a seawater marine environment.

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 03 10 00 - Concrete Forming and Accessories.

.2 Section 03 30 00 - Cast-in-Place Concrete.

.3 Section 35 59 29 - Mooring Devices.

1.2 REFERENCES

. 1 American Concrete Institute (ACI)
.1 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI)
.1 ANSI/ACI 315-99, Details and Detailing of Concrete Reinforcement.

.3 American Society for Testing and Materials International (ASTM)
.1 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
.2 ASTM A497/A497M-07, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
.3 ASTM-A123/A123M-09, Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

.4 Canadian Standards Association (CSA)
.1 CAN/CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.
.2 CSA-A23.3-04(R2010), Design of Concrete Structures.
.3 CAN/CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
.4 CSA-G40.20-04/G40.21-04(R2009),

General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 SHOP DRAWINGS

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada. ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental

Representative.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.

.4 Cold-drawn annealed steel wire ties: to ASTM A-82/A-82M.

.5 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.

.6 Mechanical splices: subject to approval of Departmental Representative.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to commencing reinforcing work.

.2 Upon request inform Departmental Representative of proposed source of material to be supplied.

PART 3 - EXECUTION

3.1 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1.

.2 Use approved type chairs to locate the reinforcing steel at the proper grade.

.3 Tie reinforcement where spacing in each direction is:
.1 Less than 300 mm: tie at alternate intersections.
.2 300 mm or more: tie at each intersection.

.4 Prior to placing concrete, obtain

Departmental Representative's approval of reinforcing material and placement.

.5 Ensure cover to reinforcement is maintained during concrete pour.

3.3 CLEANING

.1 Clean reinforcing before placing concrete to CAN/CSA-A23.1.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for supply, placing, finishing, protecting and curing cast-in-place concrete for mooring cleat blocks, wharf deck and thickened slab for future jib crane.

1.2 RELATED SECTIONS

.1 Section 03 10 00 - Concrete Forming and Accessories.

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 35 59 29 - Mooring Devices.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C109/C109M-08, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).

.2 ASTM C260/260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

.3 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.

.2 CAN/CSA-A23.2-09, Methods of Test for Concrete.

.3 CSA-A283-06, Qualification Code for Concrete Testing Laboratories.

.4 CAN/CSA-A3000-08, Cementitious Materials Compendium (consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001-08, Cementitious Materials for Use in Concrete.

1.4 CERTIFICATES

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

.2 Minimum 2 weeks prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
- .1 Portland cement.
- .2 Blended hydraulic cement.
- .3 Supplementary cementing materials.
- .4 Grout.
- .5 Admixtures.
- .6 Aggregates.
- .7 Water.
- .8 Joint filler.
- .9 Joint Sealant.

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

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

1.5 STORAGE OF MATERIALS

.1 Store materials to prevent contamination or deterioration.

.2 Provide adequate storage facilities for materials to ensure a continuous supply of these materials during batching operations.

.3 Store cement in weathertight facility.

1.6 QUALITY ASSURANCE

.1 Minimum 2 weeks prior to starting concrete work, submit proposed quality control procedures to Departmental Representative for the following items:
- .1 Cold weather concrete.
- .2 Curing.
- .3 Finishes.
- .4 Formwork removal.
- .5 Joints.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Use trigger operated spray nozzles for water hoses.

.2 Designate a cleaning area for tools to limit water use and runoff.

.3 Carefully coordinate the specified concrete work with weather conditions.

.4 Ensure emptied containers are sealed and stored safely for disposal away from children.

.5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

.6 Choose least harmful, appropriate cleaning method which will perform adequately.

1.8 MEASUREMENT FOR PAYMENT

.1 Concrete Deck: Supply and installation of reinforced concrete deck for the new wharf to be measured in square metres (m^2) calculated from actual field measurements,

excluding area occupied by mooring cleat pedestals, coping and thickened slab for future jib crane. Contractor to provide all plant, equipment, material, and labour including concrete, reinforcing steel, and control joints.

.2 Thickened Slab for Future Jib Crane: Supply and installation of the thickended slab for future jib crane will be measured by the unit. Contractor to provide all plant, equipment, material, and labour including formwork, concrete and reinforcing steel.

.3 Cleat Pedestals: No measurement for payment to be made under this section. Include costs incidental to unit price for Type "A" mooring cleats.

.4 No separate payment will be made for any other ingredient or feature of concrete work, and all factors, including cold weather placement, reinforcing steel, anchor bolts, joint filler for control joints, cement, concrete cover for conduit at approach, plant and labour will be considered as being included in the unit price for item.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Cement to CAN/CSA-A3001 (TerC-3 blended hydraulic cement).

.2 Supplementary cementing materials: to CAN/CSA-A3001.

.3 Cementitious hydraulic slag: to CAN/CSA-A3001.

.4 Water: to CAN/CSA-A23.1.

.5 Aggregates: to CAN/CSA-A23.1. Coarse aggregates to be normal density.

.6 Air entraining admixture: to ASTM C260.

.7 Chemical admixtures: to ASTM C494/C494M. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.8 Concrete retarders: to ASTM C494/C494M. Do not allow moisture of any kind to come in contact with the retarder film.

.9 Curing compound: curing compounds are not to be used.

.10 Premoulded joint fillers:
.1 Sponge rubber: to ASTM D1752, Type I, flexible grade.

2.2 MIXES

.1 Proportion concrete in accordance with CAN/CSA-A23.1, Clause 4.3.

.2 Proportion concrete to comply with Alternate 1, Table 2 in CAN/CSA-A23.1 and following requirements:
.1 Cement:
.1 TerC-3 blended hydraulic cement.
.2 Minimum compressive strength: 35 MPa at 28 days.
.3 Class of exposure: C1.
.4 Minimum cement content: 385 kg/m^3 of concrete.
.5 20 mm nominal size coarse aggregate.
.6 Air content 5% to 8%.
.7 Density of air-dry concrete in range of 2240 kg/m^3 to 2400 kg/m^3.
.8 Slump at time and point of discharge 50 mm to 100 mm.

.3 When the Contractor wishes to purchase

concrete from a ready mix concrete supplier, submit a letter from the supplier certifying the following:
.1 That plant and equipment is certified and all materials to be used in the concrete comply with the requirements of CAN/CSA-A23.1.
.2 That the mix proportions selected will produce concrete of the specified quality and yield. Indicate mix proportions and sources of all materials.
.3 That the strengths will comply with the strengths specified herein.

.4 When the Contractor wishes to mix concrete on site, identify the source of aggregates and submit samples of fine and coarse aggregates to a testing laboratory for testing and trial mixes in order to determine a suitable mix design. The testing laboratory, at Contractor's cost, will test the trial mix for slump, air content, density and strength. The results of these tests will be submitted to the Departmental Representative to be reviewed for compliance with the specification. This review must be completed before permission to place concrete is given.
.1 The sand, gravel, water and air entraining agent should be mixed prior to the addition of cement and water reducer.

.5 Weigh aggregates, cement, water and admixture when batching. No alternative methods of measuring will be permitted.

.6 Do not use calcium chloride.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Obtain Departmental Representative's approval before placing concrete. Provide

24 hours notice prior to placing of concrete.

.2 Pumping of concrete is permitted only after approval of equipment and mix.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.6 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 CONSTRUCTION

.1 Comply with additional requirements of CAN/CSA-A23.1, Clause 4.1.1.5, for concrete exposed to seawater environments.

.2 Minimum concrete cover over reinforcing steel bars to be 75 mm.

.3 Place concrete in hot weather to CAN/CSA-A23.1.

.4 Place concrete in cold weather to CAN/CSA-A23.1.

.5 Keep concrete surfaces moist continually during protection stage.

.6 Place, consolidate, finish, cure and protect concrete to CAN/CSA-A23.1.

.7 Do not commence placing concrete until

Departmental Representative has inspected and approved forms, foundations, reinforcing steel, joints, conveying, spreading, consolidation and finishing equipment and curing and protective methods.

3.3 FORMWORK

.1 Install and strip formwork to CAN/CSA-A23.1 and Section 03 10 00.

3.4 INSERTS

.1 Position and secure anchor bolts in formwork to maintain line and grades.

3.5 CONTROL JOINTS

.1 Construct control joints in locations shown on drawings or directed by Departmental Representative.

.2 All joints will be centred over a support. Joints will be made in a perfectly straight line.

.3 Cut control joint when concrete has hardened.

.4 Fill saw cut with joint sealer as specified.

3.6 PLACING CONCRETE

.1 Place and consolidate concrete to CAN/CSA-A23.1.

.2 Do not place concrete on or against frozen material.

.3 Place concrete continuously from joint to joint.

.4 Place concrete in a uniform heading, normal to the centreline. Limit rate of placing to that which can be finished

before beginning of initial set.

3.7 STRIKE OFF AND CONSOLIDATION

.1 High speed internal poker vibrators shall be used to consolidate the concrete during placing. Final compaction of the surfaces shall be done by beam-type vibratory air screed as approved by Departmental Representative. A surcharge of approximately 65 mm of concrete will be maintained at the screed face during consolidation.

.2 Strikeoff and consolidation must be completed before excess water bleeds to the surface.

.3 Ensure that the concrete deck conforms to the elevations and slopes as shown on the drawings so that satisfactory drainage will result.

3.8 FINISHING

.1 Only ACI certified or other pre-approved concrete finishers are to be utilized in finishing all concrete works. All work is to be finished to CAN/CSA-A23.1, and as specified below.

.2 The surface will be brought to the specified level by means of darbying or bull floating which will be carried out immediately following screeding and must be completed before any bleed water is present on the surface. Surface tolerance to be 8 mm under a 3 metre straight edge.

.3 Provide slope as shown on the drawings to permit proper drainage of the concrete deck.

.4 Finish slabs to elevations indicated on drawings.

.5 Strike off the surface with a straight edge.

.6 Hand tamp low slump concrete with jitterbug.

.7 Darby or bull float the surface to smooth and level the concrete.

.8 Allow bleed water or sheen to disappear.

.9 Float the surface by means of power and/or hand float where the concrete has hardened enough for a man to leave only slight footprints on the surface.

.10 Do not bring water and fines to the surface by over floating. Where extra floating is required the floating operation shall be repeated after the time interval necessary for any sheen to disappear and for concrete to set further.

.11 Steel trowel the concrete surfaces by means of power and/or hand trowel. Do not leave any hard, smooth, polished or burnished surface area.

.12 Do not bring water and fines to the surface by overtrowelling.

.13 After slight interval necessary for concrete to further harden, repeat the trowelling operation.

.14 Lightly broom surface with a soft bristle broom obtaining a fine and even textured finish with a non-slip finish. All brush strokes to be parallel across paving.

.15 The surface shall be true and accurate to a maximum tolerance of 1 mm in 500 mm.

3.9 PROTECTION AND CURING

.1 Cure to CAN/CSA-A23.1.

.2 Cure concrete by protecting it against loss of moisture, rapid temperature change and mechanical injury for at least 7 days after placement. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by whatever curing medium is applicable to local conditions and approved by the Departmental Representative. The edges of concrete slabs exposed by removal of forms shall be protected with continuous curing treatment equal to the method selected for curing the slab and curb surfaces. Cure to CAN/CSA-A23.1. Have the equipment needed for adequate curing at hand and ready to install before actual concrete placement begins.

.3 When air temperature is at or below 5°C or when there is a probability of its falling to that limit within 24 hours of placing (as forecast by the nearest official meteorological office) cold weather protection as per CAN/CSA-A23.1 will be provided and the following:

.1 Housing - Protect concrete by a windproof shelter of canvas or other material to allow free circulation of inside air around fresh touch formwork and provide sufficient space for removal of formwork for finishing. Supply approved heating equipment capable of keeping inside air at a constant temperature sufficiently high to maintain concrete at following curing temperatures.

.1 For initial 3 days at a temperature of not less than 15°C nor more than 27°C at surface.

.2 Maintain concrete at 10°C for an extra 4 days plus the initial 3 days.

.3 In addition to the protective housing, the concrete must be cured as outlined in Clause 3.9.2 above.

3.10 TESTING

.1 Departmental Representative will appoint a concrete testing company to test all work under this section of specification as per CAN/CSA-A23.1.

.2 Cost of compressive strength tests shall be paid for by the Departmental Representative.

.3 Testing company shall issue reports to Departmental Representative on quality of test cylinders.

.4 Notify Departmental Representative at least 7 days prior to start of placing concrete. Provide for testing purposes an adequate quantity of approved test cylinders.

.5 At least 1 set of 3 cylinders each shall be taken from 25 m^3 or fraction thereof of each day's pour, whichever is less. 1 cylinder shall be tested at 7 days and other 2 tested at 28 days.

.6 Crate cylinders and deliver to the testing laboratory within 48 hours after casting in accordance with CAN/CSA-A23.1. Contractor will pay for crating and delivery of cylinders to the laboratory.

.7 If strength tests of test cylinder for any portion of the work falls below the specified compressive strength at 28 days, the Departmental Representative reserves the right to determine the acceptability of the concrete by performing additional field testing as outlined in CAN/CSA-A23.1.

.8 If concrete does not conform to drawings or specifications, take measures as directed to correct the deficiency. All costs of correctional measures will be at the expense of the Contractor.

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM A 53/A53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.
.2 ASTM A 269-10, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
.3 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
.4 AST-A123/A123M-09, Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
.2 CAN/CGSB-1.181-99, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)
.1 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.2 CAN/CSA-S16.1-09, Design of Steel

Structures.
.3 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
.4 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).

.4 The Environmental Choice Program
.1 CCD-047a-98, Paints, Surface Coatings.
.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.3 SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
.1 For finishes, coatings, primers and paints.

.2 Shop Drawings
.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.2 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.3 Storage and Protection:
.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.

.2 Welding materials: to CSA W59.

.3 Welding electrodes: to CSA W48 Series.

.4 Bolts and anchor bolts: to ASTM A 307.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by

screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating to ASTM-A123/A123M.

.2 Shop coat primer: to CAN/CGSB-1.40.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

PART 3 - EXECUTION

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.7 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.3 STEEL ANGLE AND GALVANIZED CONDUIT CAPS

.1 Supply and install steel angle at approach and galvanized caps for conduits protruding above deck, as per the drawings. Include all costs associated with the steel angle and galvanized caps in the lump sum arrangement.

PART 1 - GENERAL

1.1 REFERENCES

.1 American Wood-Preservers' Association (AWPA)
.1 AWPA M2-01, Standard Inspection of Treated Wood Products.
.2 AWPA M4-06, Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA)
.1 CSA O80 Series-97 (R2007), Wood Preservation.
.2 CSA O80.201-97, Standard for Hydrocarbon Solvents for Preservatives. This Standard covers hydrocarbon solvents for preparing solutions of preservatives. This is not stand alone specification
.3 CSA O322-02, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

1.2 QUALITY ASSURANCE

.1 Testing of products treated with preservative by pressure impregnation will be carried out by the manufacturer's testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Inspection and testing of timber materials will be carried out by the manufacturer.

1.3 CERTIFICATES AND ASSAY RETENTION RESULTS

.1 Submit certificates and assay retention results in accordance with Section 01 33 00 - Submittal Procedures.

.2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:

.1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
.2 Moisture content after drying following treatment with water-borne preservative.
.3 Assay retentions results representing each treated batch of supplied timber.
.4 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of preservative treated wood through incineration.

.2 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.3 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Departmental Representative.

.4 Dispose of unused wood preservative material at official hazardous material collections site approved by Departmental Representative.

.5 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Preservative: to CSA-O80 Series.

.2 Solvent: to CSA-O80.201.

2.2 PRESERVATIVE TREATMENTS

.1 Treat to CSA 080, commodity standard 080.18, Table 1 and its referenced standards, with the following minimum assay retentions:

Species	CCA kg/m3	ACA kg/m3
Dimension Timber		
-Coast Douglas Fir	24	24
-Western/Eastern Hemlock	24	24
-Hemlock, Douglas Fir (Wheelguard, Wheelguard Blocking)	10	10
-Birch or Maple	Treat to Refusal	

Note: Birch or maple must be air dried for six (6) months in weather protected environment or kiln dried.

PART 3 - EXECUTION

3.1 FIELD TREATMENT

.1 Handle pressure treated material in a manner that will avoid damage which may expose untreated material. Rejection of any damaged material may result and replacement will be at the Contractor's expense.

.2 Fill all bored bolt holes with preservative immediately after boring. Use a pressurized container with hose to apply preservative, or some alternate method acceptable to the Departmental Representative.

.3 Fill all unused bored holes and spike holes with tight fitting treated wooden plugs.

3.2 CUTTING

.1 Field cuts, if authorized, are to receive three (3) liberal coats of the applicable preservative applied to dry wood on each application.

3.3 FIELD QUALITY

.1 Timber which contain rot, splits exposing untreated wood, excessive wane, or timbers which cannot be fastened in the work so as to be structurally sound are unacceptable.

.2 The Departmental Representative reserves the right to carry out field testing of treated timber for penetration and retention of preservative. Timber not meeting the requirements of the specification may be rejected for use under the contract.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Testing and Quality Control.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.5 Section 03 10 00 - Concrete Forming and Accessories.

.6 Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.2 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.5 Transport Canada (TC)
.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 SUBMITTALS

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

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

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

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material, in appropriate on-site bins, for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Departmental Representative.

.8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.9 Fold up metal banding, flatten, and place in designated area for recycling.

1.7 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:
.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 ENVIRONMENTAL REQUIREMENTS

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

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

.1 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Polysulfide Two Part.

.2 Self-Leveling to CAN/CGSB-19.24, Type 1, Class B, colour to match concrete.

.3 Polysulfide Two Part.
.1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour to match concrete.

.4 Preformed Compressible and Non-Compressible back-up materials.
.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
.1 Extruded closed cell foam backer

rod.
.2 Size: oversize 30 to 50%.

.2 Neoprene or Butyl Rubber.
.1 Round solid rod, Shore A hardness 70.

.3 High Density Foam.
.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape.
.1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA)
.1 CAN/CSA C22.2 No. 18.2, Nonmetallic Outlet Boxes.
.2 CSA C22.2 No. 211.2-06, Rigid PVC (Unplasticized) Conduit.

1.2 LOCATION OF CONDUIT

.1 Location to be as shown on drawings or as directed by Departmental Representative.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

1.4 APPROVALS, CODES AND PERMITS

.1 All work shall be done in accordance with the latest edition of the Canadian Electrical Code C22.1.

.2 Contractor shall present drawings to Electrical Inspection Authority for approval and obtain a permit before starting work.

.3 Notify the Departmental Representative of any changes required before proceeding.

PART 2 - PRODUCTS

2.1 CONDUITS

.1 Rigid PVC conduit complete with fittings: to CSA C22.2 No. 211.2.

2.2 CONDUIT FASTENINGS

.1 One hole epoxy coated galvanized steel straps to secure surface conduits 41 mm and smaller. Two hole epoxy coated steel straps for conduits larger than 41 mm.

2.3 CONDUIT FITTINGS

.1 Fittings: manufactured for use with conduit specified. Coating: same as conduit.

.2 Factory "ells" where 90° bends are required for 25 mm and larger conduits.

.3 Short radius bends: Coordinate conduit installation with actual space available for bend. Use short radius bend as required.

2.4 EXPANSION FITTINGS FOR PVC CONDUIT

.1 Weatherproof expansion fittings suitable for 100 mm linear expansion.

.2 Watertight expansion fittings suitable for linear expansion and 19 mm deflection in all directions.

.3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.5 FISH CORD

.1 6 mm polypropylene.

PART 3 - EXECUTION

3.1 CONDUITS IN CAST-IN-PLACE CONCRETE

.1 Use only rigid PVC conduit in wharf construction.

.2 Locate to suit reinforcing steel. Install in centre one-third of concrete slab in location as shown.

.3 Install sleeves where conduits pass through structural timbers.

.4 Protect conduits from damage where they stub out of concrete.

.5 Encase conduits completely in concrete with minimum 25 mm concrete cover.

.6 Organize conduits in slab to minimize cross-overs.

.7 Use PVC conduit for all conduit above wharf deck and cap. In all cases protect exposed PVC conduit with galvanized steel pipe guards.

.8 Ensure system is intact and clear after concrete is placed. Remove and replace blocked conduit sections. Do not use liquids to clean out conduits.

.9 Install fish cord in empty conduits.

.10 Dry conduits out before installing wire.

.11 Install PVC watertight expansion fittings on all PVC conduits passing through concrete deck expansion joints.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies supply, placement and compaction of gravel fill. The areas requiring gravel fill are shown on the drawings.

1.2 MEASUREMENT FOR PAYMENT

.1 Gravel fill - approach road: The supply and installation of gravel fill will be measured in cubic metres (m^3). Include all plant, equipment and labour in the unit price.

PART 2 - PRODUCTS

2.1 GRAVEL FILL

.1 Gravel fill will consist of hard, durable, particles of stone mixed with suitable binding material. It shall be free from flat, elongated particles and shall be well graded. When tested by means of laboratory sieves it shall fulfill requirements as follows:

Sieve Size	% by Weight Passing
56 mm	100
16 mm	45-80
4.75 mm	25-55
1.25 mm	10-35
0.300 mm	5-15
0.075 mm	3-8

PART 3 - EXECUTION

3.2 PLACING GRAVEL FILL

.1 Top 300 mm of fill, beneath granulars, will consist of gravel fill as specified in Clause 2.1.1 of this section.

.2 Place gravel fill in two (2) equal lifts to minimum 95% standard proctor density.

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation of polymeric geotextiles, purpose of which is to:
.1 Separate and prevent mixing of granular materials of different grading.
.2 Act as hydraulic filters permitting passage of water while retaining soil strength of granular structure.

1.2 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.3 Section 31 53 13 - Timber Cribwork.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)
.1 ASTM D4491-99a(2004)e1, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
.2 ASTM D4595-05, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
.3 ASTM D4716-04, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
.4 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-4.2-M88, Textile Test

Methods.
.2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Geomembranes.
.1 No.2-M85, Mass per Unit Area.
.2 No.3-M85, Thickness of Geotextiles.
.3 No.7.3-92, Grab Tensile Test for Geotextiles.
.4 No.6.1-93, Bursting Strength of Geotextiles Under No Compressive Load.

.3 Canadian Standards Association (CSA)
.1 CAN/CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.
.2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 SAMPLES

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

.2 Submit to Departmental Representative the following samples at least 2 weeks prior to commencing work.
.1 Minimum length of 1 m of roll width of geotextile.

1.5 MILL CERTIFICATES

.1 Submit to Departmental Representative a copy of mill test data and certificate at least 2 weeks prior to start of work.

1.6 DELIVERY AND STORAGE

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, and packaging material, in appropriate on-site bins, for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 MATERIAL

.1 Geotextile: woven or non-woven synthetic fibre fabric, supplied in rolls.
.1 Width: 3.5 m minimum.
.2 Length: 50 m minimum.
.3 Composed of: minimum 85% by mass of polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure.

.2 Physical properties:
.1 Thickness: to CAN/CGSB-148.1, No.3, minimum 2.5 mm.
.2 Mass per unit area: to CAN/CGSB-148.1, No. 2, minimum 400 g/m².
.3 Tensile strength and elongation (in any principal direction): to ASTM D4595.
.1 Tensile strength: minimum 1200 N, wet condition.

.2 Elongation at break: 50 to 100 percent.

.3 Seam strength: equal to or greater than tensile strength of fabric.

.4 Mullen burst strength: to CAN/CGSB-4.2, method 11.1, minimum 3100 kPa.

.3 Hydraulic properties:

.1 Apparent opening size (AOS): to ASTM D4751, 50 to 150 micrometres.

.2 Permittivity: to ASTM D4491, 0.25 cm per second.

.4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Place one (1) layer of geotextile material from base elevation of crib to top of crib and retain in position with securing pins and washers.

.2 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins and washers.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

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

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

.6 Join successive strips of geotextile by sewing.

.7 Pin successive strips of geotextile with securing pins at mid point of lap to satisfaction of Departmental Representative.

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

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

.10 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

.11 For full cribs, extend geotextile over top of cribwork, in portion of cribwork not containing a concrete deck.

3.2 CLEANING

.1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

PART 1 - GENERAL

1.1 RELATED WORK

.1 Section 31 53 13 - Timber Cribwork.

1.2 MEASUREMENT FOR PAYMENT

.1 Rock Mattress: as specified including base layer, bearing layer, the cost of all plant, labour, equipment and materials required to complete the work, will be measured in cubic metres place measure (CMPM) of material placed in work within the limits indicated. The volume of material will be determined in place from measurements taken prior to and at completion of the work. The rock mattress pay limits are shown on the drawings, and material falling outside the pay limits will not be measured separately for payment.

.2 Dredging Prior to Rock Mattress Placement: Excavation/dredging of material prior to rock mattress placement will be measured in cubic metres to within the limits indicated on the drawings. Confirm with Departmental Representative that dredged bottom is suitable for rock mattress placement, prior to installing rock mattress.

.3 Provide a sounding survey to the Departmental Representative, taken in the presence of the inspector, before and following placement of rock mattress. No separate payment will be made for the sounding survey.

.4 Scour Protection: Supply and placement of scour protection, including the cost of all plant, labour, equipment and materials

required to complete the work as specified, will not be measured for payment and is to be included in the lump sum arrangement.

1.3 REFERENCES .1 American Society for Testing and Materials (ASTM)
.1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
.2 ASTM C127-07, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
.3 ASTM C535-03e1, Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Mattress material to following requirements:
.1 Crushed quarry stone consisting of hard durable particles free from silt, clay lumps, organic matter, frozen material and other deleterious materials, and free from splits, seams or defects likely to impair its soundness during handling or under action of water.
.2 Relative density (formally specific gravity): to ASTM C127 (AASHTO T85), not less than 2.65.
.3 Base layer will be uniformly graded quarry run rock ranging in weight from 45 to 400 kg. A minimum of 50% of the total base layer will contain stones with individual weights of 200 kg. No more than 5% by weight to be rocks weighing less than 10 kg.
.4 Bearing layer will be uniformly

graded quarry run rock ranging in weight from 2 to 7 kg with average rock dimensions off 100 and 150 mm respectively. A minimum of 50% of the total bearing layer will contain stones with individual weight of 5 kg.

.2 Rock scour protection:
.1 Quarried rock: uniformly graded.
.2 Quarried rock: to be free from splits, seams or defects likely to impair its soundness during handling or by action of water and to approval of Departmental Representative.
.3 Relative density (formally specific gravity): to ASTM C127, not less than 2.65.
.4 Absorption, 1.5 to 2.0% maximum as determined by ASTM C127 test procedure.
.5 Durability, less than 35% abrasion wear, ASTM C535 test procedure.
.6 Sulphate Soundness Determination maximum 12% by ASTM C88.
.7 Rock, cubical and angular in shape with ratio of maximum to minimum dimensions of less than 2.
.8 Stone sizes for scour protection will be in the range indicated on the drawings.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Rock mattress is to be placed only after dredged bottom has been approved by Departmental Representative.

.2 Sound area in presence of the inspector before placing mattress material, and record elevation of bottom on which mattress to be placed.

3.2 PLACEMENT

.1 Ensure that no frozen material is used in placing.

.2 Do not place mattress material until bottom area has been approved by Departmental Representative.

.3 Place mattress materials to elevations and dimensions as indicated.

.4 Prevent segregation in placing of material sizes. Do not drop material through water.

.5 Do not place material during weather judged unsuitable by Departmental Representative.

.6 Place material immediately prior to planned placement of timber cribs.

.7 Level top surface of mattress to specified grade. Use sweep beam suspended from barge as screed to level surface of each mattress layer. Other methods of leveling may be employed subject to approval of Departmental Representative.

.8 In areas where the depth of the rock mattress to be placed is less than the 600 mm required for the full thickness of the bearing layer, only place the required thickness of bearing layer to reach the required crib seat elevation.

3.3 SCOUR PROTECTION

.1 Place scour protection to details as indicated as soon as practicable after placement of cribs.

3.4 ROCK MATERIAL WASHED OUT OF WORK

.1 Should during the progress of the work, any rock material be washed out of the

work, or through neglect of carelessness of the Contractor or workmen or from any other cause, be dumped into the water near the work or anywhere within the harbour or channel, so as to interfere, in the opinion of the Departmental Representative, with actual depths of water and/or impede navigation, it will be removed by the Contractor when ordered to do so by the Departmental Representative. Any material washed out of the work or displaced beyond the contract limits will be replaced by the Contractor at no cost to Canada.

3.5 TOLERANCES

.1 Surface of bearing layer to be parallel with elevation as indicated with mean elevation of surface within 50 mm of elevations as indicated.

.2 Surface of base layer to be parallel with elevation as indicated with mean elevation of surface within 100 mm of elevations as indicated.

.3 Establish mean elevation from spot elevations taken at 2 m intervals. Do not allow spot elevation to differ more than 50 mm from mean.

.4 Scour protection: +/-100 mm. This tolerance is not to be considered pay limits but is specified to ensure the Contractor keeps with acceptable lines and grades to ensure adequate protection and adequate berthing depths.

3.6 TESTING

.1 Submit rock materials samples for testing to testing laboratory approved by the Departmental Representative prior to commencement of quarry production. Allow sufficient lead time to perform and report

tests before start of production.

.2 Contractor will be responsible for procurement of samples for testing and arrange and pay for shipment of samples to testing laboratory.

.3 Departmental Representative will pay for costs associated with laboratory testing. The cost of retesting due to samples failing to meet the requirements of the contract will be borne by the Contractor.

.4 Only materials satisfactorily tested and approved by the Departmental Representative will be quarried and placed in the work.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for supply and installation of treated timber and necessary fastenings for fabrication, placing, and ballasting of timber cribwork.

1.2 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Section 06 05 73 - Wood Treatment.

1.3 MEASUREMENT FOR PAYMENT

.1 Treated Timber Cribwork: to be measured in cubic metres (m^3) of completed work which include ballast stone, gravel, treated timber, fastenings, and all plant, labour, materials and equipment to perform work.

.2 Measure timber cribwork in cubic metres determined by product. Use following dimensions measured in place:

.1 Height: average of measurements taken at each vertical from bottom of lowest timber to top side of uppermost course of timber.

.2 Width: average of measurements between outside faces of exterior longitudinal timbers, each width measured on top ties of each row of cross ties.

.3 Length: measured horizontally along centre-line of crib between outside faces of exterior cross ties.

.3 Cribwork below step will be determined by product of following dimensions measured in place:

.1 Height: average of measurements taken at each vertical from bottom of lowest timber to top side of uppermost course of

timber.
.2 Width: average of measurements between outside faces of exterior longitudinal timbers, measured at each crosstie at low water elevations.
.3 Length: measured horizontally along centre-line of crib and parallel to level water surface between outside faces of exterior cross ties.

.4 Cribwork above step will be determined by product of following dimensions measured in place:
.1 Height: average of measurements taken at each vertical from top of step crib to top of top course of timber.
.2 Width: average of measurements between outside faces of exterior longitudinal timbers, each width measured on top tier of each row of crossties.
.3 Length: measured horizontally along centre-line of crib and parallel to level water surface between outside faces of exterior cross ties.

.5 Measurements of the vertical lengths, widths and lengths of cribwork, will be taken in the presence of both the Contractor and the Inspector and will be verified and signed by both parties on the site to avoid any disputes. Departmental Representative will make final approval in this regard, as there will be no overpayment for cribwork not actually installed in the work.

1.4 SAFETY REQUIREMENTS

.1 Worker protection:

.1 Workers must wear gloves, respirators, dust masks, long sleeved

clothing, eye protection, protective clothing when handling, drilling, sawing, cutting or sanding preservative treated wood and applying preservative materials.
.2 Workers must not eat, drink or smoke while applying preservative material.

.3 Clean up spills of preservative materials immediately with absorbent material. Safely discard of absorbent material to sanitary landfill.

1.5 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
.1 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 American Wood-Preserver's Association (AWPA)
.1 AWPA M4-06, Standard for the Care of Preservation - Treated Wood Products.

.3 Canadian Standards Association (CSA International)
.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
.2 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
.3 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CAN/CSA-O80 Series-97 (R2007), Wood Preservation.

.4 Canadian Wood Council
.1 Wood Design Manual.

.5 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2000 edition.

1.6 SUBMITTALS

.1 Ballast:
.1 Submit proposed placing method to Departmental Representative for approval, prior to placing of ballast.

1.7 WASTE MANAGEMENT

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

.2 Dispose of all corrugated cardboard and polystyrene plastic packaging material in appropriate on-site bin for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Ensure emptied containers are sealed and stored safely.

.5 Do not dispose of preservative treated wood through incineration.

.6 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.7 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

.8 Dispose of unused preservative material at an official hazardous material collections site. Do not dispose of unused preservative material into sewer system, streams, lakes, on ground or in any other

location where they will pose a health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Timber: Use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board of CSA.

.2 Species: Douglas Fir, Pacific Coast Hemlock and Eastern Hemlock.

.3 Grade: No. 1 Structural.

.4 Grading authority: NLGA.

.5 Preservative treatment: To CSA O80 for coastal waters and Section 06 05 73. Supply timbers in lengths required. Cut and field treat timbers only as may be necessary to suit site conditions. Contractor will have on site sufficient lengths and thickness of treated timber to permit leveling of cribs after ballasting operations.

.6 Miscellaneous steel: Medium structural steel conforming to CSA Specification G40.21 "Structural Quality Steels".
.1 Hot dip galvanized: to CAN/CSA-G164. Minimum weight of zinc coating as stated in Table 1 of this Standard. Fabricator to adhere to recommendations in Appendix A and B of Standard.
.2 Wire nails, spikes, staples: to CSA-B111.
.3 Bolts, nuts, washers: to ASTM A307.
.4 Drift Bolts: to G40.21 from round

stock, button head and diamond or wedge point.

.5 Washers:

.1 Round Plate Washers: for 19 mm diameter machine bolts, 79 mm diameter by 7.9 mm thick, with hole diameter of 21 mm. Washers to G40.21.

.2 Square washers not permitted to be used.

.6 All hardware galvanized.

.7 Ballast for filling cribs to following requirements:

.1 Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials.

.2 Dry density in place: minimum 2600 kg per cubic metre.

.3 Ballast stone to be well graded with maximum sizes not exceeding 400 mm on any side and minimum size of not less than 250 mm on any side.

.8 Gravel: Evenly graded pit run or crushed stone, maximum size, 50 mm, with not more than 8% passing the 0.075 mm sieve.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Place cribwork after rock mattress has been approved by Departmental Representative.

.2 Contractor to confirm with Departmental Representative that rock mattress bearing layer is adequate for cribwork placement.

.3 Before construction, stockpile sufficient ballast to completely fill cribs. Provide suitable plant and equipment to keep crib in proper position and alignment during sinking operations.

.4 Take closely spaced accurate soundings and probings, 1500 mm centre to centre or less, precisely located by template, to determine actual base area of crib.

.5 Cribs out of alignment or not correctly located to be refloated and replaced in correct position. Contractor to choose his methodology such that excessive construction loads are not imposed on the cribs during construction, causing them to settle into the rock mattress (or causing the rock mattress to settle into the dredged bottom). Excessive loads imposed on the cribs during construction (as determined by the Departmental Representative), resulting in cribs settling/shifting outside tolerances, will be removed and re-instated at the Contractor's expense.

3.2 CRIB CONSTRUCTION

.1 Construct timber cribwork to 400 mm above LNT prior to sinking in final position in work.

.2 Levelling Pieces:

.1 Place treated timber levelling pieces beneath bottom timbers to conform to shape of base area.

.2 Place levelling pieces horizontally.

.3 Secure succeeding pieces at intersections of bottom timbers and vertical posts, and other levelling pieces with machine bolts.

.3 Bottom timbers:

.1 Place bottom timbers lengthwise, and crosswise to form bottom three courses of cribs.

.2 Crosswise bottom timbers to be of one

piece.
.3 Lengthwise bottom timbers to be of one piece.
.4 Secure three courses of bottom timbers together with machine bolts at every intersection with each other and with vertical posts.

.4 Ballast floor:
.1 Place ballast floor on pockets on bottom or middle course of bottom timbers.
.2 Secure each ballast floor timber to bottom timbers with drift bolts securing adjacent ballast floor timbers to same bottom timber.

.5 Longitudinals:
.1 Longitudinals one length for individual cribs below LNT.
.2 Longitudinals minimum 6100 mm long above LNT.
.3 Where cribs are married together, longitudinals of sufficient length to span a minimum of a half a bay of one crib and one and a half bays of the adjacent crib.
.4 Butt join exterior and interior longitudinals a minimum distance of 600 mm from crosstie with joint in centre of a 1200 mm long joiner block.
.5 Secure block to lower timber with drift bolt at centre and secure longitudinals and splice at ends to block with drift bolts.
.6 Stagger joints in longitudinal timbers. Do not join in same bay or on same vertical post.
.7 Secure longitudinals to intersection of cross ties with drift bolt and to intersection of vertical posts with machine bolt every third course of longitudinals, along with the top course.
.8 Countersink machine bolts on exterior

face above LNT.

.6 Cross ties: one length across cribs.
.1 Secure cross ties to intersection of longitudinals with drift bolt and to intersection of vertical posts with machine bolt every third course of cross tie, along with the top course.
.2 One row of crossties and verticals may be eliminated from one crib where cribs marry together above +400 mm LNT.

.7 Vertical posts: one length from bottom of cribwork to top of cribwork. Locate one vertical post at corner of each crib and at intersection of crossties with longitudinals.

.8 Blocking: install treated timber filler blocking as indicated on drawings.
.1 Cut blocking exact length to completely fill spaces and such that the total thickness of crossties and longitudinals carrying the bearing weight of the deck be a minimum of 1000 mm if cribwork ends on a crosstie.
.2 If cribwork ends on a longitudinal one additional tier of blocking is required.
.3 Blocking of same size and material as crossties or longitudinals and fastened with 2 drift bolts into timber immediately below it.

.9 Levelling: treated timber required for levelling of cribwork after ballasting, must be full width continuous over entire length to be levelled.

.10 Bolt Sizing and Holing:
.1 Drift Bolts: length of drift bolts equal to thickness of timbers fastened

less 50 mm, unless otherwise specified. Bore holes for drift bolts 2 mm smaller diameter than bolt and for full length of bolt.

.2 Machine Bolts: length of machine bolts equal to thickness of timbers fastened plus thickness of washers plus 40 m. Where bolts are countersunk, the length, as noted above, less depth of countersink. Thread machine bolts for 64 mm. Bore holes for machine bolts to same diameter as bolts.

3.3 HANDLING TREATED TIMBER

.1 Handle treated material without damaging original treatment.

.1 Replace treated timber with major damage to original treatment, as instructed by Departmental Representative.

.2 Field treatment: to CAN/CSA-O80. Apply and saturate cuts, minor surface damage, abrasions, and nail and spike holes with preservative.

.3 Ripping of treated timber not permitted without prior approval of Departmental Representative.

3.4 BALLAST

.1 Place ballast to avoid damage to timber cribwork.

.2 Place ballast so that differential height of fill between adjacent cells, at any time, will be less than 1 m.

.3 Pockets of cribs ballasted within 100 mm of top of crib timbers.

3.5 GRAVEL

.1 Install a 100 mm layer of gravel over the top of ballast to form a base for the

reinforced concrete deck.

.2 Hand place final items of ballast stone to fill voids and depressions to hold gravel in place.

.3 Install gravel to grade required and compact in preparation for concrete deck work.

.4 Clean any loose gravel off timber surface prior to placement of deck.

3.6 TOLERANCES

.1 1 in 300 in overall dimensions.

.2 Locate cribs within 100 mm of location as indicated. Horizontal misalignment within 100 mm along the outside faces.

.3 Space between ballasted cribs within 200 mm. No payment for this space will be made above or below LNT.

3.7 PROTECTION

.1 Protect work from damage resulting from work on other sections and from damage resulting from environmental conditions.

.2 Repair or replace portion or entire crib at no additional cost if damaged by work.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for supply and installation of structural timber as follows:

.1 Supply and installation of treated dimension timber wheelguard, wheelguard blocking, coping, and associated painting.
.2 Supply and installation of untreated dimension hardwood timber fenders, and associated painting.
.3 Supply and installation of untreated timber hardwood ladders, ladder handgrips, and associated hardware.

1.2 RELATED WORK

.1 Section 02 41 16 - Sitework, Demolition and Removal.

.2 Section 03 30 00 - Cast-in-Place Concrete.

.3 Section 06 05 73 - Wood Treatment.

.4 Section 31 53 13 - Timber Cribwork.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
.1 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.

.2 American Wood-Preserver's Association (AWPA)
.1 AWPA M4-06, Standard for the Care of Preservation - Treated Wood Products.

.3 Canadian Standards Association (CSA International)
.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
.2 CAN/CSA-G40.21-04, General

Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
.3 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CAN/CSA-O80 Series-97 (R2007), Wood Preservation.

.4 Canadian Wood Council
.1 Wood Design Manual.

.5 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2000 edition.

1.4 DIMENSIONS

.1 Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.

1.5 PROTECTION

.1 Avoid dropping, bruising or breaking of wood fibres.

.2 Avoid breaking surfaces of treated timber.

.3 Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.

.4 Treat cuts, breaks or abrasions on surfaces of treated timber with 3 brush coats of preservative to CSA 080.

.5 Treat bolt holes, cutoffs and field cuts in accordance with CSA 080.

1.6 DELIVERY AND STORAGE

.1 Store timber horizontally, evenly supported and open piled permit circulation when stored for prolonged period.

.2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.

.3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.

.4 Do not use sharp pointed tools to handle treated timber. Any timber so handled will be rejected and be replaced at Contractor's expense.

1.7 MEASUREMENT FOR PAYMENT

.1 Structural Timber:

.1 Treated Dimension Timber: The supply and installation of treated dimension timber for wheelguard, wheelguard blocking and coping will be measured by the cubic metre (m^3) of timber secured in place, including all timber, fastenings, plant, material, equipment, labour, wheelguard bolt hole levelling sealant, painting of wheelguard and wheelguard blocking.

.2 Untreated Dimension Timber: The supply and installation of untreated dimension hardwood timber for hardwood fenders, and ladders as specified will be measured by the cubic metre (m^3) of timber secured in place including all timber, fastenings, plant, material, equipment, and labour, ladder rungs, wheelguard hand grips, and painting of complete ladder uprights.

.2 Payment for all dimension timber will be made on volume calculated from nominal sizes as indicated on drawing and specified, eg. 200 mm x 200 mm.

.3 End of wharf blocking will not be measured separately for payment, and is to be included incidental to treated timber cribwork.

PART 2 - PRODUCTS

2.1 TIMBER MATERIALS

.1 Timber: Use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.

.2 Species

.1 Wheelguard, wheelguard blocks and coping: Hemlock or Douglas Fir (CCA or ACA treated).

.2 Hardwood fenders and ladder uprights: Birch or Maple (untreated).

.3 Grade: No. 1 Structural Grade

.4 Grading Authority: NLGA

.5 Preservative Treatment: Treat to CSA 080, for coastal waters and Section 06 05 73. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.

.6 Primer: Alkyd undercoat, exterior oil wood primer, similar to Pittsburgh 6-9.

.7 Paint: Alkyd/Oil Resin paint similar to Pittsburgh Paints "Safety Yellow" Product ID 7-808. Paint to conform to CAN/CGSB-1.61-2004.

2.2 MISCELLANEOUS STEEL AND FASTENINGS

.1 Miscellaneous Steel: All steel and fastenings to be CSA G40.21, Grade 300 W, galvanized.

.2 Nails and Spikes: to CSA B111.

.3 Machine Bolts and Nuts: to ASTM A307. All machine bolts and nuts to be galvanized.

.4 Drift Bolts: to G40.21 from round stock button head and diamond or wedge point. All drift bolts to be galvanized.

.5 Washers:

.1 Round Plate Washers: for 16 mm machine bolts will be 76 mm diameter by 6.4 mm thick, for 19 mm machine bolts will be 79 mm diameter by 7.9 mm thick and have a hole diameter of 18 mm and 21 mm diameter respectively. Washers to conform to G40.21. All washers to be galvanized.

.2 Plain Washers: to CSA B19.1, Class 2. All washers to be galvanized.

.3 Square washers are not permitted.

.6 Galvanizing: will conform to CSA G164 "Hot Dip Galvanizing of Irregularly Shaped Articles." Unless otherwise specified, minimum weight of zinc coating will be as stated in Table 1 of this standard. Fabricator is to adhere to recommendations of Appendix A and Appendix B of standard.

.7 Ladder Rungs and Hand Grips: to CSA G40.21, galvanized.

.8 Welding in accordance with CSA Standards. The welders will be qualified to the appropriate classification as stated in CSA W47.1 "Certification of Companies for Fusion Welding of Steel Structures." Conform welding to all appropriate requirements and recommendations of CSA Standard W59 "Welded

Steel Construction" (metal arc welding).

PART 3 - EXECUTION

3.1 PREPARATION

.1 Install structural timbers to details shown on drawings or as specified.

3.2 WHEELGUARD AND WHEELGUARD BLOCKING

.1 Wheelguard timbers to be 200 mm x 200 mm, and will be in minimum lengths of 6100 mm or as specially required with butt joints made over wheelguard blocking. Wheelguard timbers to be chamfered on top, 25 mm on each horizontal and vertical surface.

.2 Wheelguard blocks will be installed at 1500 mm on centre as support for wheelguard.

.3 Wheelguard will be secured through wheelguard blocking, coping and two (2) crib timbers below with two (2) 25 mm diameter drift bolts as shown on detail drawings. Bolts to be countersunk and filled with leveling sealant following installation.

3.3 COPING

.1 Install 200 mm x 250 mm treated timber coping in minimum length of 7620 mm around perimeter of wharf as directed.

.2 Secure coping to timber below with 19 mm diameter drift bolts spaced at 1500 mm on centre. Use machine bolts through coping into new deck as detailed on the drawings.

3.4 FENDERS

.1 Horizontal Fenders:

.1 Install hardwood timber fenders in minimum length of 4880 mm along top perimeter of wharf. Stagger joints in coping from joints in horizontal fender.

.2 Top horizontal fender to be chamfered

25 mm on top seaward face.

.3 Secure horizontal fender to coping with 16 mm diameter lag screws, minimum of four (4) each lag screws per fender, spaced at 1500 mm on centre. Secure bottom horizontal fender to a crib timber in a similar manner. All lag screws to be countersunk on the exterior face.

.2 Vertical Fenders:

.1 Install hardwood timber fenders spaced at 300 mm on centre along face of wharf except for exterior corners where fenders will be closed face for 1500 mm as directed.

.2 Secure each fender with three (3) each 16 mm diameter lag screws evenly spaced from LNT to underside of horizontal fender. All drift bolts to be countersunk.

.3 All fenders to extend from underside of horizontal fender to 300 mm below LNT.

.4 Do not notch or cut fenders to provide straight wharf face. Continuous blocking will be installed behind fenders to provide straight face.

3.5 LADDERS

.1 Install ladders on face of wharf in locations shown on drawings or designated by Engineer.

.2 Ladder uprights to be 150 mm x 200 mm and installed from 900 mm below LNT to wheelguard elevation. Uprights to be bevelled at 45° on top and complete ladder upright to be painted.

.3 Construction details and steel handgrips as per detail.

.4 Secure each upright with four (4) each evenly spaced 19 mm diameter galvanized lag screws. All lag screws to be countersunk.

3.6 PAINTING

.1 Paint four (4) sides and exposed ends of wheelguard, exposed sides of wheelguard blocking, and complete ladder uprights as directed by the Departmental Representative.

.2 Use one (1) coat of exterior oil wood primer and two (2) coats of alkyd/oil resin paint as specified. Paint materials for each coat to be product of a single manufacturer as specified. Ensure previous coat of primer or paint is dry before second coat is applied.

3.7 BOLT SIZING

.1 Drift Bolts: Drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used and for full length of bolts.

.2 Machine Bolts: Machine bolts used in work will have a length equal to thickness of timbers being fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length will be as above less depth of countersinking. Machine bolts will be threaded for 64 mm. Holes will be drilled same diameter as bolt.

.3 Lag Screws: All lag screws used in the work will have a length equal to thickness of timbers being fastened less 50 mm and depth of countersinking. Holes for lag screws to be drilled same diameter as shank portion of screw and to inside thread diameter for threaded portion of screw and for full length. All lag screws will be countersunk, screwed, not driven in place, and will have one (1) standard washer under the head.

.4 Countersink lag screws in hardwood fenders and ladders to the extent that the minimum

distance from face of timber to head of bolt is 12 mm.

.5 Bolting of timbers without properly drilled bolt holes will not be accepted.

3.8 END OF WHARF BLOCKING

.1 Install end of wharf blocking, as shown on the drawings.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the requirements for the supplying, producing and placing crushed gravel for quarried stone as a granular base course to lines, grades and typical cross sections indicated, or as directed by Departmental Representative.

1.2 REFERENCES

.1 ASTM C 117-04, Test method for material finer than 0.075 mm sieve in mineral aggregates by washing.

.2 ASTM C 131-06. Test method for resistance to degradation of small size coarse aggregate by abrasion and impact in the Los Angeles machine.

.3 ASTM C 136-6, Method for sieve analysis of fine and coarse aggregates, CAN/CGSB-8.2-M88, Sieves testing, woven wire, metric..

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver and stockpile aggregates as directed by Departmental Representative.

1.4 MEASUREMENT FOR PAYMENT

.1 Class "A" Granular Base: The supply and installation of Class "A" granular base will be measured in cubic metres of materials supplied and installed in the work. Include all costs in the unit price including plant, material and labour.

.2 Class "B" Granular Sub-Base: The supply and installation of Class "B" granular sub-base will be measured in cubic metres of materials supplied and installed in the work. Include all costs in the unit price including plant, material and labour.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base fill (Class "A") will consist of clean, hard, durable crushed gravel or stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested to ASTM C136 and ASTM C117 and giving a smooth curve without sharp breaks when plotted on a semi-chart.

ASTM Sieve Designation	% Passing
19.0 mm	100
9.51 mm	50-80
4.76 mm	35-60
1.20 mm	15-35
300 um	7-20
75 um	3-6 (Pit Source)
	3-8 (Rock Source)

.2 Physical Requirements for Class "A":

.1 Liquid Limit ASTM D4318: Maximum 25

.2 Plasticity Index ASTM D4318: Maximum 0

.3 Los Angeles Abrasion ASTM C131-81 Maximum % loss by weight: 35

.4 Crushed Fragments: 50%. The percent of crushed particles will be determined by examining the fraction retained on the 4.76mm sieve and dividing the weight of the crushed particles by the total weight retained on the 4.76 mm

sieve.

.5 CBR: ASSHTO T193-72 Min 100 when compacted to 100% of AASHTO T180-74 Method D.

.3 Granular base fill (Class "B") will consist of clean, hard, durable crushed gravel or stone, free from shale, clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested to ASTM C136 and ASTM C117 and giving a smooth curve without sharp breaks when plotted on a semi-chart.

ASTM Sieve Designation	% Passing
50.8 mm	100
25.4 mm	50 - 100
4.76 mm	20 - 55
1.20 mm	10 - 35
300 um	5 - 20
75 um	2 - 6 (Pit Source)
	2 - 8 (Rock Source)

.4 Physical Requirements for Class "B":

.1 Liquid Limit ASTM D4318: Maximum 25

.2 Plasticity Index ASTM D4318: Maximum 0

.3 Los Angeles Abrasion ASTM C131-81 Maximum % loss by weight: 35

.4 Crushed Fragments: 50%. The percent of crushed particles will be determined by examining the fraction retained on the 4.76 mm sieve and dividing the weight of the crushed particles by the total weight retained on the 4.76 mm sieve.

.5 CBR: ASSHTO T193-72 Min 100 when compacted to 100% of AASHTO T180-74 Method D.

.5 Materials from deposits acceptable as to the quality of the particles, but deficient in sizes to provide the required gradation, may be accepted if the contractor furnishes and satisfactorily incorporates into the product supplementary sizes from other sources to produce the required grading. If the deficiencies occur in Class "A" or Class "B" materials, corrections may be attempted by crushing to a smaller maximum particle size. In that event, the Departmental Representative will furnish special grading limits on the actual maximum particle size.

.6 Material shall be considered unsuitable even though particle sizes are within the specified gradation limits if particle shape or any other characteristic precludes satisfactory compaction or fails to provide a roadway suitable for traffic. If, in the opinion of the Departmental Representative, an improved particle shape can be achieved by using a different crushing unit for that proposed by the contractor, then the Contractor shall supply and use a crushing unit of the type directed by the Departmental Representative.

.7 Class "A" and Class "B" shall be processed by crushing and, when necessary, to eliminate surplus fines passing the 4.76 mm sieve, shall be screened and washed.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Place granular base after sub-base surface is inspected and approved by Departmental Representative.

.2 Placing:

.1 Construct granular base to depth and grade in area indicated.

.2 Ensure no frozen material is placed.

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 The contractor shall place all granular bases in such a manner as to prevent contamination by other materials and to prevent segregation. If, in the opinion of the Departmental Representative, the methods and techniques used by the Contractor cannot overcome contamination or segregation, then the Departmental Representative may direct a modification in these methods which may require the use of an approved spreader box or other acceptable device.

.5 All granular bases shall be placed in uniform layers such that the thickness of the compacted layer does not exceed 50 mm.

.6 Prior to closing down operations for each working day, all granular materials shall be bladed and compacted to the specified density.

.7 The materials shall be sprayed with water when and as directed by the Departmental Representative, either to aid compaction or reduce dust nuisance or both. When water is added to aid compaction, it shall be applied immediately ahead of the compacting unit

.8 Each layer of granular base shall

be bladed shaped and compacted as necessary to produce the required profile and cross-section. The finished surface shall not deviate at any place on a 3 m straight edge by more than 10mm for Class "A" and Class "B". The upper layer shall be maintained to these tolerances and to the specified density until compaction of the contract. This may require keeping the moisture content at the appropriate value during periods of dry weather in addition to regarding and re-compacting as frequently as may be deemed necessary by the Departmental Representative.

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

.4 Compaction Equipment:

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

.5 Compacting:

.1 All Class "A" and Class "B" materials shall be compacted to not less than 100% of the maximum Standard Proctor Dry Density ASTM D698-07e1 Method D.

.2 Compaction operations shall be carried out as closely as possible behind the placing and spreading operation. At the end of each working day, all materials placed shall have been compacted to the specified density.

.3 Each layer of material shall be graded and compacted as specified before the next layer is placed.

.4 Where necessary to obtain the required compaction, the contractor shall apply sufficient water by means of an approved distributor.

3.2 INSTALLATION

.1 Testing of materials and compaction will be carried out by testing laboratory designated by the Departmental Representative.

.2 Contractor will pay costs for inspection and testing.

.3 Sieve Analysis: proposed granular material will be tested to confirm suitability for intended use and conformity with specifications.

.4 Frequency of Tests: to be determined by the Departmental Representative.

3.3 TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished base in condition conforming to this section until succeeding material is applied or until acceptance by Departmental Representative.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This specification section includes requirements for dredging, as noted on the drawings.

1.2 DEFINITIONS

.1 Dredging: excavating, transporting and disposing of underwater materials.

.2 Class A material: solid rock requiring drilling and blasting to loosen, and boulders or rock fragments of individual volumes 1.5 m^3 or more.

.3 Class B material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris of individual volumes less than 1.5 m^3.

.4 Obstructions: material other than Class A, having individual volumes of 1.5 m^3 or more.

.5 CMPM: cubic metres place measurement.

.6 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.

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

.8 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (LNT).

.9 Lowest Normal Tide (LNT): plane so low that tide will seldom fall below it.

.10 Cleared Area: area of dredging accepted as achieving the required grade and verified by

a Departmental Representative survey.

1.3 REGULATORY REQUIREMENTS

.1 There are strict environmental procedures that must be followed during the Work.

.2 Comply with municipal, provincial and national codes and regulations relating to project.

.3 Mark floating equipment with lights in accordance with the provisions of the Canada Shipping Act Collision Regulations and Notices to Mariners.

1.4 PROTECTION

.1 Prevent damage to surroundings and injury to persons. Erect fencing, post guards, sound warnings and display signs when blasting to take place.

1.5 SCHEDULING

.1 Submit to Departmental Representative, within 2 weeks after acceptance of bid, schedule of work including time periods during which each operation involved in Work will be undertaken. At time of submission of schedule, meet with Departmental Representative to review schedule.

.2 Adhere to schedule and take immediate action to correct any slippage by effectively altering existing rock removal operations or mobilizing other equipment. Notify Departmental Representative of corrective action to be taken.

1.6 LOCATION

.1 Work comprises dredging of areas as indicated on drawings.

1.7 INTERFERENCE TO NAVIGATION

.1 Be familiar with vessel movements and fishery activities in area affected by dredging operations. Plan and execute Work in manner that will not interfere with fishing

operations, marine operations and construction activities at wharf site.

.2 Departmental Representative will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbour or due to other Contractor's operations.

.3 Keep the Marine Communications and Traffic Services' Centre, Fisheries and Oceans Canada, informed of dredging operations in order that necessary Notices to Mariners will be issued.

1.8 DATUM, WATER GAUGES AND TARGETS

.1 Elevations used in this specification and contract drawings are in metres referred to Canadian Hydrographic Services Survey datum.

.2 Areas to be dredged are to be referenced to vertical bench marks for each location of dredging as indicated.

1.9 FLOATING PLANT

.1 Dredges or other floating plants to be employed on this Work, to be of Canadian registry, make or manufacture, or, must receive certificate of qualification from Industry Canada, Aerospace, Defence and Marine Branch and this certificate to accompany bid submission.

.2 Requests for certification in format of form PWGSC-TPSGC 2843 (06/2007) attached to the Bid and Acceptance Form to be directed to Mr. Emile Rochon, Aerospace, Defence and Marine Branch, Industry Canada, CD Howe Building - Room 733C, 235 Queen Street, Ottawa, Ontario, K1A 0H5, and to be received there not less than 14 days prior to bid closing.

1.10 SITE INFORMATION

.1 Geotechnical boreholes are included on the drawings.

.2 Results of most recent soundings are included on the drawings. This data will be used for all calculations for quantity purposes. If the contractor wishes to perform own survey, a written notice must be submitted to the Departmental Representative (at least 7 days notice) so the Departmental Representative can verify the sounding survey before the commencement of any work.

.3 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.

1.11 SURVEY REQUIREMENTS

.1 Provide, at own expense, survey vessel, equipment and crew to set up and maintain control for location of dredge limits and to sound areas immediately after dredging to verify that grade depth has been attained. Areas are to be sounded to provide sounding printout display of at least 2 x 2 m UTM grid to approval of Departmental Representative.

1.12 SURVEYS AND ACCEPTANCE OF WORK

.1 No area will be dredged prior to Departmental Representative and Contractor's mutual acceptance of the existing sounding and topographical survey data included on the drawings.

1.13 MEASUREMENT FOR PAYMENT

.1 Dredging prior to rock mattress placement will be measured in Section 31 36 19.

.2 No separate payment will be made for Contractor's survey vessel, equipment and crew or diving services.

.3 Payment will include disposal of excavated or dredged material, using water tight boxes, at locations specified or as directed by the Departmental Representative.

.4 There will be no additional payment for delays and/or downtime for vessel traffic, fishery operations, marine operations, during periods when no dredging is permitted. Contractor should contact the Harbour Authority to determine schedules of operations.

.5 There will be no additional payment for downtime and for delays caused by vessel traffic or other activities associated with the on-going fish plant operations.

.6 Removal of infilling material will not be measured for payment.

.7 No separate payment will be made for sweeping.

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)
.1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire.
.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.3 SUBMITTALS

.1 Submit to Departmental Representative for approval, 4 weeks before blasting, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of blasting caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent changes to Departmental Representative before proceeding.

.2 Submit to Departmental Representative complete photographic and descriptive record of buildings, roads and structures in general area of Project Work, before blasting is started. Describe buildings both inside and out. Record existing cracks in walls or structural components.

.3 Samples
.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Inform Departmental Representative of proposed source of materials and provide

access for sampling at least 2 weeks prior to commencing Work.

.3 Submit 20 to 70 kg samples representative of quarry, minimum 2 weeks prior to beginning Work.

.4 Ship samples prepaid to Departmental Representative for approval.

1.4 INTERFERENCE TO NAVIGATION

.1 Be familiar with vessel movements and fishery activities in area affected by construction operations.

.2 Plan and execute work, in a manner that will not impede navigation, including movement of vessels at the facility.

.3 Plan and execute work, in a manner that will not interfere with fishing operations or access to marine structures by land or water.

.4 Departmental Representative will not be responsible for loss of time, equipment, material or any other charges related to interference with moored vessels in the harbour or other Contractor's operations.

.5 Keep the Marine Communications and Traffic Services' Centre, Fisheries and Oceans Canada, informed of construction operations, in order that necessary Notices to Mariners may be issued.

1.5 REGULATORY REQUIREMENTS

.1 Comply with municipal, provincial and national codes and regulations relating to project. Refer to the attachments.

.2 Mark floating equipment with sound and light signals in accordance with Collision Regulations made pursuant to the Canada Shipping Act and Notice to Mariners.

1.6 MEASUREMENT FOR PAYMENT

.1 Rock Fill Core - approach road: Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.

.2 Filter Stone (400 kg - 600 kg) - approach road: Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.

.3 Armour Stone (4 - 6 tonne - approach road): Measured in cubic metres of material and supplied and placed (CMPM) in the work within the limits specified on the drawings.

.4 There will be no payment made for any material or stone placed beyond limits indicated on the drawings. The final contract grade must be within 200 mm of the specific elevation. Quantities will be based on an as-built survey. Any material placed outside the lines and grades as shown on the drawings will not be measured.

.5 There will be no additional payment for delays resulting from fishing operations.

.6 There will be no additional payment for delays caused by vessel traffic.

.7 There will be no additional payment for downtime.

.8 There will be no payment for any rock fill core, filter stone or armour stone that is washed out, removed, missing or deteriorated by weather or wave action.

.9 Contractor is to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings over each type of material. Measurement for payment for this will be considered included

in the cost of the supply and installation of the materials. There will be no separate payment.

.10 Construction and maintenance of haul roads will not be measured for payment.

PART 2 - PRODUCTS

2.1 ROCK MATERIAL

.1 Hard, angular rock free from cracks, seams and other defects which may impair durability.

.2 Relative density, 2.65 minimum.

.3 Absorption, 1.5 to 2.0% maximum as determined by ASTM C127 test procedure.

.4 Durability, less than 35% abrasion Wear, ASTM C535 test procedure.

.5 Sulphate Soundness Determination maximum 12% by ASTM C88.

2.2 ROCK FILL CORE

.1 Material for new rock fill core to be blasted rock.

.2 Stone size shall be well graded between 0.1 kg to 400 kg.

.3 No more than 15% of core stone to weigh less than 20 kg.

.4 Silt content to be less than 3% by mass.

2.3 FILTER STONE

.1 Material for filter stone to be blasted rock or field stones.

.2 Stone size to be well graded between 400 kg to 600 kg, in categories specified, well graded within each category.

.3 Greatest dimension of each stone not to exceed two (2) times the least dimension.

2.4 ARMOUR STONE

.1 Material for armour stone to be blasted rock or field stones.

.2 Stone sizes to be in the range of 4 to 6 tonnes, in categories specified, well graded within each category.

.3 Greatest dimension of each stone not to exceed two (2) times least dimension.

PART 3 - EXECUTION

3.1 GENERAL

.1 Take precautions not to damage existing properties during hauling of rock materials. Damage to existing roads or other private or public properties will be repaired at the Contractor's expense.

3.2 PREPARATION

.1 Haul roads: construct and maintain haul roads.

3.3 ROCK FILL CORE

.1 Place rock fill core to lines, grades and dimensions indicated on the drawings. Contractor should realize the large distance required to place the rock fill core out into the water, supply necessary equipment to complete as shown on drawings.

.2 Side slopes to be 1.5 horizontal to 1.0 vertical unless otherwise indicated on the drawings.

.3 Sequence construction operations such that sufficient armour and filter stone is placed to protect the core at all times.

.4 The Contractor is to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings, measurement for payment for this will be included in the cost of the supply and installing the above item.

3.4 FILTER STONE

.1 Place filter stone layers to grades, dimensions, profiles and cross sectional elements indicated on the drawings. Contractor should realize the large distance required to place the filter stone out into the water, supply necessary equipment to complete as shown on drawings.

.2 Place filter stone in layers as indicated on the drawings.

.3 Side slopes to be 1.5 horizontal to 1.0 vertical unless otherwise indicated on the drawings.

.4 Do not transport different categories of material in the same truckload. If rocks of markedly different sizes are present in the same load, Departmental Representative reserves the right to have each rock measured separately and sorted prior to installing in structure.

.5 The Contractor is to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings, measurement for payment for this will be included in the cost of the supply and installing the above item.

3.5 ARMOUR STONE

.1 Place armour stone to lines, grades and

dimensions indicated on the drawings. Contractor should realize the large distance required to place the armour stone out into the water, supply necessary equipment to complete as shown on drawings.

.2 Dumping of armour stone will not be permitted. Each stone will be lifted and individually placed.

.3 Side slopes to be 1.5 horizontal to 1.0 vertical unless otherwise indicated on the drawings.

.4 Choose stones and place them in such a way that the whole structure will be bonded and consolidated to as great an extent as nature or rock will allow. Rocks should vary in size so they don't create steep slopes when placing to the grade lines as indicated on the drawings.

.5 Do not transport different categories of material in the same truckload. If rocks of markedly different sizes are present in the same load, Departmental Representative reserves the right to have each rock measured separately and sorted prior to installing in structure.

.6 Contractor to provide cross sections to the Departmental Representative at 10 metre stations to show that lines and grades have been achieved as shown on the drawings. Measurement for payment for this work will be included in the cost of the supply and installing the above item.

3.6 ROCK MATERIAL WASHED OUT OF WORK

.1 Should during the progress of the Work, any rock material be washed out of the Work, or through neglect of carelessness of the Contractor or their employees or from any other cause, be dumped into the water near the Work or anywhere within the harbour or

channel so as to interfere in the opinion of the Departmental Representative with actual depths of water and/or impede navigation, it will be removed by the Contractor when ordered to do so by the Departmental Representative. Any material washed out of the Work or displaced beyond the contract limits will be replaced by the Contractor at no cost to Canada.

3.8 TOLERANCES

.1 Note: These tolerances are not to be considered pay limits but are specified to ensure contractor keeps within acceptable lines and grades.

.2 Completed component layers to be within the following tolerances of lines and grades indicated:

.1 Rock fill core +/-100 mm.

.2 Filter stone +/-100 mm.

.3 Armour stone +/-300 mm.

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the requirements for supply and installation of mooring devices as follows:

.1 Supply and installation of Type "A" mooring cleats.

1.2 RELATED WORK

.1 Section 02 41 16 - Sitework, Demolition, and Removal.

.2 Section 03 10 00 - Concrete Forming and Accessories.

.3 Section 03 20 00 - Concrete Reinforcing.

.4 Section 03 30 00 - Cast-in-Place Concrete.

1.3 MEASUREMENT FOR PAYMENT

.1 Mooring Cleats - Type "A": The supply and installation of Type "A" mooring cleats, including reinforced concrete block and pedestal, will be measured by the unit secured in place. Contractor to provide all concrete, reinforcing steel, anchor bolts, nuts, washers, welding, grout, fastenings, paint, plant, equipment, and labour.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Mooring Devices:
.1 Mooring Cleats Type "A": carbon cast steel, 225 kg weight as dimensioned on the attached drawing.
.2 Anchor Bolts and Nuts: to ASTM A307, galvanized.

.3 Non-Shrink Grout: pre-mixed compound of non-metallic aggregate and plasticizing agents, capable of developing minimum compressive strength of 50 MPa at 28 days.
.4 Galvanizing: to CSA G164, minimum zinc coating 610 g/m².
.5 Welding: to CSA W59.
.6 Sealer: to Section 07 92 10.
.7 Concrete: to Section 03 30 00.
.8 Concrete Reinforcement: to CSA G30.12M, Grade 400.
.9 Primer: Alkyd undercoat, exterior oil ferrous metal primer, similar to Pittsburgh 6-208.
.10 Paint: Alkyd/Oil Resin paint similar to Pittsburgh Paints "Brilliant Red (Safety Red)" Product ID 7-801. Paint to conform to CAN/CGSB-1.61-2004.

2.2 SHOP DRAWINGS .1 Submit fabricator's shop drawings on cleats in accordance with Section 01 33 00 - Submittal Procedures.

PART 3 - EXECUTION

3.1 INSTALLATION .1 Mooring Cleats - Type "A":
.1 Install concrete cleat block and pedestal for Type "A" mooring cleat as per the drawings.
.2 Install concrete cleat blocks monolithically with deck.
.3 Secure cleats with 25 mm diameter anchor bolts of lengths required complete with associated nuts and washers. After cleat installation is complete, bolt holes in cleats to be filled with approved waterproofing compound.
.4 For the cleat to be removed at the head of the existing Provincial ferry wharf,

remove existing elevated pedestal flush with deck and install 50MPa non-shrink grout to roughened surface. Install new cleat, chemically anchored to the deck, as shown on the drawings.

3.2 GROUT

.1 Set all mooring cleats at locations and elevations indicated or as directed by the Departmental Representative. Grout under base of cleat using a non-shrink, non-metallic type of grout after tightening of anchor bolts or positioning wedges. Grout must be approved by Departmental Representative. Fill anchor bolt holes with approved sealer. Ensure that temperatures of foundation, air, base and grout are within range specified by grout manufacturers.

.2 Do not grout until approval given by Departmental Representative.

FISHERIES AND OCEANS
CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) 2012
PROJECT EFFECTS DETERMINATION REPORT

GENERAL INFORMATION

1. Project Title: Wharf Construction, Dover, NL	
2 Proponent: Fisheries and Oceans Canada, Small Craft Harbours (DFO SCH)	
3. Other Contacts (Other Proponent, Consultant or Contractor): Public Works and Government Services Canada	**4. Role:** OGD Consultant
5. Source of Project Information: Mike Collins, Senior Project Engineer	
6. Project Review Start Date: January 26, 2016	
7. DFO File No.: 16-HNFL-00044	**8. PWGSC File No:**
9. TC File No.:	

BACKGROUND

10. Background about Proposed Development (including a description of the proposed development):

The scope of work includes construction of a finger pier wharf, site dredging, and relocation of a floating dock in Dover, NL.

PROJECT REVIEW

11. DFO's rationale for the project review:

Project is on federal land ☒ and;

☒ DFO is the proponent

☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit

☐ DFO to provide financial assistance to another party to enable the project to proceed

☐ DFO to lease or sell federal land to enable the project to proceed

☐ Other

12. Fisheries Act Sections (if applicable): n/a

13. Other Authorities	**14. Other Authorities rationale for involvement:**
Transport Canada, Navigation Protection Program and Environmental and Indigenous Affairs	*Navigation Protection Act*

15. Other Jurisdiction: Service NL

NDOEC, Water Resources Division

16. Other Expert Departments Providing Advice:	**17. Areas of Interest of Expert Departments:**
Fisheries and Oceans Canada, Fisheries Protection Program	*Fisheries Act*

18. Other Contacts and Responses: n/a

19. Scope of Project (details of the project subject to review):

Project Description

Construction/Installation:

The project scope of work includes:

- Removal of the existing armour stone approach structure;
- Construction of a new finger pier wharf in the footprint of the existing armour stone structure. The finger pier wharf will measure 24.4m long x 6.1m wide and be composed of treated timber cribwork with a concrete deck and be constructed on a rock mattress. The project includes construction of a new gravel approach measuring 39.4m long by 6.1m wide leading to the new finger pier;
- Dredging of bottom sediment to seat the finger pier.

The construction will require removal of bottom sediment material to seat the cribwork. Sediment samples were collected during borehole drilling. All samples came back within guidelines except BH2 which had a slightly elevated TPH. The material will be disposed of at an approved landfill site. Construction debris will be disposed of appropriately as per regulatory approvals.

Operation

The Environmental Management System (EMS) with an integrated Environmental Management Plan (EMP) for the Harbour Authority of Dover will cover operational aspects of environmental management at the harbour (fuelling, waste disposal, activities on the property and water).

Decommissioning

This facility is not presently planned to be decommissioned. At the time of decommissioning, Small Craft Harbours will develop a site-specific re-use or reclamation plan that is appropriate for the applicable environmental legislation and Fisheries and Oceans Canada policies.

Scheduling

Subject to regulatory approval and DFO SCH operational priorities and funding, this project will commence during the 2016 fiscal year.

20. Location of Project:

The Dover is a small fishing site located in Butlers Cove in Shoal Bay, NL. The project site is located at coordinates 48° 52' 42" N and 53° 58' 02" W in Dover. The project site is accessible via provincial route 320, approximately 321kms northwest of the City of St. John's.

21. Environment Description:

Physical Environment

The general area is flat and exposed coastal beach area with a moderate cover of grass, native shrub, and coniferous vegetation. The project site is located along the shoreline in the area of the existing floating dock site.

Water depth at the proposed project site is approximately 0.1 - 5.4 metres.

Biological Environment

Dover is a community of approximately 730 people located on the northeastern portion of the Central Peninsula, Newfoundland and Labrador. Dover is located in the Central Newfoundland Eco-region. This maritime-influenced ecoregion covers the north-central part of Newfoundland. The ecoregion is marked by cool summers and short, cold winters. It is the most continental part of the island. The mean annual temperature is approximately 4.5°C. The mean summer temperature is 12.5°C and the mean winter temperature is -3.5°C. The mean annual precipitation ranges 1000-1300 mm. This ecoregion is classified as having a maritime mid-boreal eco-climate. Its forests are dominated by closed, intermediate to low stands of balsam fir and black spruce on steep, moist, upland slopes. Paper birch, aspen, and black spruce are typical of disturbed sites. Drier sites are characterized by woodlands of black spruce, kalmia heath, and lichens. Dwarf, open stands of black spruce and tamarack with ericaceous shrubs are found on raised domed bogs. Where forest growth is poor, exposure to winds and wet, cold soils are the main causes. This ecoregion is composed of a mixture of crystalline Palaeozoic strata. Where stream erosion has cut deeply, the uplands are rugged and rocky, but elsewhere they present a rolling terrain of low relief. The surface of the uplands is dominated by hummocky to ridged, sandy morainal deposits with slopes that range from 5-30% and are associated predominantly with Humo-Ferric Podzols. Significant inclusions are Ferro-Humic Podzols, Gleyed Podzols, and Brunisolic and Gleysolic soils. Characteristic wildlife includes moose, lynx, black bear, red fox, and caribou. Forestry is the principal land use in the ecoregion. The major communities include Gander, Grand Falls, Windsor, and Botwood. The population of the ecoregion is approximately 75 100.

Species at Risk (Aquatic and Terrestrial)

A search of the Atlantic Canada Conservation Data Centre (ACCDC) database was conducted within a 5 km radius of the proposed project location (ACCDC 2014). The search yielded several species with documented sightings within the search area. However, those species are not identified as being listed under Schedule 1 of the Species at Risk Act (SARA).

22. Scope of Effects Considered (sections 5(1) and 5(2)):

Table 1: Potential Project / Environment Interactions Matrix

	As per Section 5(1)			Section 5(1c) Aboriginal Interest				Section 5(2)			Due Diligence			
Project Phase / Physical Work/Activity	*Fish (Fisheries Act)*	*Aquatic Species (SARA)*	*Birds (MBCA)*	*Health and Socio economic*	*Physical and cultural heritage*	*Land use*	**HAPA Significance*	*Health and Socio economic*	*Physical and cultural heritage*	**HAPA Significance*	*Water (ground, surface, drainage, etc)*	*Terrestrial / Aquatic Species*	*Soil*	*Air Quality*
Construction/Installation														
Deconstruction of armourstone structure	P	-	P	-	-	-	-	-	-	-	P	P	P	P
Construction of new finger pier wharf	P	-	P	-	-	-	-	-	-	-	P	P	P	P
Dredging	P	-	P	-	-	-	-	-	-	-	P	P	P	P
Dredge spoil disposal	P	-	P	-	-	-	-	-	-	-	P	P	P	P
Operation / Maintenance	P	-	-	-	-	-	-	-	-	-	P	-	-	-
Decommissioning / Abandonment	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**structure, site or thing that is of historical, archaeological, paleontological or architectural significance.*
Legend: P = Potential Effect of Project on Environment; ' - ' = No Interaction

Navigation Consideration

Environmental effects of the project on navigation are taken into consideration as part of the environmental assessment only when the effects are indirect, *i.e.* resulting from a change in the environment affecting navigation. Direct effects on navigation are not considered in the environmental assessment, but any measures necessary to mitigate direct effects will be included as conditions of the *Navigation Protection Act* approval.

☒ Only direct effects are identified; therefore the effects of the project on navigation are not addressed in this environmental assessment.

☐ Indirect effects were identified and have been addressed in this environmental assessment.

23. Environmental Effects of Project:

Potential Project/Environment Interactions and their effects are outlined below:

Fish / Fish Habitat

- Dredging activities and wharf construction could result in the loss of fish habitat.
- Sedimentation as a result of dredging may negatively impact fish and quality of potential fish habitat.
- Construction of new finger pier wharf may result in destruction of potential fish habitat.
- A "Request for Review" has been forwarded to DFO Habitat. Response from DFO has been forwarded to PWGSC, SCH and the contractor.

Birds/Bird Habitat

- Any type of hydrocarbon spill could result in bird or bird habitat loss.
- Noise / fumes may result in birds avoiding the site and surrounding area.

Water

- Improper disposal of dredge material could result in contamination of ground water by placement in areas that may be susceptible to groundwater.
- Improper disposal of dredge material could result in contamination of freshwater (e.g. dredge material placed in or near a waterbody).
- Dredging activities resulting in a sedimentation event within the water column.
- Construction of finger pier wharf will result in a loss of flora, fauna, and habitat.

Aquatic species

- Sedimentation as a result of placement of cribs may negatively impact aquatic species near project site.
- Accidental discharge of heavy machinery fuel/fluids may negatively impact aquatic species near project site.

Soil (Surface and Subsurface)

- Project activities could potentially result in soil contamination due to improper disposal of dredge material or to some type of mechanical malfunction resulting in a hydrocarbon spill.
- Construction activities at site or natural events (e.g. rainfalls) could result in erosion / sedimentation events.
- Improper disposal of dredge material could result in contamination of soil.

Air Quality / Noise

- May cause a temporary disturbance to residents and wildlife/marine life.

24. Mitigation Measures for Project (including Habitat Compensation):

Work should be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) are to be used, as appropriate, to prevent erosion and release of sediment and/or sediment laden water during the construction phase.

As part of this project's pre-planning process, marine sediment samples were collected from the proposed dredge area and submitted for chemical analysis. The sediment materials will disposed of at an approved landfill site. Results from the sediment sample analysis are available upon request.

The in-water use of heavy equipment is not permitted. The operation of such equipment should be from dry/stable shoreline areas.

Work should be properly timed to avoid potential interference with commercial and/or recreational fisheries.

Appropriate sedimentation control measures (e.g. silt curtains, booms, etc), should be deployed where required.

All wastes should be recycled where possible or otherwise disposed of appropriately.

All crib backfill material should be clean and obtained from an approved quarry.

All drainage and wash water from concrete production should be properly contained and should not drain into the marine environment.

There should be no sedimentation events as a result of proposed activities. If required, mitigation measures must be implemented such as installation of a turbidity barrier, construction of sediment ponds, etc.

Machinery should be well muffled and local municipality construction by-laws must be adhered to.

Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refuelling must be done at least 100m from any water body. Basic petroleum spill clean-up equipment should be on-site. All spills or leaks should be promptly contained, cleaned up and reported to the 24-hour environmental emergencies report system (1-800-563-9089). The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event.

The banks along the shoreline should be restored to original conditions upon completion of construction.

Weather conditions should be assessed on a daily basis to determine the potential risk on project activities.

Several environmental approvals / permits have been obtained on behalf of SCH. These include:

1. Service NL provided approval to dispose sediment material to an approved landfill with owners/operators consent.
2. NPP provided approval for the proposed alteration of the lawful work under the Navigation Protection Act. Conditions outlined have to be met.
3. NDOEC permit to alter a body of water is provided for the dredging work on small craft harbor property. Mitigations are listed in the approval.
4. Fisheries and Oceans provided mitigation measures for the protection of fish and fish habitat.

These approvals are attached and all conditions/mitigation measures must be reviewed and implemented by the contractor.

The proponent should ensure that copies of all regulatory approvals are available on-site during project activities.

25. Significance of Adverse Environmental Effects of project:

Significant adverse environmental effects are unlikely, taking into account mitigation measures.

26. Other Considerations (Public Consultation, Aboriginal Consultation, Follow-up)

Public Consultation

The proposed project will provide safer and more secure access for vessels utilizing this facility. No negative public concern is expected as a result of this project. As such, public consultation was not deemed necessary as part of this determination.

Aboriginal Consultation

Aboriginal fishers are not known to utilize the Dover SCH facility, nor are there any known aboriginal groups in the surrounding area. As such, aboriginal consultation was not deemed necessary as part of this determination.

Government Consultation

Federal and provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services, during the course of this assessment. A project description was distributed to the following authorities:

- Fisheries and Oceans Canada – Fisheries Protection Program (DFO FPP)
- Transport Canada – Navigation Protection Program (TC NPP)
- Service NL – Environmental Protection Office (SNL – EPO)
- NDOEC, Water Resources Division (NDOEC – WR)

Mitigations prescribed by DFO FPP have been incorporated into this report and may also be found in Appendix C. It is the proponents' responsibility to ensure that appropriate mitigation measures are adhered to.

All expert advice/specialist information provided by the above noted departments has been incorporated into this document.

Accuracy and Compliance Monitoring

A follow-up program (as defined in S. 2(1) and as applicable to non-designated projects on federal lands) is a program for determining the effectiveness of any mitigation measures. Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

27. Other Monitoring and Compliance Requirements (e.g. *Fisheries Act* or *Species at Risk Act* requirements)

n/a

CONCLUSION

28. Conclusion on Significance of Adverse Environmental Effects:

The Federal Authority has evaluated the project in accordance with Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the department has determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigative measures as outlined.

29. Prepared by: Cathy Martin **30. Date:** March 17, 2015

31. Name: Cathy Martin

32. Title: Environmental Specialist, PWGSC-ES

DECISION

33. Decision Taken

☒ DFO may exercise its power, duty or function, i.e. may issue the authorization - where the project is not likely to cause significant adverse environmental effects. Confirm below the specific power, duty or function that may be exercised.

- ☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit
- ☒ DFO to proceed with project (as proponent)
- ☐ DFO to provide financial assistance for project to proceed
- ☐ DFO to provide federal land for project to proceed

☐ DFO has decided not to exercise its power, duty or function because the project is likely to cause significant adverse environmental effects.

☐ DFO to ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances

34. Approved by: _____ **35. Date:** _____

36. Name: Paul Curran

37. Title: Regional Engineer, DFO-SCH, NL

38. References: n/a

TRANSPORT CANADA RECOMMENDATION

Project Title:		
TC File No.:	NEATS:	
NPP File No.:		
Environmental Review Decision:	Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project **is not likely** to cause significant adverse environmental effects and, as such, Transport Canada may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part. Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project **is likely** to cause significant adverse environmental effects that cannot be justified. As such, Transport Canada shall not exercise any power or perform any duty or function conferred on it by or under any Act of Parliament that would permit the project to be carried out in whole or in part, at this point in time. The project shall be referred to the Governor in Council to decide if those adverse environmental effects are justified under the circumstances pursuant to subsection 69(3) CEAA, 2012.	
Prepared by:	**Melissa Ginn** Environmental Officer Environmental Affairs and Aboriginal Consultation Unit	
Signature:		**Date:**
Mailing Address:		
Tel:		
Fax:		
Email:		
Recommended by:	**J. Jason Flanagan** Senior Environmental Assessment Officer Environmental Affairs and Aboriginal Consultation Unit	
Signature:		**Date:**
Approved by:	**Kevin LeBlanc** Regional Manager Environmental Affairs and Aboriginal Consultation Unit	
Signature:		**Date:**

APPENDICES

-Appendix A - Topographic Map and Aerial Photographs
- Appendix B: Site Plan
- Appendix C: Regulatory approvals/responses

Appendix A
Topographic Map and Aerial Photo

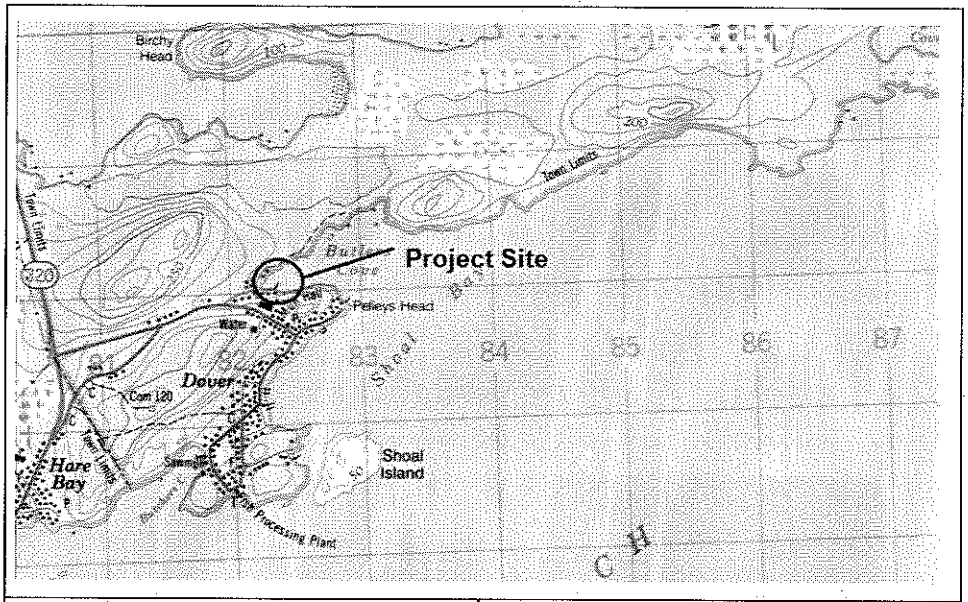
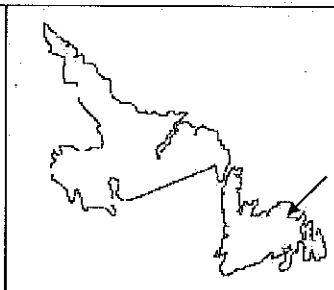
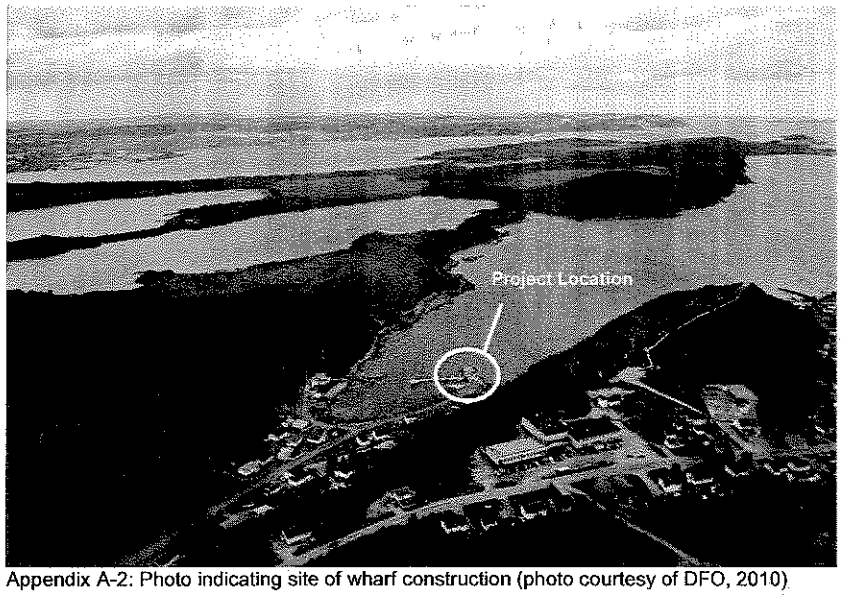
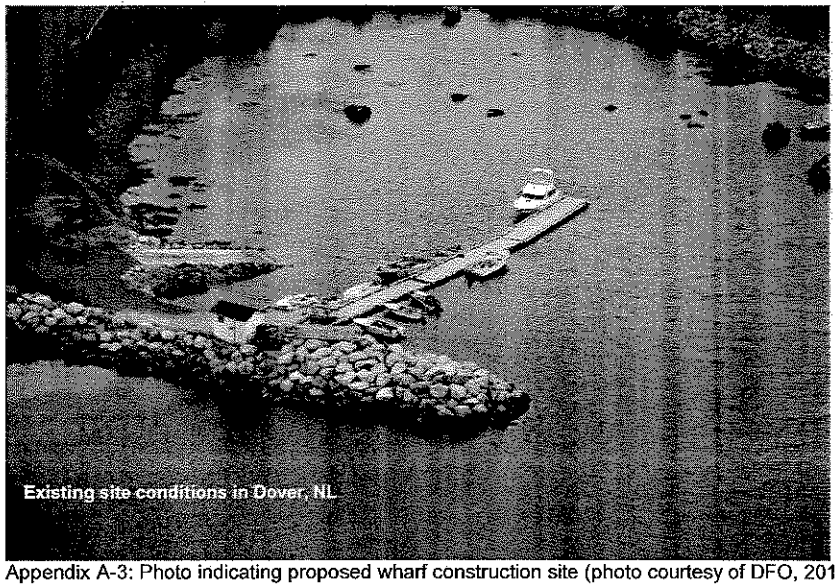


Figure 1: Topographical Map of Dover, NL
Map 02-C-13-02-C-14, St. Brendans



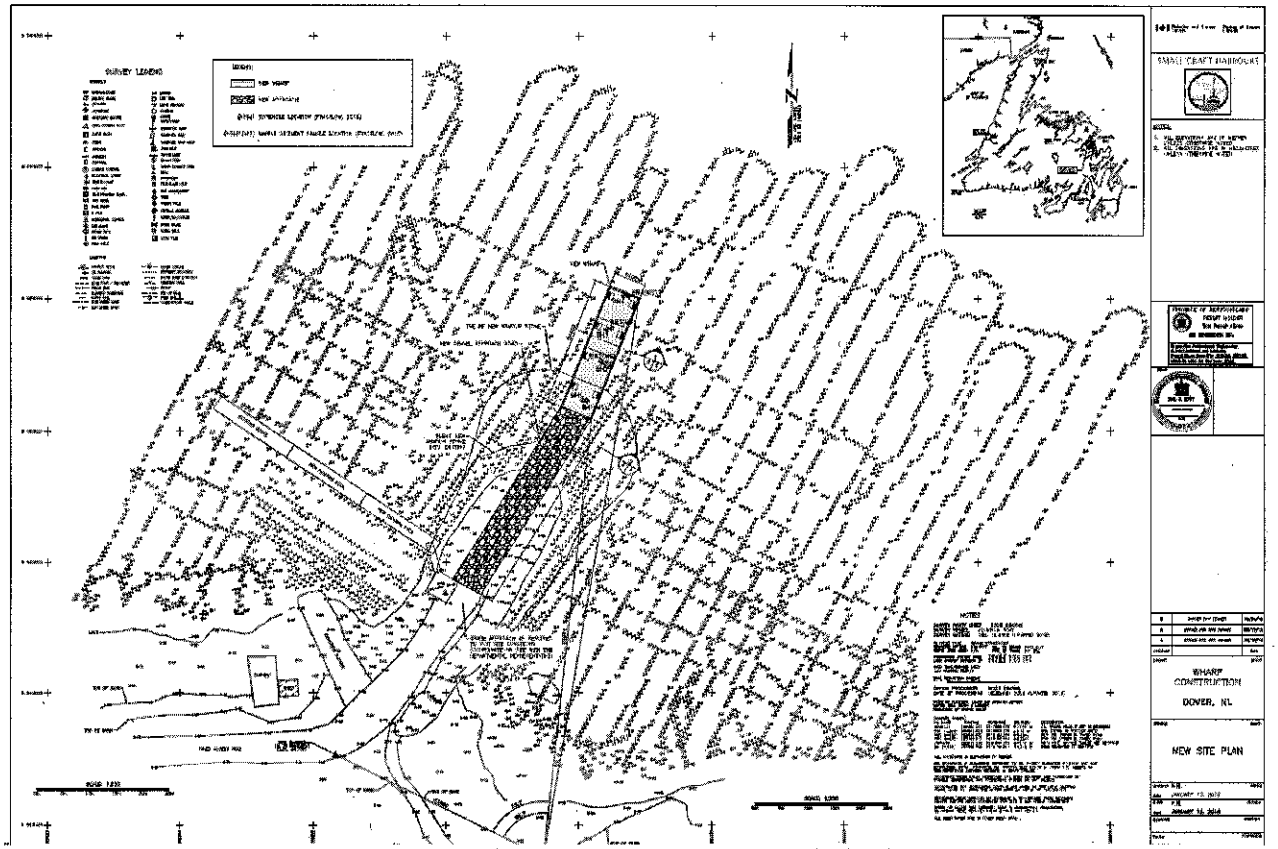


Appendix A-2: Photo indicating site of wharf construction (photo courtesy of DFO, 2010)



Appendix A-3: Photo indicating proposed wharf construction site (photo courtesy of DFO, 2010)

Appendix B
Site Plan of proposed project



Appendix B-1: Dover Site Plan indicating proposed wharf construction

Appendix C
Regulatory approvals/responses

Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

PERMIT TO ALTER A BODY OF WATER

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, Section(s) 48

Date: **JANUARY 13, 2010**

File No: **532-02**
Permit No: **ALT5054**

Proponent: **Department of Fisheries and Oceans**
Small Craft Harbours Branch
1144 Topsail Road
Mount Pearl NL A1N 5E8

Attention: **William Goulding**

Re: **Minor DFO Dredging Projects (2010 - 2015)**

Permission is hereby given for: **routine dredging or beach grading of 2000 cubic metres or less of primarily sand, gravel, cobble, and boulder material in order to provide safe navigation at various harbour facilites around the Province, with reference to January 6, 2010 request to extend Permit ALT 2120.**

- This permit does not release the proponent from the obligation to obtain appropriate approvals from other concerned provincial, federal and municipal agencies.
- This permit is subject to the terms and conditions indicated in Appendix A (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this permit must be obtained from the Department of Environment and Conservation under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this permit null and void, place the proponent and their agent(s) in violation of the *Water Resources Act* and make the proponent responsible for taking any remedial measures as may be prescribed by this Department.

MINISTER

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

Permit No: ALT5054

APPENDIX A

Terms and Conditions for Environmental Permit

Minor DFO Dredging Projects (2010 - 2015)

Dredging

1. Dredging activity must only be carried out during periods when wind, wave and tide conditions minimize the dispersion of silt and sediment from the work site.

2. For each minor dredging project requiring the removal of more then 200 cubic metres of material, the proponent must notify this Department by e-mail or fax using the attached project notification for at least two (2) working days prior to the start date.

General Alterations

3. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.

4. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.

5. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.

6. All areas affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of the Department.

7. All dredged materials resulting from this project must be disposed of at a site approved by the regional Government Services Centre of the Department of Government Services. Depending on test results, dredged materials may in some cases be redeposited and levelled along nearby shorelines.

8. This Permit is valid for five (5) years from the date of issue. An application for renewal or for amendments to this permit may be submitted prior to the expiry date.

Special Conditions

9. All work must take place within the proponents legal boundary or with the approval of the upland owner. All work must comply with all other terms and conditions of the Crown Lands grant, lease or license for occupancy.

Water Quality

10. This Department reserves the right to require that the proponent sample, analyze, and submit results of water quality tests, for the purpose of ensuring that water quality is maintained within acceptable guidelines.

cc: Mr. Bob Whitten, Director
Department of Government Services
PO Box 8700
St. John's NL A1B 4J6

cc: Mr. Calvin Adams (Avalon)
Regional Manager, Department of Government Services
Regional Government Service Centre
PO Box 512
Harbour Grace NL A0A 2M0

cc: Mr. Carl Hann (Western)
Department of Government Services
PO Box 2006
Corner Brook NL A2H 6J8

cc: Mr. Ken Russell (Labrador)
Manager of Operations
Department of Government Services
PO Box 3014, Stn. B
Happy Valley-Goose Bay NL A0P 1E0

cc: Mr. Robert Groves (Clarenville Area)
Regional Government Services Centre
Department of Government Services
2 Masonic Terrace
PO Box 1148
Clarenville NL A5A 1N2

cc: Mr. Robert Turner (Eastern Central)
Manager of Operations
Department of Government Services
PO Box 2222
Gander NL A1V 2N9

cc: Ms Tanya Simms (Western)
Manager of Operations
Department of Government Services
PO Box 2006
Corner Brook NL A2H 6J8

cc: Ms. Donna Folks (Western Central)
Manger of Operations, Department of Government Services
3 Cromer Ave.
Grand Falls-Winsor NL A2A 1W9

cc: Mr. Darrin Sooley (W)
Area Habitat Co-ordinator
Department of Fisheries and Oceans
1 Regent Square, Suite 201
Corner Brook NL A2H 7K6

cc: Mr. Jack O'Rourke (S)
Area Habitat Biologist - Southern
Department of Fisheries and Oceans
1144 Topail Road
St. John's NL A1N 5E8

cc: Mr. Leon W. King (C)
Area Habitat Biologist - Central

Department of Fisheries and Oceans
4A Bayley Street, Suite 200
Grand Falls-Windsor NL A2A 2T5

cc: Mr. Terry Fleet (E)
Area Habitat Biologist - Eastern
Department of Fisheries and Oceans
1144 Topsail Road
St. John's NL A1N 5E8

cc: Ms. Kathleen Simms (L)
Area Habitat Biologist - Labrador
Department of Fisheries and Oceans
Bldg. 397, CFB Goose Bay
PO Box 7003, Station A
Happy Valley - Goose Bay, NL A0P 1S0

---

cc: Ms. Ellen Pickett
NWPA
Transport Canada
John Cabot Building
PO Box 1300
St. John's NL A1C 6H8

cc: Mr. A. W. Pitcher
Environmental Services
Department of Public Works and Government Services Canada
Suite 204, 1 Regent Square
Corner Brook NL A2H 7K6

Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

File No. 532-02

PROJECT NOTIFICATION

Pursuant to the *Water Resources Act* SNL 2002 cW-4.01, Section(s) 48

Date: _____ Permit No: ALT 5054

Proponent: Department of Fisheries and Oceans
Small Craft Harbours Branch
PO Box 5667, John Cabot Bldg.
St.John's, NL A1C 5X1

Attention: William Goulding

Re: Minor DFO Dredging Projects (2010 – 2015)

This Permit is valid for: Routine dredging or beach grading of 2000 cubic metres or less of primarily sand, gravel, cobble, and boulder material in order to provide safe navigation at various harbour facilities around the Province, with reference to January 6, 2010 request to extend Permit ALT 2120.

DETAILS:

Waterbody: _____ Region: _____ Location: _____
UTM: N: _____ E: _____ Zone: _____ NAD: _____

Contact Person: _____ Project Schedule: From _____ to _____
Contact Tel #: _____

Work Description: _____

This NOTIFICATION must be completed and forwarded as noted below to Department of Environment and Conservation a minimum of TWO WORKING DAYS prior to the start of construction. By FAX: (709) 729-0320 or by email: clydemclean@gov.nl.ca

Newfoundland Labrador

Government of Newfoundland and Labrador
Service NL

March 11, 2016

File No: GA/GSC/9173

Mrs. Cathy Martin
Environmental Services
Public Works and Government Services Canada
P.O. Box 4600
St. John's, NL, A1C 5T2

RE: Wharf Construction and Dredge Material Disposal – Dover, NL

Dear Mrs. Martin,

Service NL has received and reviewed your request of March 11, 2016, regarding the above mentioned project. The project proposes removal and disposal of dredge material.

Based on the results of chemical analysis provided, the sample location of BH2-0B1is greater that 1000mg/kg and is not acceptable for disposal at the Central Newfoundland Waste Management Facility, therefore must be treated at a soil treatment facility. The remaining dredge material less than 1000mg/kg can be accepted at Central Newfoundland Waste Management Facility. Service NL recommends additional sampling to occur during the dredging to ensure the higher concentration material is separate from the lower concentration material. Only material greater than 1000mg/kg requires treatment.

The soil can be utilized for backfill material and any unused material should be stockpiled on site for future use. Prior approval from the owner/operator of Central Newfoundland Waste Management Facility is required.

Should you have any questions regarding this matter, please feel free to contact the undersigned at 256-1423.

Regards,

Courtney Hunt, CPHI(C)
Environmental Protection Officer

Copy: Ed Evans – Central Newfoundland Waste Management

Fisheries and Oceans Canada | Pêches et Océans Canada

P.O. Box 5667
St. John's, NL A1C 5X1

Your file *Votre référence*

FEB 2 9 2016

Our file *Notre référence*
16-HNFL-00044

Paul Curran
Johns Cabot Building
10 Barter's Hill
St. John's, NL
A1C 5X1

Dear Mr. Curran:

Subject: Serious harm to fish can be avoided or mitigated – Wharf Construction, Dover, NL.

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on February 23, 2016.

Based on the information provided, your proposal has been identified as a project where a *Fisheries Act* authorization is not required given that serious harm to fish can be avoided by following standard measures. Proposals in this category are not considered to need an authorization from the Program under the *Fisheries Act* in order to proceed. In order to comply with the Act, it is recommended that you follow our guidance tools which can be found at the following website (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html). It remains your responsibility to meet the other requirements of federal, provincial and municipal agencies.

Should your plans change or if you have omitted some information in your proposal such that your proposal meets the criteria for a site specific review, as described on our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html), you should complete and submit the request for review form that is also available on the website.

Should you have any questions or concerns about the compliance of your proposal with the *Fisheries Act* you may wish to engage an environmental professional familiar with measures to avoid impacts to fish and fish habitat (http://www.dfo-mpo.gc.ca/pnw-ppe/env-pro-eng.html).

Yours sincerely,

Terry Fleet
A/Team Leader
Triage and Planning

Canada

Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

File Reference #

December 15, 2010

Paul Curran, P. Eng.
Regional Engineer
Small Crafts Harbours
St. John's NL A1C 5X1

Dear Mr. Curran:

Re: Section 48 Permitting Requirements under the Water Resources Act – Wharves, Breakwaters, Slipways and Boathouses

This letter is to inform you that as of January 1, 2011 permits will no longer be required under Section 48 of the *Water Resources Act* for the construction and maintenance of wharves, breakwaters, slipways and boathouses. Therefore blanket permit ALT5055 is canceled effective January 1, 2011. Water Resources Management Division is currently preparing guidelines on environmental controls which should be followed during the construction and maintenance of wharves, breakwaters, slipways and boathouses. These guidelines will be posted on the department's website once they are completed. In the interim, we have attached a list of terms and conditions which we recommend be followed when completing these types of projects.

This letter does not affect other activities, such as dredging, which will continue to require permits under Section 48 of the Act. As such existing blanket permit ALT5054 remains valid.

This letter does not release Small Crafts Harbours from the obligation to obtain permits and approvals from other concerned provincial, federal and municipal agencies for wharves, breakwaters, slipways and boathouses.

Please do not hesitate to contact this office at **729-5713** if you have any questions.

Yours truly,

Clyde McLean, P.Eng
Manager Water Investigations

cc. Shawn Kean
Haseen Khan

RCM/WSWord 2003
SCH Wharves Breakwaters Permitting Dec 15 2010.doc

Environmental Terms and Conditions

General Alterations

1. All work must take place within the legal boundaries of the proponent or with the approved of the land owner. The constructed works must comply with all other terms and conditions provided in the Crown Lands grant, lease or license for occupancy.

2. Any work that must be performed below the high water mark must be carried out during a period of low water levels.

3. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.

4. Water pumped from excavations for work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the *Environmental Control Water and Sewage Regulations, 2003*.

5. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.

6. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.

7. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.

8. During the construction of concrete components, formwork must be properly constructed to prevent any fresh concrete from entering a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.

9. Wood preservatives such as penta, CCA or other such chemicals must not be applied to timber near a body of water. All treated wood or timber must be thoroughly dry before being brought to any work site and installed.

10. The use of creosote treated wood is strictly prohibited within 15 metres of all bodies of fresh water in the province.

11. Any areas adversely affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of the Department of Environment and Conservation.

12. All waste materials resulting from this project must be disposed of at a site approved by the regional Government Service Center of the Department of Government Services. The Department of Government Services may require samples to be submitted for testing and analysis.

13. Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.

14. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by the wind, wave, ice action, or structural failure.

15. Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.

16. Fill or ballast material must be of good quality, free of fines or other substances including metals, organics or chemicals that may be harmful to the receiving waters.

17. Armour stone must be placed around cribbing, where required, to prevent erosion.

18. Suitable booms must be deployed around construction sites to contain any floating debris that might otherwise be carried away. All booms must be properly maintained and remain in place until all work is completed.

19. The proponent must consult with the Department of Fisheries and Oceans should the total combined footprint of the dock exceed 15 metres squared ($15m^2$) and/or it is made of concrete or steel sheeting or any other skirting that isolates the inside of the crib from the rest of the water.

20. This work must not interfere with the operation of any sanitary or storm sewer outfalls in the area. If it is determined that your work adversely impacts any outfalls, you will be responsible for any repairs, modifications or associated costs to correct the problem.

21. Before commencing work on this project, approval must first be obtained from any municipality in which the work is planned.

Maxxam
A Bureau Veritas Group Company

Your P.O. #: CALL UP #86
Your Project #: R-049540-002
Site Location: DOVER, NL
Your C.O.C. #: B144676

Attention:Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's , NL
A1C 5T2

Report Date: 2015/12/21
Report #: R3820514
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B5O7095
Received: 2015/12/02, 09:00

Sample Matrix: SEDIMENT
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	3	2015/12/07	2015/12/08	CAM SOP-00457	OMOE E3015 m
Free (WAD) Cyanide (1)	7	2015/12/07	2015/12/09	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 3)	9	2015/12/04	2015/12/05	ATL SOP 00111	Atl. RBCA v3 m
TEH in Soil (PIRI) (2, 3)	1	2015/12/17	2015/12/17	ATL SOP 00111	Atl. RBCA v3 m
Metals Solids Acid Extr. ICPMS (2)	6	2015/12/07	2015/12/07	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	4	2015/12/08	2015/12/08	ATL SOP 00058	EPA 6020A R1 m
Moisture (2)	10	N/A	2015/12/07	ATL SOP 00001	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (2, 3)	1	2015/12/04	2015/12/07	ATL SOP 00102	EPA 8270D 2007 m
PAH in sediment by GC/MS (Low Level) (2, 3)	1	2015/12/08	2015/12/10	ATL SOP 00102	EPA 8270D 2007 m
PAH in sediment by GC/MS (Low Level) (2, 3)	8	2015/12/08	2015/12/11	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (2)	10	2015/12/04	2015/12/08	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (low level soil) (2)	10	N/A	2015/12/08		Auto Calc.
pH (5:1 DI Water Extract) (2)	10	2015/12/07	2015/12/08	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (2)	1	2015/12/03	2015/12/05	ATL SOP 00119	Atl. RBCA v3 m
VPH in Soil (PIRI) (2)	5	2015/12/03	2015/12/07	ATL SOP 00119	Atl. RBCA v3 m
VPH in Soil (PIRI) (2)	4	2015/12/03	2015/12/08	ATL SOP 00119	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	1	N/A	2015/12/07	N/A	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	4	N/A	2015/12/08	N/A	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	4	N/A	2015/12/09	N/A	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	1	N/A	2015/12/18	N/A	Atl. RBCA v3 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) This test was performed by Maxxam Bedford
(3) Soils are reported on a dry weight basis unless otherwise specified.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Your P.O. #: CALL UP #86
Your Project #: R-049540-002
Site Location: DOVER, NL
Your C.O.C. #: B144676

Attention:Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's , NL
A1C 5T2

Report Date: 2015/12/21
Report #: R3820514
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B5O7095
Received: 2015/12/02, 09:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		BLI650	BLI651	BLI652	BLI653			
Sampling Date		2015/11/26	2015/11/26	2015/11/26	2015/11/26			
COC Number		B144676	B144676	B144676	B144676			
	UNITS	BH1-OB1	BH1-CP1-0-1.5Z	BH1-MS1-0-0.5Z	BH1-MS2-0.5-1.0Z	RDL	MDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	ND	ND	0.025	N/A	4298945
Toluene	mg/kg	ND	ND	ND	ND	0.025	N/A	4298945
Ethylbenzene	mg/kg	ND	ND	ND	ND	0.025	0.025	4298945
Total Xylenes	mg/kg	ND	ND	ND	ND	0.050	N/A	4298945
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	2.5	N/A	4298945
>C10-C16 Hydrocarbons	mg/kg	ND	ND	ND	ND	10	N/A	4299080
>C16-C21 Hydrocarbons	mg/kg	44	ND	23	ND	10	N/A	4299080
>C21-<C32 Hydrocarbons	mg/kg	100	52	75	52	15	N/A	4299080
Modified TPH (Tier1)	mg/kg	150	52	98	52	15	N/A	4295269
Reached Baseline at C32	mg/kg	Yes	Yes	Yes	Yes	N/A	N/A	4299080
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (2)	COMMENT (2)	COMMENT (2)	N/A	N/A	4299080
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	103	99	101	96			4299080
n-Dotriacontane - Extractable	%	106	109	112	105			4299080
Isobutylbenzene - Volatile	%	114	117	114	117			4298945

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Unidentified compound(s) in fuel oil range. Lube oil fraction.
(2) Lube oil fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		BLI654	BLI654		BLI655			
Sampling Date		2015/11/26	2015/11/26		2015/11/28			
COC Number		B144676	B144676		B144676			
	UNITS	BH1-MS3-1.0-1.5Z	BH1-MS3-1.0-1.5Z Lab-Dup	QC Batch	BH2-OB1	RDL	MDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	4299622	ND	0.025	N/A	4298945
Toluene	mg/kg	ND	ND	4299622	ND	0.025	N/A	4298945
Ethylbenzene	mg/kg	ND	ND	4299622	ND	0.025	0.025	4298945
Total Xylenes	mg/kg	ND	ND	4299622	ND	0.050	N/A	4298945
C6 - C10 (less BTEX)	mg/kg	ND	ND	4299622	ND	2.5	N/A	4298945
>C10-C16 Hydrocarbons	mg/kg	ND		4299080	ND	10	N/A	4317538
>C16-C21 Hydrocarbons	mg/kg	ND		4299080	250	10	N/A	4317538
>C21-<C32 Hydrocarbons	mg/kg	ND		4299080	2400	15	N/A	4317538
Modified TPH (Tier1)	mg/kg	ND		4295269	2700	15	N/A	4315469
Reached Baseline at C32	mg/kg	NA		4299080	No	N/A	N/A	4317538
Hydrocarbon Resemblance	mg/kg	NA		4299080	COMMENT (1)	N/A	N/A	4317538
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	101		4299080	87			4317538
n-Dotriacontane - Extractable	%	102		4299080	98 (2)			4317538
Isobutylbenzene - Volatile	%	108	106	4299622	108			4298945

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) Lube oil fraction. Unidentified compound(s) in fuel / lube range.
(2) TEH Analysis: Silica gel clean-up performed prior to analysis as per client request.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B507095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		BLI656	BLI657	BLI658	BLI659			
Sampling Date		2015/11/30	2015/11/30	2015/11/30	2015/11/29			
COC Number		B144676	B144676	B144676	B144676			
	UNITS	BH2-MS1-0-1.0Z	BH2-MS2-1.0-2.0Z	BH2-MS3-2.0-3.0Z	BH3-OB1	RDL	MDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	ND	ND	0.025	N/A	4301436
Toluene	mg/kg	ND	ND	ND	ND	0.025	N/A	4301436
Ethylbenzene	mg/kg	ND	ND	ND	ND	0.025	0.025	4301436
Total Xylenes	mg/kg	ND	ND	ND	ND	0.050	N/A	4301436
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	2.5	N/A	4301436
>C10-C16 Hydrocarbons	mg/kg	ND	ND	ND	ND	10	N/A	4299080
>C16-C21 Hydrocarbons	mg/kg	64	23	ND	33	10	N/A	4299080
>C21-<C32 Hydrocarbons	mg/kg	270	150	80	60	15	N/A	4299080
Modified TPH (Tier1)	mg/kg	340	170	80	93	15	N/A	4295269
Reached Baseline at C32	mg/kg	Yes	Yes	Yes	Yes	N/A	N/A	4299080
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	COMMENT (1)	COMMENT (2)	N/A	N/A	4299080
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	99	100	98	97			4299080
n-Dotriacontane - Extractable	%	113	101	109	110			4299080
Isobutylbenzene - Volatile	%	124	127	129	114			4301436

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Lube oil fraction.
(2) Unidentified compound(s) in fuel oil range. Lube oil fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		BLI650		BLI651	BLI652	BLI653			
Sampling Date		2015/11/26		2015/11/26	2015/11/26	2015/11/26			
COC Number		B144676		B144676	B144676	B144676			
	UNITS	BH1-OB1	QC Batch	BH1-CP1-0-1.5Z	BH1-MS1-0-0.5Z	BH1-MS2-0.5-1.0Z	RDL	MDL	QC Batch
Inorganics									
Free Cyanide	ug/g	0.02	4301760	ND	0.02	0.01	0.01	0.005	4301758
Moisture	%	39	4298962	40	51	45	1.0	0.20	4298962
Soluble (5:1) pH	pH	7.45	4303508	7.09	7.12	7.50	N/A	N/A	4303508

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam ID		BLI654		BLI654		BLI655	BLI656			
Sampling Date		2015/11/26		2015/11/26		2015/11/28	2015/11/30			
COC Number		B144676		B144676		B144676	B144676			
	UNITS	BH1-MS3-1.0-1.5Z	RDL	BH1-MS3-1.0-1.5Z Lab-Dup	QC Batch	BH2-OB1	BH2-MS1-0-1.0Z	RDL	MDL	QC Batch
Inorganics										
Free Cyanide	ug/g	ND	0.01		4301760	0.02	0.05	0.01	0.005	4301758
Moisture	%	15	1.0		4298962	62	66	1.0	0.20	4298962
Soluble (5:1) pH	pH	7.81	N/A	7.78	4303508	7.49	7.42	N/A	N/A	4303508

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

Maxxam ID		BLI657		BLI658	BLI659			
Sampling Date		2015/11/30		2015/11/30	2015/11/29			
COC Number		B144676		B144676	B144676			
	UNITS	BH2-MS2-1.0-2.0Z	QC Batch	BH2-MS3-2.0-3.0Z	BH3-OB1	RDL	MDL	QC Batch
Inorganics								
Free Cyanide	ug/g	0.02	4301760	0.02	0.03	0.01	0.005	4301758
Moisture	%	51	4298962	49	39	1.0	0.20	4298962
Soluble (5:1) pH	pH	7.23	4303508	7.07	7.17	N/A	N/A	4303508

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		BLI650	BLI650	BLI651	BLI652	BLI653			
Sampling Date		2015/11/26	2015/11/26	2015/11/26	2015/11/26	2015/11/26			
COC Number		B144676	B144676	B144676	B144676	B144676			
	UNITS	BH1-OB1	BH1-OB1 Lab-Dup	BH1-CP1-0-1.5Z	BH1-MS1-0-0.5Z	BH1-MS2-0.5-1.0Z	RDL	MDL	QC Batch
PCBs									
Aroclor 1016	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1221	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1232	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1248	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1242	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1254	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1260	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Calculated Total PCB	mg/kg	ND		ND	ND	ND	0.010	N/A	4295264
Surrogate Recovery (%)									
Decachlorobiphenyl	%	89	82	74 (1)	80	82			4299616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		BLI654	BLI655	BLI656	BLI657	BLI658			
Sampling Date		2015/11/26	2015/11/28	2015/11/30	2015/11/30	2015/11/30			
COC Number		B144676	B144676	B144676	B144676	B144676			
	UNITS	BH1-MS3-1.0-1.5Z	BH2-OB1	BH2-MS1-0-1.0Z	BH2-MS2-1.0-2.0Z	BH2-MS3-2.0-3.0Z	RDL	MDL	QC Batch
PCBs									
Aroclor 1016	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1221	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1232	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1248	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1242	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1254	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Aroclor 1260	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4299616
Calculated Total PCB	mg/kg	ND	ND	ND	ND	ND	0.010	N/A	4295264
Surrogate Recovery (%)									
Decachlorobiphenyl	%	96	92	87 (1)	86	84			4299616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam ID		BLI659			
Sampling Date		2015/11/29			
COC Number		B144676			
	UNITS	BH3-OB1	RDL	MDL	QC Batch
PCBs					
Aroclor 1016	mg/kg	ND	0.010	N/A	4299616
Aroclor 1221	mg/kg	ND	0.010	N/A	4299616
Aroclor 1232	mg/kg	ND	0.010	N/A	4299616
Aroclor 1248	mg/kg	ND	0.010	N/A	4299616
Aroclor 1242	mg/kg	ND	0.010	N/A	4299616
Aroclor 1254	mg/kg	ND	0.010	N/A	4299616
Aroclor 1260	mg/kg	ND	0.010	N/A	4299616
Calculated Total PCB	mg/kg	ND	0.010	N/A	4295264
Surrogate Recovery (%)					
Decachlorobiphenyl	%	87			4299616

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		BLI650	BLI651	BLI652	BLI653			
Sampling Date		2015/11/26	2015/11/26	2015/11/26	2015/11/26			
COC Number		B144676	B144676	B144676	B144676			
	UNITS	BH1-OB1	BH1-CP1-0-1.5Z	BH1-MS1-0-0.5Z	BH1-MS2-0.5-1.0Z	RDL	MDL	QC Batch
Metals								
Acid Extractable Aluminum (Al)	mg/kg	6500	6500	6800	6600	10	N/A	4301673
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	ND	2.0	N/A	4301673
Acid Extractable Arsenic (As)	mg/kg	4.2	3.9	5.8	3.3	2.0	N/A	4301673
Acid Extractable Barium (Ba)	mg/kg	19	13	16	12	5.0	N/A	4301673
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	ND	2.0	N/A	4301673
Acid Extractable Boron (B)	mg/kg	ND	110	140	190	50	N/A	4301673
Acid Extractable Cadmium (Cd)	mg/kg	0.83	1.1	2.7	0.95	0.30	N/A	4301673
Acid Extractable Chromium (Cr)	mg/kg	13	18	19	19	2.0	N/A	4301673
Acid Extractable Cobalt (Co)	mg/kg	4.4	4.9	4.7	4.2	1.0	N/A	4301673
Acid Extractable Copper (Cu)	mg/kg	7.3	9.8	15	9.5	2.0	N/A	4301673
Acid Extractable Iron (Fe)	mg/kg	8900	20000	14000	12000	50	N/A	4301673
Acid Extractable Lead (Pb)	mg/kg	11	4.3	8.0	2.5	0.50	N/A	4301673
Acid Extractable Manganese (Mn)	mg/kg	200	260	210	200	2.0	N/A	4301673
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	ND	0.10	N/A	4301673
Acid Extractable Molybdenum (Mo)	mg/kg	3.4	8.6	13	10	2.0	N/A	4301673
Acid Extractable Nickel (Ni)	mg/kg	11	14	15	14	2.0	N/A	4301673
Acid Extractable Selenium (Se)	mg/kg	ND	ND	2.1	ND	1.0	N/A	4301673
Acid Extractable Silver (Ag)	mg/kg	ND	ND	ND	ND	0.50	N/A	4301673
Acid Extractable Strontium (Sr)	mg/kg	28	36	40	36	5.0	N/A	4301673
Acid Extractable Thallium (Tl)	mg/kg	0.26	0.21	0.42	0.23	0.10	N/A	4301673
Acid Extractable Tin (Sn)	mg/kg	7.3	9.3	24	ND	2.0	N/A	4301673
Acid Extractable Uranium (U)	mg/kg	1.8	3.2	4.0	3.9	0.10	N/A	4301673
Acid Extractable Vanadium (V)	mg/kg	17	22	22	24	2.0	N/A	4301673
Acid Extractable Zinc (Zn)	mg/kg	39	55	150	26	5.0	N/A	4301673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		BLI654	BLI655		BLI656	BLI657			
Sampling Date		2015/11/26	2015/11/28		2015/11/30	2015/11/30			
COC Number		B144676	B144676		B144676	B144676			
	UNITS	BH1-MS3-1.0-1.5Z	BH2-OB1	QC Batch	BH2-MS1-0-1.0Z	BH2-MS2-1.0-2.0Z	RDL	MDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	6100	4600	4301673	6300	6000	10	N/A	4303096
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	4301673	ND	ND	2.0	N/A	4303096
Acid Extractable Arsenic (As)	mg/kg	2.2	11	4301673	7.2	3.8	2.0	N/A	4303096
Acid Extractable Barium (Ba)	mg/kg	8.1	18	4301673	19	12	5.0	N/A	4303096
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	4301673	ND	ND	2.0	N/A	4303096
Acid Extractable Boron (B)	mg/kg	ND	110	4301673	190	210	50	N/A	4303096
Acid Extractable Cadmium (Cd)	mg/kg	ND	2.0	4301673	3.9	1.3	0.30	N/A	4303096
Acid Extractable Chromium (Cr)	mg/kg	17	12	4301673	19	18	2.0	N/A	4303096
Acid Extractable Cobalt (Co)	mg/kg	4.4	3.2	4301673	4.4	3.9	1.0	N/A	4303096
Acid Extractable Copper (Cu)	mg/kg	4.2	11	4301673	15	9.7	2.0	N/A	4303096
Acid Extractable Iron (Fe)	mg/kg	11000	8200	4301673	10000	11000	50	N/A	4303096
Acid Extractable Lead (Pb)	mg/kg	1.7	9.9	4301673	5.3	2.6	0.50	N/A	4303096
Acid Extractable Manganese (Mn)	mg/kg	220	140	4301673	180	180	2.0	N/A	4303096
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	4301673	ND	ND	0.10	N/A	4303096
Acid Extractable Molybdenum (Mo)	mg/kg	2.2	6.6	4301673	14	11	2.0	N/A	4303096
Acid Extractable Nickel (Ni)	mg/kg	12	10	4301673	18	14	2.0	N/A	4303096
Acid Extractable Selenium (Se)	mg/kg	ND	1.6	4301673	2.4	1.1	1.0	N/A	4303096
Acid Extractable Silver (Ag)	mg/kg	ND	ND	4301673	ND	ND	0.50	N/A	4303096
Acid Extractable Strontium (Sr)	mg/kg	12	170	4301673	130	37	5.0	N/A	4303096
Acid Extractable Thallium (Tl)	mg/kg	ND	0.32	4301673	0.43	0.21	0.10	N/A	4303096
Acid Extractable Tin (Sn)	mg/kg	ND	ND	4301673	ND	ND	2.0	N/A	4303096
Acid Extractable Uranium (U)	mg/kg	1.1	2.2	4301673	4.4	4.2	0.10	N/A	4303096
Acid Extractable Vanadium (V)	mg/kg	21	17	4301673	23	23	2.0	N/A	4303096
Acid Extractable Zinc (Zn)	mg/kg	24	93	4301673	45	25	5.0	N/A	4303096

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		BLI658	BLI659			
Sampling Date		2015/11/30	2015/11/29			
COC Number		B144676	B144676			
	UNITS	BH2-MS3-2.0-3.0Z	BH3-OB1	RDL	MDL	QC Batch
Metals						
Acid Extractable Aluminum (Al)	mg/kg	5900	4500	10	N/A	4303096
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	2.0	N/A	4303096
Acid Extractable Arsenic (As)	mg/kg	3.2	5.0	2.0	N/A	4303096
Acid Extractable Barium (Ba)	mg/kg	12	13	5.0	N/A	4303096
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	2.0	N/A	4303096
Acid Extractable Boron (B)	mg/kg	190	54	50	N/A	4303096
Acid Extractable Cadmium (Cd)	mg/kg	1.7	1.1	0.30	N/A	4303096
Acid Extractable Chromium (Cr)	mg/kg	18	9.9	2.0	N/A	4303096
Acid Extractable Cobalt (Co)	mg/kg	3.9	2.9	1.0	N/A	4303096
Acid Extractable Copper (Cu)	mg/kg	10	6.8	2.0	N/A	4303096
Acid Extractable Iron (Fe)	mg/kg	10000	6500	50	N/A	4303096
Acid Extractable Lead (Pb)	mg/kg	2.2	3.4	0.50	N/A	4303096
Acid Extractable Manganese (Mn)	mg/kg	170	140	2.0	N/A	4303096
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	0.10	N/A	4303096
Acid Extractable Molybdenum (Mo)	mg/kg	11	4.3	2.0	N/A	4303096
Acid Extractable Nickel (Ni)	mg/kg	14	8.6	2.0	N/A	4303096
Acid Extractable Selenium (Se)	mg/kg	1.2	ND	1.0	N/A	4303096
Acid Extractable Silver (Ag)	mg/kg	ND	ND	0.50	N/A	4303096
Acid Extractable Strontium (Sr)	mg/kg	42	22	5.0	N/A	4303096
Acid Extractable Thallium (Tl)	mg/kg	0.23	0.24	0.10	N/A	4303096
Acid Extractable Tin (Sn)	mg/kg	ND	ND	2.0	N/A	4303096
Acid Extractable Uranium (U)	mg/kg	4.1	1.6	0.10	N/A	4303096
Acid Extractable Vanadium (V)	mg/kg	22	13	2.0	N/A	4303096
Acid Extractable Zinc (Zn)	mg/kg	26	22	5.0	N/A	4303096

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		BLI650	BLI651	BLI652		BLI653			
Sampling Date		2015/11/26	2015/11/26	2015/11/26		2015/11/26			
COC Number		B144676	B144676	B144676		B144676			
	UNITS	BH1-OB1	BH1-CP1-0-1.5Z	BH1-MS1-0-0.5Z	QC Batch	BH1-MS2-0.5-1.0Z	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	0.038	ND	ND	4303094	ND	0.0050	N/A	4299146
2-Methylnaphthalene	mg/kg	0.065	ND	ND	4303094	ND	0.0050	N/A	4299146
Acenaphthene	mg/kg	0.040	ND	ND	4303094	ND	0.0050	N/A	4299146
Acenaphthylene	mg/kg	0.050	ND	ND	4303094	ND	0.0050	N/A	4299146
Anthracene	mg/kg	0.36	0.011	0.021	4303094	ND	0.0050	N/A	4299146
Benzo(a)anthracene	mg/kg	0.49	0.033	0.057	4303094	ND	0.0050	N/A	4299146
Benzo(a)pyrene	mg/kg	0.37	0.026	0.040	4303094	ND	0.0050	N/A	4299146
Benzo(b)fluoranthene	mg/kg	0.28	0.024	0.035	4303094	ND	0.0050	N/A	4299146
Benzo(g,h,i)perylene	mg/kg	0.19	0.015	0.018	4303094	ND	0.0050	N/A	4299146
Benzo(j)fluoranthene	mg/kg	0.17	0.014	0.022	4303094	ND	0.0050	N/A	4299146
Benzo(k)fluoranthene	mg/kg	0.15	0.013	0.021	4303094	ND	0.0050	N/A	4299146
Chrysene	mg/kg	0.47	0.037	0.052	4303094	ND	0.0050	N/A	4299146
Dibenz(a,h)anthracene	mg/kg	0.053	ND	ND	4303094	ND	0.0050	N/A	4299146
Fluoranthene	mg/kg	1.4	0.12	0.14	4303094	ND	0.0050	N/A	4299146
Fluorene	mg/kg	0.32	ND	ND	4303094	ND	0.0050	N/A	4299146
Indeno(1,2,3-cd)pyrene	mg/kg	0.17	0.013	0.018	4303094	ND	0.0050	N/A	4299146
Naphthalene	mg/kg	0.070	ND	ND	4303094	ND	0.0050	N/A	4299146
Perylene	mg/kg	0.10	0.071	0.034	4303094	0.12	0.0050	N/A	4299146
Phenanthrene	mg/kg	1.7	0.085	0.074	4303094	ND	0.0050	N/A	4299146
Pyrene	mg/kg	1.0	0.090	0.11	4303094	ND	0.0050	N/A	4299146
Surrogate Recovery (%)									
D10-Anthracene	%	86	89	80	4303094	91			4299146
D14-Terphenyl	%	99	106	95	4303094	92			4299146
D8-Acenaphthylene	%	83	78	77	4303094	81			4299146

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		BLI654	BLI655	BLI656	BLI657	BLI657			
Sampling Date		2015/11/26	2015/11/28	2015/11/30	2015/11/30	2015/11/30			
COC Number		B144676	B144676	B144676	B144676	B144676			
	UNITS	BH1-MS3-1.0-1.5Z	BH2-OB1	BH2-MS1-0-1.0Z	BH2-MS2-1.0-2.0Z	BH2-MS2-1.0-2.0Z Lab-Dup	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
2-Methylnaphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
Acenaphthene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
Acenaphthylene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
Anthracene	mg/kg	ND	0.048	0.019	ND	ND	0.0050	N/A	4303094
Benzo(a)anthracene	mg/kg	ND	0.086	0.041	ND	ND	0.0050	N/A	4303094
Benzo(a)pyrene	mg/kg	ND	0.064	0.028	ND	ND	0.0050	N/A	4303094
Benzo(b)fluoranthene	mg/kg	ND	0.060	0.024	ND	ND	0.0050	N/A	4303094
Benzo(g,h,i)perylene	mg/kg	ND	0.037	ND	ND	ND	0.0050	N/A	4303094
Benzo(j)fluoranthene	mg/kg	ND	0.034	0.015	ND	ND	0.0050	N/A	4303094
Benzo(k)fluoranthene	mg/kg	ND	0.029	ND	ND	ND	0.0050	N/A	4303094
Chrysene	mg/kg	ND	0.079	0.039	ND	ND	0.0050	N/A	4303094
Dibenz(a,h)anthracene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
Fluoranthene	mg/kg	ND	0.28	0.14	ND	ND	0.0050	N/A	4303094
Fluorene	mg/kg	ND	0.021	ND	ND	ND	0.0050	N/A	4303094
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.033	ND	ND	ND	0.0050	N/A	4303094
Naphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	N/A	4303094
Perylene	mg/kg	0.014	0.032	0.10	0.088	0.075	0.0050	N/A	4303094
Phenanthrene	mg/kg	ND	0.18	0.094	ND	ND	0.0050	N/A	4303094
Pyrene	mg/kg	ND	0.20	0.11	ND	ND	0.0050	N/A	4303094
Surrogate Recovery (%)									
D10-Anthracene	%	84	84	88	85	79			4303094
D14-Terphenyl	%	90	98	92	91	96			4303094
D8-Acenaphthylene	%	84	83	83	82	76			4303094

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		BLI658	BLI659			
Sampling Date		2015/11/30	2015/11/29			
COC Number		B144676	B144676			
	UNITS	BH2-MS3-2.0-3.0Z	BH3-OB1	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	ND	ND	0.0050	N/A	4303094
2-Methylnaphthalene	mg/kg	ND	ND	0.0050	N/A	4303094
Acenaphthene	mg/kg	ND	ND	0.0050	N/A	4303094
Acenaphthylene	mg/kg	ND	ND	0.0050	N/A	4303094
Anthracene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(a)anthracene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(a)pyrene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(b)fluoranthene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(g,h,i)perylene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(j)fluoranthene	mg/kg	ND	ND	0.0050	N/A	4303094
Benzo(k)fluoranthene	mg/kg	ND	ND	0.0050	N/A	4303094
Chrysene	mg/kg	ND	ND	0.0050	N/A	4303094
Dibenz(a,h)anthracene	mg/kg	ND	ND	0.0050	N/A	4303094
Fluoranthene	mg/kg	ND	0.013	0.0050	N/A	4303094
Fluorene	mg/kg	ND	ND	0.0050	N/A	4303094
Indeno(1,2,3-cd)pyrene	mg/kg	ND	ND	0.0050	N/A	4303094
Naphthalene	mg/kg	ND	ND	0.0050	N/A	4303094
Perylene	mg/kg	0.094	ND	0.0050	N/A	4303094
Phenanthrene	mg/kg	ND	ND	0.0050	N/A	4303094
Pyrene	mg/kg	ND	0.0092	0.0050	N/A	4303094
Surrogate Recovery (%)						
D10-Anthracene	%	82	81			4303094
D14-Terphenyl	%	91	98			4303094
D8-Acenaphthylene	%	78	81			4303094

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

GENERAL COMMENTS

Revised report - Additional silica gel and TEH analysis added to sample BH2-OB1 as per request from Cathy. HM Dec 16/15

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4298945	LLC	Matrix Spike	Isobutylbenzene - Volatile	2015/12/06		101	%	60 - 130
			Benzene	2015/12/06		107	%	60 - 130
			Toluene	2015/12/06		105	%	60 - 130
			Ethylbenzene	2015/12/06		129	%	60 - 130
			Total Xylenes	2015/12/06		NC	%	60 - 130
4298945	LLC	Spiked Blank	Isobutylbenzene - Volatile	2015/12/06		96	%	60 - 130
			Benzene	2015/12/06		83	%	60 - 140
			Toluene	2015/12/06		81	%	60 - 140
			Ethylbenzene	2015/12/06		81	%	60 - 140
			Total Xylenes	2015/12/06		79	%	60 - 140
4298945	LLC	Method Blank	Isobutylbenzene - Volatile	2015/12/06		100	%	60 - 130
			Benzene	2015/12/06	ND, RDL=0.025		mg/kg	
			Toluene	2015/12/06	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2015/12/06	ND, RDL=0.025		mg/kg	
			Total Xylenes	2015/12/06	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2015/12/06	ND, RDL=2.5		mg/kg	
4298945	LLC	RPD	Benzene	2015/12/06	NC		%	50
			Toluene	2015/12/06	NC		%	50
			Ethylbenzene	2015/12/06	37		%	50
			Total Xylenes	2015/12/06	33		%	50
			C6 - C10 (less BTEX)	2015/12/06	44		%	50
4299080	KCR	Matrix Spike	Isobutylbenzene - Extractable	2015/12/04		94	%	30 - 130
			n-Dotriacontane - Extractable	2015/12/04		99	%	30 - 130
			>C10-C16 Hydrocarbons	2015/12/04		82	%	30 - 130
			>C16-C21 Hydrocarbons	2015/12/04		79	%	30 - 130
			>C21-<C32 Hydrocarbons	2015/12/04		93	%	30 - 130
4299080	KCR	Spiked Blank	Isobutylbenzene - Extractable	2015/12/04		96	%	30 - 130
			n-Dotriacontane - Extractable	2015/12/04		91	%	30 - 130
			>C10-C16 Hydrocarbons	2015/12/04		85	%	30 - 130
			>C16-C21 Hydrocarbons	2015/12/04		78	%	30 - 130
			>C21-<C32 Hydrocarbons	2015/12/04		92	%	30 - 130
4299080	KCR	Method Blank	Isobutylbenzene - Extractable	2015/12/04		97	%	30 - 130
			n-Dotriacontane - Extractable	2015/12/04		94	%	30 - 130
			>C10-C16 Hydrocarbons	2015/12/04	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2015/12/04	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2015/12/04	ND, RDL=15		mg/kg	
4299080	KCR	RPD	>C10-C16 Hydrocarbons	2015/12/04	NC		%	50
			>C16-C21 Hydrocarbons	2015/12/04	NC		%	50
			>C21-<C32 Hydrocarbons	2015/12/04	NC		%	50
4299146	KBT	Matrix Spike	D10-Anthracene	2015/12/07		93	%	30 - 130
			D14-Terphenyl	2015/12/07		92	%	30 - 130
			D8-Acenaphthylene	2015/12/07		92	%	30 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1-Methylnaphthalene	2015/12/07		91	%	30 - 130
			2-Methylnaphthalene	2015/12/07		97	%	30 - 130
			Acenaphthene	2015/12/07		108	%	30 - 130
			Acenaphthylene	2015/12/07		108	%	30 - 130
			Anthracene	2015/12/07		121	%	30 - 130
			Benzo(a)anthracene	2015/12/07		NC	%	30 - 130
			Benzo(a)pyrene	2015/12/07		NC	%	30 - 130
			Benzo(b)fluoranthene	2015/12/07		NC	%	30 - 130
			Benzo(g,h,i)perylene	2015/12/07		NC	%	30 - 130
			Benzo(j)fluoranthene	2015/12/07		134 (1)	%	30 - 130
			Benzo(k)fluoranthene	2015/12/07		108	%	30 - 130
			Chrysene	2015/12/07		NC	%	30 - 130
			Dibenz(a,h)anthracene	2015/12/07		105	%	30 - 130
			Fluoranthene	2015/12/07		NC	%	30 - 130
			Fluorene	2015/12/07		110	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/12/07		126	%	30 - 130
			Naphthalene	2015/12/07		100	%	30 - 130
			Perylene	2015/12/07		117	%	30 - 130
			Phenanthrene	2015/12/07		99	%	30 - 130
			Pyrene	2015/12/07		NC	%	30 - 130
4299146	KBT	Spiked Blank	D10-Anthracene	2015/12/06		89	%	30 - 130
			D14-Terphenyl	2015/12/06		94	%	30 - 130
			D8-Acenaphthylene	2015/12/06		85	%	30 - 130
			1-Methylnaphthalene	2015/12/06		98	%	30 - 130
			2-Methylnaphthalene	2015/12/06		106	%	30 - 130
			Acenaphthene	2015/12/06		104	%	30 - 130
			Acenaphthylene	2015/12/06		102	%	30 - 130
			Anthracene	2015/12/06		94	%	30 - 130
			Benzo(a)anthracene	2015/12/06		93	%	30 - 130
			Benzo(a)pyrene	2015/12/06		104	%	30 - 130
			Benzo(b)fluoranthene	2015/12/06		103	%	30 - 130
			Benzo(g,h,i)perylene	2015/12/06		100	%	30 - 130
			Benzo(j)fluoranthene	2015/12/06		103	%	30 - 130
			Benzo(k)fluoranthene	2015/12/06		96	%	30 - 130
			Chrysene	2015/12/06		98	%	30 - 130
			Dibenz(a,h)anthracene	2015/12/06		94	%	30 - 130
			Fluoranthene	2015/12/06		111	%	30 - 130
			Fluorene	2015/12/06		104	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/12/06		96	%	30 - 130
			Naphthalene	2015/12/06		107	%	30 - 130
			Perylene	2015/12/06		100	%	30 - 130
			Phenanthrene	2015/12/06		110	%	30 - 130
			Pyrene	2015/12/06		105	%	30 - 130
4299146	KBT	Method Blank	D10-Anthracene	2015/12/06		92	%	30 - 130
			D14-Terphenyl	2015/12/06		94	%	30 - 130
			D8-Acenaphthylene	2015/12/06		91	%	30 - 130
			1-Methylnaphthalene	2015/12/06	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2015/12/06	ND, RDL=0.0050		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Anthracene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Chrysene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Fluorene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Naphthalene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Perylene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2015/12/06	ND, RDL=0.0050		mg/kg	
			Pyrene	2015/12/06	ND, RDL=0.0050		mg/kg	
4299146	KBT	RPD	1-Methylnaphthalene	2015/12/06	NC		%	50
			2-Methylnaphthalene	2015/12/06	NC		%	50
			Acenaphthene	2015/12/06	NC		%	50
			Acenaphthylene	2015/12/06	NC		%	50
			Anthracene	2015/12/06	NC		%	50
			Benzo(a)anthracene	2015/12/06	14		%	50
			Benzo(a)pyrene	2015/12/06	7.8		%	50
			Benzo(b)fluoranthene	2015/12/06	2.0		%	50
			Benzo(g,h,i)perylene	2015/12/06	13		%	50
			Benzo(j)fluoranthene	2015/12/06	8.7		%	50
			Benzo(k)fluoranthene	2015/12/06	12		%	50
			Chrysene	2015/12/06	4.8		%	50
			Dibenz(a,h)anthracene	2015/12/06	NC		%	50

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Fluoranthene	2015/12/06	11		%	50
			Fluorene	2015/12/06	NC		%	50
			Indeno(1,2,3-cd)pyrene	2015/12/06	4.6		%	50
			Naphthalene	2015/12/06	NC		%	50
			Perylene	2015/12/06	2.5		%	50
			Phenanthrene	2015/12/06	10		%	50
			Pyrene	2015/12/06	11		%	50
4299616	LGE	Matrix Spike [BLI650-01]	Decachlorobiphenyl	2015/12/08		86	%	70 - 130
			Aroclor 1254	2015/12/08		78	%	30 - 130
4299616	LGE	Spiked Blank	Decachlorobiphenyl	2015/12/08		88	%	70 - 130
			Aroclor 1254	2015/12/08		72	%	30 - 130
4299616	LGE	Method Blank	Decachlorobiphenyl	2015/12/08		99	%	70 - 130
			Aroclor 1016	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1221	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1232	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1248	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1242	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1254	2015/12/08	ND, RDL=0.010		mg/kg	
			Aroclor 1260	2015/12/08	ND, RDL=0.010		mg/kg	
4299616	LGE	RPD [BLI650-01]	Aroclor 1016	2015/12/08	NC		%	50
			Aroclor 1221	2015/12/08	NC		%	50
			Aroclor 1232	2015/12/08	NC		%	50
			Aroclor 1248	2015/12/08	NC		%	50
			Aroclor 1242	2015/12/08	NC		%	50
			Aroclor 1254	2015/12/08	NC		%	50
			Aroclor 1260	2015/12/08	NC		%	50
4299622	LLC	Matrix Spike [BLI654-01]	Isobutylbenzene - Volatile	2015/12/05		108	%	60 - 130
			Benzene	2015/12/05		127	%	60 - 130
			Toluene	2015/12/05		123	%	60 - 130
			Ethylbenzene	2015/12/05		123	%	60 - 130
			Total Xylenes	2015/12/05		117	%	60 - 130
4299622	LLC	Spiked Blank	Isobutylbenzene - Volatile	2015/12/05		85	%	60 - 130
			Benzene	2015/12/05		82	%	60 - 140
			Toluene	2015/12/05		80	%	60 - 140
			Ethylbenzene	2015/12/05		80	%	60 - 140
			Total Xylenes	2015/12/05		78	%	60 - 140
4299622	LLC	Method Blank	Isobutylbenzene - Volatile	2015/12/05		108	%	60 - 130
			Benzene	2015/12/05	ND, RDL=0.025		mg/kg	
			Toluene	2015/12/05	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2015/12/05	ND, RDL=0.025		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Xylenes	2015/12/05	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2015/12/05	ND, RDL=2.5		mg/kg	
4299622	LLC	RPD [BLI654-01]	Benzene	2015/12/05	NC		%	50
			Toluene	2015/12/05	NC		%	50
			Ethylbenzene	2015/12/05	NC		%	50
			Total Xylenes	2015/12/05	NC		%	50
			C6 - C10 (less BTEX)	2015/12/05	NC		%	50
4301436	LLC	Matrix Spike	Isobutylbenzene - Volatile	2015/12/09		95	%	60 - 130
			Benzene	2015/12/09		NC	%	60 - 130
			Toluene	2015/12/09		NC	%	60 - 130
			Ethylbenzene	2015/12/09		NC	%	60 - 130
			Total Xylenes	2015/12/09		NC	%	60 - 130
4301436	LLC	Spiked Blank	Isobutylbenzene - Volatile	2015/12/08		111	%	60 - 130
			Benzene	2015/12/08		96	%	60 - 140
			Toluene	2015/12/08		93	%	60 - 140
			Ethylbenzene	2015/12/08		96	%	60 - 140
			Total Xylenes	2015/12/08		94	%	60 - 140
4301436	LLC	Method Blank	Isobutylbenzene - Volatile	2015/12/08		93	%	60 - 130
			Benzene	2015/12/08	ND, RDL=0.025		mg/kg	
			Toluene	2015/12/08	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2015/12/08	ND, RDL=0.025		mg/kg	
			Total Xylenes	2015/12/08	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2015/12/08	ND, RDL=2.5		mg/kg	
4301436	LLC	RPD	Benzene	2015/12/09	NC		%	50
			Toluene	2015/12/09	10		%	50
			Ethylbenzene	2015/12/09	7.5		%	50
			Total Xylenes	2015/12/09	7.4		%	50
			C6 - C10 (less BTEX)	2015/12/09	15		%	50
4301673	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2015/12/07		86	%	75 - 125
			Acid Extractable Arsenic (As)	2015/12/07		98	%	75 - 125
			Acid Extractable Barium (Ba)	2015/12/07		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/12/07		101	%	75 - 125
			Acid Extractable Boron (B)	2015/12/07		94	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/12/07		98	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/12/07		95	%	75 - 125
			Acid Extractable Cobalt (Co)	2015/12/07		98	%	75 - 125
			Acid Extractable Copper (Cu)	2015/12/07		NC	%	75 - 125
			Acid Extractable Lead (Pb)	2015/12/07		97	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/12/07		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/12/07		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/12/07		98	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/12/07		95	%	75 - 125
			Acid Extractable Selenium (Se)	2015/12/07		98	%	75 - 125

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Silver (Ag)	2015/12/07		101	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/12/07		NC	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/12/07		100	%	75 - 125
			Acid Extractable Tin (Sn)	2015/12/07		100	%	75 - 125
			Acid Extractable Uranium (U)	2015/12/07		102	%	75 - 125
			Acid Extractable Vanadium (V)	2015/12/07		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2015/12/07		NC	%	75 - 125
4301673	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2015/12/07		96	%	75 - 125
			Acid Extractable Arsenic (As)	2015/12/07		99	%	75 - 125
			Acid Extractable Barium (Ba)	2015/12/07		95	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/12/07		97	%	75 - 125
			Acid Extractable Boron (B)	2015/12/07		96	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/12/07		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/12/07		99	%	75 - 125
			Acid Extractable Cobalt (Co)	2015/12/07		99	%	75 - 125
			Acid Extractable Copper (Cu)	2015/12/07		97	%	75 - 125
			Acid Extractable Lead (Pb)	2015/12/07		97	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/12/07		97	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/12/07		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/12/07		96	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/12/07		97	%	75 - 125
			Acid Extractable Selenium (Se)	2015/12/07		98	%	75 - 125
			Acid Extractable Silver (Ag)	2015/12/07		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/12/07		97	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/12/07		98	%	75 - 125
			Acid Extractable Tin (Sn)	2015/12/07		97	%	75 - 125
			Acid Extractable Uranium (U)	2015/12/07		101	%	75 - 125
			Acid Extractable Vanadium (V)	2015/12/07		97	%	75 - 125
			Acid Extractable Zinc (Zn)	2015/12/07		99	%	75 - 125
4301673	BAN	Method Blank	Acid Extractable Aluminum (Al)	2015/12/07	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2015/12/07	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2015/12/07	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2015/12/07	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2015/12/07	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2015/12/07	ND, RDL=2.0		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Iron (Fe)	2015/12/07	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2015/12/07	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2015/12/07	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2015/12/07	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2015/12/07	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2015/12/07	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2015/12/07	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2015/12/07	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2015/12/07	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2015/12/07	ND, RDL=5.0		mg/kg	
4301673	BAN	RPD	Acid Extractable Aluminum (Al)	2015/12/07	6.6		%	35
			Acid Extractable Antimony (Sb)	2015/12/07	NC		%	35
			Acid Extractable Arsenic (As)	2015/12/07	NC		%	35
			Acid Extractable Barium (Ba)	2015/12/07	6.8		%	35
			Acid Extractable Beryllium (Be)	2015/12/07	NC		%	35
			Acid Extractable Boron (B)	2015/12/07	NC		%	35
			Acid Extractable Cadmium (Cd)	2015/12/07	NC		%	35
			Acid Extractable Chromium (Cr)	2015/12/07	20		%	35
			Acid Extractable Cobalt (Co)	2015/12/07	7.0		%	35
			Acid Extractable Copper (Cu)	2015/12/07	7.8		%	35
			Acid Extractable Iron (Fe)	2015/12/07	8.0		%	35
			Acid Extractable Lead (Pb)	2015/12/07	NC		%	35
			Acid Extractable Manganese (Mn)	2015/12/07	6.9		%	35
			Acid Extractable Mercury (Hg)	2015/12/07	NC		%	35
			Acid Extractable Molybdenum (Mo)	2015/12/07	NC		%	35
			Acid Extractable Nickel (Ni)	2015/12/07	NC		%	35
			Acid Extractable Selenium (Se)	2015/12/07	NC		%	35
			Acid Extractable Silver (Ag)	2015/12/07	NC		%	35
			Acid Extractable Strontium (Sr)	2015/12/07	5.4		%	35
			Acid Extractable Thallium (Tl)	2015/12/07	NC		%	35
			Acid Extractable Tin (Sn)	2015/12/07	NC		%	35
			Acid Extractable Uranium (U)	2015/12/07	NC		%	35

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Vanadium (V)	2015/12/07	8.3		%	35
			Acid Extractable Zinc (Zn)	2015/12/07	8.3		%	35
4301758	XQI	Matrix Spike	Free Cyanide	2015/12/09		104	%	75 - 125
4301758	XQI	Spiked Blank	Free Cyanide	2015/12/09		105	%	80 - 120
4301758	XQI	Method Blank	Free Cyanide	2015/12/09	ND, RDL=0.01		ug/g	
4301758	XQI	RPD	Free Cyanide	2015/12/09	NC		%	35
4301760	CP	Matrix Spike	Free Cyanide	2015/12/08		99	%	75 - 125
4301760	CP	Spiked Blank	Free Cyanide	2015/12/08		103	%	80 - 120
4301760	CP	Method Blank	Free Cyanide	2015/12/08	ND, RDL=0.01		ug/g	
4301760	CP	RPD	Free Cyanide	2015/12/08	NC		%	35
4303094	KBT	Matrix Spike [BLI657-01]	D10-Anthracene	2015/12/10		82	%	30 - 130
			D14-Terphenyl	2015/12/10		90	%	30 - 130
			D8-Acenaphthylene	2015/12/10		75	%	30 - 130
			1-Methylnaphthalene	2015/12/10		86	%	30 - 130
			2-Methylnaphthalene	2015/12/10		98	%	30 - 130
			Acenaphthene	2015/12/10		99	%	30 - 130
			Acenaphthylene	2015/12/10		88	%	30 - 130
			Anthracene	2015/12/10		104	%	30 - 130
			Benzo(a)anthracene	2015/12/10		103	%	30 - 130
			Benzo(a)pyrene	2015/12/10		95	%	30 - 130
			Benzo(b)fluoranthene	2015/12/10		101	%	30 - 130
			Benzo(g,h,i)perylene	2015/12/10		87	%	30 - 130
			Benzo(j)fluoranthene	2015/12/10		98	%	30 - 130
			Benzo(k)fluoranthene	2015/12/10		94	%	30 - 130
			Chrysene	2015/12/10		103	%	30 - 130
			Dibenz(a,h)anthracene	2015/12/10		85	%	30 - 130
			Fluoranthene	2015/12/10		124	%	30 - 130
			Fluorene	2015/12/10		102	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/12/10		86	%	30 - 130
			Naphthalene	2015/12/10		98	%	30 - 130
			Perylene	2015/12/10		NC	%	30 - 130
			Phenanthrene	2015/12/10		106	%	30 - 130
			Pyrene	2015/12/10		122	%	30 - 130
4303094	KBT	Spiked Blank	D10-Anthracene	2015/12/10		79	%	30 - 130
			D14-Terphenyl	2015/12/10		87	%	30 - 130
			D8-Acenaphthylene	2015/12/10		80	%	30 - 130
			1-Methylnaphthalene	2015/12/10		94	%	30 - 130
			2-Methylnaphthalene	2015/12/10		99	%	30 - 130
			Acenaphthene	2015/12/10		100	%	30 - 130
			Acenaphthylene	2015/12/10		99	%	30 - 130
			Anthracene	2015/12/10		105	%	30 - 130
			Benzo(a)anthracene	2015/12/10		97	%	30 - 130
			Benzo(a)pyrene	2015/12/10		82	%	30 - 130
			Benzo(b)fluoranthene	2015/12/10		85	%	30 - 130
			Benzo(g,h,i)perylene	2015/12/10		76	%	30 - 130
			Benzo(j)fluoranthene	2015/12/10		84	%	30 - 130
			Benzo(k)fluoranthene	2015/12/10		79	%	30 - 130
			Chrysene	2015/12/10		94	%	30 - 130
			Dibenz(a,h)anthracene	2015/12/10		65	%	30 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Fluoranthene	2015/12/10		108	%	30 - 130
			Fluorene	2015/12/10		103	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/12/10		67	%	30 - 130
			Naphthalene	2015/12/10		93	%	30 - 130
			Perylene	2015/12/10		79	%	30 - 130
			Phenanthrene	2015/12/10		108	%	30 - 130
			Pyrene	2015/12/10		106	%	30 - 130
4303094	KBT	Method Blank	D10-Anthracene	2015/12/10		84	%	30 - 130
			D14-Terphenyl	2015/12/10		94	%	30 - 130
			D8-Acenaphthylene	2015/12/10		82	%	30 - 130
			1-Methylnaphthalene	2015/12/10	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Acenaphthene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Anthracene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Chrysene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Fluorene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Naphthalene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Perylene	2015/12/10	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2015/12/10	ND, RDL=0.0050		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Pyrene	2015/12/10	ND, RDL=0.0050		mg/kg	
4303094	KBT	RPD [BLI657-01]	1-Methylnaphthalene	2015/12/10	NC		%	50
			2-Methylnaphthalene	2015/12/10	NC		%	50
			Acenaphthene	2015/12/10	NC		%	50
			Acenaphthylene	2015/12/10	NC		%	50
			Anthracene	2015/12/10	NC		%	50
			Benzo(a)anthracene	2015/12/10	NC		%	50
			Benzo(a)pyrene	2015/12/10	NC		%	50
			Benzo(b)fluoranthene	2015/12/10	NC		%	50
			Benzo(g,h,i)perylene	2015/12/10	NC		%	50
			Benzo(j)fluoranthene	2015/12/10	NC		%	50
			Benzo(k)fluoranthene	2015/12/10	NC		%	50
			Chrysene	2015/12/10	NC		%	50
			Dibenz(a,h)anthracene	2015/12/10	NC		%	50
			Fluoranthene	2015/12/10	NC		%	50
			Fluorene	2015/12/10	NC		%	50
			Indeno(1,2,3-cd)pyrene	2015/12/10	NC		%	50
			Naphthalene	2015/12/10	NC		%	50
			Perylene	2015/12/10	15		%	50
			Phenanthrene	2015/12/10	NC		%	50
			Pyrene	2015/12/10	NC		%	50
4303096	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2015/12/08		92	%	75 - 125
			Acid Extractable Arsenic (As)	2015/12/08		99	%	75 - 125
			Acid Extractable Barium (Ba)	2015/12/08		94	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/12/08		95	%	75 - 125
			Acid Extractable Boron (B)	2015/12/08		88	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/12/08		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/12/08		101	%	75 - 125
			Acid Extractable Cobalt (Co)	2015/12/08		97	%	75 - 125
			Acid Extractable Copper (Cu)	2015/12/08		91	%	75 - 125
			Acid Extractable Lead (Pb)	2015/12/08		95	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/12/08		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/12/08		91	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/12/08		91	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/12/08		96	%	75 - 125
			Acid Extractable Selenium (Se)	2015/12/08		96	%	75 - 125
			Acid Extractable Silver (Ag)	2015/12/08		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/12/08		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/12/08		97	%	75 - 125
			Acid Extractable Tin (Sn)	2015/12/08		93	%	75 - 125
			Acid Extractable Uranium (U)	2015/12/08		101	%	75 - 125
			Acid Extractable Vanadium (V)	2015/12/08		95	%	75 - 125
			Acid Extractable Zinc (Zn)	2015/12/08		98	%	75 - 125
4303096	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2015/12/08		99	%	75 - 125
			Acid Extractable Arsenic (As)	2015/12/08		98	%	75 - 125
			Acid Extractable Barium (Ba)	2015/12/08		95	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/12/08		97	%	75 - 125
			Acid Extractable Boron (B)	2015/12/08		96	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/12/08		98	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/12/08		100	%	75 - 125

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Cobalt (Co)	2015/12/08		100	%	75 - 125
			Acid Extractable Copper (Cu)	2015/12/08		98	%	75 - 125
			Acid Extractable Lead (Pb)	2015/12/08		98	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/12/08		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/12/08		98	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/12/08		97	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/12/08		101	%	75 - 125
			Acid Extractable Selenium (Se)	2015/12/08		99	%	75 - 125
			Acid Extractable Silver (Ag)	2015/12/08		102	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/12/08		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/12/08		101	%	75 - 125
			Acid Extractable Tin (Sn)	2015/12/08		101	%	75 - 125
			Acid Extractable Uranium (U)	2015/12/08		102	%	75 - 125
			Acid Extractable Vanadium (V)	2015/12/08		99	%	75 - 125
			Acid Extractable Zinc (Zn)	2015/12/08		101	%	75 - 125
4303096	BAN	Method Blank	Acid Extractable Aluminum (Al)	2015/12/08	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2015/12/08	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2015/12/08	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2015/12/08	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2015/12/08	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2015/12/08	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2015/12/08	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2015/12/08	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2015/12/08	ND, RDL=1.0		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Silver (Ag)	2015/12/08	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2015/12/08	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2015/12/08	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2015/12/08	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2015/12/08	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2015/12/08	ND, RDL=5.0		mg/kg	
4303096	BAN	RPD	Acid Extractable Aluminum (Al)	2015/12/08	13		%	35
			Acid Extractable Antimony (Sb)	2015/12/08	NC		%	35
			Acid Extractable Arsenic (As)	2015/12/08	NC		%	35
			Acid Extractable Barium (Ba)	2015/12/08	NC		%	35
			Acid Extractable Beryllium (Be)	2015/12/08	NC		%	35
			Acid Extractable Boron (B)	2015/12/08	NC		%	35
			Acid Extractable Cadmium (Cd)	2015/12/08	NC		%	35
			Acid Extractable Chromium (Cr)	2015/12/08	3.0		%	35
			Acid Extractable Cobalt (Co)	2015/12/08	NC		%	35
			Acid Extractable Copper (Cu)	2015/12/08	NC (2)		%	35
			Acid Extractable Iron (Fe)	2015/12/08	12		%	35
			Acid Extractable Lead (Pb)	2015/12/08	19		%	35
			Acid Extractable Manganese (Mn)	2015/12/08	6.3		%	35
			Acid Extractable Mercury (Hg)	2015/12/08	NC		%	35
			Acid Extractable Molybdenum (Mo)	2015/12/08	NC		%	35
			Acid Extractable Nickel (Ni)	2015/12/08	NC		%	35
			Acid Extractable Selenium (Se)	2015/12/08	NC		%	35
			Acid Extractable Silver (Ag)	2015/12/08	NC		%	35
			Acid Extractable Strontium (Sr)	2015/12/08	NC		%	35
			Acid Extractable Thallium (Tl)	2015/12/08	NC		%	35
			Acid Extractable Tin (Sn)	2015/12/08	NC		%	35
			Acid Extractable Uranium (U)	2015/12/08	4.9		%	35
			Acid Extractable Vanadium (V)	2015/12/08	15		%	35
			Acid Extractable Zinc (Zn)	2015/12/08	NC		%	35
4303508	TPE	RPD [BLI654-01]	Soluble (5:1) pH	2015/12/08	0.38		%	N/A
4317538	KCR	Spiked Blank	Isobutylbenzene - Extractable	2015/12/17		92	%	30 - 130
			n-Dotriacontane - Extractable	2015/12/17		92	%	30 - 130
			>C10-C16 Hydrocarbons	2015/12/17		101	%	30 - 130
			>C16-C21 Hydrocarbons	2015/12/17		105	%	30 - 130
			>C21-<C32 Hydrocarbons	2015/12/17		129	%	30 - 130
4317538	KCR	Method Blank	Isobutylbenzene - Extractable	2015/12/17		97	%	30 - 130
			n-Dotriacontane - Extractable	2015/12/17		106	%	30 - 130
			>C10-C16 Hydrocarbons	2015/12/17	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2015/12/17	ND, RDL=10		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			>C21-<C32 Hydrocarbons	2015/12/17	ND, RDL=15		mg/kg	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Matrix Spike: < 10 % of compounds in multi-component analysis in violation.

(2) Poor RPD due to sample inhomogeneity. < 10 % of compounds in multi-component analysis in violation.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B5O7095
Report Date: 2015/12/21

Public Works & Government Services Canada
Client Project #: R-049540-002
Site Location: DOVER, NL
Your P.O. #: CALL UP #86
Sampler Initials: FC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Eva Pranjic

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Mike MacGillivray

Mike MacGillivray, Scientific Specialist (Inorganics)

Philippe Deveau

Phil Deveau

RoseMarie MacDonald

Rosemarie MacDonald, Scientific Specialist (Organics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com