SPECIFICATION

LANTERN ROOM FLOOR REPAIRS
CAPE RACE, NL
PROJECT NUMBER: F6879-151000

OWNER/AGENT:

DEPARTMENT OF FISHERIES AND OCEANS
REAL PROPERTY, SAFETY AND SECURITY
ST. JOHN'S, NL A1C 5X1

PRIME CONSULTANT:

DILLON CONSULTING LIMITED
66 KENMOUNT ROAD, SUITE 203
ST. JOHN'S, NL A1B 3V7

DATE:

March 25, 2015

REGISTERED PROFESSIONAL ENGINEER
PEGNL Newfoundland and Labrador
STEPHEN PEARCE
SIGNATURE
03-25-15
DATE
NEWFOUNDLAND & LABRADOR

PROVINCE OF NEWFOUNDLAND AND LABRADOR
PEGNL Newfoundland and Labrador
PERMIT HOLDER
This Permit Allows
DILLON CONSULTING LIMITED
To Practice Professional Engineering in Newfoundland and Labrador.
Permit No. as issued by PEGNL D0161
which is valid for the year 2015

SPECIFICATION INDEX

LANTERN ROOM FLOOR REPAIRS
CAPE RACE, NL

This document is the document referred to as “Plans and Specifications” and marked “A” in the Articles of Agreement and includes the following:

DRAWING NO.	DESCRIPTION	DATE
01K1101A052S1	PLANS AND SECTIONS	MARCH 17, 2015
01K1101A052S2	SECTIONS	MARCH 17, 2015

END

.1 Scope

.1 The work covered under this project consists of the furnishing of all plant, labour, equipment, hardware and materials for Light Tower Lantern Room Floor Repairs at Cape Race, Newfoundland, complete in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of Contract.

.2 Description of Work

.1 The work will consist of, but will not necessarily be limited to, the following major work items at Cape Race Light Tower, Cape Race, Newfoundland:

.1 Sandblast all existing support jacks, deteriorated steel beam at top of stairs, supplementary steel at lantern floor level including steel support brackets, and supplementary steel at intermediate floor level.

.2 Supply and install steel upgrades to all support jacks, deteriorated steel beam at top of stairs, supplementary steel at lantern floor level, and supplementary steel at intermediate floor level.

.3 Re-paint existing steel and new upgrades as indicated.

.3 Site of Work

.1 The work is to be carried out in the Light Tower at Cape Race, NL, located on the Southeast end of the Avalon Peninsula.

.4 Project Overview

.1 The Cape Race lens was built in the early 1900's. It consists of a stationary lamp and rotating lens and base assembly mounted on a cast iron support on top of the lighthouse tower. The lens and base weigh 7 tons and float in an 1100-pound bath of liquid mercury. With ongoing investigations of the light tower, it was noted that the steel members beneath the concrete floor were badly corroded.

The contractor is requested to take special note of the *"Interim Personal Guidelines Associated with Mercury in DFO Lighthouses Containing or Previously Contained a Mercury Bath"* provided in the specifications and must ensure that this issue is addressed in their site specific Health and Safety plan.

Note on mandatory site pre-tender site visit:

DFO will schedule a mandatory site visit during the tender period. The site visit will occur over a one day period (Contractors wishing to visit site shall contact the Departmental Representative to obtain schedule). Contractor responsible for all costs associated with getting to/from the site in Cape Race. Note the following:

- If weather is poor on the scheduled site visit day, it will occur on the following day.
- A maximum of 2 persons per Contractor will be permitted entry into the building.
- Time allocated on site will be a maximum of 2 hours.
- 2 days advance notice is to be given to the Departmental Representative with respect to the company and individuals attending the visit.
- Contractor will be required to wear a half mask respirator with mercury vapour cartridge filters, in order to enter the light tower. The cost of the respirators and filters are the responsibility of the Contractor.

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The Site visit will occur within 8 calendars days after posting of the project.

END

. 1 Definition of Terms

.1 **"Engineer"**, unless otherwise stated, where used in the Specifications or the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

.2 Work Schedule

.1 Upon award of Contract and prior to mobilization, Contractor shall submit a schedule of work to Engineer. Each entry will show an intended start and completion using a horizontal bar graph method.

.2 Should Contractor find that the schedule cannot be maintained as originally intended, immediately submit a revised schedule without being requested to do so by Engineer.

.3 All work on the project shall be completed within the twelve (12) weeks of tender award.

.3 Abbreviations

.1 Following abbreviations of standard specifications have been used in this specification and on 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 tender call will be considered as applicable.

.4 Layout of Work

.1 Contractor will lay out work on ground to satisfaction of Engineer using base and datum information shown on drawings or as directed by Engineer.

.2 Before commencing repairs the Contractor and Engineer will re-confirm the locations of work.

.5 Site Operations

.1 Contractor will arrange with Department of Fisheries and Oceans for sufficient space adjacent to project site to conduct operations, and for storage of materials. 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 At completion of work, restore area to its original condition. Contractor will repair damage to ground and property. Remove all construction materials, residue, excess, etc. and leave site in a condition acceptable to Engineer.

.3 Twenty (20) kilometer road leading to site is not snow cleared. If required to access site during winter months, contractor is responsible for providing own access.

.6 Project Meetings and Reporting

.1 Engineer will schedule and administer progress meetings.

.2 Prior to commencement of work there will be a project "Kick-off" meeting. The Contractor's Project Manager, the Owner, and the Consultant will be in attendance. Specified issues such as resources, schedule, submittals, controls, and safety will be discussed. Contractor is responsible for any expenses to attend this meeting. Meeting will be held in St. John's, NL.

.3 Contractor to make arrangements to facilitate all project meetings / inspections and ensure a responsible member of their firm and that of their sub contractors, if required, are on site.

.4 The Engineer will assume responsibility for recording minutes of meetings and forward copies to all parties present at meetings.

.5 Contractor is to submit a weekly progress report to DFO Project Engineer. Report should be bullet format covering the following:

- work in progress
- materials on site
- personnel and equipment on site
- work completed

Report should include photos of any work prior to encasement or concealment before the Engineer has a chance to view.

.7 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 and at no cost to the Engineer.

.8 Existing Services

.1 Before commencing work, establish locations and extent of any service lines in area of work and notify Engineer of findings.

.2 Submit schedule to, and obtain approval from, Engineer for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

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

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

.9 Documents Required

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

- .1 Contract drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed shop drawings.
- .5 Change orders.
- .6 Other modifications to Contract.
- .7 Field test reports.
- .8 Copy of approved work schedule.
- .9 Coating Data Sheets
- .10 Health and Safety Manuals.

.10 Taxes and Permits

.1 Pay applicable federal, provincial and municipal taxes.

.2 Obtain all building permits required for the work.

.11 Contractor's Use of Site

.1 The Contractor is advised that the construction operations, including storage of materials, for this contract must not interfere with operations at the site.

.11 Contractor's Use Site (cont'd)

.2 The Contractor will be solely responsible for arranging the storage of of materials on or off the site, and any materials stored at the site which interferes 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 the Engineer.

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

.12 Work Commencement

.1 Contractors are advised that mobilization is to commence immediately after award.

.2 The Contractor is to make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after award.

.13 Cost Breakdown

.1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Engineer and aggregating contract price. After approval by Engineer cost breakdown will be used as basis for progress payment.

.14 Building Smoking Environment

.1 Comply with smoking restrictions.

.15 Asbestos Discovery

.1 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of work, stop work and notify Engineer immediately. Do not proceed until written instructions have been received from Engineer.

.16 Personnel

.1 The Contractor and his/her personnel must adhere to the Federal Government "NO SMOKING" policy while in Federal Facilities.

.2 The Contractor will provide the DFO Representative with a list of all people working on DFO premises, complete with a copy of their licenses, where applicable, and will update the list immediately when personnel changes.

.17 Clean Up	.1	The Contractor shall take appropriate measures to ensure that the building premises are kept free at all times from accumulation of waste, demolished materials and/or rubbish caused by their employees or work, and at the end of each day dispose of in a dump container outside the building and/or remove from site. At the completion of work, remove all rubbish, etc., from and about the building premises and all equipment, tools, scaffolding, surplus materials, temporary protection, etc., and shall leave work in a neat orderly condition. In case of a dispute, the Engineer may have the rubbish removed and charge the cost to the Contractor.
.18 Owners Waiver of Liability	.1	The Contractor shall save the DFO harmless from liability of any kind arising from any patented or unpatented invention used in the performance of the work of this contract.

END

.1 Tender Submission

.1 The Contractor shall include the following documentation with the tender submission:

.1 Breakdown of Costs as per TENDER AND ACCEPTANCE FORM.

.2 List of previous projects completed by your company which are of a similar nature and/or a company history/profile.

.3 List of Sub-Contractors proposed, the item of work they will be completing, and their related experiences.

.4 Upon acceptance of tender a complete copy of the company's Health and Safety Plan will be required in electronic format.

.5 Any other information, which may help in the evaluation of the submission.

.6 **The above mentioned documentation is in addition to those documents required in the tender package.**

.2 Contract Submission

.1 Upon award of the Contract, the Contractor shall submit sealed drawings, which include:

.1 Schedule of the work including all milestones.

.2 Any drawings or diagrams required in order to make clear the work intended or show its relation to adjacent work of others.

.3 Prior to commencement of field work or field related activities, a detailed **Site Specific Safety Plan** for the field work must be submitted for review by the Owner/Owner's Representative; especially pertaining to remote site work, and have focus on environmental issues. This must also include safety plan coverage of all subcontractors/suppliers who may work in the field component of the project.

.2 Contract Submission (cont'd)

.4 Detailed methodology and logistics program for project.

.3 Notice of Completion

.1 Upon completion of work, the Contractor shall submit to the Owner and Consultant written notification that the tower refurbishment is complete and ready for an acceptance inspection. The Consultant shall complete the acceptance inspection while the Contractor is onsite. If there are any deficiencies the Consultant shall provide the Contractor with a preliminary list on site.

.2 The Contractor shall within three (3) weeks of receiving the "Official Acceptance Inspection Report" from the Consultant, correct all items to the satisfaction of the Owner. If this time has elapsed and no corrective measures taken, the Owner may hire a Sub-Contractor to complete the work on behalf of the Contractor and deduct any monies from the amount of the contract owed to the Contractor. If a major deficiency is identified in the Acceptance inspection Report, the Owner may suggest that a second visit to the site is necessary by the Consultant. This visit shall be at the expense of the Contractor.

END

.1 General

.1 Submit to Engineer, for review, shop drawings, product data and samples specified.

.2 Shop Drawings

.1 Drawings to be originals prepared by Contractor, sub-contractor, supplier or distributor which illustrates appropriate portion of work showing fabrication, layout, setting or erection details as specified in the appropriate sections.

.2 Identify details by reference to sheet and detail numbers shown on Contract drawings.

.3 Maximum sheet size: 559 mm x 1118 mm.

.4 Reproductions for submissions: opaque diazo print.

.3 Product Data

.1 Certain specification sections specify that manufacturers' standard schematic drawings, catalogue sheets, diagrams schedule, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

.2 Above will only be accepted if they conform to following:

.1 Delete information which is not applicable to this project.
.2 Supplement standard information to provide additional information applicable to project.
.3 Show dimensions and clearances required.

.4 Samples and Mock-ups

.1 Submit samples in sizes and quantities specified.

.2 Where colour, pattern or texture is criterion, submit full range of samples.

.3 Construct each sample or mock-up complete, including work of all trades required to finish work.

.4 Construct field samples and mock-ups at locations acceptable to Engineer.

.4 Samples and Mock-ups (cont'd)

.5 Reviewed samples or mock-ups will become standards of workmanship and material against which, installed work will be checked on project.

.5 Co-ordination of Submissions

.1 Review shop drawings and product data prior to submission.

.2 Verify:

.1 Field measurements.
.2 Field construction criteria.
.3 Catalogue numbers and similar data.

.3 Co-ordinate each submission with requirements of work and Contract documents.

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

.5 Contractor's responsibility for deviations in submission from requirements of Contract Documents are not relieved by Engineer's review of submission unless Engineer gives written acceptance of specified deviations.

.6 Notify Engineer, in writing, at time of submission of deviations from requirements of Contract Documents.

.7 After Engineer's review, distribute copies.

.6 Submission Requirements

.1 Schedule submissions at least seven (7) days before dates reviewed submissions will be needed.

.2 Submit number of opaque diazo copies of shop drawings, product data which Contractor requires for distribution plus four (4) copies which will be retained by Engineer.

.6 Submission Requirements (cont'd)

.3 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Number of each shop drawing, product data and sample submitted.
.5 Other pertinent data.

.4 Submissions shall include:

.1 Data and revision dates.
.2 Project title and number.
.3 Name of:
  .1 Contractor.
  .2 Sub-contractor.
  .3 Supplier.
  .4 Manufacturer.
  .5 Separate detailer when pertinent.
.4 Identification of product or material.
.5 Relation to adjacent structure to materials.
.6 Field dimensions, clearly identified as such.
.7 Specification Section number.
.8 Applicable standards, such as CSA or CGSB numbers.
.9 Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.

END

PART 1 – GENERAL

1.1 References

.1 Canadian Painting Contractors' Architectural (CPCA).
  .1 Painting Specifications Manual 1993.

.2 National Building Code of Canada (NBC) latest edition including all amendments up to tender closing date.

.3 Canadian General Standards Board (CGSB).
  .1 CGSB 1-GP-48M-78, Primer, Marine, for Steel.

.4 CAN2-1.500-75 Methods of Test for Toxic Trace Elements in Protective Coatings.

1.2 Regulations

.1 Comply with Federal, Provincial, and Local Requirements, provided that in any case of conflict among those requirements or with these Specifications the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time the work is performed.

PART 2 – PRODUCTS

NOT APPLICABLE

PART 3 – EXECUTION

3.1 General

.1 Provide instruction to personnel before allowing entry to Lead Work Area and in all areas where jet blasting is required. Instruction shall include training in health effects of lead exposure, importance of good personal hygiene, use of respirators, dress, entry and exit from work areas and work procedures and protective measures for use of all lead cleaning and blasting agents. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.2 Do not eat, drink, smoke or chew gum or tobacco except in established locations outside the work area.

3.1 General (cont'd)

.3 Workers shall be fully protected at all times when lead dust, blasting agents or residuals could be disturbed.

.4 Provide and post in a conspicuous place the procedures described under Worker Protection.

3.2 Respiratory Protection

.1 Provide appropriate respiratory equipment for the work being performed for persons who are required to enter the Lead Work Area and in all areas where jet blasting is required.

.2 Workers must have respirators fit checked by qualitative or quantitative fit-testing.

.3 Workers shall use a minimum of half-facepiece air purifying respirators fitted with HEPA filters. The maximum use concentration (MUC) of the half-facepiece respirator is 500 ug/m3. If airborne lead concentrations exceed this value, the Contractor shall stop all work and modify work practices or ventilation to reduce exposures to acceptable levels.

.4 Use full-facepiece Powered Air Purifying Respirators fitted with Dust, Fume and Mist (High Efficiency) filter cartridges, for use of powered tools and cleaning of Lead Work Area and in all areas where jet blasting is required.

.5 Use positive pressure supplied air protection for abrasive blasting work.

.6 Respiratory protective devices shall be certified by the National Institute of Occupational Safety and Health (NIOSH).

.7 Maintain respiratory equipment in proper functioning and clean condition or remove from site.

.8 Used filters shall be replaced or tested according to the manufacturer's specifications and replaced as necessary.

.9 Ensure that no person required to enter a Lead or Blasting Work Area has facial hair which affects the seal between respirator and face.

3.2 Respiratory Protection (cont'd)	.10	Where compressors are used to provide assisted breathing, contractor shall show current test reports showing that compressor meets all regulatory requirements for air quality.
3.3 Protective Clothing and Equipment	.1	Provide all workers with full body protective coveralls including attached head covering.
	.2	Provide boot covers with non-slip soles, or work boots dedicated to the Lead Work Area.
	.3	Provide abrasive blaster employees with appropriate blasting coveralls to be worn over the full body protective coveralls. Once protective coveralls and boot covers are worn they must be treated as lead-contaminated waste and disposed of.
	.4	Wear all protective apparel required by Ministry of Labour regulation for construction projects.
	.5	Use impervious gloves suitable for handling of the Lead Cleaning Agent and other chemicals.
3.4 Clean Change Room	.1	Contractor to provide a Clean Change Room in accordance with Section 01520.
3.5 Contaminated Access Room	.1	Contractor to provide a Contaminated Access Room and washing facilities in accordance with Section 01520.
3.6 Decontamination Facilities	.1	Construct or make provision for Waste and Equipment and Worker decontamination facilities.
3.7 Lead and Blasting Work Area Entry Procedures	.1	Use the following procedure to enter the Work Area: .1 Remove street clothes in Clean Change Room. .2 Put on respirator with new or tested filters and coveralls in Clean Change Room. .3 Store all street clothes, uncontaminated footwear, towels, etc. in the Clean Change Room.

3.8 Lead and Blasting Work Area Exit Procedures

.1 Use the following procedure to exit the Work Area:

.1 Remove gross contamination from protective clothing using HEPA vacuum or by wet wiping or by disposable Tyvek Coveralls.

.2 Proceed to Contaminated Access Room and remove all contaminated clothing and equipment except respirator.

.3 Store contaminated footwear, hard hats, etc. in Contaminated Access Room.

.4 Remove filters for testing or dispose of in a container provided for this purpose. Make available a wash basin for cleaning respirator components.

.5 Make available a wash basin which employees can carry out hand and face washing.

3.9 Visitor Protection

.1 Provide clean protective clothing and equipment and approved respirators to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training for entry into Lead and Blasting Work Areas.

3.10 Site Preparation (Inside Tower)

.1 Seal all openings to the Lead Work Areas using polyethylene, tape, caulking, etc., including but not limited to windows, doors, openings to mechanical equipment, etc.

.2 Prior to blasting, clean and remove all items specified for removal.

.3 Retain all blasting grit and contaminated dust from blasting and store in labelled salvage drums.

.4 All drums of blasting grit and lead paint must be delivered to an approved waste disposal site. All costs associated with collection, transportation of drums and fees for disposal shall be borne by the Contractor.

3.11 Signage

.1 Post signs at all doorways leading into contaminated areas.

.1 Such signs shall read:

1. Caution;
2. Lead Hazard Area;
3. No Unauthorized Entry;

3.11 Signage (cont'd)

4. Wear assigned protective equipment;
5. Breathing lead dust may cause serious bodily harm.

3.12 Maintenance of Contaminated Work Area

.1 Maintain enclosures in tidy condition.

.2 Ensure that work area enclosures, barriers and polyethylene enclosures are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Clean all surfaces in the enclosure with HEPA vacuuming.

3.13 Site Dismantling

.1 Place polyethylene tape, cleaning material, clothing and other contaminated waste in plastic bags for transportation.

.2 Remove and dispose of as lead-contaminated, all debris and materials resulting from work of this Section.

3.14 Disposal

.1 All drums of blasting grit and lead paint must be delivered to an approved waste disposal site.

.2 The salvage drums will be provided and delivered to site by the Contractor.

.3 Contractor shall collect grit, transport drums to an approved dump site and pay all disposal fees associated with disposal of grit.

END

.1 Requirements Included

.1 Inspection and testing, administrative and enforcement requirements.

.2 Mock-ups.

.3 Mill tests.

.2 Related Requirements

.1 Section 01300: Submittals.

.2 Section 01600: Material and workmanship quality, reference standards.

.3 Inspection

.1 The Engineer shall have access to the work. If parts of the work are in preparation at locations other than the place of the work, access shall be given to such work whenever it is in progress.

.2 Give timely notice requesting inspection if work is designated for special tests, inspections or approvals by Engineer's instructions, or the law of the place of the work.

.3 If the Contractor covers, or permits to be covered, any work prior to completion of all required tests, inspections or approvals, the contractor shall uncover such work, have testing and/or inspection satisfactorily completed and make good such work at no cost to the owner.

.4 The Engineer may order any part of the Work to be examined if such work is suspected to be not in accordance with the Contract Documents. If, upon examination such work is found not in accordance with the Contract Documents, correct such work and pay the cost of examination and correction. If such Work is found in accordance with the Contract Documents, the Owner will pay the cost of examination and replacement.

.4 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by the Owner for the purpose of inspecting and/or testing portions of Work.

.2 Cost of such services will be borne by the Owner.

.4 Independent Inspection Agencies (cont'd)

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

.4 Employment of inspection/testing agencies does not relax the responsibility to perform work in accordance with the Contract Documents.

.5 If defects are revealed during inspection and/or testing, the Engineer will request additional inspection and/or testing to ascertain full degree of defect. Correct defects and irregularities as advised by Engineer at no cost to the Owner. Pay costs for re-testing and re-inspection.

.5 Access to Work

.1 Allow inspection/testing agencies access to the Work, offsite manufacturing and fabrication plants.

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

.6 Procedures

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

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the work.

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

.7 Rejected Work

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

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

.7 Rejected Work (cont'd)	.3	If in the opinion of the Engineer it is not expedient to correct defective Work or Work not performed in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the work performed and that called for by the Contract Documents, the amount of which shall be determined by the Engineer.
.8 Reports	.1	Submit 3 copies of inspection and test reports promptly to the Engineer.

END

.1 Sanitary Facilities

.1 Contractor is responsible for providing sanitary facilities for employees and all other authorized personnel visiting site.

.2 Keep area and premises in sanitary condition.

.2 Power

.1 Contractor shall be aware that no power is available at this site. Contractor shall provide all power required to perform the work.

.3 Water Supply

.1 Contractor shall provide all water supply including potable water as required to complete the work.

.4 Heating and Ventilating

.1 Pay for costs of temporary ventilation used during construction, including costs of installation, operation, maintenance and removal of equipment.

.2 Provide temporary ventilation in enclosed areas as required to:

.1 Facilitate progress of work.
.2 Protect work and products against dampness and cold.
.3 Maintain comfort Building Occupants.
.4 Prevent moisture condensation on surfaces.
.5 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
.6 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of project by Engineer.

.1 Maintain ambient temperature and humidity levels as required for comfort of office personnel.

.4 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.4 Heating and Ventilating (cont'd)

.1 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
.2 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
.3 Ventilate storage spaces containing hazardous or volatile materials.
.4 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.5 Maintain strict supervision of operation of temporary ventilating equipment to:

.1 Conform with applicable codes and standards including but not limited to all aspects of the PCB Hazardous Materials Regulations.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.

.6 Submit tenders assuming existing or new equipment and systems will not be used for temporary ventilating.

.5 Removal of Temporary Facilities

.1 Remove temporary facilities from site when directed by Engineer.

.6 Garbage

.1 Existing garbage facilities (i.e. dumpster, etc.) are not to be used by the contractors. All garbage, construction debris, etc. shall be removed daily from site. All material shall be disposed of in accordance with all applicable environmental regulations.

END

PART 1 – GENERAL

1.1 Access	.1	Use of existing ATV's or other motorized vehicles as a means of access to project site shall conform strictly to all provincial, federal and municipal laws, regulations and guidelines.
1.2 Contractor's Site Office	.1	Provide office of sufficient size to accommodate site meetings and furnished with drawing laydown table suitable for meetings.
1.3 Storage Sheds	.1	Provide adequate weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.
1.4 Clean Change Room	.1	Provide a change room adjacent to the tower where workers can change unto clothing suitable for the Work Area.
	.2	Provide suitable benches, clothing hooks, shelving, etc., for storage of breathing apparatus.
1.5 Contaminated Access Room	.1	Provide an access room immediately adjacent to the tower where workers can remove contaminated clothing.
	.2	Make space available for storage of contaminated clothing in the contaminated access room.
1.6 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.
	.3	Provide potable water to the site suitable for drinking and for washing by the workers.

1.7 Power

.1 Provide a temporary electrical power supply using a generator of satisfactory size to operate all equipment and lighting.

1.8 Scaffolding

.1 Design and construct scaffolding in accordance with CSA S269.2.

.2 Install and maintain an approved fall arrest system for duration of work.

.3 Scaffold system design shall be stamped by a professional structural engineer registered with Professional Engineers and Geoscientists of Newfoundland and Labrador.

.4 Leave scaffold in place until work is completed and accepted by the Engineer.

.5 All personnel using scaffolding shall abide by the Newfoundland Occupational Health and Safety Act and Regulations and Canada Labour code – Part 2. DFO staff shall, with no cost penalty, stop all work being undertaken without due regard for proper safety procedures.

1.9 Heating and Ventilation

.1 Maintain required atmosphere in enclosure to facilitate the successful completion of the work.

.2 Provide temporary ventilation in enclosed areas as required to:

- .1 Provide adequate ventilation to meet health regulations for safe working environment.
- .2 Facilitate progress of all work as per manufacture's instructions.
- .3 Protect work and products against dampness and cold.
- .4 Prevent moisture condensation on surfaces.

.3 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of structure by Engineer.

- .1 Maintain ambient temperature and humidity levels as required for storage, application, and curing of materials as per coating manufacturers requirements.

1.9 Heating and Ventilation (cont'd)

.4 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.5 Maintain strict supervision of operation of ventilating equipment to:
- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.

1.10 Removal of Temporary Facilities

.1 Remove temporary facilities from site when directed by Engineer.

.2 When project is closed down at end of construction season keep temporary facilities operational until close down or removal is approved by Engineer.

PART 2 – PRODUCTS

NOT APPLICABLE

PART 3 – EXECUTION

NOT APPLICABLE

END

.1 References

.1 CSA S269.1-1975 (1998), Falsework for Construction Purposes.

.2 CSA S269.2-M87 (R1998), Access Scaffolding for Construction Purposes.

.3 FCC No. 301-1982 Standard for Construction Operations.

.4 FCC No. 302-1982 Standard for Welding and Cutting.

.5 DFO 2003, Decontamination Protocol in Lighthouses and Other Buildings at DFO Facilities.

.2 Responsibility

.1 Be responsible for safety of persons and property on work site and for protection of building employees and general public circulating adjacent to work operations and to extent that they may be affected by conduct of work.

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

.3 General Protection

.1 Carry out work placing maximum emphasis on safety, giving precedence to health and safety of public, site personnel, and protection of the environment over cost and schedule considerations of work.

.2 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.3 Be vigilant and ensure that non-authorized persons are not allowed to circulate in designated construction areas of work site. Provide appropriate means by use of barricades, fences, warning signs and temporary lighting as required. Secure site at night time (or provide security guard) as deemed necessary to protect site against entry.

.4 All personnel to be fit tested and use full face respirators while working in tower. Cartridge approved for mercury vapour.

.4 Regulatory 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, and Canada Occupational Safety and Health Regulations.

.3 Observe and enforce construction safety measures required by:
- .1 2005 National Building Code of Canada, Part 8;
- .2 Workplace Health and Safety Compensation Commission;
- .3 Municipal statutes and ordinances.

.4 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, Engineer will advise on the course of action to be followed.

.5 A copy of the Canada Labour Code Part II may be obtained by contacting:
Canadian Government Publishing
Public Works and Government Services Canada
Ottawa, ON K1A 0S9
Telephone: (819) 956-4800, (1-800-635-7943)

.5 Filing of Notice .1 File all Notices with Provincial authorities prior to commencement of work.

.6 Work Permit .1 Obtain building permit related to project prior to commencement of work and post on site.

.7 Safety Assessments .1 The list of potential hazards identified by Department of Fisheries and Oceans includes, but is not limited to, the following:
- .1 Working around Elemental Mercury Vapours.
- .2 Overhead power lines.
- .3 Dilapidated structure.
- .4 Working from heights.
- .5 Wet and slippery conditions.
- .6 Working in and around heavy construction equipment.

.7 Safety Assessments (cont'd)

.7 Working with construction/power tools.
.8 Vehicular/pedestrian site traffic.
.9 Excavation/trenching.

.2 Contractor to perform site specific safety hazard assessment related to project.

.8 Meetings

.1 Attend health and safety pre-construction meeting as directed by Engineer.

.2 Conduct safety orientation session to all workers at commencement of work and on an as-needed basis during progress of work when new workers arrive or change in conditions or work occurs.

.9 Health and Safety Plan

.1 Develop written site-specific Project Health and Safety Plan prior to commencement of work. Submit plan to Engineer within 7 calendar days after award of contract.

.2 To prepare Health and Safety Plan, conduct a site specific hazard assessment based on review of all work of Contract Documents and of work site. Identify all known and potential health risks and safety hazards.

.3 Based on hazard assessment, prepare Project Health and Safety Plan to include the following:

.1 Summary of health risk and safety hazards resulting from analysis, clearly identifying those of high risk;
.2 List special tasks and operations which are to be followed for activities or operations of high health and safety risk;
.3 List hazardous materials to be brought on site as required by work;
.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards;
.5 Identify personal protective equipment to be used by workers as required to manage hazards that cannot be reasonably or practically managed by engineering and administrative control;

.9 Health and Safety Plan (cont'd)

.6 State company's Safety Policy. Provide confirmation that General Contractor and subcontractors currently have in place Standard Operating Procedures (SOP) and Safe Work Practices (SWP), representative of the work type to be undertaken and meeting provincial safety regulations; that such procedures and practices will be stringently followed and enforced during work of this contract. Maintain a copy of all SOP and SWP on site at all times for own use and provide for inspection when requested by Engineer;

.7 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

.1 Designated personnel from own company;

.2 Local emergency resources;

.3 Regulatory agencies applicable to work and as per legislated regulations;

.4 List of contacts from DFO and Client Department as provided by Engineer;

.8 Provide a communication plan or strategy of approved procedures to be followed on site by all workers as to how project specific construction information and Health and Safety issues must flow and be shared between Workers, Subcontractors, General Contractor, Engineer, Building Manager and designated tenant representatives. Engineer will provide names of client contacts and their requirements for incorporation into the plan.

.4 Develop plan in collaboration with all sub-contractors. Ensure that all work and activities of sub-contractors are included in the hazard assessment and reflected within plan.

.5 Implement, maintain, and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.

.6 As project progresses, continually review and evaluate work and construction site. Carryout additional hazard assessments, identifying new or potential health risk and safety hazards not previously known. Immediately revise and update Project Health and Safety Plan. Notwithstanding the above, carryout additional hazard assessments and revise the Health and Safety Plan whenever:

.9 Health and Safety Plan (cont'd)

.1 New subtrade work, new subcontractor (s) or new workers arrive at the site to commence another portion of the work;
.2 The scope of work has been changed by Change Order;
.3 Errors or omissions are identified by Engineer or any authorized safety representative.

.7 Post a legibly typed copy of the Health and Safety Plan in a common visible area at the work site. Ensure that all workers and other authorized persons allowed access to the construction area (s) are aware of and abide by the rules and regulations indicated in the plan.

.8 Post all versions to the plan and submit an updated copy to the Engineer in all instances.

.9 Maintain copies of all hazard assessments on site for the entire duration of work. Make available to Engineer for review upon request.

.10 Submission of the Health and Safety Plan, and any revised version, to the Engineer is for information and reference purposes only. It shall not be construed to imply approval by Engineer, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of his legal obligations for the provision Health and Safety on the construction project.

.10 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.2 Deliver copies of WHMIS-MSDS data sheets to Engineer on delivery of materials.

.3 All data sheets must be posted on site, in a common area, visible to all workers (and in locations accessible to tenants employees when work of this contract includes construction activities adjacent to occupied areas).

.10 Hazardous Products (cont'd)

.4 Make all efforts to select and use materials (i.e. adhesives, solvents, cleaners etc.) for the type and nature of work to be carried out which are the least hazardous products available, of low VOC content or low toxicity type products and emitting low noxious odours. Select products known to be friendly to the environment and to human health. Communicate this intent to sub-contractors, suppliers and manufacturers.

.5 Where the use of hazardous and toxic products cannot be avoided:

.1 Advise Engineer beforehand of the product (s) intended for use, submit WHMIS data sheets as per clause 10.1 above.

.11 Fire, Safety, and Hot Work Requirements

.1 Comply with Federal and Provincial fire safety regulations, including the requirements of the following standards as issued by the Fire Protective Services of Human Resources Development Canada:

.1 FCC 301-Standard for Construction Operations.

.2 FCC 302-Standard for Welding and Cutting.

.2 Obtain Engineer's authorization before any welding, cutting or any other hot work operations can be carried out on site. Hot work includes all cutting with use of torch or other open flame devices and grinding with equipment which produces sparks.

.3 To obtain Engineer's authorization, Contractor shall develop, and implement use of written Hot Work Procedures and Safe Work Practices to be followed on the construction site for all hot work. Submit such procedures to Engineer for review and approval.

.4 The Hot Work Procedures and Safe Work practices shall meet with fire safety regulations specified in clause (11.1) above and shall include the following criteria:

.1 Use of a Hot Work Permit system, between Contractor and each worker performing the hot work; consisting of a form to be filled out and issued for each and every hot work operation.

.11 Fire, Safety, and Hot Work Requirements (cont'd)

.2 Requirement for a hazard analysis to be carried out of the immediate area and on the nature and extent of the hot work required. The assessments must be done prior to and for each and every event where a Hot Work permit will be issued. Hazard analysis shall document in writing the following:

.1 Identified known and potential hazards;

.2 Protective controls and measures to be taken to minimize the risk of a fire;

.3 Planned emergency responses.

.3 Provision of a designated person (s) to carry out fire safety watch for a minimum of 30 minutes after completion of the hot work.

.5 Hot Work Permit Form to include, as a minimum, the following information:

.1 Project name and project number.

.2 Name and address of building or facility where work to be performed including specific floor or room etc.

.3 Description of hot work and nature of work to be carried out.

.4 Special precautions required, including the type of fire extinguisher needed.

.5 Worker (s) License or Certificate number when applicable in accordance with provincial regulations.

.6 Name and signature of Contractor, or his designated superintendent authorized to issue the permit, and the date when permit was prepared and issued.

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

.8 Time duration when permit is in force (not to exceed 8 hours) indicating "Start" date and time and "completion" date and time.

.9 Worker signature with date and time when work has been completed.

.10 Name of fire safety watch person, with his signature, date and time at completion of safety watch, certifying that the surrounding area was under his watch and inspected for a minimum of (30 minutes) immediately upon hot work completion and found to be in a fire safe condition.

.11 Fire, Safety, and Hot Work Requirements (cont'd)

.6 The Hot Work Permit shall be completed in full before work Hot commences, signed by the respective persons upon completion and returned to the contractor.

.7 Maintain Work Permits and Hazard analysis documentation on site for duration of Work. Upon request, make available for viewing by Engineer and by any person authorized by Engineer.

.8 Submit copy of Contractor's Hot Work Procedures and Safe Work Practices to obtain Engineer's authorization of such procedures in sufficient lead time before any hot work must be carried out so as not to delay work.

.9 In most cases, Engineer will issue only one written authorization covering the entire construction project and duration. However in some cases, depending on the nature or phasing of work, the quantity of various trades needing to perform welding and cutting, or other deemed situation, Engineer might designate certain portion of the construction work as separate entities each requiring its own written authorization. Follow Engineer's directives in this regard.

.12 Blasting

.1 Blasting or other use of explosives is not permitted.

.13 Powder Actuated Devices

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

.14 Overloading

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

.15 Falsework

.1 Design and construct falsework in accordance with CSA S269.1.

.16 Scaffolding

.1 Design and construct scaffolding in accordance with CSA S269.2.

.2 Install and maintain an approved fall arrest system for duration of work. Use safety harnesses at all times.

.16 Scaffolding (cont'd)

.3 Scaffold system design shall be stamped by a professional structural engineer registered with the Association of Professional Engineers and Geoscientists of Newfoundland.

.4 Leave scaffold in place until work is completed and accepted by the Engineer.

.5 Construct and maintain scaffolding in rigid, secure and safe manner.

.6 Erect scaffolding independent of walls. Remove promptly when no longer required.

.7 All personnel using scaffolding shall abide by Newfoundland Occupational Health and Safety Act and Regulations and Canada Labour Code – Part 2. Climbing harnesses shall be provided and used at all times. DFO staff shall, with no cost penalty, stop all work being undertaken without due regard for proper safety procedures.

.17 Confined Spaces

.1 For the purposes of this contract, "confined space" means an enclosed or partially enclosed space that:

- .1 is not designed or intended for human occupancy except for the purpose of performing work,
- .2 has restricted means of access and egress, and
- .3 may become hazardous to an employee entering it due to:
  - .1 its design, construction, location, or atmosphere,
  - .2 the materials or substances in it, or
  - .3 any other conditions relating to.

.2 All work in confined spaces shall be carried out in compliance with:

- .1 Part XI of the Regulations Respecting Occupational Safety and Health made under Part II of the Canada Labour code and;
- .2 The safety regulations made under the Occupational Health and Safety Act for the Province of Newfoundland.

.17 Confined Spaces (cont'd)

.3 Prior to commencement of work within confined space, notify the Occupational Health and Safety Officer of the type of confined space and nature of work to be carried out therein. Provide notification sufficiently in advance to allow for the Safety Officer to carry out a site inspection as deemed required by him.

.4 Provide and maintain all equipment as required by any person to enter and/or perform work in a safe manner within the confined space.

.5 Safety for Inspectors: At the Engineer's request, the contractor agrees, as part of the contract requirements, to provide to DFO employees or its consultants all necessary equipment and training, meeting confined space regulations stipulated above, to enter the confined space. Contractor further acknowledges that he/she is responsible for the efficacy of this equipment and for the safety of such persons during their entry and occupancy in the confined space.

.6 Provide and maintain training to all persons entering and working in confined spaces.

.1 Contractor and/or his employees shall provide proof of training and qualifications when requested by the Engineer.

.7 Develop and use "Entry Permits" for each and every entry into the confined space in accordance with Section 11.3 of Part XI of the Regulations Respecting Occupational Safety and Health made under Part II of the Canada Labour Code. Keep all entry permits on site for duration of work. Make permits available to Engineer for inspection upon request.

.8 Ensure that a hazardous assessment of the confined space is performed.

.1 Contractor to keep a copy of all hazardous assessment on site for the duration of Contract as well as provide copies to the Engineer.

END

.1 Fire Extinguishers	.1	Supply fire extinguishers, necessary to protect the work in progress and the contractors physical plant on site.
.2 Blockage of Roadways	.1	Advise local volunteer Fire Departments of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, erecting barricades and digging of trenches.
.3 Rubbish and Waste Materials	.1	Rubbish and waste materials are to be kept at a minimum.
	.2	Burning of rubbish is prohibited.
	.3	Remove all rubbish from the work site at the end of each work day or shift or as directed.
	.4	Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
	.5	Deposit greasy or oily rags and materials subject to spontaneous combustion in an approved receptacle and remove as required in 1.9.3.
.4 Flammable Liquids	.1	The handling, storage and use of flammable liquids are to be governed by the National Fire Code of Canada, latest edition.
	.2	Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriters laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes, requires permission of the Fire Chief.
	.3	Transfer of flammable and combustible liquids is prohibited within buildings or jetties. Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.

.4 Flammable Liquids (cont'd)

.4 Flammable liquids having a flash point below 38^{o} C such as naphtha or gasoline will not be used as solvents or cleaning agents.

.5 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe, ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

.5 Hazardous Substances

.1 Work entailing the use of toxic or hazardous materials, chemicals and/or explosives or otherwise creates a hazard to life, safety or health, will be in accordance with the national Fire Code of Canada.

.2 Obtain a Hot Work Permit for work involving welding, burning or the use of blow torches and salamanders, in buildings or facilities.

.3 When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers, equipped with sufficient fire extinguishers. Determination of what constitutes dangerous or hazardous areas, along with the requisite level of fire watch and fire extinguishers, shall be in accordance with the National Fire Code of Canada.

.4 Where flammable liquids, such as lacquers or urethanes are used, proper ventilation will be provided and all sources of ignition shall be eliminated. The local volunteer Fire Departments shall be informed prior to, and at the completion of such work.

.6 Clarification

.1 Direct any questions or requests for clarification of Fire Safety to the Engineer.

.7 Fire Inspection

.1 Site inspections by Fire Safety Officials will be co-ordinated by Engineer.

.2 Allow Fire Safety Officials unrestricted access to work site.

.3 Co-operate with the Fire Safety Officials during routine fire safety inspection of the work site.

.7 Fire Inspection (cont'd)

.4 Immediately remedy all unsafe fire situations observed during fire safety inspections.

END

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

INTRODUCTION

SCOPE

These interim personal protection guidelines deal with the hazards associated with metallic mercury (Hg) and must be adhered to by DFO personnel and/or contractors who must carry out work in/or enter DFO lighthouses.

This document only applies to situations where entering the Lighthouse is required to perform minor functions (see *definitions* below).

The following guideline <u>does not</u> apply for maintenance type of work, which require the mercury to be removed from the mercury bath. Trained personnel should do this type of work only.

Work under this section shall also conform with all relevant requirements of Section 01357.

DEFINITIONS

Major maintenance: any intervention dealing with the mercury bath

Minor maintenance: changing a light bulb, changing a lock on the door, minor renovation, paint scraping, general clean up, etc.

HAZARD DESCRIPTION

Mercury is a silvery white metal and is the only pure metal that is liquid at ordinary temperatures. Mercury vapour can be highly toxic and precautions must always be taken to avoid the inhalation of vapours and direct skin contact with the metal. Mercury evaporates, at ordinary room temperatures and the concentration of vapour produced in a closed unventilated room could exceed the recommended exposure limit of 0.025 milligrams per cubic metre (mg/m^3) for a conventional 8-hour workday / 40-hour work week.

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

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INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

Consult your regional Health & Safety Advisor for Specific information on Personnel Protection Equipment

1. PERSONAL PROTECTIVE EQUIPMENT

1.1 Type of Equipment

As per Treasury Board Personal Protective and Clothing Directive, respiratory devices must be selected, fitted and maintained according to the current CSA Standard 94.4 "Selection, Use and Care of Respirators".

All personnel working in the light tower must wear the following personal protective equipment:

- Tyvek coveralls which are capable of chemical resistance to elemental mercury,
- Rubber gloves or a suitable alternative,
- protective footwear and Tyvek booties,
- Each individual during grinding and blasting must wear a full mask cartridge***** type of respirator equipped with end-of-service-life indicators, which will provide air-purifying protection against low-level mercury vapors.

  ***** The cartridge has to be changed when it becomes saturated. Verify the **color change exposure indicator** on the cartridge to that effect. **(These cartridges must meet National Institute of Occupational Safety and Health (NIOSH) approved equipment e.g. the cartridge 6009 3M ™ for mercury vapor; has color change exposure indicator.)**

NOTE: Respiratory protection devices are considered **personal items** and should not be shared among personnel. Each employee must wear a device that was **fit tested** by a qualified person for his/her use. Specific type respirators are not available on the market for men wearing a beard; employees to be fitted with the device should therefore not wear a beard.

1.2 Storage and Disposal of Equipment

- All personal protective equipment must be kept in a secure place in the workplace where it will not enter in contact with hazardous substances and personal belongings.

- The personal protective equipment should be worn and kept inside the light tower to avoid the possibility of mercury contamination being spread to vehicles, exterior soils and adjacent buildings.

**INTERIM PERSONAL PROTECTION GUIDELINES
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CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH**

- All personal protective equipment shall be placed in a sealed plastic bag in a drum designated for this purpose when their useful life is finished (the Tyvek suits may be worn several times before disposal is necessary while the gloves and booties shall be changed after each use). Dispose of the cartridge in a sealed plastic bag in the waste storage drum when saturated.

- The Contractor shall dispose of used equipment in accordance with municipal, provincial, and federal regulatory requirements.

1.3 Maintenance of Equipment

Respiratory protection device has to be maintained according to the CSA Standard 94.4 Selection, Use and Care of Respirators.

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

2. PROTECTION MEASURES FOR ACCESS TO SITE

NOTE: At the **planning stage of any maintenance work,** contact your **Regional Safety and Health Advisor** who, taking into account the scope of available data on the contamination level of the lighthouse, will provide proper safety precautions **and** the protection measures to apply. ***The following measures do not include cases where manipulation of the mercury bath or any type of work involving some kind of intervention on the mercury bath.***

2.1 Employees should wear the personal protective equipment listed in Section 1.1.

AND ensure the following safety measures:

- activity must be performed under optimal ventilation conditions ;
  - at the beginning of each day the contractor or an employee of the contractor is required to open door for one (1) hour prior to entering. Then all windows and vents can be opened to increase ventilation. After windows and vents are opened the contractor must ventilate the tower interior for a minimum of thirty (30) minutes before commencing work. This may include forced air ventilation if required.
  - The door at the base of the tower must be left open during this ventilation process. At this time the contractor is required to wear personal protective equipment as per Section 1.1-Personal Protective Equipment.
- limit as much as possible the time spent in the lighthouse;
- limit as much as possible movement within the lighthouse.

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

3. PERSONAL PROTECTION TRAINING PROGRAM

Every employee who undertakes any work in lighthouse must have been trained specifically on personal protection for elemental mercury exposure.

3.1 How to Use the Guidelines

- understanding the guidelines (scope, definitions, hazards, etc);
- application of the guidelines to specific situations;

3.2 Who Should Have Training

- lightkeepers
- maintenance employees
- managers
- contractors
- employees

3.3 Training Frequency

- ½ day session required once a year (before the start of the hot season)
- reassessment of the respirator fitting

3.4 Personal Hygiene

Employees should be made aware of personal hygiene requirements such as:

- the washing of hands after doing work inside mercury contaminated towers ;
- no smoking or eating be undertaken prior to washing up after the work is completed ;
- gold rings and other items like watches should not be worn as these can form amalgams with mercury through simple contact.

3.5 Use of Personal Protective Equipment

- See Section 1.1-Personal Protective Equipment

3.6 Maintenance of Personal Protective Equipment

- cleaning of equipment;
- evaluation of respirator cartridge saturation;
- disposal of used equipment;

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

4. SMALL SPILL EMERGENCY

Every employee who attends to any mercury spill emergency cleanup must have been trained on personal protection for elemental mercury exposure AND proper spill procedures and cleaning techniques

4.1 Reporting

- all spill incidents must be reported to:
  - Managers; Supervisor/Superintendent;
  - Environment group;
  - Occupational Safety Advisor.
- medical follow up is required for those attending a spill

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

5. BLAST CLEANING

Blast cleaning the interior of the bath will release mercury vapour into the ambient air within the tower. All personnel working in the light tower during blast cleaning must wear personal protective equipment as per Section 1.1-Personal Protective Equipment. The blast cleaning Contractor will carry out the following items:

- Collect and drum the blasting debris after the blasting has been completed on the interior of the tower.

INTERIM PERSONAL PROTECTION GUIDELINES ASSOCIATED WITH MERCURY IN DFO LIGHTHOUSES CONTAINING OR HAVING PREVIOUSLY CONTAINED A MERCURY BATH

6. OTHER SECURITY MEASURES

6.1 General Security

Employees are required to work in pairs at all times when attending to maintenance in the lighthouses.

6.2 Signage

Mercury bath: Hg basin must be labelled with WHMIS compliant signage.

Outside the tower: Towers where mercury is still used or where it has been removed but not decontaminated should be identified with signage to indicate its presence.

.1 General

.1 Use new material and equipment unless otherwise specified.

.2 Within 7 days of written request by Engineer, submit following information for materials and equipment 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.

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

.2 Manufacturers Instructions

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Engineer in writing of any conflict between these specifications and manufacturers instructions. Engineer will designate which document is to be followed.

.3 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.

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

.3 Conceal fasteners where indicated. Space evenly and lay out neatly.

.4 Fastenings which cause spalling or cracking are not acceptable.

.5 Obtain Engineer's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166- 1975.

.4 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. Use No. 304 stainless steel for exterior areas.

.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. Use resilient washers with stainless steel.

.5 Delivery and Storage

.1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance with suppliers instructions.

.4 Touch-up damaged factory finished surfaces to Engineer's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

.6 Selection of Material and Equipment

.1 Material and equipment will be specified in the Tender documents, and selected by Contractor, by one or more of the following methods:

.1 Specification by reference to a relevant Standard, such as CSA, ASTM, ULC, etc., - select any material or equipment that meets or exceeds the specified Standard.

.2 Specification by reference to an accepted product evaluation publication, such as the CGSB "Qualified Products List", or CCMC "Registry of Product Evaluations", - select any manufacturer's product so listed.

.3 Specification by Prescriptive or Performance specification – select any material or equipment meeting or exceeding specification.

.6 Selection of Material and Equipment (cont'd)

.4 Specification by identification of one or more Manufacturer's specific product(s) as an "Acceptable Product", along with a listing of other manufacturers who may offer equivalent products - select any product so named, or select from equivalent product(s) of other listed manufacturers.

.2 "Acceptable Product" is deemed to be a complete and working commodity as described by a manufacturer's name, catalogue number, trade name, or any combination thereof, and will constitute the minimum standard of acceptance.

.3 Engineer will determine acceptability of Contractor's selection of material and equipment at time of Shop Drawing review.

.4 When material or equipment is specified by a Standard, Prescriptive or Performance specification, upon request of the Engineer, obtain from manufacturer an independent laboratory reporting, showing that material or equipment meets or exceeds the specified requirements.

.7 Substitution of Material and Equipment

.1 **Prior to Tender closing** bidders may propose addition of other manufacturer's names to those listed in the tender documents providing requests are made in writing at least 7 days prior to tender closing date. Engineer will inform all prospective bidders of decision by addendum.

.2 **After Contract award** substitutions of material or equipment, other than as selected by Contractor from those specified, will be considered by Engineer only if:

.1 material or equipment selected from those specified are not available;

.2 delivery date of material or equipment selected from those specified would unduly delay completion of the Contract; or

.3 alternative material or equipment to those specified, provided they are determined by the Engineer to be equivalent to or better than those specified, will result in a credit to the Contract amount.

.7 Substitution of Material and Equipment (cont'd)

.3 Requests for substitutions after Contract award must be accompanied by sufficient information in the form of shop drawings, manufacturer's literature, samples or other data to permit proper investigation of the substitutes proposed. Requests must also include statements of respective costs of material or equipment originally specified and the proposed substitution.

.4 Should a proposed substitution be accepted after Contract award either in part or in whole, assume full responsibility and costs when substitution affects other work on Project. Contractor to pay for design or drawing changes required as a result of the substitution.

.5 Amounts of all credits arising from approval of substitutions after Contract award will be determined by Engineer and the Contract amount will be reduced accordingly.

.8 Contractor's Options for Selection of Materials for Tendering

.1 Materials specified by referenced standard, select any material that meets or exceeds the specified standard.

.2 Materials specified by "Prescriptive" or "Performance" specification, select any material meeting or exceeding specification.

.3 The use of specific brands or projects in a specification, followed by the phrase "or approved equal" is intended to be used to indicate a level of quality or performance, and should not in any way be considered as an endorsement by Her Majesty for the use of this brand or product. Secure approval of equal brands or products from the Engineer in the same manner as stated in Article 7, Substitutions.

.4 Products listed are to be used as a guide, indicating the level of quality or performance, and do not imply exclusion of unlisted manufacturers and models.

.9 Substitution

.1 After Contract award, Engineer will consider written requests from Contractor for Substitution of products.

.2 Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:

.9 Substitution (cont'd)

.1 Comparison of the qualities of the proposed substitution with that specified.
.2 Changes required in other elements of the work because of the substitution.
.3 Effect on the construction schedule.
.4 Cost data comparing the proposed substitution with the product specified.

.3 A request for a substitution constitutes a representation that the Contractor:
.1 Will provide the same warranties for the substitution as for the product specified.

.4 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.5 Amounts of all credits arising from approval of substitutions will be determined by Engineer and Contract Price will be reduced accordingly.

.10 Construction Equipment and Plant

.1 On request, prove to the satisfaction of Engineer 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 Contractor shall provide copies of current certification for welding fabrication shop and for all welders employed in this work prior to contract award.

END

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 As indicated on the accompanying drawings and herein specified, demolition and removal will consist of, but will not necessarily be limited to, the following:

.1 Sandblast all existing support jacks, deteriorated steel beam at top of stairs, supplementary steel at lantern floor level including steel support brackets and supplementary steel at intermediate floor level and recover lead contaminated grit for proper removal/disposal as per Section 01357.

.2 Clean top of existing concrete slab in area of jack upgrades of all loose debris and concrete prior to placement of non-shrink grout.

1.2 Protection

.1 Protect existing objects designated to remain including but not limited to main light. In event of damage, immediately replace or make repairs to approval of and at no additional cost to Engineer.

PART 2 – PRODUCTS NOT APPLICABLE

PART 3 – EXECUTION

3.1 Execution

.1 Inspect site and verify with Engineer 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 as indicated in the limits of work.

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

3.3 Disposal of Material

.1 All demolished materials not designated for reinstatement will become property of Contractor and will be removed from site and disposed of to satisfaction of the Engineer. It is the sole responsibility of the Contractor to dispose of all demolished materials to an approved dump site. Contractor should ensure that the site is approved and willing to accommodate any materials disposed of from work site.

.2 Contractor shall obtain and pay for all necessary permits for use of an approved disposal site.

.3 Contractor shall make every effort to recycle demolished materials where possible.

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.

END

PART 1 – GENERAL

1.1 Reference Standards

.1 Do welding work in accordance with CSA W59 (latest edition) unless specified otherwise.

1.2 Shop Drawings

.1 Submit shop drawings in accordance with Section 01340.

.2 Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcements, details, and accessories.

PART 2 – PRODUCTS

2.1 Materials

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.

.2 Steel pipe: to ASTM A53/A53M standard weight, galvanized finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Grout: non-shrink, non-metallic, flowable, 50 MPa at 24 hours.

2.2 Fabrication

.1 Fabricate work square, true, straight and accurate to requested 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. Use screws for interior metal work. Use welded connections exterior metal work unless otherwise approved by Consultant.

2.2 Fabrication (cont'd)

.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. Seal exterior steel fabrications to provide corrosion protection in accordance with CAN/CSA-S16.1-M89.

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 Owner's Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

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

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

END

1.1 Environmental Requirements

.1 Do not apply paint finish in areas where dust is being generated.

1.2 References

.1 Canadian Painting Contractors' Architectural (CPCA).
- .1 Painting Specifications Manual.
- .2 Canadian General Standards Board (CGSB).
- .3 National Fire Code of Canada (Latest Edition)
- .4 Steel Structures Painting Council (SSPC).
  - .1 Systems and Specifications Manual (Latest Edition)

1.3 Product Data

.1 Submit product data in accordance with Section 01330 - Submittal Procedures.

.2 Submit full records of all products used and include the following:
- .1 Finish formula designation.
- .2 Product type and use.
- .3 CGSB number.
- .4 Manufacturer’s product number.
- .5 Colour numbers.
- .6 Manufacturer’s Material Safety Data Sheets (MSDS).
- .7 Maximum VOC classification.

.3 Submit manufacturer’s application instructions for each product specified.

1.4 Samples

.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

.2 Submit full range of available colours where colour availability is restricted.

.3 Use 3 mm plate steel for finishes over metal surfaces. Use concrete block for finishes over concrete surfaces.

1.5 Quality Assurance

.1 Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet requirements of the specifications. Produce documents for inclusion in commissioning manual.

.2 Walls. No defects visible from a distance of 1000 mm at 90 degrees to surface.

.3 Ceilings. No defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.4 Final coat to exhibit uniformity of colour and texture as well as uniformity of sheen across full surface area.

1.6 Delivery, Storage and Handling

.1 Deliver and store materials in original containers, sealed, with labels intact.

.2 Indicate on containers or wrappings:

.1 Manufacturer's name and address.
.2 Type of paint.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, weatherproof, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in a well ventilated area with temperature range 7° C to 30° C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

1.6 Delivery, Storage and Handling (cont'd)

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Engineer. After completion of operations, return areas to clean condition to approval of Engineer.

.10 Provide minimum one 9 kg type ABC dry chemical fire extinguisher adjacent to storage area.

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

.12 Fire Safety Requirements:

.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approval, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.7 Environmental Requirements

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

.2 Ventilation:

.1 Ventilate area of work as directed by Engineer by use of approved portable supply and exhaust fans.

.3 Apply paint finishes only when conditions forecast for entire period of application fall within manufacturer's recommendations.

.4 Where surface to be painted is not under cover, do not apply paint when:

.1 Substrate and ambient air temperature are expected to fall outside limits prescribed in paint standard and by manufacturer.

.2 Rain or snow are forecast to occur before paint has thoroughly cured; it is foggy, misty, raining or snowing at site; relative humidity is above 85%.

.3 Surface to be painted is wet, damp or frosted.

.4 Previous coat is not dry.

1.7 Environmental Requirements (cont'd)

.5 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.6 Apply paint finish only when dust is no longer being generated or when wind conditions are such that airborne particles will not affect the quality of the finished surface.

.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

1.8 Scheduling of Work

.1 Submit work schedule for various stages of painting to Engineer for approval. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Engineer for any changes in work schedule.

.3 Contractor shall perform an "Adhesion Test" to verify product compatibility. Test procedure shall be carried out in accordance with manufacturer's written instructions.

PART 2 – PRODUCTS

2.1 Materials

.1 Two-component, 100% solids, polyurethane system, which meets performance requirements outlined in the following section "Performance Requirements".

.2 Pre-qualified Coating System:

.1 490/Ameron Amershield polyurethane as supplied by Amercoat Canada.

.2 Or approved equal:

2.1 Materials (cont'd)

.1 Coating System for all structural steel upgrades including existing supplementary lantern room floor steel and intermediate room floor steel:

.1 Base Coat: Self-priming solvent free aromatic polyurethane.
Solids Content: 100% by volume.
VOC: 0 gm/l
Applied at 1.0 - 1.5 mm (40 - 60 mils) dft.

.2 Top Coat: High solids acrylic aliphatic polyurethane.
VOC compliant.
Applied at 0.05 - 0.10 mm (2 - 4 mils) dft.
Colour to match existing.

.3 Metallic filler: two component metallic repair and rebuilding material. Standard of Acceptance Belzona 1111 by Belzona Inc., or approved equal. For tendering purposes, the Contractor shall assume a volume of 3 litres shall be required to complete the work.

2.2 Performance Requirements

.1 The following standards are applicable to the cured coating:

.1 Adhesion, ASTM 4541, > 800psi
.2 Abrasion, ASTM 4060, < 100 mg/ 1000 cycles (C17 1 Kg wheel)
.3 Hardness, ASTM 2240, Shore D 60-80
.4 Elongation, <75%
.5 Good Chemical Resistance (ASTM D714)

.2 VOC : 0gm/l

.3 Resistant to exposed marine environment (UV rays, salt spray, etc.) This may require addition of UV stabilizer as a finish top coat.

2.3 Performance Warranty

.1 Provide a written warranty for Product and Application against defects or breakdown of the coating for a minimum of **ten years** under normal service and weather conditions.

2.3 Performance Warranty (cont'd)

.2 Within the warranty period coating failure caused by defects such as: surface preparation, coating application, improper material supplied, will require complete replacement of coating on surface with specified original coating system at no extra cost.

PART 3 – EXECUTION

3.1 General

.1 Perform all painting operations in accordance with CAN/CGSB-85.100.

.2 Perform all painting operations in accordance with CPCA Painting Specifications Manual except where specified otherwise.

.3 Apply all paint materials in accordance with paint manufacturers written application instructions.

3.2 Protection

.1 Contractor shall collect all blast debris and grit for all blasting operations as outlined in Section 01357 - Lead Based paint and Soda Blasting Safety and Environmental Protocols.

.2 Protect any existing building surfaces not to be painted from paint spatters, markings blasting spray and other damage. If damaged, clean and restore such surfaces as directed by Engineer.

.3 Protect exterior solar panel, wiring and battery pack located at Ground Level.

.4 Protect items that are permanently attached such as Fire Labels on doors and frames.

.5 Protect factory finished products and equipment.

.6 Protect passing pedestrians and the general public who may be in a location where they may be affected by the Work.

.7 Contractor shall protect all adjacent items from water damage/grit/debris during blasting operations. Any items damaged during the operation shall be repaired by the contractor at no cost to the owner.

3.3 Surface Preparation

.1 Blast clean all metal surfaces.

.2 Abrasive blast clean all metal surfaces to meet SSPC-SP 10/NACE 2/Sa21/2 - Near White Blast Clean.

.3 Abrasive grit must be of proper size to achieve the cleanliness and anchor profile requirements of the coating manufacturer for the specified coating. No substitution of blasting media shall be made without written approval from the engineer.

.4 Abrasive grit shall be either sharp steel grit, coal slag, garnet, or aluminum oxide, and meet the following requirements:

.1 Contains less than 1% free silica.
.2 Free of harmful quantities of toxic metal.
.3 Contain less than 20 ppm water-soluble chlorides.
.4 Contain less than 80 ppm water-soluble sulphates.
.5 Free of clay, limestone, shells, undersize and oversize particles, organic material, and other detrimental foreign material.

.5 Prior to abrasive blasting, the contractor must obtain certification from the abrasive supplier that the abrasive meets these requirements.

.6 Reclamation and reuse of blast media shall not comprise surface cleanliness or surface profile as required in this specification.

.7 Surfaces which are abrasive blast cleaned using a non-approved abrasive shall be re-blasted with the proper abrasive at no additional cost.

.8 Defects in metal surfaces:

.1 Surface defects revealed during abrasive blasting (slivers, laminations, cracks, pitting, etc.) shall be reported to the engineer for evaluation.
.2 In all areas identified for re-painting, the contractor shall grind smooth these surfaces to create a clean prepared surface suitable for the application of metallic filler material as specified. For surface pitting, contractor shall use an appropriately sized and shaped drill bit to remove all paint, dirt, rust and debris from inside the pit.

3.3 Surface Preparation (cont'd)

.3 Immediately after defective surfaces have been prepared, the surfaces shall be examined with the unaided eye for visible defects from a distance of no greater than 150-200 mm at 90 degrees to the surface.

.9 All sharp edges, fillets and corners shall be ground to form a contour of a minimum edge radius of 2mm. This may be achieved by a minimum of 2-3 strokes of a grinding disc.

.10 Contractor shall clean all paint, rust and other debris out of vertical and horizontal joints between tower panels. Depending on the width of openings, this may require cleaning with hand tools or specialized power tools.

3.4 Cleaning and Protection of Surfaces

.1 After blasting and prior to application of coatings, surfaces must be properly cleaned to remove all dirt, dust, oil, and all other contaminants that will interfere with adhesion and extended coating performance. Proposed method to remove water soluble salts and solvent-SP1 residue must be by a high-pressure water cleaning procedure, as per SSPC procedure (appox. 20-30MPa).

.2 Maintain clean surfaces immediately prior to coating by solvent washing surface followed by wiping dry with clean rags.

3.5 Inspection of Prepared Surfaces

.1 Prior to the application of the coating systems, all metal surfaces will be inspected for chlorides attached to the surfaces which will inhibit the long term performance of the coating systems. Inspection to be carried out by a qualified person and paid for by the Owner.

.2 One or more chloride measurements greater than 5 micrograms per square centimeter (mg/cm^2) is evidence of excessive chloride contamination. One or more sulphate measurements greater than 15 micrograms per square centimeter (mg/cm^2) is evidence of excessive sulphate contamination.

3.5 Inspection of Prepared Surfaces (cont'd)

.3 Excessively contaminated surfaces shall be considered non-compliant and washed with clean water or water modified with a soluble salt remover and allowed to dry. Re-test and/or re-wash until all tests are compliant

3.6 Metallic Filler

.1 All metal exhibiting severe pitting and corrosion shall have a filler material as specified in Section 2.1.4 trowelled applied using a plastic applicator or spatula in strict accordance with manufacturer's instructions. Areas shall be then machined smooth to an acceptable surface profile suitable for the coatings.

3.7 Application of Coatings

.1 Apply specified coatings to all existing and new metal, as indicated.

.2 All edges , corners, crevices, rivets, bolts, welds and sharp edges shall be stripe painted with the selected coating before the first application of the coating system.

.3 Verify film thickness of completed coating system in field using appropriate coating inspection gauge.

.4 Using other appropriate means work coating into cracks, crevices and places which are not adequately painted by spray.

.5 Apply additional costs as required to achieve specified dry film thickness, as per manufacturer's directions.

.6 Apply coating only when conditions such as temperature and humidity inside of temporary enclosure are satisfactorily maintained within manufacturer's recommendations. Also ensure:

.1 Substrate and ambient temperature must be within limits prescribed in paint standard and by manufacturer to approval of Engineer.

.2 Maximum relative humidity 85% during application.

.3 Apply the coating only if the substrate temperature is 3° C above the dew point. Before abrasive blasting, determine the dew point by using a sling psychorometer and psychormetric chart.

.4 Conduct moisture tests using a properly calibrated electronic moisture meter.

3.8 Mixing Paint

.1 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

3.9 Application Procedures

.1 Apply paint by brush roller air sprayer airless sprayer as approved by Engineer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush application.

.1 Work paint into cracks, crevices and corners. Paint surface not accessible to brushes by daubers or sheepskins.

.2 Brush out runs and sags.

.3 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application.

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately all runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Engineer.

.5 Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure for minimum time period after cleaning and between coats as recommended by manufacturer.

.7 Sand and dust between each coat to remove visible defects.

3.9 Application Procedures (cont'd)

.8 Finish tops of projecting ledges, both above and below sight lines as specified for surrounding surfaces.

.9 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

3.10 Field Quality Control

.1 Advise Engineer when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved. Cost for inspection to be paid for by the Owner.

.2 Contractor will be required to apply an additional coating if testing indicates the required coating thickness has not been achieved.

3.11 Restoration

.1 Clean and re-install all items that were removed before undertaking painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect surfaces from paint droppings and dust to approval of Engineer. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Engineer.

END

APPENDIX ‘A’

Maxxam Results – Beam Paint Samples

Your Project #: 5-664-INT
Site Location: CAPE RACE-INTERIOR BEAMS
Your C.O.C. #: 5-664-Int

Attention:Neil Hunt

AFN Engineering Inc
29 Brad Gushue Crescent
St. John's, NL
A1H 0A3

Report Date: 2015/02/17
Report #: R3332398
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B523586
Received: 2015/02/10, 10:11

Sample Matrix: Paint
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Leach TCLP/CGSB extraction (1)	1	2015/02/13	2015/02/14	ATL SOP 00058	EPA 6020A R1 m
TCLP Inorganic extraction - pH (1)	1	N/A	2015/02/12	ATL SOP 00035	EPA 1311 m
TCLP Inorganic extraction - Weight (1)	1	N/A	2015/02/12	ATL SOP 00035	EPA 1311 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 Bedford

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Avery Withrow, Project Manager
Email: AWithrow@maxxam.ca
Phone# (902)420-0203 Ext:233
==========
This report has been generated and distributed using a secure automated process.
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 Job #: B523586
Report Date: 2015/02/17

AFN Engineering Inc
Client Project #: 5-664-INT
Site Location: CAPE RACE-INTERIOR BEAMS
Sampler Initials: NH

ATLANTIC TCLP LEACHATE + LEAD (PAINT)

Maxxam ID		ZL9694		
Sampling Date		2015/02/06		
COC Number		5-664-Int		
	Units	**INTERIOR BEAM #1**	**RDL**	**QC Batch**
Inorganics				
Sample Weight (as received)	g	27	N/A	3916688
Initial pH	N/A	NA		3916710
Final pH	N/A	5.0		3916710
Metals				
Leachable Lead (Pb)	ug/L	<5.0	5.0	3916285

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 Job #: B523586
Report Date: 2015/02/17

AFN Engineering Inc
Client Project #: 5-664-INT
Site Location: CAPE RACE-INTERIOR BEAMS
Sampler Initials: NH

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	13.5°C

Sample ZL9694-01 : Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

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 #: B523586
Report Date: 2015/02/17

AFN Engineering Inc
Client Project #: 5-664-INT
Site Location: CAPE RACE-INTERIOR BEAMS
Sampler Initials: NH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3916285	DLB	Matrix Spike	Leachable Lead (Pb)	2015/02/14		99	%	75 - 125
3916285	DLB	Spiked Blank	Leachable Lead (Pb)	2015/02/14		99	%	80 - 120
3916285	DLB	Method Blank	Leachable Lead (Pb)	2015/02/14	<5.0		ug/L	
3916688	GDX	Method Blank	Sample Weight (as received)	2015/02/12	NA		g	

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.

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 #: B523586
Report Date: 2015/02/17

AFN Engineering Inc
Client Project #: 5-664-INT
Site Location: CAPE RACE-INTERIOR BEAMS
Sampler Initials: NH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Mike MacGillivray, Scientific Specialist (Inorganics)

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.

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