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Requisition No. EZ108-151489/A

MERX I.D. No. _____

SPECIFICATIONS
For
Security Fence Replacement
Esquimalt Graving Dock, 825 Admirals Rd, Victoria, BC

Project No. R.016116.105 December 2014

APPROVED BY:

_____ Jan 20, 2015
Regional Manager, A&E Services Date

_____ 2015.01.20
Construction Safety Coordinator Date

IFT Submission:

_____ JANUARY 15, 2015
Project Manager Date

Drawing List

C-100 COVER SHEET AND SITE PLAN

C-101 PLAN AND PROFILE STA 1+000 TO STA 1+160

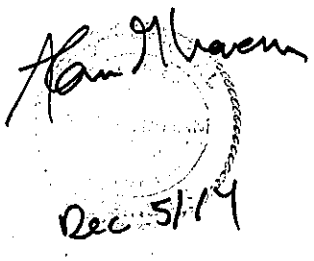
C-102 PLAN AND PROFILE STA 1+160 TO STA 1+320

C-103 PLAN AND PROFILE STA 1+320 TO STA 1+480

C-104 PLAN AND PROFILE STA 1+480 TO STA 1+640

C-105 PLAN AND PROFILE AND FENCE DETAILS STA 1+640 TO STA 1+670

END OF SECTION



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PART 1 - GENERAL

1.1 RELATED SECTIONS

Section 01 31 19 – Project Meetings

1.2 CODES

.1 Perform work to CURRENT Codes, Construction Standards and Bylaws, including Amendments up to the TENDER closing date.

1.3 DESCRIPTION OF WORK

.1 Work to be performed under this Contract includes but is not limited to the following items covered further in the Contract documents:

.1 Replacement of approximately 670m of the existing north perimeter chain link security fence at the Esquimalt Graving Dock with a new chain link fence ranging in minimum height from 3.048m to 6.100m per the contract drawings and documents.

.2 Removal and disposal of the existing chain link fence and all associated appurtenances such as posts, post footings, fittings, caps, gates, barbed wire, including reinstatement of any disturbed ground or holes that remain after removal.

.3 The bottom 305mm of the epoxy coated 37.5mm (non-climb) chain link mesh to be buried in the existing ground where existing ground conditions allow and otherwise bolted to the existing bedrock outcroppings per the contract drawings and documents.

.4 Fence posts to be installed in excavations in the existing ground and backfilled with concrete where existing ground conditions permit, or otherwise in holes drilled into the existing bedrock and backfilled with non-shrink cement grout. Dimensions and materials to be per the contract drawings and documents.

.5 As Built site survey of all new work. Refer to Appendix D EGD Standards for Survey.

.6 The Contractor will remove existing fencing and construct new fencing only in a manner and quantity in which demolition and new construction can be completed in a single work day.

.2 "Green" Requirements

.1 Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from landfill.

.2 Use materials/products containing highest percentage of recycled and recovered materials practicable - consistent with maintaining cost effective satisfactory levels of competition.

1.4 SITE SECURITY

.1 Prior to commencing any work onsite the Contractor is to submit a Security Plan to the Departmental representative for approval describing how security at the fence line is to be maintained during the Work

.2 The securing/security at the fence line will be the contractor's responsibility during the project and the fence line must be manned/maintained at all times during the work day and fully secured at the end of each work day with no exceptions.

.3 Security must be maintained during any and all fence work.

.4 The Contractor will remove existing fencing and construct new fencing only in a manner and quantity in which demolition and new construction can be completed in a single work day.

.5 Temporary construction fencing is not permitted to be used as a means to maintain security.

1.5 CONTRACT DOCUMENTS

.1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

1.6 DIVISION OF SPECIFICATIONS

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment, and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

1.7 TIME OF COMPLETION

.1 Complete the project within 10 weeks after contract award.

1.8 HOURS OF WORK

.1 Hours of work: Restrictive as follows:

.1 Schedule deconstruction, removal and construction work during normal working hours of the Graving Dock. Normal weekday working hours are 0730 to 1700 Monday through Friday, excluding statutory holidays.

.2 Submit written request to Departmental Representative for authorization prior to working outside of normal working hours.

1.9 WORK SCHEDULE

.1 Carry on work as per indicated and as follows:

.1 Within 5 working days after Contract award, provide a "phasing bar chart" and a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents. Indicate the following:

.1 Submission of shop drawings, product data, MSDS sheets and samples.

.2 Commencement and completion of work of each section of the specifications or trade for each phase as outlined.

.3 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule - without notifying Departmental Representative.

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

1.10 COST BREAKDOWN

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative and aggregating Contract price.

1.11 CODES, BYLAWS, STANDARDS

.1 Perform work in accordance with the National Building Code of Canada (NBC), 2005 BC Building Code, and other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.

.2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

1.12 DOCUMENTS REQUIRED

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

.1 Contract drawings.

.2 Contract specifications.

.3 Addenda to Contract documents.

.4 Copy of approved work schedule.

.5 Change orders.

.6 Other modifications to Contract.

.7 Current construction standards of workmanship listed in technical Sections.

.8 Project Safety Plan.

1.13 REGULATORY REQUIREMENTS

.1 Obtain and pay for - Building Permit, Certificates, Licenses and other permits required by regulatory municipal, provincial or federal authorities to complete the work.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

1.14 CONTRACTOR'S USE OF SITE

.1 The Esquimalt Gracing Dock shall be assumed to be fully operational for the duration of the Contract.

.2 Contractor's work site is indicated on the drawings.

.3 Maintain vehicle access at all times.

.4 Do not unreasonably encumber site with material or equipment.

.5 Contractor is designated as Prime Contractor on the Contractor's work site and assumes all responsibilities of Prime Contractor as per relevant acts and regulations. Contractor shall be responsible for all work on Contractor's work site.

1.15 EXAMINATION

.1 Examine site and be familiar and conversant with existing conditions likely to affect work.

1.16 EXISTING SERVICES

.1 Where work involves working around or near existing services contractor is to ensure that no damage occurs to those services. Any damage to existing services is the sole responsibility of the contractor to immediately repair and make good to the satisfaction of the by the Departmental Representative.

1.17 LOCATION OF EQUIPMENT AND SERVICES

.1 Location of equipment, services and features indicated or specified are to be considered as approximate.

1.18 CUTTING AND PATCHING

.1 Cut existing fence as required to accommodate new work.

.2 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing materials, finish and texture.

.3 Making good is defined as matching new grades and surfaces with the existing adjacent ground and surfaces.

1.19 SETTING OUT OF WORK

.1 Installation of the new security fence is to occur on the exact same alignment as the existing security fence.

.2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

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

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

1.20 ACCEPTANCE OF SUBTRADES

.1 Each trade shall examine surfaces prepared by others and job conditions which may affect his work, and shall report defects to the Departmental Representative. Commencement of work shall imply acceptance of prepared work or substrate surfaces.

1.21 QUALITY OF WORK

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.22 WORKS COORDINATION

.1 Coordinate work of sub-trades:

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

.3 Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor's failure to coordinate work.

.4 Maintain efficient and continuous supervision.

1.23 APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

.1 In accordance with Section 013300, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.

.2 Allow sufficient time for the following:

.1 Review of product data.

.2 Approval of shop drawings.

.3 Review of re-submission.

.4 Ordering of approved material and/or products - refer to Sections of Divisions 2 to 33.

1.24 RELICS AND ANTIQUITIES

.1 Relics and antiquities and items of historical or scientific interest shall remain property of the Crown. Protect such articles and request directives from Departmental Representative.

.2 Give immediate notice to Departmental Representative if evidence of archeological finds are encountered during excavation/construction, and await Departmental Representative's written instructions before proceeding with work in this area.

1.25 SECURITY CLEARANCES

.1 Personnel employed on this project will be subject to security check. Obtain requisite clearances, as instructed, for each individual required to enter the premises.

1.26 PROJECT MEETINGS

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

1.27 TESTING AND INSPECTIONS

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

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

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

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

.4 Additional tests specified in Paragraph .2 above.

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

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

.4 Notify Departmental Representative in advance of planned testing.

.5 The Departmental Representative may require, and pay for additional inspection and testing services.

.6 Provide Departmental Representative with 2 copies of testing laboratory reports as soon as they are available.

1.28 AS-BUILT DOCUMENTS

.1 The Departmental Representative will provide 2 sets of drawings, 2 sets of specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.

.2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.

.3 Refer to Section 01 77 00 – Closeout Procedures

1.29 CLEANING

.1 Conduct daily cleaning and disposal operations. Comply with local ordinances and anti-pollution laws.

.2 **Ensure cleanup of the work areas each day after completion of work.**

.3 In preparation for interim and final inspections:

.1 Examine all sight-exposed exterior surfaced and concealed spaces.

1.30 DUST CONTROL

.1 Provide temporary dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

.2 Maintain and relocate protection until such work is complete.

1.31 ENVIRONMENTAL PROTECTION

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

.2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.

.3 Ensure proper disposal procedures in accordance with all applicable territorial regulations.

.4 Ensure adherence to Esquimalt Graving Dock Environmental Best Management Practices.

1.32 ADDITIONAL DRAWINGS

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

.2 Upon request, Departmental Representative may furnish up to a maximum of 10 sets of Contract documents for use by the Contractor at no additional cost. Should more than 10 sets of documents be required the Departmental Representative will provide them at additional cost.

1.33 BUILDING SMOKING ENVIRONMENT

.1 Smoking within buildings is not permitted.

.2 Smoking is permitted in designated areas only.

1.34 SYSTEM OF MEASUREMENT

.1 The metric system of measurement (SI) will be employed on this Contract.

1.35 FAMILIARIZATION WITH SITE

.1 Before submitting tender, visit site - as indicated in tender documents and become familiar with all **conditions likely to affect the cost of the work**.

1.36 SUBMISSION OF TENDER

.1 Submission of a tender is deemed to be confirmation of the fact that the Tenderer has analyzed the Contract documents, and is fully conversant with all conditions.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 55 – General Instructions

1.2 ADMINISTRATIVE

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

.2 Departmental representative will provide physical space and make arrangements for meetings.

.3 Departmental representative will record and distribute the meeting minutes. Minutes will include significant proceedings and decisions including actions by parties.

.4 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 PRECONSTRUCTION MEETING

.1 Within 5 days after award of Contract, Departmental Representative will request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, will be in attendance.

.3 Departmental Representative will establish time and location of meeting and notify parties concerned.

.4 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 56 00 – Temporary Facilities and Enclosures

.3 Delivery schedule of specified equipment.

.4 Site security in accordance with Section 01 11 55 – General Instructions

.5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.6 Owner provided products.

.7 Close out procedures, acceptance, warranties, surveys in accordance with Section 01 77 00 - Closeout Procedures.

.8 Monthly progress claims, administrative procedures, photographs, hold backs.

.9 Appointment of inspection and testing agencies or firms.

.10 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During course of Work and two weeks prior to project completion, schedule progress meetings monthly.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

.3 Notify parties minimum five days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for affect on construction schedule and on completion date.

.12 Other business.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 General Conditions of Contract.

.2 Section 01 11 55 – General Instructions.

1.2 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Construction Work outside of routine hours. Work that takes place outside of regular work periods of Monday to Friday 07:00 to 17:00 hours.

.6 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.7 Master Plan: summary-level schedule that identifies major activities and key milestones.

.8 Milestone: significant event in project, usually completion of major deliverable.

.9 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

1.3 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame specified in Section 01 11 55 – General Instructions.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 It is understood that Award of Contract or time of beginning, rate of progress, Substantial Performance Certificate and Total Performance Certificate as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

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

.2 Submit to Consultant within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within 10 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

- .1 Award
- .2 Shop Drawings, Samples
- .3 Permits

.4 Mobilization
.5 Electrical
.6 Testing and Commissioning
.7 Mandatory Schedule Milestones

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress. Submit updated schedule with payment application.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 General Conditions of Contract.

1.2 ADMINISTRATIVE

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

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

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

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project and item will be returned without being examined and considered rejected.

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

.7 Verify field measurements and affected adjacent Work to be co-ordinated.

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

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

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

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

.2 Submit shop drawings bearing stamp and signature of qualified professional registered or licensed in Province of BC, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for the Departmental Representative's review of each submission.

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

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

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

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

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

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

.10 Submit electronic copies of shop drawings for each requirement requested in specification Sections and as the Departmental Representative may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.2 Testing must have been within 1 year of date of contract award for project.

.13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by the Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by the Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.16 Submit 2 hard copies and an electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by the Departmental Representative.

.17 Delete information not applicable to project.

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

.19 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.20 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop

drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Special procedures required during the work due to the presence of contaminated soil beneath the site.

1.2 RELATED SECTIONS

.1 Section 01 74 19 – Waste Management and Disposal

.2 Section 31 00 99 – Earthworks for Minor Works

.3 Section 31 23 11 – Excavation and Handling of Contaminated Material

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 51-GP-51M-81, Polyethylene Sheet for Use in Building Construction.

.2 Transportation and Dangerous Goods Act.

.3 CCME (Canadian Council of Ministers of Environment) Canadian Soil Quality Guidelines

.1 Canadian Soil Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial (**CCME IL**).

.2 Canadian Soil Quality Guidelines for PAH, Industrial, Environmental Health guidelines, Soil Contact (**CCME ILsc**).

.3 Canadian Soil Quality Guidelines for PAH, Industrial, Environmental Health guidelines, Protection of Freshwater Life (**CCME ILfl**).

.4 Canadian Soil Quality Guidelines for PAH, Industrial, Environmental Health guidelines, Interim Soil Quality Criteria (CCME 1991) **(CCME IIi).**

.5 Soil Quality Guidelines for the Protection of Human Health (**CCME SQGhh**).

.4 BC Environmental Management Act and Contaminated Sites Regulation (CSR) most recent updates related to soil standards and waste soil disposal.

.5 BC Ministry of Environmental Technical Guidance Document 1. Site Characterization and Confirming Testing.

.6 Department of Fisheries and Oceans Land Development Guidelines.

1.4 REGULATORY REQUIREMENTS

.1 Provide erosion and sediment control in accordance with the following documents:

.1 Federal Fisheries Act 1970 (and applicable updates).

.2 BC Ministry of Environment Lands and Parks Approved And Working Criteria for Water Quality – 1998 (and applicable updates)

.3 BC Water Act 1988 Section 9 Changes in and about a Stream (and applicable updates)

.4 Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans Canada, and BC Ministry of Environment, Lands and Parks, 1993 (and applicable updates)

.2 BC Environmental Management Act and Contaminated Sites Regulation (CSR) soil standards and spoil disposal requirements.

.3 Ensure that water which falls upon or drains across the work site is collected, treated, and released in accordance with the above referenced documents and regulations.

.4 Comply with federal, provincial, municipal and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, water, soil, debris, and rubbish.

1.5 POTENTIALLY CONTAMINATED MATERIALS

.1 The soils at Esquimalt Graving Dock are known potentially to contain contaminants – hydrocarbons and metals. Contractor shall follow appropriate steps as described in this and other sections of the Specifications when performing excavation and removal of soils.

.2 Do not commence Work involving contact with potentially contaminated materials until decontamination facilities are operational and approved by the Departmental Representative.

1.6 ENVIRONMENTAL PROTECTION

.1 Contractor must adhere to Esquimalt Graving Dock's Environmental Best Management Practices.

.2 Submit Environmental Management Plan that outlines contractors procedures to achieve environmental protection requirements including the management of soils, erosion and sediment control, waste management, storm water

management, spill prevention and response, noise and dust control, archeological, and conformance to applicable environmental regulations, standards and requirements of the EGD Best Management Practice

.3 Contractor shall adhere to the following mitigation/protection measures:

.1 Spill Response Plan must be submitted to the Departmental Representative prior to project start-up.

.2 Spill response materials must be on site at all times and must be sufficient to handle potential spills.

.3 All machinery equipment must be in good working order.

.4 Fuelling operations/hazardous materials storage must be done in a protected area away from the marine environment and the drainage system.

.5 No waste materials or wastewater is to be allowed to enter the drainage system or the marine environment. Construction runoff into the marine environment is a contravention of the Fisheries Act. This includes raw concrete and concrete silt. Drains in the vicinity of the project must be covered with filter media.

.6 Soils must be stockpiled so they are completely contained and stockpiled in an area designated by the Departmental Representative.

1.7 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and dispose of in appropriate off-site disposal facility. Clean access roads and any roads used by trucks or equipment at least once per shift using a street sweeper.

.2 The Departmental Representative may collect soil samples for chemical analyses from the traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to the Contract.

1.8 DUST AND PARTICULATE CONTROL

.1 Execute work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures immediately during construction and in accordance with Province of British Columbia regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for dust and particulate control.

.4 Recover and treat any runoff from water applied to the roads or excavation. Prevent any water applied to the roads or excavation from discharging directly to the storm sewer or offsite.

.5 Use chemical means for water misting system for dust and particulate control only with Departmental Representative's prior written approval.

.6 As a minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.

.7 Prevent dust from spreading to adjacent property sites.

.8 Departmental Representative may stop work at any time when Contractor's control of dust and particulate is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulate into atmosphere equals or exceeds specified levels in the Contractors Health and Safety Plan and by British Columbia Workers Compensation Board. Cost of such work stoppage shall be borne by the Contractor.

.9 If Contractor's dust and particulate control is not sufficient for controlling dust and particulate into atmosphere, stop work. Contractor must prepare and discuss procedures to resolve the problem. Make all necessary changes to operations prior to resuming any excavation, handling, processing, or any other work that may cause release of dusts or particulate.

1.9 POLLUTION CONTROL

.1 Provide methods, means, and facilities to prevent contamination soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations

.2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

.3 Promptly report spills and releases potentially causing damage to the environment to:

.1 Authority having jurisdiction or interest in spill or release including any conservation authority, water supply authorities, drainage authority, road authority, and fire department.

.2 Owner of pollutant, if known.

.3 Person having control over pollutant, if known.

.4 Departmental Representative.

.4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measure used in cleanup or mitigating action.

.5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

.6 Volatile Organic Compounds (VOC) Control:

.1 In addition to requirements of Section 01 35 33, monitor air quality for volatile organics at the Contractors work zone during contaminated materials excavation and management activities, and maintain a log of air quality readings. Report the readings to the Departmental Representative.

.2 If air quality monitoring indicates that release of volatile organic in air at site boundary exceeds Level C of Personnel Protective Equipment threshold for air quality, implement corrective actions to control volatile organics.

.3 If actions are not sufficient to control release of volatile organics within an hour of identification of air quality problem, suspend work resulting in excessive volatile organic emissions. Contractor and Contractor's Environmental Engineer to prepare and discuss additional methods that Contractor proposes to control the release of volatile organics with the Departmental Representative.

.4 Make all necessary changes at no additional cost to the Owner and Departmental Representative prior to resuming Work.

.5 In addition, if Departmental Representative's monitoring of ambient air at site perimeter indicated that concentration of contaminants in air exceed WCB specified limits, modify operations to keep volatile organic contaminants below acceptable limits.

1.10 WATER CONTROL

.1 Maintain work areas relatively free of water such that the presence of water in the excavation does not interfere with the progress of the work.

.2 Protect site from puddles or running water. Grade site to drain. Provide berm as necessary to protect the slopes of the excavation from soil erosion.

.3 Prevent surface water runoff from leaving work areas.

.4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off the site or to municipal sewers.

.5 Prevent precipitation from infiltrating or from directly running off stockpiled or exposed material surfaces. Cover stockpiled or exposed material surfaces at all times with an impermeable liner.

.6 Direct surface waters outside of the excavation that has not contacted potentially contaminated materials to existing surface drainage systems.

.7 Control surface drainage ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

.8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

.10 Contain water from stockpiled materials. Transfer all potentially contaminated surface waters to the designated waste water storage tanks.

.11 Have on hand sufficient pumping equipment, machinery and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

.12 Contain and collect surface and decontaminations water and transfer such collected water to the waste water storage tanks.

1.11 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.

.2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.12 FINAL DECONTAMINATION

.1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.

.2 Perform decontamination as specified to satisfaction of the Departmental Representative. The Departmental Representative will require the Contractor to perform additional decontamination if required.

1.13 REMOVAL AND DISPOSAL

.1 Remove surplus materials and temporary facilities from site.

.2 Dispose of all non-contaminated waste materials, litter, debris, and rubbish off site.

.3 Do not burn or bury rubbish and waste materials on site.

.4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, paint thinner etc., in storm or sanitary drains.

.5 Do not discharge wastes into streams or waterways.

.6 Dispose of the following materials at appropriate off-site facility identified by Contractor and approved by Departmental Representative: Debris including excess construction material, non-contaminated matter and rubbish; disposable PPE worn during final cleaning; wastewater removed from wastewater storage tank, wastewater generated from final decontamination operations including wastewater storage tank cleaning; and lumber from decontamination pads.

END OF SECTION

1. References

.1 Government of Canada.
- .1 Canada Labour Code - Part II
- .2 Canada Occupational Health and Safety Regulations.

.2 National Building Code of Canada (NBC):
- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 Fire Protection Engineering Services, HRSDC:
- .1 FCC No. 301, Standard for Construction Operations.
- .2 FCC No. 302, Standard for Welding and Cutting.

.4 Province of British Columbia:
- .1 Workers Compensation Act Part 3-Occupational Health and Safety.
- .2 Occupational Health and Safety Regulation

2. Related Sections

.1 Refer to the following current NMS sections as required:
- .1 Construction progress schedules: Section [013218]
- .2 Submittals procedures: Section [013300]
- .3 Special procedures for contaminated sites: Section [013515]
- .4 Temporary Facilities and Enclosures: Section [015600]

3. Workers' Compensation Board Coverage

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

4. Compliance with Regulations

.1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers

are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

5. Submittals

.1 Submit to Departmental Representative submittals listed for review. [in accordance with Section 013300]

.2 Work effected by submittal shall not proceed until review is complete.

.3 Submit the following:

- .1 Health and Safety Plan.
- .2 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 2 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.

.5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:

- .1 Be construed to imply approval by the Departmental Representative.
- .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
- .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6. Responsibility

.1 Assume responsibility as the Prime Contractor for work under this contract.

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

.3 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.

7. Health and Safety Coordinator

.1 The Health and Safety Coordinator must:

.1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.

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

.3 Be on site during execution of work.

NOTE: The Contractor's Superintendent may fulfill this role if qualified.

8. General Conditions

.1 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.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.3 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.4 Secure site at all times including the night time [or provide security guard] as deemed necessary to protect site against

entry and to the satisfaction of the Departmental Representative.

9. Project/Site Conditions

.1 The Esquimalt Graving Dock is a dry dock and ship repair facility. It is an industrial site wherein industrial, manufacturing, fabrication, heavy construction, and like works are conducted by a variety of contractors and sub-trades for a variety of owners and/or PWGSC

.2 Work at site will involve a number of hazards known to PWGSC as noted in the Preliminary Job Hazard Analysis in Appendix B attached).

This site may involve contact with hazardous and/or toxic materials and substances such as, but not limited to:

- .1 Waste sandblast grit.
- .2 Paint spray, including solvents and mineral spirits.
- .3 Waste water.
- .4 Contaminated soils and debris.
- .5 Polychlorinated biphenyl (PCB).
- .6 Creosote and creosote materials.
- .7 Asbestos.
- .8 Lead paints and other paints containing toxic substances such as arsenic and carcinogens.

.3 Other safety hazards or risks which may be encountered include, but are not limited to:

- .1 Contact with traveling and mobile cranes, forklifts, man lifts and other motorized vehicles.
- .2 Overhead hazards such as that created by material transported by cranes.
- .3 Fall hazards.
- .4 Drowning hazards.
- .5 Confined space hazards.
- .6 Electrical hazards.
- .7 Contact with operating mechanical, electrical, electronic, pneumatic, thermal, and hydraulic machinery and equipment.
- .8 Fire hazards.

10. Regulatory Requirements

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

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

11. Work Permits

.1 Obtain specialty permit[s] related to project before start of work.

12. Filing of Notice

.1 The General Contractor is to complete and submit a Notice of Project as required by Provincial authorities.

.2 Provide copies of all notices to the Departmental Representative.

13. Health and Safety Plan

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards. Incorporate Preliminary Job Hazard Analysis (JHA)-Appendix B provided by PWGSC that identifies those hazards known to PWGSC.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following (see checklist in Appendix A attached):

.1 Primary requirements:

1. Contractor's safety policy.
2. Identification of applicable compliance obligations.
3. Definition of responsibilities for project safety/organization chart for project.
4. General safety rules for project.
5. Job-specific safe work, procedures.
6. Inspection policy and procedures.
7. Incident reporting and investigation policy and procedures.
8. Occupational Health and Safety Committee/Representative procedures.
9. Occupational Health and Safety meetings.

10. Occupational Health and Safety communications and record keeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
.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 (PPE) to be used by workers.
.6 Identify personnel and alternates responsible for site safety and health.
.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

14. Emergency Procedures

.1 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 Regulatory agencies applicable to work and as per legislated regulations.
.3 Local emergency resources.
.4 Departmental Representative and site staff.

.2 Include the following provisions in the emergency procedures:
- .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
- .2 Evacuate all workers safely.
- .3 Check and confirm the safe evacuation of all workers.
- .4 Notify the fire department or other emergency responders.
- .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
- .6 Notify Departmental Representative and site staff.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:
- .1 Workplaces where there are persons who require physical assistance to be moved.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

15. Hazardous Products

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

.2 Where use of hazardous and toxic products cannot be avoided:
- .1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per [Section 013300].

16. Electrical Safety Requirements

.1 Comply with authorities and ensure that, when installing

new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

17. Fire Safety and Hot Work

.1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles or other open flame devices and grinding with equipment which produces sparks.

18. Fire Safety Requirements

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, 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.

19. Fire Protection and Alarm System

.1 Fire protection and alarm systems shall not be:

.1 Obstructed.

.2 Shut off.

.3 Left inactive at the end of a working day or shift.

.2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.

.3 Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

20. Unforeseen Hazards

.1 Should any unforeseen or peculiar safety-related factor,

hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

21. Posted Documents .1 Post legible versions of the following documents on site:

- .1 Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
- .5 Notice of Project.
- .6 Floor plans or site plans.
- .7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
- .8 Workplace Hazardous Materials Information System (WHMIS) documents.
- .9 Material Safety Data Sheets (MSDS).
- .10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

22. Meetings .1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

23. Correction of Non-Compliance .1 immediately address health and safety non-compliance Issues identified by the Departmental Representative.

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

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

.2 Reference Standards:

.1 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

.3 Esquimalt Graving Dock - Environmental Best Management Practices, PWGSC, October 6, 2012, Version 04. Refer to the appendix.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative.

.2 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.6 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.7 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.8 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.9 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.10 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, disinfection water, and water used in flushing of lines.

1.3 FIRES

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

1.4 DRAINAGE

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

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

1.7 POLLUTION CONTROL

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

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

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

.1 Provide temporary enclosures where directed by Departmental Representative.

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

1.8 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Do not take action until after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 – PRODUCTS

1.2 Not used

.1 Not use

PART 3 - EXECUTION

3.1 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

.3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 55 – General Instructions

1.2 INSPECTION

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

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

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

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be organized and engaged by the Contractor for purpose of inspecting and/or testing all concrete used in the execution of the Work. Cost of such services will be borne by the Contractor.

.2 Independent Inspection/Testing Agencies will be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Departmental Representative.

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

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

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

1.4 ACCESS TO WORK

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

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

1.5 PROCEDURES

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

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

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

1.6 REJECTED WORK

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

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

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

1.7 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.9 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to Departmental Representative as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.

.6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.

.7 Mock-ups may remain as part of Work.

.8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.10 MILL TESTS

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

END OF SECTION

PART 1 – GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 55 – General Instructions

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 GUARD RAILS AND BARRICADES

Provide as required by:
.1 WorkSafeBC and all governing authorities.
.2 Canada Labour Code - Part II
.3 Government of Canada Occupational Health and Safety Regulations.
In the case of multiple applicable regulations the more stringent will apply.

1.6 ACCESS TO SITE

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

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

PART 1 - GENERAL

1.1 PRODUCT/MATERIAL AND EQUIPMENT

.1 Use NEW products/material and equipment unless otherwise specified. The term "products" is referred to throughout the specifications.

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

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

.4 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions. Departmental Representative will designate which document is to be followed.

.5 Provide metal fastenings and accessories in the same texture, colour and finish in which they are specified.

- .1 Prevent electrolytic action between dissimilar metals.
- .2 Use non-corrosive fasteners, anchors and spacers for securing exterior work.

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

.7 Bolts may not project more than 1 diameter beyond nuts.

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

.9 Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from site.

.10 Store products in accordance with suppliers' instructions.

.11 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction.

- .1 Use primer or enamel to match original.
- .2 Do not paint over nameplates.

1.2 QUALITY OF PRODUCTS

.1 . Products, materials and equipment (referred to as products) incorporated into work shall be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of the products provided.

.2 Defective products will be rejected regardless of previous inspections.

.1 Inspection does not relieve responsibility, but is precaution against oversight or error.

.2 Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Retain purchase orders, invoices and other documents to prove that all products utilized in this Contract meet the requirements of the specifications. Produce documents when requested by the Departmental Representative.

.4 Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract documents.

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

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

1.3 AVAILABILITY OF PRODUCTS

.1 Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of products are foreseeable, notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the work.

.3 In event of failure to notify Departmental Representative at the start of work and should it subsequently appear that the work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in either the Contract price or the Contract time.

1.4 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in the specifications, install or erect products in accordance with the manufacturer's instructions.

.1 Do not rely on labels or enclosures provided with products.

.2 Obtain written instructions directly from the manufacturer.

.2 Notify Departmental Representative in writing of conflicts between the specifications and the manufacturer's instructions so that the Departmental Representative may establish the course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in either the Contract price or the Contract time.

1.5 CONTRACTORS' OPTION FOR SELECTION OF PRODUCTS FOR TENDERING

.1 Products are specified by "Prescriptive" specifications: select any product meeting or exceeding specifications.

.2 Products specified under "Acceptable Products" (used for complex Mechanical or Electrical Systems): select any one of the indicated manufacturers, or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.

.3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

.4 When products are specified by a referenced standard or by or Performance specifications, upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements.

1.6 SUBMISSION AFTER CONTRACT AWARD

.1 No substitutions are permitted without prior written approval of the Departmental Representative.

.2 **Proposals for substitution may only be submitted after Contract award.** Such request must include statements of respective costs of items originally specified and the proposed substitution.

.3 Proposals will be considered by the Departmental Representative if:

.1 products selected by tenderer from those specified are not available.

.2 delivery date of products selected from those specified would unduly delay completion of Contract, or

.3 alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified, and will result in a credit to the Contract amount.

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

.5 Amounts of all credits arising from approval of the substitutions will be determined by the Departmental Representative, and the Contract price will be reduced accordingly.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used

PART 3 - PART 3 EXECUTION

3.1 NOT USED

.1 Not Used

END OF SECTION

PART 1 – GENERAL

1.1 RELATED SECTIONS

.1 Section 01 77 00 – Closeout Procedures.

1.2 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative.

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

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

.5 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Waste Management and Disposal.

.6 Dispose of waste materials and debris off site.

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

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

.9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces.

1.3 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris including that caused by Sub-Contractors, and leave Work clean and suitable for occupancy.

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

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

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

.6 Remove stains, spots, marks and dirt from work.

.7 Inspect finishes and equipment and ensure specified workmanship and operation.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Refer to every technical section for waste management and disposal. Esquimalt Graving Dock - Environmental Best Management Practices, PWGSC, October 6, 2010, Version 04. Refer to the appendix.

1.2 DEFINITIONS

.1 Waste Audit (WA): relates to projected waste generation. Involves controlled separation of waste.

.2 Waste Reduction Workplan (WRW): a written report, which addresses opportunities for reduction, re-use or recycling of materials.

.3 Materials Source Separation Program (MSSP): consists of a series of ongoing activities to separate re-usable and recyclable waste material into material categories from other types of waste at point of generation.

1.3 MATERIALS SOURCE SEPARATION

.1 Before project start-up, prepare Materials Source Separation Program. Provide separate containers for re-usable and/or recyclable materials of the following:

- .1 Metals.
- .2 Wood.
- .3 Plastics.
- .4 Other materials as indicated in technical sections.

.2 Implement Materials Source Separation Program for waste generated on project in compliance with approved methods and as approved by Departmental Representative.

.3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.4 Locate separated materials in areas which minimize material damage.

1.4 DIVERSION OF MATERIALS

.1 Create a list of materials to be separated from the general waste stream and stockpiled in separate containers, to the approval of the Departmental Representative and consistent with applicable fire regulations.

- .1 Mark containers.
- .2 Provide instruction on disposal practices.

1.5 STORAGE, HANDLING, AND APPLICATION

.1 Do work in compliance with Waste Reduction Workplan.

.2 Handle waste materials not re-used, salvaged, or recycled in accordance with appropriate regulations and codes.

.3 Materials in separated condition: collect, handle, store on site, and transport off-site to an approved and authorized recycling facility.

.4 Materials must be immediately separated into required categories for re-use or recycling.

.5 Unless specified otherwise, materials for removal become the Contractor's property.

.6 On-site sale of salvaged/recyclable material is not permitted.

.7 **Provide Departmental Representative with receipts** indicating quantity of material delivered to landfill.

.8 **Provide Departmental Representative with receipts** indicating quantity and type of materials sent for recycling.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Departmental Representative inspection.

.2 Departmental Representative Inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.

.2 When Work incomplete according to Departmental Representative complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Final Payment: when Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met including provision of the As-Built Survey, make application for final payment.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Supply and installation on cast-in-place concrete and accessories.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 35 33 - Health and Safety

1.3 REFERENCES

.1 Abbreviations and Acronyms:

.1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).

.1 Type GU or GUb - General use cement.

.2 Type MS or MSb - Moderate sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 8%.

.3 GGBFS - Ground, granulated blast-furnace slag.

.2 Reference Standards:

.1 ASTM International

.1 ASTM C260-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

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

.3 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CSA International

.1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

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

.3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Independent Inspection/Testing Agencies will be organized and engaged by the Contractor for purpose of inspecting and/or testing all concrete used in the execution of the Work. Contractor to provide all testing and inspection results and reports for review by Departmental Representative and shall not proceed without written approval when deviations from mix design or parameters are found.

.3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3.3 – Field Quality Control.

.4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

.5 Supply pour sheets to Departmental Representative at least two days prior to pour.

1.5 QUALITY CONTROL

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Provide Departmental Representative, minimum 2 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 2 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items as required:

.1 Hot weather concrete.

.2 Cold weather concrete.

.3 Curing.

.4 Finishes.

.5 Formwork removal.

.6 Joints.

.4 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in Part 2 - Products.

.5 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

.2 Divert unused concrete materials from landfill to local facility approved by Departmental Representative.

.3 Provide an appropriate area on the job site where concrete trucks can be safely washed.

.4 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.5 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Performance: to CSA A23.1/A23.2, and as described in Mixes of Part 2 - Products.

2.2 MATERIALS

.1 Cement: to CSA A3001, Type GU, MS.

.2 Supplementary cementing materials: with minimum 20% Type F fly ash replacement, by mass of total cementitious materials to CSA A3001.

.3 Water: to CSA A23.1.

.4 Aggregates: to CSA A23.1/A23.2.

2.3 MIXES

.1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.

.2 Concrete mix to meet product requirements of Section 32 31 13 – Chain Link Fences and Gates (Exterior)

.1 Compressive strength: 30 MPa minimum at 28 days.

.2 Exposure Classification F-1

.3 Air Entrainment 6%

.4 Aggregate Size 38mm maximum, 5mm minimum

.5 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in Part 3.5 – Verification.
Provide quality management plan to ensure verification of concrete quality to specified performance.

.6 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.7 Documentation indicating the compatibility of the water reducing admixture, the air entraining admixture, the superplasticizing admixture (if any), the silica fume (if any) and the fly ash (if any) is to be submitted upon request for review by the Departmental Representative.

Part 3 Execution

3.1 PREPARATION

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

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

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

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

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

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

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

3.2 CONSTRUCTION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

3.3 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in Part 1.4 – Departmental and Information Submittals.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory approved by Departmental Representative for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Testing firm to take a minimum of three (3) test cylinders for a strength test and not less concrete placed and not less than one (1) test for each type of concrete placed in any one day.

.4 Testing firm to moist cure and test one (1) cylinder in 7 days and to moist cure and test the remaining two (2) cylinders in 28 days.

.5 Testing firm to take at least one slump test and one entrained air test for each set of test cylinders taken.

.6 Testing firm to take one additional test cylinder during cold weather concreting and cure on job site under same conditions as the concrete it represents.

.7 Testing firm is to report results of tests immediately to the Contractor and the Departmental Representative. The Contractor is responsible for ensuring that the concrete meets the requirements of the specifications.

.8 Testing firm is to submit to the Departmental Representative and Contractor copies of test results. Include the following information with the results:

.1 Name of the project.
.2 Date of sampling.
.3 Mix design, specified strength, slump and air content.
.4 Name of supplier, truck and ticket number.
.5 Time batched and time placed.
.6 Identification of sampling and testing technician.
.7 Cement type and admixtures used.
.8 Exact location in the structure of the concrete sampled.
.9 Ambient air and concrete temperatures.
.10 Nominal aggregate size.
.11 Water added and personnel authorizing additional water.
.12 Concrete density.

.9 Inspection and Testing of Grout

.1 In accordance with ASTM C109, provide at least two (2) cube tests on all types of non-shrink grout used.

.10 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.

.11 Departmental Representative may at his/her discretion take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.12 Non-Destructive Methods for Testing Concrete: in accordance with CSA-A23.1/A23.2.

3.4 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

3.5 VERIFICATION

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established in Part 2 - Products, by Departmental Representative and provide verification of compliance as described in Part 1.5 – Quality Control.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C88, Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM C136, Method for Sieve Analysis of Fine and Coarse Aggregate.
- .3 ASTM C117, Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .4 ASTM D1557, Specification for Test Methods for Aggregate Mixtures using 10 lb (4.54 kg) Rammer and 18 inch (457 mm) Drop.
- .5 ASTM D698, Standard Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures using 2.49 kg Rammer and 304.8 mm Drop.

.2 Canadian Standards Association (CSA International)

- .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction.

1.2 REGULATIONS

.1 Shore and brace excavations, protect slopes and banks and perform all work in accordance with Federal, Provincial and Municipal regulations whichever is more stringent.

.2 Not later than one week before backfilling or filling, provide test results from the approved testing firm certifying the suitability of the chosen material.

.3 Do not begin backfilling or filling operations until material has been approved for use by the Departmental Representative.

.4 Not later than 48 hours before backfilling or filling with approved material, notify the Departmental Representative.

.5 Before commencing work, conduct, with the Departmental Representative, condition survey of existing structures, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

1.3 TESTS AND INSPECTIONS

.1 Testing of materials and compaction of backfill and fill will be carried out by a certified testing firm, retained by the Contractor and approved by the Departmental Representative.

1.4 BURIED SERVICES

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

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

.3 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.

1.5 PROTECTION

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to the Departmental Representative's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage unless approved by the Departmental Representative.

.5 Protect buried services that are required to remain undisturbed.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Gravel to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles. In absence of satisfactory performance records over a five year period for particular source of material, soundness to be tested according to ASTM test procedure C-88 or latest revised issue. Maximum weight average losses for course and fine aggregates to be 30% when magnesium sulphate is used after five cycles.

.2 All crushed gravel when tested according to ASTM C-136 and ASTM C-117, or latest revised issue, to have a generally uniform gradation and conform to following sieve must have one or more fractured faces. Determination of the Ministry of Transportation and Highways' Specification I-11, Fracture Count for Coarse Aggregate, Method "A", which determines fractured faces by count. The Plasticity Index for crushed gravel to not exceed 6.0.

.3 Native material is workable soil free of organic or foreign matter; obtained within limits of Contract may be deemed native material if it is approved by the Departmental Representative. Native material may be reused only if tested and confirmed to be "Uncontaminated Soil" as defined in Specification 31 23 11-Excavation and Handling of Contaminated Material, Section 1.4.1 and approved by the Departmental Representative. Native material is not acceptable if it is

contaminated or impracticable to control its water content or compact to specified density.

PART 3 - EXECUTION

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 CLEARING AND GRUBBING

.1 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.

.2 Remove stumps and tree roots below footings, slabs, and paving, and to not less than 200 mm below finished grade elsewhere.

.3 Dispose of cleared and grubbed plant material off site daily to disposal areas acceptable to authority having jurisdiction.

3.3 EXCAVATION

.1 All excavated soil under this contract shall be treated as potentially contaminated soil. Excavate, handle and store excavated soil as per Sections 13515 and 013533 and all other related sections.

.2 Topsoil stripping

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.2 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.

.3 Excavate as required to carry out work, in all materials met. Do not disturb soil or rock below bearing surfaces. Notify the Departmental Representative when excavations are complete. If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work. Excavation taken below depths shown without Departmental Representative's written authorization to be filled with concrete of same strength as for footings at Contractor's expense.

.4 Excavate trenches to provide uniform continuous bearing and support for 100 mm thickness of pipe bedding material on solid and undisturbed ground. Trench

widths below point 300 mm above pipe not to exceed diameter of pipe plus 600 mm.

.5 Excavate for footings, slabs and paving to subgrade levels. In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.4 BACKFILLING

.1 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by the Departmental Representative.

.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.4 Compaction: place backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (All densities in compliance with ASTM D1557).

.1 Boulevards and easements to minimum 90%

.2 Roads, driveways, shoulders, re-shaped ditches and sidewalks to minimum 95%.

.3 Use caution in pipe zone to ensure no damage to pipe.

.5 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.

.6 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.

.7 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

3.5 CONTAMINATED MATERIALS

.1 The soils at Esquimalt Graving Dock are known potentially to contain contaminants such as hydrocarbons and metals. Contractor is to take appropriate measures as per Section 013515 and 013533 for excavation work.

3.6 GRADING

.1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by the Departmental Representative. Grade to be gradual between finished spot elevations shown on drawings.

3.7 SHORTAGE AND SURPLUS

.1 Supply all necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance.

.2 Dispose of surplus fencing and imported backfill material off site.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

.1 Section 31 00 99 – Earthworks for Minor Works

1.2 DEFINITIONS

.1 Clearing consists of cutting or removing of trees brush and vegetative growth and disposing of felled trees, previously uprooted trees and stumps, and surface debris as required to facilitate the installation of the replacement security fence.

.2 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris as required to permit the installation of the replacement security fence.

.3 Underbrush clearing consists of removal from treed areas of undergrowth, deadwood, and trees smaller than 50 mm trunk diameter, and disposing of fallen timber and surface debris as required to facilitate the installation of the replacement security fence.

.4 Grubbing consists of excavation and disposal of stumps and roots boulders and rock fragments as required to facilitate the installation of the replacement security fence.

1.3 APPROVALS

.1 The limit and extent of any clearing or grubbing operations to be discussed, reviewed and approved by the Departmental Representative prior to any clearing or grubbing operations.

1.4 STORAGE AND PROTECTION

.1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, site appurtenances, water courses, root systems of trees which are to remain.

.1 Repair damaged items to approval of Departmental Representative.

.2 Replace trees designated to remain, if damaged, as directed by Departmental Representative.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

PART 2 Products

2.1 MATERIALS

.1 Soil Material for Fill:

.1 Excavated soil material: Uncontaminated Soil per section 31 23 11, free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, deleterious, or objectionable materials.

PART 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction or sediment and erosion control plan, specific to site.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.4 Refer to the Esquimalt Graving Dock Environmental Best Management Practices Manual (October 6, 2010) prior to and during and Clearing and Grubbing Exercises. Refer to appendix for copy of manual.

3.2 PREPARATION

.1 Inspect site and verify with Department Representative items designated to remain.

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

.1 Notify Department Representative immediately of damage to or when unknown existing utility lines are encountered.

.3 Notify Department Representative and utility authorities before starting clearing and grubbing.

.4 Keep roads and walks free of dirt and debris.

3.3 CLEARING

.1 Clearing includes felling, trimming, and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within limit of security fence replacement works.

.2 Clear as directed by Department Representative, by cutting at height of not more than 300mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.

.3 Cut off branches and cut down trees overhanging work area as directed by Department Representative.

.4 Cut off unsound branches on trees designated to remain as directed by Department Representative.

3.4 GRUBBING

.1 Any rocks or soil materials that have fallen down the adjacent rail corridor embankment and are resting against the existing fence are to be considered to be contaminated and are to be handle per section 31 23 11 – Excavation and Handling of Contaminated Materials and as directed by the Department Representative.

.2 Grub out visible rock fragments and loose boulders to provide a sound, consistent surface to attach or bury the replacement security fence.

.3 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

3.5 REMOVAL AND DISPOSAL

.1 Remove cleared and grubbed plant materials to an off-site recycling facility.

.2 Way-bills for all materials removed offsite to be provided to the Departmental Representative within 5- business days of removal from site.

3.6 FINISHED SURFACE

.1 Leave ground surface daily in condition suitable for immediate security fence replacement operations or to approval of Department Representative.

.2 Areas disturbed along the fence, and due to security construction or removal activities to be grass seeded to match the existing surrounding areas.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 The work shall consist of excavation and stockpiling of suspect contaminated material at the Departmental Representative's designated storage area on site.

1.2 RELATED SECTIONS

.1 Section 013515 – Special Project Procedures for Contaminated Sites

.2 Section 310099 – Earthworks for Minor Works

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 2487 (2000), Classification of Soils for Engineering Purposes (Unified Soil Classification System)

.2 ASTM D 5434 (1997), Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock.

.2 .3 BC Ministry of Environment Technical Guidance Document 1, Site Characterization and Confirmation Testing.

1.4 DEFINITIONS

.1 Uncontaminated Soil – Materials that have been sampled, tested and determined by the Departmental Representative to contain metal, hydrocarbon and/or volatile organic compounds at concentrations less than the British Columbia CSR IL Standards and/or the CCME criteria.

.2 Known Contaminated Soil – Materials that have been sampled, tested and determined by the Departmental Representative to contain metal, hydrocarbon and/or volatile organic compounds contaminants exceeding the CSR and/or CCME standards based on site investigations

.3 Confirmed Contaminated Soil – Materials that have been excavated, segregated and stockpiled by the Contractor and; sampled and tested by the Departmental Representative according to BC Environment "*Guidance on Contaminated Site, Site Characterization and Confirmation Testing*" and determined to contain metal hydrocarbon and/or volatile organic compounds at concentrations in excess of the British Columbia CSR IL Standards and/or the CCME criteria.

.4 Confirmed Special Waste – Materials that have been excavated, segregated and stockpiled by the Contractor and; sampled and tested by the Departmental Representative and found to contain metals and/or Hydrocarbon contaminates exceeding the standards defined in the Special Waste Regulations of British Columbia.

.5 Waste Manifest (Tracking Form): A document that will allow tracking of individual truck loads of confirmed contaminated soil leaving the site. The Waste Manifest must be signed upon transfer of the materials and at the final disposal location. The Departmental Representative is to be provided with a copy of all Waste Manifests and weight scale receipts.

1.5 POTENTIALLY CONTAMINATED SOIL

.1 The soils at Esquimalt Graving Dock are known potentially to contain contaminants such as hydrocarbons and metals. Contractor is to take appropriate measures as per Section 013515 and 013533 for excavation work.

.2 All excavated soil under this contract shall be treated as potentially contaminated soil. Excavate, handle and store excavated soil as per this Section and all other related sections.

1.6 SUBMITTALS

.1 Provide submittals as required in Section 013515 – Special Project Procedures for Contaminated Sites.

1.7 SCHEDULING

.1 The Contractor shall notify the Departmental Representative two (2) calendar days prior to the start of excavation of known or suspect contaminated material.

Part 2 Products

2.1 MATERIALS

.1 Furnish all necessary materials, at a minimum furnish:
- .1 8 mil minimum plastic sheeting for base of any stockpiles;
- .2 8 mil plastic sheeting for covering of contaminated soil in any stockpiles.

Part 3 Execution

3.1 EXISTING STRUCTURES AND UTILITIES

.1 No excavation shall be performed until site utilities have been field located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Departmental Representative.

3.2 CONTAMINATED MATERIAL REMOVAL

.1 Excavation
- .1 Excavated soils shall be segregated and stockpiled as directed by the Departmental Representative or as per direction from EGD Environmental Services staff. Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. An excavation log describing visible signs of contamination encountered shall be maintained for each area of excavation. Excavation logs shall be prepared in accordance with ASTM D 5434.
- .2 Soils must be stockpiled and characterized in accordance with the above referenced.
- .3 Disposal documentation of soil volumes, characterization results

and disposal locations must be provided to the Departmental Representative.

.2 Dewatering

.1 Surface water shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to assure adequate access, a safe excavation, prevent the spread of contamination, and to ensure that compaction requirements can be met.

3.3 CONTAMINATED SOIL HANDLING

.1 Soil Segregation

.1 Excavate known or suspect contaminated material and place in stockpile at storage area designated by Departmental Representative. In no case will the material be transported off site before laboratory analysis has been received and excavated materials have been characterized for disposal.

.2 Segregate excavated soils into separate stockpiles as directed by the Departmental Representative or as per direction from EGD Environmental Services staff. Construct stockpiles on a double layer of 8-mil polyethylene sheeting. Cover the stockpiles with a single layer of 8-mil polyethylene sheet at the end of each workday. Secure sheet to prevent disturbance by wind. Maintain the stockpile and replace the cover, if damaged. Grade surrounding surface to provide for positive drainage away from the pile. Maintain covering and grading for as long as stockpile exists.

.2 Soil Testing

.1 Testing of excavated soil will be performed by the Departmental Representative. Soil will be assessed for indications of contamination and will be classified as confirmed contaminated soil, special waste soil, or uncontaminated soil.

.2 The Departmental Representative will dispose of the excavated soil material after testing is completed, according to applicable rules and regulations.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES:

.1 Requirements for Chain Link Fences and Gates.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

- .1 ASTM A90/A90M-07, Standard Test Method for Weight of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
- .2 ASTM A121-07, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
- .3 A653/A653M-08, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM C618-08, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
- .5 ASTM F1664-08, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

.2 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
- .2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
- .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
- .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
- .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International).

- .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-A3000-03, Cementitious Materials Compendium. Includes:
  - .1 CAN/CSA-A23.5-98, Supplementary Cementing Materials

.4 The Master Painters Institute (MPI) - Architectural Painting Specification Manual - March 1998.

.1 MPI # 18, Organic Zinc Rich Primer.

1.4 SUBMITTALS

.1 Shop Drawings: 3 copies of fence and gate details, manufacturer specifications to be submitted prior to start of construction in accordance with Section 01 33 00 – Submittal Procedures.

.2 Injectable Mortar, and Non-Shrink Grout product specifications to be submitted for Departmental Representative review prior to start of construction in accordance with Section 01 33 00 – Submittal Procedures.

Part 2 Products

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete CAN/CSA-A23.1.

.1 Compressive strength: 30 MPa minimum at 28 days.
.2 Exposure Classification F-1
.3 Air Entrainment 6%
.4 Aggregate Size 38mm maximum, 5mm minimum

.2 Chain-link fence fabric: to CAN/CGSB-138.1.

Vinyl-Coated Fence Fabric: CAN/CGSB 138.1, Black vinyl coated No.9 guage steel wire woven in 37.5mm mesh, with knuckled finish top and bottom selvedge edges. Height of fabric as indicated on project drawings.

.3 Posts, braces and rails: ASTM Schedule 40 galvanized steel pipe **with black powder coating**. Dimensions as indicated.

.4 All posts, rails, caps, hinges and fittings galvanized and powder coated black.

.5 Bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.

.6 Fence mesh to be buried 300mm into existing ground or pinned to existing bedrock. Where fence is over bedrock bottom rail to be added and attached to the rock with 14mm galvanized threaded rod, complete with nuts and washers, drilled 100mm into the bedrock and fixed in place with injectable

mortar suitable for use in cracked concrete applications during dry, wet, and submerged water conditions for a temperature range of 140-70 degrees Celsius.

.7 Bottom rail to be **42mm ASTM Schedule 40 galvanized and powder coated black.**

.8 Top rail to be **42mm ASTM Schedule 40 galvanized and powder coated black.**

.9 Mid rail used when 2 layers of mesh overlap to obtain the required height fence height above 3.3m to be **42mm ASTM Schedule 40 galvanized and powder coated black.**

.10 Posts:

-63mm ASTM Schedule 40 line posts spaced 3.048 m apart for fences 4.0m high or less.

-73mm ASTM Schedule 40 line posts spaced 3.048m apart for fences above 4.0m high.

-89mm ASTM Schedule 40 Terminal and Gate posts

.11 Tie wire fasteners: aluminum wire (9 Gauge minimum), No. 6 fastened 450 MM on centers.

.12 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel **powder coated black.**

.13 Gates: to CAN/CGSB-138.4. All posts, rails, caps, hinges and fittings galvanized **and powder coated black.**

.14 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 90 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized **and powder coated black after welding.**

.2 Fasten fence fabric to gate with twisted selvage at top.

.3 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

.15 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel **and powder coated black**

.1 Provide "V" type projection with clips or recesses to hold 3 strands of barbed wire spaced 100 mm apart **and powder coated black.**

.2 Projection of approximately 300 mm long to project from fence at 45 degrees above horizontal.

.3 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.

.4 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

.5 Overhang tops to provide waterproof fit, to hold top rails and an outward projection to hold barbed wire overhang.

.6 Turnbuckles to be drop forged.

.16 Organic zinc rich coating: to CAN/CGSB-1.181.

.17 Barbed wire: to ASTM A121 2 mm diameter galvanized steel wire 4 point barbs 150mm spacing.

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

.2 For pipe: 550 g/m^{2}minimum to ASTM A90.

.3 For barbed wire: to CAN/CGSB-138.2.

.4 For other fittings: to CAN/CSA-G164.

.5 For other fittings: to CAN/CSA-G164.

.2 All posts, rails, caps, hinges and fittings to be galvanized and powder coated black.

Part 3 Execution

3.1 GRADING

.1 Remove debris and correct ground undulations along fence line to obtain relatively smooth uniform gradient between posts.

.2 Bury bottom 300mm of wire mesh in ground or pin to the existing bedrock.

3.2 ERECTION OF FENCE

.1 Erect fence along lines as indicated to CAN/CGSB-138.3.

.2 Excavate post holes to dimensions indicated.

.3 Space line posts as indicated, measured parallel to ground surface.

.4 Space straining posts at equal intervals not to exceed 90m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 90m.

.5 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.

.6 Install corner post where change in alignment exceeds 10 degrees.

.7 Install end posts at end of fence and at buildings.

.1 Install gate posts on both sides of gate openings.

.8 Place concrete in post holes then embed posts into concrete to depths indicated.

.1 Extend concrete 50 mm above ground level and slope to drain away from posts.

.2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.9 Do not install fence fabric until concrete has cured minimum of 5 days.

.10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.

.1 Install braces on both sides of corner and straining posts in similar manner.

.11 Install overhang tops and caps.

.12 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.

.13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.14 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

.1 Knuckled selvedge at top and bottom.

.15 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.

.1 Give tie wires minimum two twists.

.16 Install barbed wire strands and clip securely to lugs of each projection.

3.3 INSTALLATION OF GATES

.1 Install 4.0m wide sliding gate in location as indicated on the contract drawings.

.2 Provide 4.0m Long x 400mm Wide x 100mm Thick concrete slab complete with base gravels and aluminum V-Track with minimum 500kg capacity between gateposts per Detail on drawing C105. Supply V-Track specifications with the gate shop drawing submittal to the Departmental Representative for approval

.3 Provide phenolic or rubberized V-Groove wheel with minimum 500kg capacity at the end of gate to follow the aluminum V Track installed in the concrete slab between the gateposts. Supply V-groove wheel specifications with the gate shop drawing submittal to the Departmental Representative for approval.

.4 Sliding gate to have maximum 25mm clear spacing between the bottom rail and aluminum V-Track.

.5 Install sliding gate and concrete slab sloped linearly to follow the existing ground so as to slide open and remain in the open position when unlocked. Gate to roll on pipe Track Rails and V Track as indicated, with smooth, precision operation, requiring minimal force to open or close.

.1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

3.4 TOUCH UP

.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas and top coat with approved black paint.

END OF SECTION

Appendix A
Sample Contractors Health and Safety Plan

CHECKLIST OF HEALTH & SAFETY PLAN REQUIREMENTS

Prepare and comply with a site-specific project Health and Safety Plan (see sample below) based on hazard assessment, including, but not limited to, the following:

- ❑ Reference to Contractor's health & safety policy.
- ❑ Indication Health & Safety has been fully considered in the bid.
- ❑ General safety rules for the project.
- ❑ Commitment to comply with all applicable regulations and applicable policies and procedures of PWGSC and Esquimalt Graving Dock.
- ❑ Confirmation that PWGSC will be informed of any sub-contractors before they enter the site and that PWGSC has the right to remove any sub it deems unsatisfactory.
- ❑ Commitment to completion of a Job Hazard Analysis and ensuring workers are made aware of the hazards and comply with specific requirements.
- ❑ Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations.
- ❑ Commitment to the documentation of job-specific safe work procedures and ensuring workers are trained in those procedures before starting work.
- ❑ Define regular communication channels to ensure information is transferred between the Construction team and the Departmental Representative/ operations and record keeping procedures.
- ❑ Commitment to provision of plans by Qualified Persons when required by regulation (e.g. fall arrest program, etc.), ensuring workers are trained in the plan, have approved equipment and follow the agreed plan.
- ❑ Commitment to ensuring no worker (including sub-trades) enters the job site without proper training. Ensuring Workers are made aware of their right to refuse work they consider too hazardous. Acknowledgement that the PWGSC orientation is not to be considered complete training.
- ❑ Commitment to using only "Qualified Persons" on the project and provision of proof of qualification as required.
- ❑ Definition of roles & responsibilities for project safety/organization for project specifically the Construction Superintendent, OH&S Representative and Worker Safety Representative. Identify any alternates and the qualifications of all individuals.
- ❑ A commitment to holding Occupational Health and Safety Meetings at a frequency agreed with the Departmental Representative and provision of minutes within 2 days of the meeting.
- ❑ Define Inspection Policy & Procedures. A commitment to holding formal site inspections at a frequency agreed with the Departmental Representative and provision of a report within 2 days of the inspection. The Worker Safety Representative will participate whenever possible.
- ❑ A commitment to conform to all environmental requirements and safe work procedures for hazardous materials. This includes provision of MSD Sheets and training of workers in correct use, handling, disposal and personal protective measures to be used.

- Definition of how First Aid will be provided and how medical emergencies will be treated.
- Incident reporting and investigation policy and procedures. Commitment to reporting all incidents, accidents, near-miss and WORKSAFEBC inspections/ orders to the Departmental Representative immediately followed by copies of relevant reports etc. within 2 days.
- Occupational Health and Safety Committee/Representative procedures.
- Occupational Health & Safety communications and record keeping procedures.
- List hazardous materials to be brought on site as required by work.
- Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- Identify personal protective equipment (PPE) to be used by workers.
- Identify personnel and alternates responsible for site safety and health.
- Identify personnel training requirements and training plan, including site orientation for new workers.

XYZ CONSTRUCTION

CONTRACTOR'S HEALTH & SAFETY PLAN – sample only

XYZ Construction (XYZ) considers safety to be an integral part of doing the work and takes pride in its safety program and record. See XYZ safety policy and program documentation attached.

XYZ's Safety Plan to ensure compliance with WORKSAFEBC Regulations and Environmental practices as required under this contract includes the following elements.

Safety & Health Considered in Bid:

XYZ confirms all known hazards and safety requirements have been considered in the bid and that it will follow all applicable policies and procedures of PWGSC as the owner's representative and comply with all applicable regulations.

Sub-Contracting:

XYZ confirms it will not enter into any sub-contracting agreement without the approval of the PWGSC Departmental Representative. XYZ confirms PWGSC will retain the right to remove any sub-XYZ from the work site if the Departmental Representative deems it necessary and has so informed its sub-contractors.

Sub contractors will be identified to the Departmental Representative prior to entering the work site.

Job Hazard Analysis

XYZ will work with sub-trades and other resources to complete the Job Hazard Analysis to the extent possible. XYZ will then assist in finalizing the Job Hazard Analysis documentation with the Departmental Representative, Safety specialists and IOS Operations Representatives ***prior*** to starting work. The Departmental Representative will review the Job Hazard Analysis provided by the XYZ prior to worker orientation proceeding. XYZ will ensure worker compliance with requirements included in the Job Hazard Analysis, job/site specific procedures and all regulations.

XYZ will comply with the PWGSC Lockout Policy, Confined Space Entry Policy and other applicable site rules/ policies.

Safe Work Procedures:

XYZ will work with safety professionals, engineers and others as required to document safe working procedures for all hazardous work and ensure workers are trained in these procedures prior to starting work. Where required, Personal Protective Equipment will be provided and a list is attached.

Provision of Plans by Qualified Persons:

Where regulations require plans provided by Qualified Persons (e.g. Fall Protection Plan, Crane lifting plans, Confined Space Entry procedures) XYZ will identify the requirement, provide the plan and commit to ensuring

workers are trained in the plan, have suitable approved equipment and follow the agreed plan. ABC Engineering will provide the required documentation for the 3 identified needs.

Worker Training:

XYZ will ensure no worker (including sub-trades) enters the job site without proper training in applicable WORKSAFEBC Regulations and project specific procedures as defined in the Job Hazard Analysis, Emergency Response /Rescue Plans, or detailed work procedure. XYZ will ensure all workers understand the hazards of the work and those inherent in working at IOS and that they have the right to refuse work they consider to be too hazardous. XYZ will provide documentation confirming training to the Departmental Representative prior to the workers starting work. It is understood that the Orientation to be conducted by PWGSC cannot be considered complete training in everything the worker must know and Supervisors are ultimately responsible for workers being fully trained. No worker will enter the site without a complete orientation.

Qualified Persons:

XYZ will ensure that only "Qualified Persons" are used on the project and provide proof of qualification prior to the Pre-startup Orientation and Tour for workers as requested by the Departmental Representative. The list of designated qualified persons for this project is attached.

Construction Superintendent:

XYZ will ensure that the Construction Superintendent is qualified to supervise the work and will be capable of carrying out the following roles & responsibilities. John Smith, an employee with 34 years experience in building/construction type of work will supervise during the most critical activities and otherwise Dustin Brown, a senior employee with 10 years experience will act as alternate Construction Superintendent. Resumes are attached. The Construction Superintendent and Alternate meet the requirements outlined below:

1. To document a Project Safety Plan (this document) for both his people and any sub-trades involved on the project. This will be prepared in conjunction with the sub-contractor management as necessary and provides the framework for safety and health related activity on the project.
2. To train and/or ensure training has been done for any worker under his/her supervision including sub-trades.
3. To monitor the daily activities of his workers, including sub-trades, for compliance with safe work practices and immediately correct any violations.
4. To ensure no worker operates IOS equipment of any kind.
5. To re-train and coach workers as required for the purpose of correcting improper practices. To ensure the same is done for workers of sub-trades.
6. To report any injury, near miss or hazardous condition observed or brought to his attention to the PWGSC Departmental Representative immediately.
7. To report any WORKSAFEBC Orders or Inspections received by XYZ to the PWGSC Departmental Representative immediately.
8. To conduct safety meetings as outlined in the section below.

XYZ will ensure sufficient supervision to monitor the activities of the workers and ensure compliance with safe

work practices. For this project, the Construction Superintendent or his alternate Construction Superintendent will be on site at all times when work is proceeding.

Designated O H & S Person:

XYZ will employ and assign to the work, a competent and authorized representative as the Health and Safety Officer. Jack Brown, the Health and Safety Officer meets the following requirements (resume attached):

1. Have a minimum of 2 years of site-related working experience specific to activities associated with the work.
2. Have basic working knowledge of specified occupational safety and health regulations and site-specific safe work procedures.
3. To finalize the Job Hazard Analysis and safe work practices with the Departmental Representative, Safety Representative(s) and Operations Representative(s).
4. Be responsible for completing Health and Safety Worker Training and Site Orientation sessions, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.
5. Be responsible for implementing and enforcing daily, and monitoring, the site-specific Health and Safety Plan.
6. Be on site during execution of work.
7. To be responsible for carrying out accident/incident investigations and provide a copy of the report to the PWGSC Departmental Representative. The Departmental Representative and/or his representative will *assist* in doing this.
8. Conduct regular drills, in co-ordination with Departmental Representative, to test adequacy of emergency response procedures and worker knowledge of their roles and responsibilities.
9. To conduct site inspections daily, as agreed with the PWGSC Departmental Representative and provide documentation of inspections to the Departmental Representative on a weekly basis.
10. To participate in safety meetings as outlined in the section below.

Worker Safety Representative:

The Worker Safety Representative on this project will be Sam White. Sam has been XYZ's worker safety rep for 5 years and is very familiar with applicable WORKSAFEBC regulations and safe work practices. Workers will be encouraged to contact their safety rep regarding safety and health issues that may arise. The Worker Safety Rep will participate in safety meetings and inspections and the resolution of health & safety issues.

Safety Meetings:

It is agreed that safety meetings with workers will consist of weekly meetings to be held every Monday morning with minutes to be provided to the Departmental Representative by the following Wednesday. The Construction Superintendent will document the actions of the meetings, who attended and provide a copy to the PWGSC Departmental Representative or his designate.

Typical topics for meetings will include but are not limited to:
- Review of hazards and safe work procedures and use of protective equipment.

- Changes in work practices, schedule or adjacent work areas which could affect worker safety,
- A review of critical procedures (e.g. Fall arrest plan, Fire and Emergency procedures,)
- Discussion of any injury, near miss or accident and steps to prevent recurrence.
- Worker health & safety concerns.

If changing conditions require communication to the workers prior to the next safety meeting, a "tail-gate" meeting will be held to train the workers prior to commencing work.

Inspections:

The Construction Superintendent/ OH&S resource will carry out daily inspections to identify new hazards, observe adherence to safe work practices and record findings and actions in his log. Written Inspection Reports will be provided to the PWGSC Departmental Representative weekly. Whenever possible, the weekly inspection will be conducted together with the Workers Safety Representative. This inspection will make use of the Job Hazard Analysis as a checklist of items to inspect.

Hazardous Materials & Environment:

XYZ confirms it will conform to all environmental requirements as defined in the contract and comply with Environmental Services best practices and directives. Material Safety Data Sheets will be provided prior to finalizing the Job Hazard Analysis for all potentially hazardous materials to be used. Workers will be fully trained by XYZ in the hazards of these materials and the proper use, storage, handling, Personal Protective Equipment (PPE) usage, disposal of these materials, appropriate emergency response and any other relevant information from the MSD Sheets. XYZ will ensure workers have received WHMIS training as required by regulations. A list of hazardous materials and PPE to be used on this job is attached.

First Aid/ Medical Assistance:

XYZ will provide a written risk assessment and detailed procedures for dealing with various types of possible injuries to comply with WORKSAFEBC First Aid amendments effective 31 Mar/04 and ensure required First Aid coverage is in place ***prior*** to the first day of work. A Level 1 First Aid Kit will be kept at the XYZ field office trailer near the work area. All First Aid Attendants will have their *Original* certificates on site for inspection by WORKSAFEBC if required. Three employees, Bob Horvath, Brian West, and George Taylor have level 1First Aid training.

In the case of non-serious injury not requiring a stretcher or ambulance, the injured worker will be taken to: Admirals Walk Health Centre, 105-1505 Admirals Rd. (PH. 380-9070) using a company truck.

In the case of more serious injury, 911 will be called and ambulance service will be provided. Two XYZ workers will have 4-channel radios and can raise the alarm. The Construction Superintendent has a cell phone and will call 911.

Emergency Response Plan

XYZ will work with sub-trades, fire departments and others to document the response procedures in the event of an emergency or serious injury if work is of a nature that requires these details. Documentation will be posted and all workers trained. Plans will be compatible with IOS emergency response for fire, bomb threat, earthquake and confined space rescue.

Accident/Incident/Injury/WORKSAFEBC Order Reporting & Investigation:

XYZ will emphasize to employees that ALL accidents, injuries, equipment damage and incidents are to be reported and will ensure they are documented and reported to the PWGSC Departmental Representative immediately. Also, report to WORKSAFEBC as required by regulation and cooperate with any officer performing inspections or investigations. Any WORKSAFEBC Order or Inspection will be immediately reported to the PWGSC Departmental Representative.

XYZ will complete a full investigation of all incidents, near misses and accidents and take immediate corrective action as required to prevent recurrence. The Departmental Representative will participate with XYZ in investigations and planning appropriate action to prevent recurrence.

Approved by (XYZ): _____ Date: _____.

General Manager, XYZ Construction

Appendix B
Preliminary Job Hazard Analysis Checklist

Inspection Date: 21 October 2014

Inspection/Job Hazard Analysis Conducted By: Jon Siska

Note:

1. This form is also intended for use as a checklist when making daily inspections of the worksite. Therefore some questions will not apply to the initial inspection/ job hazard analysis.

2. This form is intended as a guide only and does not necessarily cover every situation regulated by WORKSAFEBC or other jurisdictions. It is imperative that the Contractor be familiar with safety requirements and add anything that is relevant but not listed below. New items should be noted to the attention of the Department Representative for inclusion in future revisions. Contractors must finalize the JHA to reflect the methods/equipment etc. they will use to do the work.

3. Department Representatives must review all items as part of creating preliminary JHA. Do not simply reuse this form from a previous project. Delete or add to "Hazard/action required" items as appropriate for your project and enter checkmarks or NA (not applicable) or TBD (to be determined with Contractor) under "Existing" column as appropriate.

4. CODES:

- **"*" indicates covered in Basic Site Orientation for Contractors presentation by PWGSC.**
- **"S" indicates item covered in startup meeting with Contractor and up to Contractor to carry out appropriate action. Not covered in EGD orientation session.**
- **"O" indicates item covered in EGD project specific orientation session. This does not relieve the contractor of responsibility for training workers regarding to this item.**

5. Column "WORKSAFEBC Ref." May also contain Canadian Occupational Safety & Health (COSH) regulation references.

Brief description of work to be done:

Complete the replacement of the security fencing along the north perimeter of the Esquimalt Graving Dock from the main gate entrance at Admirals Road to the corner of the property at Parking Lot C to meet recommended marine port security standards.
Anticipated Construction: Jan-Mar 2015
Contractor will remove fencing for single days work and then replace fencing same day to ensure security is maintained.

Significant Risks include but are not limited to:

- **Risk of falling approx 6 m. when working on highest portion of fencing**
- **Exposure to noise, rock dust and flying chips when drilling rock. Protective equipment required.**
- **Risk of cuts and abrasions when handling old fencing and installing new**
-

-

	Cond. No.	Condition	Existing √	CODE	WORKSAFEBC Ref. #	Hazard/ Action Required
GENERAL	1.1	Notice of Project (NOP) given to WORKSAFEBC? Check regulations for conditions requiring notice: - Over $100,000. -	√	S	20.2 24.9 22.6 29.8	Contractor to provide NOP to WORKSAFEBC and provide copy to Department Representative before pre-startup safety orientation meeting. Note that WORKSAFEBC NOP Form 52E49 is used for general construction work and when asbestos or lead is involved. NOP should go to WORKSAFEBC 4-5 days before starting work if possible and MUST be submitted no less than 24 hrs before commencing work. The white copy is for the site and the canary and pink copies go to the WORKSAFEBC. Photocopies should be posted on the safety notice board, placed on the project file, contract file and sent to the Regional Safety Coordinator.
	1.2	Multiple Contractor Coordination. - 2 or more employers? - Overlapping work areas - Appoint qualified safety coordinator - Post construction procedures and JHA	√	S	Review WORK SAFEBC 20.3	Contractor to appoint Worker Safety Representative and Construction Superintendent. Coordination with EGD personnel and others on site will be through Department Representative. Post Final JHA and procedures.
	1.3	Building and other permits obtained?	√	S		Building permit may required for new construction.
	1.4	Notice of Project Posted?	√	S		Contractor will post on safety notice board.
	1.5	Post emergency response plan and site plan? Workers trained in emergency response? Conduct risk assessment for: Special needs individuals Others as required by 4.13 or identified in other sections below	√	*	4.13-4.18 20.3 COSH 17.5	Site plan and emergency response to be posted on safety notice board. Contractor to ensure all workers trained in emergency response for fire, earthquake, medical, bomb threats, power outage and hazardous materials accidents before starting work. Ensure response plan is coordinated with EGD site emergency response plan.
	1.6	Regular Safety Meeting Minutes Posted?	√	*	3.2	Weekly safety meeting to be held. Contractor to provide minutes to Department Representative for posting.
	1.7	WORKSAFEBC Orders, Inspections or "Notice to Workers" Posted? Notification of compliance posted?	√	S	Div. 10 183	Contractor to provide any WORKSAFEBC inspections and/or orders to Department Representative and post any inspections and compliance reports.

	1.8	Regular Inspections carried out with Safety Rep and Posted? Conduct special inspection if required due to malfunction or accident.	√	S	3.5 3.7 3.8	Provide inspection reports to P.M. and post.
	1.9	Contractor's workers safety representative identified for each employer? Alternatively, a Joint Committee set up if required by WORKSAFEBC Div. 4?	√	S	20.3 Div4 125-140	Worker Safety representative if 9 or more workers.
	1.10	Insufficient lighting?	√	S	4.65	Contractor to ensure lighting levels are sufficient for work to be performed. Provide portable lighting where necessary.
	1.11	Workers informed of the hazards of the job and that they have the right to refuse work they consider too hazardous without discriminatory action?	√	*	Review 3.12	To be covered in orientation session and reinforced by Contractor
	1.12	Workers with physical or mental impairment that could affect work must inform their supervisor.	√	*	4.19	To be covered in orientation session and reinforced by Contractor. Do not work at heights if subject to dizziness or if worker has a fear of heights
	1.13	Workers informed no alcohol, drugs or other substance so as to endanger self or others?	√	*	4.20	To be covered in orientation session and reinforced by Contractor. Inform First Aid attendant of any medications being taken as they may be important in case of accident.
	1.14	Firearms of any kind are prohibited on site.	√	*		To be covered in orientation session and reinforced by Contractor
	1.15	Duties of Employers, Workers, Supervisors and Owners	√	*	Div.3 115-119	Review duties/responsibilities of parties involved. To be covered in orientation session.
	1.16	General Duty: In the absence of a specific requirement, all work must be carried out without undo risk of injury or disease to anyone.	√	*	2.2	To be covered in orientation session and reinforced by Contractor
	1.17	Do not remove or render inoperative any safeguard and ensure safeguards are in place before operating equipment.	√	*	4.11 4.12	To be covered in orientation session and reinforced by Contractor
	1.17a	All workers must be given adequate instruction in the fire prevention and emergency evacuation procedures applicable to their workplace	√	O	4.16	To be covered in orientation session and reinforced by Contractor
	1.18	Do not operate any EGD equipment. Only those trained and authorized by the contractor are to operate contractor's equipment.	√	*	4.10	

	1.19	Ensure equipment inspection & maintenance record (s) are readily available to equipment operators or inspectors.	√	*	4.9	To be covered in orientation session and reinforced by Contractor
	1.20	Workers must not engage in improper activity that could constitute a hazard to themselves or others including horseplay threats or physical force. Improper activity must be investigated. Contractor has written policy regarding violence in the workplace?	√	*	4.24-4.31 COSH 20.3 20.8	To be covered in orientation session and reinforced by Contractor. Violence or harassment will not be tolerated. Contractor to carry out risk assessment of injury from violence if there is potential for violence. Inform workers and prepare plans to minimize risk as required by 4.30 Post policy re violence in the workplace and procedures to call for help if subjected to violence.
	1.21	Workers to restrict activity to designated areas of the site.	√	*		Restrictions to be discussed at pre-start-up safety orientation meeting.
	1.22	Workers informed of location of copy of WORKSAFEBC Regulations and Worker's Compensation Act.	√	*		Cover at orientation meeting. Contractor to ensure current copy of Regulations and the Act is available on site.
	1.23	Written work procedures developed? Provided to P.M. and workers?	√	S & O		Contractor to document work procedures and sequence of activities and provide to Department Representative and workers before starting work.
	1.24	Do not work on site outside of agreed working hours.	√	*		EGD must ensure an employee is on site anytime contractors are on site. Therefore notice is required.
	1.25	If work damages a utility it must be reported.	√	O	4.18	Immediately inform the Utility and then the Department Representative
	1.26	Wildlife, rodents may be encountered on the site.	√	O		Be aware of potential for encounters with wildlife on the site. Rodents may leave droppings in crawl spaces that could present a hazard if dust is breathed. Also, raccoons may be aggressive if cornered and deer may protect their young.

FIRST AID & INVESTIGATIONS	2.1	Has the Contractor carried out an assessment and identified the numbers of workers who may require first aid at any time; the types of injuries that might occur; barriers to first aid being provided to an injured worker; and time required to transport an injured worker to medical attention?	√	*	3.16 & 3.17	Contractor to provide written first aid assessment and written procedures for providing first aid to comply with first aid amendments effective 1 Feb/08
	2.2	Workers instructed to report ALL injuries or near misses, hazardous conditions?	√	*	3.10	To be covered at the pre-startup safety orientation meeting.

	2.3	Workers know where first aid is located and how to call for first aid? Communication between first aid attendant and ambulance service defined?	√	*	3.17 & 3.18	Contractor MUST have own First Aid. Before starting work. Identify location & adequacy of Contractor's F.A. equipment. Cover procedures in orientation.
	2.4	First Aid qualified person(s) on contractor's crew? ORIGINAL Certificate(s) must be with person(s) on site. Provide photocopy to Department Representative.	√	S	Part 3	Required. Provide certificate(s) to Department Representative before orientation session.
	2.5	First Aid equipment on site where required? Must comply with "High" Hazard class 20 min or less travel to hospital.	√	S	3.16	Provide location and type.
	2.6	Provide immediate investigation & notice to WORKSAFEBC for: - serious injury/death - major structural failure of bldg., bridge, tower, crane, hoist, excavation, temp. construction support system. - major release of a hazardous substance - incident required to be reported.	√	S	Div. 10 172	To be covered in project startup meeting with Contractor. Do not disturb the accident site except to attend injured persons, prevent further injuries or protect property. Assist investigators every way possible.
	2.7	Provide emergency transport to hospital as required by WORKSAFEBC and written procedures for transport	√	S	3.17	Contractor to define procedures for provision of first aid, calling ambulance service etc. as required by regulation. Post them and ensure workers are informed.
	2.8	Is the first aid attendant available to render prompt service?	√	S	3.18	Do not assign activities that will interfere with the attendant's ability to receive and respond to call for first aid. Ensure coverage during lunch and other breaks. Provide backup first aid immediately for planned absences. About ½ shift absence is permissible for unplanned absence until replacement attendant is in place.
	2.9	Has the general contractor included all subs in determining the numbers or workers and first aid requirements	√	S	3.20	General Contractor's first aid assessment and procedures to include sub-contractors.
	2.91	Has the contractor assigned a person to manage first aid service?	√	S	3.17	Assign someone to ensure attendants, supplies, facilities and equipment are always available.

	2.92	Does the Contractor have New or Young Workers as defined by WorkSafeBC regulations?	√	S	3.22-3.25	Ensure New or Young workers receive special orientation and training as required by regulations and documentation is provided to the Department Representative. Ensure follow up observation and provide reinforcement training if required or requested by the worker.
CHEMICAL/ BIOLOGICAL - WHMIS	3.1a	Hazardous Substances Used? Provide details. - E.g. concrete, welding materials, rock dust	TBD	O	PART 5	Contractor to provide Material Safety Data (MSD) Sheets for all hazardous substances to be used including welding materials and gases. Sheets must be provided by the contractor at first meeting with the engineer in order to complete the Job Hazard Analysis and define safe work practices. Ensure effective written procedures are prepared and implemented to prevent exposure by any route that could cause an adverse health effect, and to address emergency and cleanup procedures in the event of a spill or release of the substance. Ensure the supervisor and the workers are trained in and follow the established procedures.
	3.1b	Environmental Assessment completed? Check identified hazards and measures to be taken.	TBD	S		Environmental Assessment to be provided to Contractor.
	3.1c	EGD Environmental Best Management Practices applicable?	TBD	O		Contractor to follow Best Management Practices provided by Environmental Services.
	3.2	Implementation Plan Checklist completed?	TBD	S	5.7	Contractor to follow Implementation plan checklist for hazardous substances. See WORKSAFEBC section 5.7
	3.3	Material Safety Data Sheets Available?	TBD	O	5.16	Contractor to provide MSD Sheets and make available at worksite to all workers.
	3.5	Emergency Response Defined?	TBD	O		Contractor to define emergency response as appropriate for hazardous substances.
	3.6	Training Checklist Completed?	TBD	S	5.7	Contractor to follow education & training checklist for hazardous substances provided by WORKSAFEBC. See 5.7
	3.7	Flammable/Combustible Substances?	TBD	O	5.27-5.35	
	3.8	Substances under pressure?	TBD		5.36-5.47	
	3.9	Controlling Worker Exposure	TBD	O	5.48-5.59	If the work period is more than 8 hours in a 24 hour day, the 8-hour TWA limit must be reduced by multiplying the TWA limit by the appropriate factor in reg. 5.5
	3.13	Personal Hygiene	√	O	5.82-5.84	Wash hands before eating or smoking or at breaks as required by regulation.

	3.14	Emergency Washing Facilities, eyewash required?	TBD	O	5.85-5.96	Contractor to provide emergency washing facilities where required due to hazardous substances.
	3.15	Emergency Procedures defined? Review First Aid, Fire, Spill Control.	TBD	O	5.97-5.102	Contractor to review emergency procedures with workers
	3.16	First Aid and Fire depts. aware of substance and quantities used and locations stored?	TBD	S	4.17	Contractor provide notice if required by regulations.
	3.17	Supervisor & Workers trained? General WHMIS instruction as well as substance specific training?	TBD	S		Contractor to ensure Workers and Supervisors have WHMIS training and training in dealing with specific substances.
	3.18	Substance specific requirements?	TBD	S	PART 6	Review Part 6 and ensure compliance as per MSD sheets. See also sections 25, 28 and 29 below.
	3.19	Evaluate worker understanding of substance specific requirements and emergency/spill procedures during inspections.	TBD	S		Inspection item.
	3.26	Follow proper procedures in disposing of hazardous substances.	TBD	S		Follow MSD Sheet instructions.
	3.28	Other	TBD			
		Note: Refer to WHMIS Implementation Plan checklist when doing inspections for hazardous substances	TBD	S		Create inspection checklist where required.

WORKING ALONE	4.1	Working alone process defined for workers assigned to work alone? Note new guidelines Nov./08 for determining if working alone regs apply. Amongst other things a "person check" system alone is unlikely to meet the "readily available" test.	No working alone	*	4.21-4.23	There will generally be no working alone. Document special procedures and agree with Department Representative if working alone is necessary. Note regulation changes 1 Feb/08
	4.2	Working alone process followed?	√		4.21-4.23	Inspection item.
	4.3	Restricted Access area?	√	O		Contractor to ensure workers follow procedures for restricted access.

LOCK-OUT & ELECTRICAL	6.1	Has the EGD Lockout policy been reviewed and relevant sections complied with?	√	S		Policy to be reviewed by Contractor with workers as part of training.
	6.2	Each worker has own lock, no combination locks? Means of identifying lock owner?	√	O	PART 10	Every worker must have own lock and tag identifying worker and company.
	6.3	Lockout procedures documented for project?	√	O	PART 10	To be documented and agreed with EGD Electrical Department and permit issued before initiating lockout.
	6.4	Workers and Supervisors trained in lockout? Only certified electricians to do electrical work.	√	O	PART 10	Contractor to ensure all Workers and Supervisors are trained in the lockout procedure. Contractor to provide proof of certification to Department Representative before start of work.
	6.5	All isolation points identified?	√	S	PART 10	To be done in conjunction with EGD Electrical Department and documented in lockout procedure.
	6.6	Electrical ground hazard?	√	S		To be done in conjunction with EGD Electrical Department and documented in lockout procedure.
	6.7	Pneumatic Devices hazard?	√	S		Document if this type of hazard exists and controls required.
	6.8	Potential Energy hazards? All parts secured against inadvertent movement?	√	S		Document if this type of hazard exists and controls required.
	6.15	No working NEAR energized H.V. equipment or conductors.	Not permitted	S	Lockout Policy	Not permitted.
	6.16	No working on energized lighting circuits.	Not permitted	S	Lockout Policy	Not permitted.
	6.17	Control the use of metal ladders, wire reinforced ladders,, metal scaffolds or work platforms.	√	S	19.10	Planned use of ladders, scaffolds etc. to be determined with Contractor and electrical risks assessed.
	6.18	No Qualified workers within 1 m. of uninsulated, energized parts.	Not permitted	S	Lockout Policy	Not permitted. Keep unqualified personnel at least 3 m. from energized parts.
	6.19	If using an insulated aerial device has it been tested as required by WORKSAFEBC Reg. 19.9	√	S	19.9	Check plans to use aerial device & insure compliance.
	6.20	Is all portable electrical equipment either double insulated and so marked or effectively grounded? Workers trained to inspect?	√	S	19.14	Contractor to check any portable equipment and ensure workers trained in inspecting electrical equipment for safe operation.
	6.21	Is all portable electrical equipment used outdoors or in wet/damp conditions protected by Class A Type ground fault circuit interrupters?	√	S	19.15	Contractor to check any portable equipment and ensure workers trained in inspecting electrical equipment for safe operation.
	6.22	Ensure good access to electrical equipment and that no flammable materials are stored or placed close to electrical equipment.	√	O	19.7	Practice good housekeeping. Keep areas clear in front of electrical panels, fire alarms & extinguishers. No flammables inside work areas unless agree by Department Representative.

	6.27	Be SURE to understand what will happen if an energy source is activated.	√	S		Reminder item
	6.28	Consider severity of injury, frequency of doing the job and probability of injury in assessing tasks.	√	S		Reminder item

FALL PROTECTION	7.0	Fall Protection required?	√	S	11.2	1.Work over 7.5 ft. (CLC requirement) or shorter distance if risk of injury greater than fall to flat surface 2.Use guardrails or similar restraint if practicable. 3.Use other fall restraint if 2 not practicable. 4.If 3 not practicable use fall arrest system 5.If 4 not practicable ensure work procedures acceptable to WORKSAFEBC are used. Note changes to WORKSAFEBC regulations 1 Jan/05
	7.1	Fall Protection System defined in writing?	√	S&O	11.3	Contractor to define fall protection plan for any work over 7.5 ft. (CLC requirement) above ground on unguarded surfaces from which fall greater than 7.5m.(25ft) can occur or 11.2(5) applies.
	7.2	Workers & Supervisors Trained?	√	S&O	11.2(6)	Contractor to ensure all workers & supervisors trained in fall protection procedures before work starting and provide documentation to Department Representative.
	7.3	Workers trained & Fall Protection Procedures followed?	√		11.2(6)	Inspection item.
	7.4	Inspection of fall arresting equipment before each use by a qualified person being done?	√	S	11.9-	Qualified Person to perform inspection before use on each shift. Keep free from foreign substances & conditions that can contribute to deterioration & keep in good working order.
	7.5	Fall Protection System used?	√	S	11.2(7)	Ensure workers use system
	7.6	Safety Belts used for fall restraint only? Otherwise use body harness.	√	S	11.4	Follow written fall protection plan.
	7.7	Ensure equipment meets standards	√	S	11.5	Ensure components are suitable and compatible, sufficient to support the forces and meet and are used in accordance with standards.
	7.8	Ensure anchors meet standards	√	S	11.6	Check anchors meet WORKSAFEBC requirements. Changed 1 Apr/13

	7.9	Temporary horizontal lifeline system used?	√		11.7	Acceptable if 1) manufactured for commercial use and installed and used per written instructions and drawings (available on site) 2) designed, installed & used per written instruction and drawings (available on site) certified by P.Eng. 3) other acceptable to WORKSAFEBC Changed 17 May/06
	7.10	Need to remove from service?	√	s	11.10	If fall protection system has arrested fall of a worker remove from service until inspected and recertified safe by manufacturer or P.Eng.
FIRE RELATED	8.1	Workers aware they generally do not fight fires? First priority is to raise the alarm and get selves and others to safety.	√	*		Workers to fight fires only if small (2'x2') and they have been trained in fire extinguisher use and they are confident they can extinguish the fire. To be reinforced at orientation meeting and reinforced by Contractor.
	8.2	Fire Extinguishers Available and accessible?	√	O		Contractor to ensure proper type and number of extinguishers available. Check monthly inspection and tags.
	8.3	Electrostatic Discharge	√	O		Contractor to determine risk of ignition due to discharge and take preventive measures.
	8.4	Ignition Sources eliminated or controlled if flammable gas or liquid used or stored?	√	O	5.27	No smoking on this project except in designated areas defined by Department Representative. Define any other ignition sources and controls required.
	8.5	Flammable gas concentrations	√	S&O		Ensure adequate ventilation to comply with WORKSAFEBC regulations. Monitor flammable gas concentrations and use forced ventilation if required.
	8.6	Combustible materials	√	O		Keep area clear of combustibles. Practice good housekeeping. Store oily rags in approved metal containers with tight fitting lids and empty daily. Burning of waste is prohibited.
	8.7	No smoking in buildings, on cranes, in caissons or tunnels. Define other restrictions. Rules being followed?	√	O	4.81	Contractor to enforce no smoking except in areas designated by the Department Representative.
	8.11	Do not use flammable liquids as a manual cleaning solvent.	√	S	5.32	Flammable fumes can collect on clothes and result in the worker being engulfed in flames should ignition occur. Also, these substances are often hazardous to health and can be absorbed through the skin. Contractor to reinforce with workers and monitor for compliance.

	8.12	Hot Work Permits issued and posted?	√	*		Obtain permit from Department Representative before starting any cutting, welding, brazing, soldering, grinding, heat-treating or other hot work like roof tarring, thawing pipe, hot riveting or using powder-driven fasteners.
	8.13	Fire Alarms explained?	√	*		To be covered at pre-startup meeting and worker orientation session.
LADDERS/SCAFFOLDS & TEMP WORK PLATFORMS	9.0	Is work off ladders/scaffolds etc planned? Note new guidelines Nov/08 re suitable ladders, work platforms, and scaffoldings, and to specify that the top plate of interior or exterior walls, the top plate/top walers used in concrete formwork, or other elevated surfaces narrower than 50 cm (20 in) are not considered suitable work platforms or acceptable as elevated walkways.	√	S		Work off ladders/scaffolds is foreseen.
	9.4	Ladder type and condition? Meet specifications per WORKSAFEBC?	√	S	PART 13	Contractor to ensure all ladders are in good condition and meet WORKSAFEBC requirements for the application. Ensure portable ladders are marked with grade of material and use for which ladder constructed.
	9.5	Ladder Inclination, Footing and Support and use according to WORKSAFEBC regulations	√	S	PART 13 COSH 3.11	Check for minimum ¼ maximum 1/3 inclination, solid footing and support. Tie off if possible for stability during use. No working off the top 3 rungs of a single/extension ladder or top 2 of a step ladder.
	9.6	Contractor to ensure work off ladders meets regulations. If work cannot be done safely from a ladder provide work platform.	√	O	13.6	Follow safe ladder work practices
	9.7	Heavy/bulky objects or others that may make ascent or descent unsafe not to be carried up ladders	√	O	13.6	Use an assist to raise & lower tools.
	9.21	Vehicle-mounted and self-propelled boom-supported elevating work platforms tested?	√	S	13.23	Inspect and certified by in writing by manufacturer or P.Eng. every 12 months as complying with reg. Part 13 and safe for use.
	9.25	Forklift mounted work platform not to be used except as defined by WorkSafeBC regulation.	√	S	13.30	Check revised regulations 1 Feb/13. Inform Department Representative before using a forklift mounted platform.

PROTECTIVE EQUIPMENT	10.1	Hard Hats Worn at all times. Chinstraps available for high wind/ bending over?	√	*	8.11-8.13	Contractor to monitor and enforce hardhat and chinstrap usage.
	10.2	High Visibility Clothes, correct type for the job.	√	O	8.24-8.25	Wear high viz vests when required. Traffic Control Persons will have special requirements.
	10.4	Safety Footwear	√	*	8.22-8.33	Approved steel-toed footwear in good repair, required at all times meeting WORKSAFEBC requirements for the work to be performed.
	10.5	Approved Safety Eyewear/ Face Shields. Note new guidelines re acceptable standards Nov/08	√	O	8.14-8.18	Eye protection required when doing any work where flying objects may be encountered. Also may be required when using hazardous substances (TBD).
	10.6	Wear Hearing Protection when required by WORKSAFEBC regulations.	√	O	7.1-7.9	Hearing protection required when in high noise situations exceeding WORKSAFEBC noise exposure limits. Implement and provide evidence of noise control and hearing conservation program where required by regulation. Post warning signs in high noise areas and enforce wearing approved hearing protection.
	10.7	Respiratory Protection & Fit	√	O	8.32-8.37	Wear approved respiratory protection considering the respirator protection factor and maximum use concentration, MSD Sheets, exposure to oxygen deficient atmosphere when selecting respirators for workers that may be exposed to dusts or hazardous fumes/mists above exposure limits.
	10.71	Respirator fit tests conducted?	√	O	8.38-8.41 8.44	Ensure proper fit tests per regulations and keep records. Workers must perform a positive or negative pressure user seal check in accordance with *CSA Standard before each use.*
	10.72	Worker's ability to use a respirator in doubt for medical reasons?	√	O	8.42	Ensure worker examined by a physician, and advice obtained re the ability of the worker to wear a respirator.
	10.8	Gloves, Aprons, leg protection	√	O	8.19-8.21	Wear protective clothing when performing work that could result in cuts, slivers, abrasions, etc. Check added requirements from MSD Sheets.
	10.9	Flame resistant clothing	√	O	8.31	Wear when welding or cutting or other hot work hazards
	10.10	Welding Goggles	√	O		Wear when welding or cutting
	10.11	Welding Clothes (e.g. leather aprons, face shields, leather gauntlet gloves etc.)	√	O		Wear when welding or cutting. Also those working nearby may need to wear protective clothing.

	10.12	Vibration Reduction	√	O	7.10-7.16; 5.54	Provide written exposure control plan where required by regulation and inform worker of hazards. Employer ensure equipment is labelled to identify hazard. Ensure hands and arms not exposed to cold if also exposed to vibration.
	10.13	Radiation Exposure Control	√	O	7.17-7.25	Provide written exposure control plan where required by regulation and inform worker of hazards.
	10.14	Personal clothing, rings, hair etc. OK	√	O	8.10	Ensure workers do not have loose clothing, long hair or rings which could become entangled if operating rotating power tools.
	10.15	Apply Sunscreen, to protect against sunburn on exposed skin.	√	O		Wear sunscreen when working outdoors.
	10.16	Safety belts, harnesses, lanyards & shock absorbers	√	O		Follow fall protection plan and use prescribed equipment.
	10.17	Employees must wear suitable personal clothing for the work they are doing to reduce risk of injury.	√	S		Contractor to ensure workers wear suitable clothing.
		Note: Check all protective equipment for proper fit and condition.	√	S		Contractor responsible for ensuring proper fit and care of all protective equipment and documentation thereof.

COLD STRESS	12.1	Cold Stress Control Required? Followed?	√	S	7.33	Cold stress not likely to be a factor during summer months. Contractor to be aware of conditions under which cold stress could be a concern based on ACGIH standard (Jan /05)
	12.2	Check Table 7-4 for conditions	√	S	7.34- 7.37	Contractor to monitor for cold stress risk conditions and take appropriate action. if ACGIH standard requires. If required, conduct assessment and develop exposure control plan. Provide engineering controls if practicable, otherwise reduce exposure or provide admin controls or PPE.
	12.3	Workers & Supervisors trained to recognize?	√	O	7.38	Ensure workers trained. First Aid attendant may be asked to monitor for cold stress. Remove workers exhibiting stress from exposure and provide First Aid or physician treatment

CRANES, HOISTS & RIGGING	13.1	Note WorkSafeBC definitions for "critical lift" "duty cycle work", "load bearing component", "sign truck" and "tandem lift"	√	S		Changes effective 1 Feb./08 to add clarity.
	13.1a	Only EGD Operators operate EGD Cranes/hoists or other equipment.	√	*		No plans to use any EGD equipment. Contractor to reinforce that only EGD workers are to operate EGD equipment.
	13.1b	Contractor supplied crane meets specifications and has required labelling etc per WORKSAFEBC regulation?			14.2-14.8	Ensure crane is marked with: a) Manufacturer, model, sr# b)rated capacity or load chart. c)boom angle, boom extension and load measure (where applicable) d) any modifications to the crane or components
	13.1c	Crane Hoist documentation available?			14.12	Ensure manufacturer's crane/hoist manual, including instructions for assembly/disassembly, maintenance, and safe operation are readily available on site.
	13.1d	Inspection and maintenance carried out and documented including any modifications? Operator to carry out start of shift inspection and document.	√	S	14.13 to 14.16 14.35	(1) Each crane and hoist must be inspected and maintained at a frequency and to the extent required to ensure that every component is capable of carrying out its original design function with an adequate margin of safety. (2) A crane or hoist must not be used until any condition that could endanger workers is remedied. (3) Any repair to load bearing components of a crane or hoist must be certified by a professional engineer or the original equipment manufacturer.
	13.1e	Crane properly equipped?			14.17 to 14.33	Ensure crane/hoist meets all WORKSAFEBC requirements for stops, audible warnings, guards, controls, operator protection, etc. as per WORKSAFEBC regulations
	13.2	Weight lifted determined and communicated to operator and all others involved in lift?	√	O	14.36 14.38	Contractor to ensure that load weights are accurately determined and communicated to the crane operator and others involved. Crane operators must not lift if there is any doubt about the safety of the lift.
	13.3	Ensure crane operators meet the trade qualification specified by WORKSAFEBC	√	S	14.34	Provide proof of qualification to Department Representative before starting work.
	13.4	Ensure workers stay clear of swinging loads and equipment when swinging creates a hazard	√	O	14.40 14.41	Position equipment to ensure 2 ft. clearance or more between crane parts etc. and obstructions in any area accessible to workers.
	13.6	Travel with load? Follow WORKSAFEBC regs.	√	S	14.43	Follow safe practices.
	13.7	Prevent passing over workers with load	√	O	14.44	Contractor to ensure loads do not pass over workers.

	13.8	Load left suspended and unattended?	√	O	14.45	Do not leave loads suspended & unattended.
	13.9	Hook position over load to prevent side loading?	√	O	14.46	Ensure straight lifts are used. If lifts on an angle are necessary observe working load limit (WLL) reduction.
	13.10	Designated signalman? Use std signals? Use radio if possible.	√	O	14.47 to 14.49	Ensure trained workers use standard signals when communicating with crane operator. Use dedicated 2-way radio communication on UHF at power assigned and coordinated by the WORKSAFEBC whenever possible.
	13.11	High voltage in vicinity? Risk of induced charge? Review and follow WORKSAFEBC requirements.	√	O	14.51-14.52	No lifts planned near high voltage.
	13.12	Up-travel limit tested for bridge, gantry & OH traveling cranes? (crane operator daily check)	√	O	14.55	If crane/hoist is not EGD operated equipment, Contractor to ensure operator has tested limits.
	13.13 a	Ensure mobile cranes are on surface capable of supporting the load	√	S	14.69	Contractor to check before lift.
	13.13 b	Mobile cranes or boom trucks inspected at least annually?	√	S	14.71	Ensure mobile cranes or boom trucks are inspected at least annually. Provide proof to Department Representative.
	13.14	Rigging/slinging work done by or under direct supervision of qualified workers familiar with the rigging to be used.	√	S	15.2	Contractor to use trained riggers following accepted good practices when performing lifts and provide a list of trained individuals to the Department Representative.
	13.15	Ensure rigging is identified with the manufacturer and Working Load Limit (WLL) as well as any other information required by WORKSAFEBC and meets the WORKSAFEBC requirements for the work to be performed.	√	O	15.5 15.42 15.46 15.55 15.59	Do not use rigging without proper permanent identification. DO NOT EXCEED the designated WLL; also applies to below-the-hook lifting devices.
	13.16	Use only rigging permanently marked with an adequate working load limit considering the angle of lift, termination efficiencies, numbers of legs used, conditions for the lift, temperature restrictions and good rigging practices.	√	S	15.9	Follow good rigging practices. Ensure design factors comply with changes Jan/05.
	13.17	Ensure any attachments (rings, shackles, couplings etc) are designed for use with the rigging to which they are fastened.	√	S		Contractor to ensure compatibility in design.
	13.18	Slings & attachments must conform with specifications and be visually inspected before use on each shift.	√	S	15.30 15.31	Remove defective equipment from service immediately.
	13.19	Do not subject the rigging to dynamic loading.	√	S		Apply the load slowly & smoothly

	13.20	Do not use rope/slings with evidence of wear or distortion, broken strands, kinking, bird-caging, corrosion, heat or arc damage that meets the rejection criteria specified by WORKSAFEBC.	√	S	15.25-15.27 15.48-.49	Remove equipment from service immediately if it meets rejection criteria.
	13.21	Do not use worn or damaged hooks that fail to meet WORKSAFEBC regulations.	√	S	15.29	Remove rejected hooks from service immediately.
	13.22	Protect slings from damage if passing over a sharp edge and store properly.	√	S	15.37 15.39	
	13.23	Follow WORKSAFEBC rules for slinging to prevent slipping or overstressing the sling and when lifting multiple piece lifts.	√	S	15.40 15.41	
	13.24	Hooks must have safety latches unless meeting the exemption of WORKSAFEBC 15.10(2)	√	S	15.10	
	13.25	Consider effect of wind on loads	√	S		Crane operator to use judgement and consider wind velocity in determining if lift can be safely made. Crane operator has final decision on making any lift.

MOBILE EQUIPMENT & TRANSPORT OF WORKERS	14.1	Does the contractor intend to use any mobile equipment on site other than trucks for transporting workers?	TBD	S	PART 16	To be determined. Define equipment to be used and any special requirements.
	14.2	Are contractor's vehicles safe for transport of worker's?	√	S	16.3	Contractor to ensure vehicles are properly equipped and maintained.
	14.3	Are workers obeying speed limits? Max speed 20kph	√	*	PART 16	Cover at start up orientation meeting.
	14.4	Are vehicles properly parked?	√	*	PART 16	Workers will be shown the designated parking areas. Do not park in areas where crane travels, Fire Lanes, blocking fire hydrants, fire/emergency alarm pull stations or fire extinguishers.
	14.5	Elevating work platform(s) operations manual and inspection certificate on site? Daily inspection log available?	√	S	PART 16	Requirements depend on contractor use of this type of equipment. TBD in final JHA
	14.6	Ensure seat belts used and roll over protection provided if required. Note guidelines Nov./08	√	O	PART 16	Requirements depend on contractor use of this type of equipment. TBD in final JHA
	14.8	Do not leave delivery vehicles unattended for extended periods.	√	*		
	14.9	Do not hitch a ride on forklifts unless proper seats exist for this purpose.	√	*		Contractor to enforce.

	14.10	Ensure volatile, flammable, or hazardous materials transported in isolated compartment accessible only from outside & properly ventilated & drained	√	S	17.6	Contractor to ensure vehicles meet WORKSAFEBC requirements.
	14.11	Ensure tools/materials/ equipment are carried in separate designated area for that purpose.	√	S	17.5	Contractor to ensure workers cannot be injured by unsecured items in the vehicle.
	14.12	Equipment properly secured if elevated? No use of hydraulic or pneumatic lifts as blocks unless collapse not possible.	√	S	16.37	Ensure workers do not leave equipment parts unattended in an elevated condition or work under equipment unless properly secured.
	14.13	Loads secured according to regulations? Loads do not interfere with lift truck operation?	√	S	16.44-16.46	Contractor to ensure loads are properly secured.
	14.14	Workers have procedures, equipment and training for tire repairs?	√	S	16.47 16.48	Contractor to ensure workers have training & equipment if they will change tires.
	14.15	Motorized materials handling equipment handling flammable substances equipped with minimum 5BC dry chemical fire extinguisher?	√	S	COSH 14.12	

TRAFFIC CONTROL	15.1	Is there any blocking of roadways, or aisles during the project? If so install signs, barricades etc.	√	S&O		Define road blocking and traffic control requirements. Contractor to ensure proper traffic control if temporary road blocking is required to deliver materials etc. Contractor to ensure non-project personnel are kept out of the work area as agreed with the P.M. before starting work.
	15.3	Is there operations activity near the project site? Ensure coordination and minimize impact.	√	S&O		The Engineer will ensure all supervisors and contractors on site are aware of the work and schedule.
	15.7	Is there an individual assigned supervisory responsibility for traffic control?	√	S&O		Contractor to assign an individual. Ensure all workers and supervisors are trained in safe work requirements and supervisors ensure workers follow prescribed procedures.
	15.8	Are Traffic Control Persons trained?	√	S&O		Contractor to ensure only trained individuals engage in traffic control and that they have written instructions. Provide proof of completion of MoTH approved course.
	15.9	Has the Contractor kept records of changes in traffic control?	√	S&O		Contractor to maintain records to assist investigation in event of an accident.
	15.10	Are there risks to workers due to vehicles/equipment operating on the construction work site?	√	S&O		Contractor to define risks to workers on the construction site due to vehicles and measures to minimize risks of injury. Risks to employees of other companies to be acknowledged, minimized and communicated to appropriate supervisors.

EVACUATION & RESCUE	16.1	Written procedures developed?	√	S&O	4.13	Contractor to ensure need for emergency rescue assessed and procedures for rescue documented. Call 911. Rescue will be by DND/Esquimalt Fire Dept. Ensure all workers understand process to call for assistance and have emergency numbers. Review emergency procedures at orientation session.

EXCAVATION /DEMOLITION	19.0	Excavation work to be carried out?	√	S		Some excavation on this project but not over 4 ft..
	19.2	All utilities accurately located & danger determined?	√	S&O	20.79	Contractor to confirm details on utility location. None expected to be in the work area but may be nearby.
	19.11	Are there soil contaminants expected or chance of encountering archeological materials?	√	O		Workers to be shown sample of archeological materials and instructed to stop excavating if they encounter possible archeological materials. Also provide workers with details of soil contaminants and potential risks. Stop work and immediately report to P.M. if anything is encountered including suspected soil contaminants.
	19.12	All Workers must be aware that soils on the site may contain hydrocarbons and metals such as arsenic, zinc, copper, lead.	√	O		All excavation and management of soils must be in compliance with the Interim Soil Management Plan for Munroe Head, Esquimalt Graving Dock and North Naden - stored fully contained, sampled, and disposed off-site if above federal industrial criteria. Department Representative to provide guidance for specific project.
	19.13	Ensure structure and adjoining structure are properly supported during demolition to the extent and manner prescribed by a P. Engineer IF Workers could be endangered by the demolition or adjoining structures could have their stability compromised.	√	S&O	20.111	Follow demolition/ temporary support procedures and detailed schedule as defined by an Engineer in writing. Copy of the plan must be available on site.
	19.15	Stop all work if hazardous materials are discovered during demolition and not previously identified.	√	O		Report to Department Representative immediately.

HOUSEKEEPING; MATERIALS STORAGE	20.1	Refuse spills and waste materials not allowed to accumulate and create a hazard	√	O	4.41	Cover at start up orientation meeting.
	20.2	No use of compressed air to clean clothing of any potentially hazardous dusts etc.	√	O	4.42	Compressed air can penetrate skin, enter bloodstream and result in death. Do not use compressed air to clean work surfaces. Cover at start up orientation meeting.
	20.4	Material stacked securely and stable?	√	S	4.43	Check plans for stacking materials. Also Inspection item.
	20.5	Are areas free of risk of entrapment or falling materials? If not take appropriate measures per 4.44 and 4.45	√	S	4.44-4.45	Evaluate risks. Also Inspection item.
	20.6	Use metal containers with tight fitting lids for oily or painting rags & empty daily.	√	O		Oily or paint soaked rags can ignite through spontaneous combustion. Store properly. Also Inspection item
	20.7	Use proper containers for refuse.	√	O		Inspection item
	20.8	Are work areas free of protruding nails?	√	O		Ensure nails are either removed or bent over to eliminate the hazard of stepping on them.
	20.9	Are nuts/bolts etc. stored in containers to reduce tripping hazards?	√	O		Clean up components frequently to reduce risks.
	20.10	Returned tools to proper place after use.	√	O		Ensure tools are properly stored.

EQUIPMENT MAINTENANCE & USE	21.1	Equipment operator's manuals at site?	√	S		Keep manuals on site with equipment. Includes equipment like concrete pumping trucks
	21.2	Equipment operated by qualified persons?	√	S		Contractor to provide proof of qualification of equipment operators.
	21.3	Equipment maintained according to manufacturer's instructions?	√	S		Maintain equipment as specified by manufacturer and maintain a record of maintenance.
	21.4	Equipment inspection before use carried out?	√	S	16.34	Operators inspect equipment before use, record results (where required by WORKSAFEBC) and report any defects to Supervisor. Do not use defective equipment until defect is remedied.
	22.0	Follow safe lifting practices. Use mechanical lifting assist wherever feasible or get assistance.	√	S	COSH 14.49	Contractor to train all workers in safe lifting practices and monitor for compliance. If required to lift over 45 kg. document safe practice and provide to worker and keep on file.
	22.1	Materials and things stored and placed such that workers will not be overextended or strained when manually lifting?	√	S	COSH 14.50	

CONCRETE PUMPING	23.1	Concrete pumping not anticipated. However if used ensure placing boom must certified safe within last 12 months and review Part 20 for other requirements.	NA	S	Part 20	Serious injury could result due to failure of components, couplings etc. if pressures or other loads are exceeded. Contractor provide certificate copy to P.M.
TREE REMOVAL	26.1	Risk of injury due to tree falling practices	√			The hazards associated with removing large trees exist. To ensure workers and passers-by are not injured: - Coordinate with all concerned and barricade off all potential fall areas. - Document the tree falling plan Employ only qualified / experienced fallers to do this work - Define tree falling plan and agree with P.M. Drop in sections not entire tree. - Check trees for internal rot that could put persons at risk if scaling tree. - Clean up and remove trees from site immediately after falling and cutting up.
	26.2	Are workers trained to carry out tree removal?	√		26.3	Ensure workers meet WBC training requirements and provide documentation to the Department Representative.
	26.3	Are workers using all required PPE for tree removal operations?	√		26.7	Ensure workers using chainsaws use leg protective devices in addition to other PPE. Also ensure all PPE is checked for wear, fits the users and is in serviceable condition
	26.4	Have workers been trained in the hazards of operating chain saws?				Contractor to ensure workers are aware of hazards, safe working practices and protective equipment to be used.
WELDING & CUTTING	27.1	Are workers qualified to perform welding/cutting work and work performed according to standard?	√		12.112	Contractor to provide proof of qualification. Perform work according to CSA Standard W117.2-94 Safety in Welding, Cutting and Allied Processes or other standard acceptable to WORKSAFEBC and manufacturer's instructions for equipment being used.

	27.2	Workers must be aware of the health effects of exposure to welding smoke. The combination of base materials, coatings, shielding gases and other factors can create many different substances that can potentially have an adverse effect on almost any part of the body.	√	S	12.124	Contractor to identify the specific hazards associated with a particular welding operation and the environmental conditions and ensure workers understand the short-term and long-term health effects of exposure to welding smoke and how to protect him or herself. Undertake appropriate engineering controls or work practices to control/remove welding fumes. Ensure respirators are the correct type and fit-tested.
	27.3	Coatings must be removed from base metal before welding/cutting.	√	S	12.115 12.129	Coatings could emit harmful contaminants during welding or cutting. Remove coatings and wear protective equipment. Do not apply paint to materials about to be welded.
	27.4	Workers must be aware of the risk of burning due to contact with hot slag, metal chips, sparks and hot electrodes.	√	S	12.125	Contractors to ensure workers protect themselves and others against the risk of burns. Wear suitable protective clothing. Ensure recently welded or flame cut work is marked "HOT" or guarded to prevent accidental contact.
	27.5	Workers must be aware of the risks associated with exposure to ultraviolet or infrared light from welding which can damage the eye and result in skin burns.	√	S	12.122	Contractors to ensure workers understand the hazards of exposure to the welding arc and how to protect themselves. Be sure the lens shade number is adequate for the type of welding/cutting being performed. Hand-held screens are not acceptable. Use barriers of flame resistant non-reflective material to protect other people from exposure to the arc, heat, and hot spatter. Also use signs to warn of the dangers of looking at the arc.
	27.6	Workers must be aware that exposure to the noise of welding can permanently damage hearing, cause stress leading to increased blood pressure.	√	S		Contractor to ensure workers have regular hearing test and that wearing protective equipment is enforced.
	27.7	Workers must be aware of the risks of electrical shock especially in wet or cramped conditions. Even a small shock can lead to a fall or other accident. Brain damage or death can result from a large shock.	√	S		Ensure workers use dry gloves, rubber-soled shoes or an insulating layer. Ensure work piece and frame of electrically powered machines are grounded. Keep electrode holders and cables dry and in good condition. Electrodes should not be changed with bare hands, with wet gloves or if standing on grounded surfaces or wet floors.
	27.8	Workers must be aware of dangers of welding on containers, pipes or structures or in any place that has held flammable or combustible materials unless thoroughly cleaned.	√	S	12.116	Fires, explosions or release of toxic vapours can result. Containers with unknown contents should be assumed flammable or combustible. Ensure a qualified person has tested

	27.9	Beware of backfires and flashbacks when using compressed gases.	√	S	12.120	Do not ignore these warnings. Undertake immediate corrective action. Ensure safety devices are used to prevent reverse flow and arrest flashbacks on oxyfuel systems
	27.10	Ensure fire prevention and fighting capabilities before welding/cutting.	√	S	12.121	Suitable fire extinguishing equipment must be available close to the work. Use a firewatcher if work is being done where other than a minor fore might develop. Maintain the fire watch at least ½ hour after welding or cutting work is completed to detect smouldering fires. Keep areas clear of combustibles and cover those that cannot be removed with flame-resistant materials, Cover doorways, windows and cracks. Provide and use receptacles for electrode stubs.
	27.11	Welders must wear required personal protective equipment including flame resistant clothing, gauntlet gloves, etc.	√	S	12.123	Ensure welders wear all required special PPE
	27.12	Check Gas Cylinder Condition & Securing/Upright storage, & protection from sparks, flames, heat, physical damage or corrosion. Ensure pressure relief valves are present.	√	S	5.36	Cylinders of compressed gas can explode or become projectiles if exposed to excessive heat, or if the valve stem were to break should the tank be knocked over from a vertical position. Inspection item
	27.13	Ensure empty gas cylinders have regulator removed, capped & are tagged as empty.	√	S		Identify empty tanks. Inspection item
	27.14	Ensure Cylinders are identified re type of gas and valid testing.	√	S	5.37-5.39	Cylinders must be pressure tested to ensure ability to perform safely and the test date recorded. The cylinder must be identified regarding the type of gas in the cylinder to prevent confusion and potential accidents. Inspection item Do not use cylinders or contents for other than intended purpose.
	27.15	Ensure Cylinder valves are closed when not used.	√	S		Do not rely on the welding torch or other device to control the release of gas other than when manned by an operator. Dangerous leakage could occur with gas building up inside buildings, vessels etc. with potential for explosion or other hazards. Inspection item

ROCK DUST	29.1	Rock crushing, drilling, mucking, excavation, loading, transportation, road grading, road construction or conveying of rock or similar operations?	√	S	6.110 6.111	Ensure that dust concentrations to which a worker may be exposed are maintained at or below the established exposure limits, by one or a combination of (a) mechanical ventilation, (b) the use of water spray, (c) other equally effective methods.
	29.2	Access restricted?	√	S	6.112	Restrict access to area of exposure
	29.3	A rock drill, other than a manually-powered rock drill used?	√	S	6.113	Must be equipped with a dust suppression system, that uses water jet, spray, or other equally effective means to suppress drilling dust.
MUSCULOSKELETAL INJURY	30.1	Is there a risk of musculoskeletal injury?	TBD	S	4.47	Contractor to eliminate or control risk
	30.2	Are controls required?	TBD	S	4.50-4.52	Contractor to define control measures and train workers in risks and safe work procedures, use of PPE etc. Contractor to monitor for compliance and effectiveness.

Contractor's Superintendent: _____ **Date:** _____.

Distribution:

EGD Operations Manager
EGD Supervisors
Engineer-of Record
Resident Engineer/Construction Coordinator
Project File

Appendix C
EGD Environmental Best Management Practices Manual

Esquimalt Graving Dock

Environmental Best Management Practices

Prepared By:
Public Works and Government Services Canada
Environmental Services

Date: October 6, 2010
Version: 04

Table of Contents

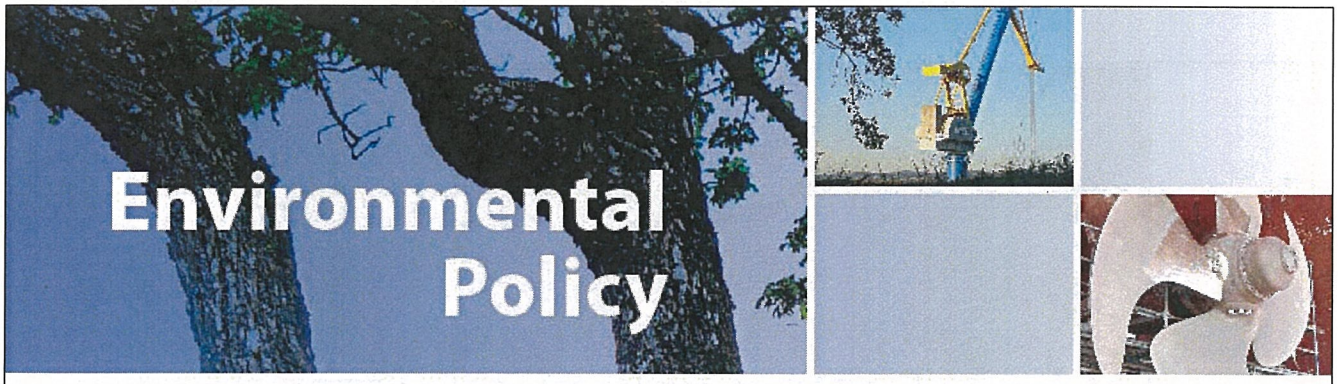
Overview

The **Esquimalt Graving Dock (EGD)** is a federal-government-operated, multi-user ship repair and maintenance facility located in Esquimalt, British Columbia. The facility has been in operation since 1925, and provides service to local, Federal, and international vessels. The vessel repair and maintenance work at the EGD is carried out by privately owned shipyards that rent the required sections of the drydock and lease upland work space from the government, and pay a fee for services such as cranes, compressed air, water and power.

Industrial ship maintenance and repair operations have the potential to result in significant environmental issues and impacts. To help identify and manage these potential impacts, the EGD has implemented an **Environmental Management System (EMS)** certified under the internationally recognized standard **ISO 14001**. The EMS provides the framework for identifying potential impacts, and ensures adequate controls are in place to effectively manage them.

This manual contains a series of recommended **Environmental Best Management Practices (EBMPs)** to reduce potential environmental impacts of common activities and operations at the Esquimalt Graving Dock. The manual contains guidance for those operating at the EGD, and is intended to complement existing environmental legislation. It does not remove the responsibility of all contractors and companies operating at the facility to abide by all applicable regulatory requirements and industry standards. All users of the facility are expected to follow the EBMPs.

For further information on environmental rules and standards contact the EGD Environmental Department.



Environmental Policy

It is the goal of the Esquimalt Graving Dock, in partnership with the ship repair industry, to be the premier ship repair, construction and maintenance facility on the west coast of North America.

The Esquimalt Graving Dock and its Users realize that environmental management is an integral part of attaining that goal. Through the implementation of an ISO 14001 Environmental Management System, we are committed to managing the actual and potential environmental impacts of our operations.

To meet our commitment we will:

- *Protect the natural environment and prevent pollution.*
- *Meet or exceed applicable federal, provincial and municipal legislation and regulations; uphold departmental policies; and abide by industry standards, practices and other requirements related to our identified environmental aspects.*
- *Establish and review our programs, objectives and targets to ensure we are meeting our environmental commitments.*
- *Communicate openly with our employees, Users, tenants, contractors, suppliers, neighbours and other stakeholders regarding our Environmental Management System and the nature of our operations.*
- *Educate our employees and the Users of our facility to ensure they are aware of and understand their roles and responsibilities in protecting the environment.*
- *Meet the evolving needs and expectations of our industry and community through the continual improvement of our systems, programs and procedures.*

Bonnie MacKenzie	Jim Milne	David Latoski
Director General	Director	Operations Manager
Engineering Assets	Esquimalt Graving Dock	Esquimalt Graving Dock
Strategy Sector	Engineering Assets	Engineering Assets
	Strategy Sector	Strategy Sector

JULY 2009

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ISO 14001
EMS-011
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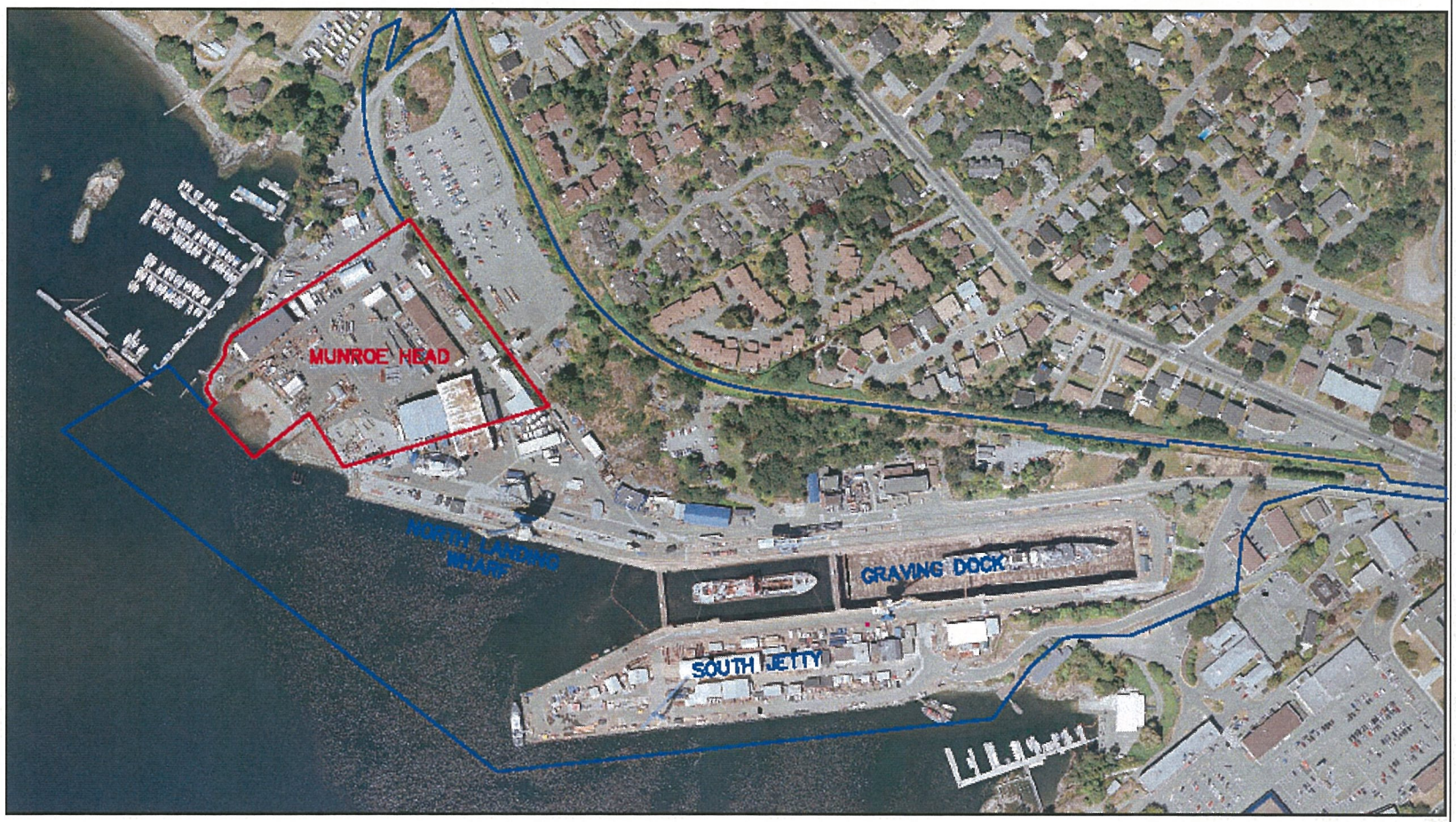
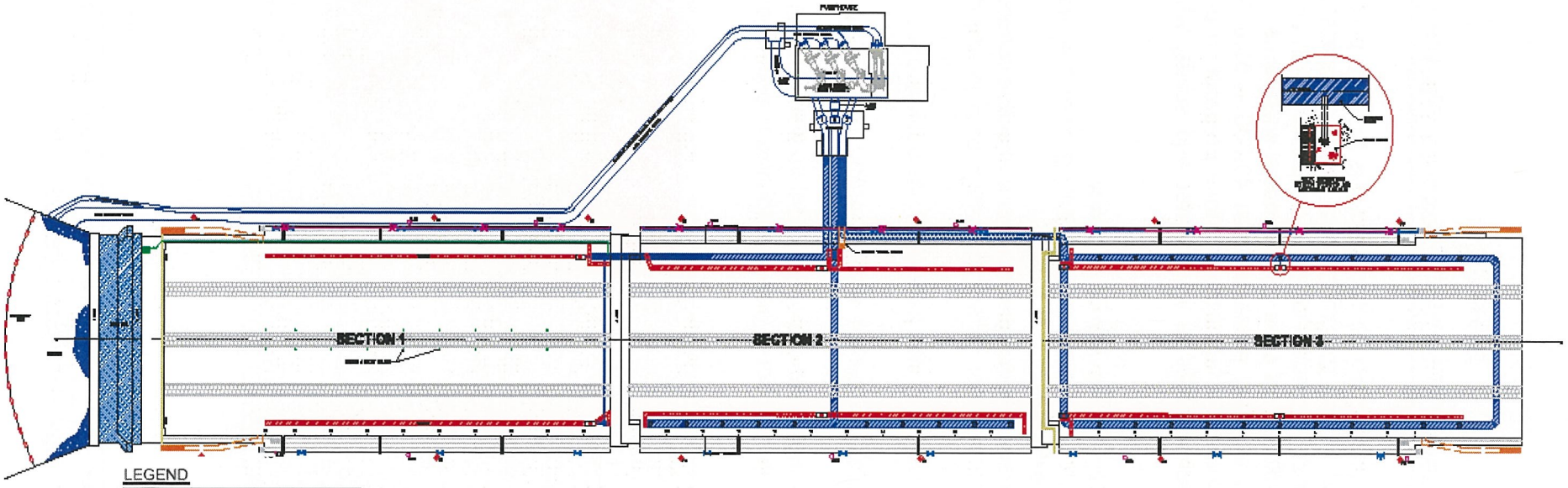
Canada

Esquimalt Graving Dock



ESQUIMALT GRAVING DOCK
DRAINAGE PLAN

Note: It is intended that this drawing be printed in colour.
If printed in black and white some detail will be lost.



LEGEND

LADDER	
STAIR	
FIRE ACCESS	
ELECTRICAL CONN.	
AIR CONNECTION	
WATER CONNECTION	
WATER PIPE	
TRENCH GRATE	
TUNNEL GRATE	
TUNNEL MANHOLE	
NET CAGE- MAIN TUNNEL ACCESS	
TRENCH DRAIN	
DE-WATERING TUNNEL	
SILL PUMP & PIPE	
MOON POOL	

ESQUIMALT GRAVING DOCK:
1178' (361.8m) LONG
135' (41.2m) WIDE
49.5' (16m) DEEP

THIS DRAWING IS NOT TO SCALE

BMP #1

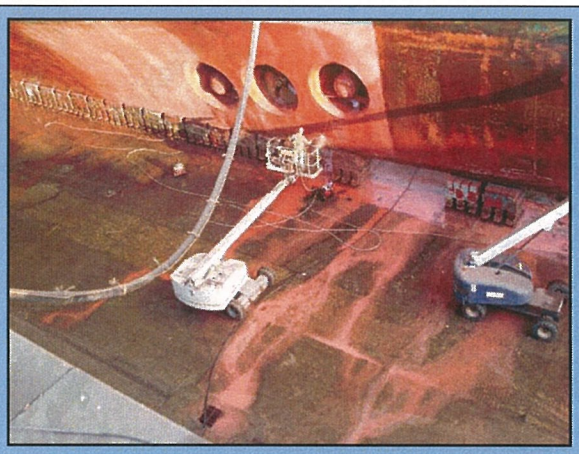
High Pressure/ Ultrahigh Pressure Washing

One of the first activities to occur on a dry-docked vessel is the high pressure washing of the vessel hull to remove salts and marine growth prior to surface preparation or painting. This typically involves pressure washing the hull and/or super structure with water at 2,000 – 3,500 psi, which may produce large volumes of paint contaminated wastewater. Shipyards may use an Ultra High Pressure (UHP) washing process (from 40,000 – 55,000 psi) to completely remove all paints, eliminating the need for further surface preparation prior to painting. This operation generates even larger volumes of wastewater and solids, which will need to be managed.

Management of Wastewater on the Graving Dock Floor

- Ensure all wastes and wastewater discharges resulting from hull washing activities are collected and disposed properly.
- Coordinate high pressure washing operations to ensure effective collection of wastewater.
- Close all sump well valves in the floor collection system prior to and during high pressure washing operations.
- Divert contaminated wastewater that falls outside of the dock floor containment area away from the tunnel drains.
- Direct non-contaminated water (i.e. ballast water, cooling water) away from contaminants on the dock floor.
- Collect and dispose of stormwater that comes into contact with contaminants.
- Do not use environmentally harmful detergents or additives in wash water.

All wastewater containing paint contaminants must be directed to the collection drains and sumps on the drydock floor, collected, and sent for treatment.



Antifoulant contaminated wash water entering the trench drain sump wells on dock bottom.

Section 1 Considerations – Caisson Leakage and Sediment

Diversion of sill water away from pressure washing areas

Water leaking into Section 1 of the graving dock from the caisson can be diverted from the work area by using a sump pump hooked to the PVC pipe installed along the north wall of the graving dock (Section 1).

Managing Entrained Sediment

Harbour sediment may become trapped in section 1, and accumulate in the corners, trenches and sumps. The users of the section will need to be aware of this. This sediment will have to be removed if it becomes contaminated with pressure washing wastewater, sandblast grit, paint chips, paint overspray, or other contaminants.

The sill diversion pump removes clean saltwater from the pool at the front of Section 1(moon pool) and discharges to the tunnel drains through a hard pipe on the dock wall.

Sediment from the harbour often settles on dock bottom after dewatering. This may become contaminated with paint, etc. and must be disposed of.

Ultra High Pressure (UHP) Washing

Ultra high pressure washing generates significant volumes of wastewater and sludge that may pose a challenge for collection and disposal.

- Prepare in advance for the management of the UHP waste.
- Remove all water, sludge and debris generated from UHP washing from the dock.
- Ensure the sludge is disposed of at an appropriately permitted facility.

The hull of a cruise ship being ultra high pressure washed. Inset: sludge produced during ultra high pressure washing.

Management of Small Vessel High Pressure Wastewater in the Upland Areas

- Perform pressure washing only in designated areas where wastewater management can be effectively achieved.
- Completely block off all drains prior to use for collecting wastewater from pressure washing.
- Ensure sufficient equipment is available for the timely collection and removal of wash water.
- Clean up work area and drains prior to removal of collection equipment. (i.e. filter cloth, plugs, tarps)

A small vessel is power washed on the North Landing Wharf (NLW).

The trench drain is blocked and a sump pump is installed to collect wash water into a tote.

Example of styrofoam blocks used as a drain blocker on the NLW.

Example of a pump set up used to collect wash water on the NLW.

BMP #2
Abrasive Blasting

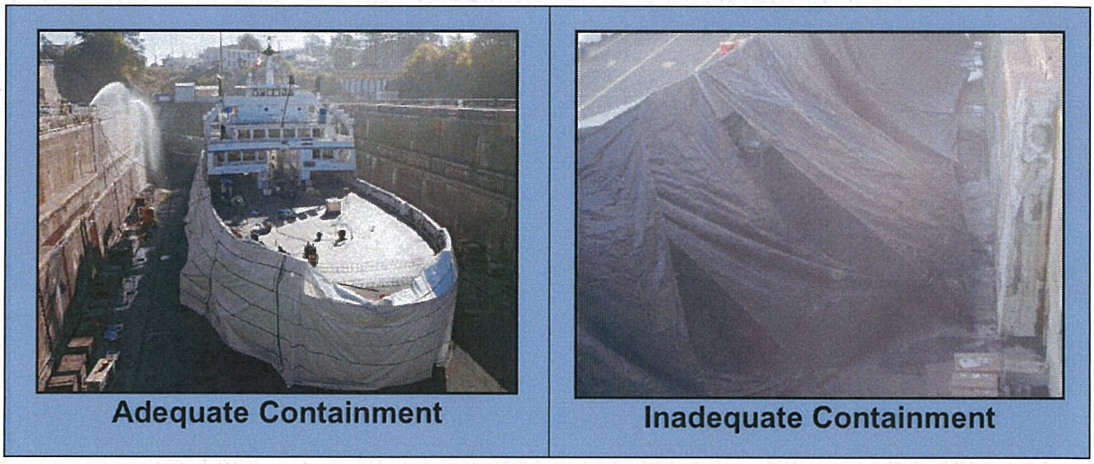
Abrasive blasting is a common operation performed at the Esquimalt Graving Dock (EGD) to prepare vessel surfaces for painting. However, this operation creates challenges with respect to controlling air emissions and the waste materials generated.

Fugitive emissions from blasting operations have the potential to negatively affect employees, facility users, neighbours, equipment and infrastructure. The dust from blasting may contain harmful environmental pollutants which may enter the harbour directly or via stormwater runoff.

Waste grit may be contaminated with antifouling paint which poses a risk to marine life if not handled properly.

Dust Control

- Cover all blast media (new and used) during transport.
- Use containment such as tarps, shrouds or portable structures to prevent airborne particles from entering the atmosphere and surface waters.
    - Containment should be large enough to adequately enclose or segregate the working area.
    - Ensure containment devices are connected so there are no gaps.
    - Ensure that containment reaches the dock floor or walls



Adequate Containment

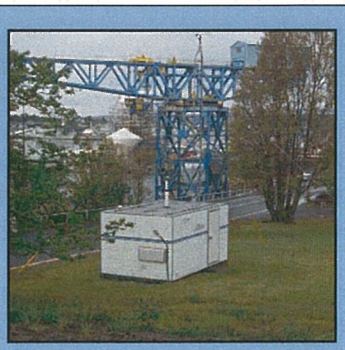
Inadequate Containment

- Where physical containment techniques are not sufficient to prevent fugitive emissions water curtains may be used to mitigate dust emissions in problem areas.
- Do not abrasive blast during conditions that render containment ineffective (i.e. during windy conditions)
- Minimize dust emissions by ensuring blast nozzles are angled close to perpendicular and aimed slightly downward during blasting.
- No abrasive blasting of vessels shall be performed while vessels are docked at the North Landing Wharf or South Jetty

Air Quality Alarm

The Esquimalt Graving Dock has an onsite PM_{10} monitor in partnership with the Ministry of Environment.

If particulate matter levels in the air exceed 100µg/m^3 an alarm sounds in the Pumphouse, at which time corrective actions must be taken.



Waste Grit Management

- Remove waste grit from work areas as soon as possible.
- Store all waste grit in appropriate containers to prevent stormwater and wind impacts.
- Cover all skips, storage bins, tanks, and hoppers to prevent dust emissions.
- Dispose of waste grit in accordance with applicable provincial regulations.

Store all waste grit away from drains, to prevent contaminated water migrating into the marine environment.

Sweep waste grit under the vessel to prevent it from being washed down the drain.

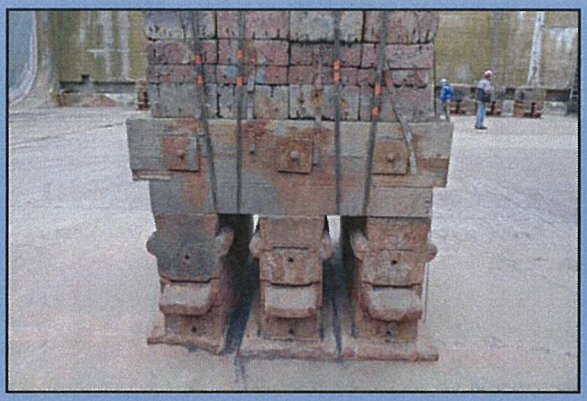
Store waste grit in appropriate containers, protected from inclement weather.

Remove waste grit from work areas as soon as possible.

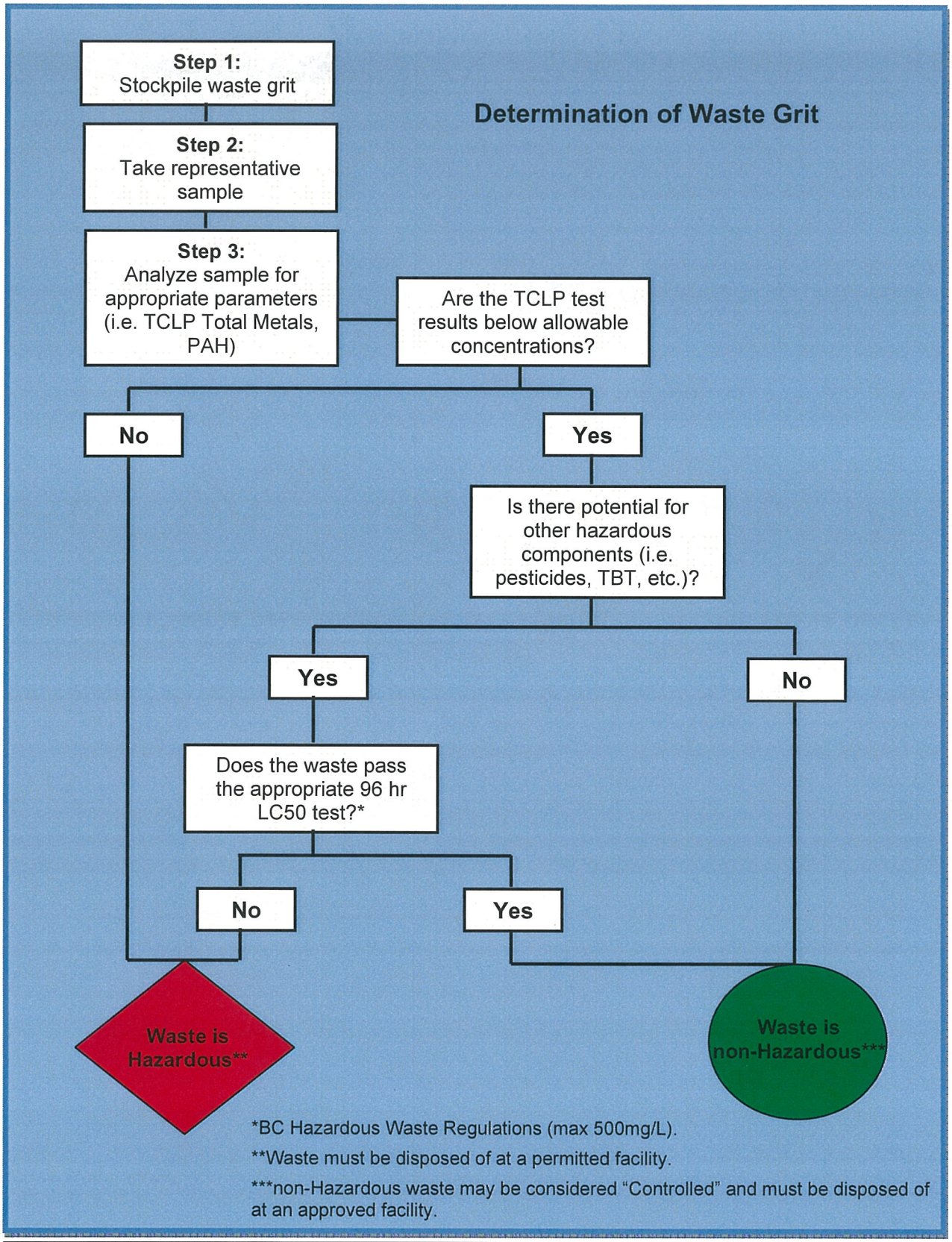
Keel/Bilge Blocks

Keel and bilge blocks on dock bottom present a challenge for clean up of spent waste grit.

Excess blocks stored in dock bottom may be moved prior to sandblasting, or covered to prevent grit from collecting between the blocks.



Determination of Waste Grit



*BC Hazardous Waste Regulations (max 500mg/L).

**Waste must be disposed of at a permitted facility.

***non-Hazardous waste may be considered "Controlled" and must be disposed of at an approved facility.

BMP #3
Painting and Coating

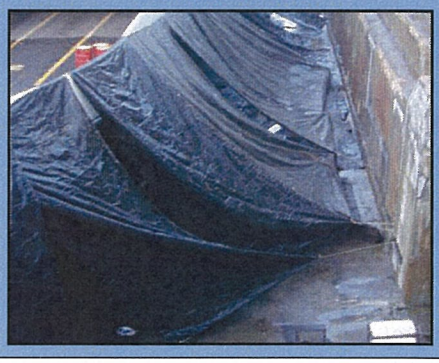
Ship repair and maintenance often requires painting and coating of vessel surfaces to protect from corrosion or to inhibit growth of marine life. The industrial nature of marine paints, in particular antifouling paints, may result in negative impacts to the environment and surrounding infrastructure if not properly managed.

Paint Overspray
Paint overspray has the potential to impact the marine environment, soils, neighbouring residences, and nearby equipment and infrastructure.

- Use containment such as tarps, shrouds or portable structures to prevent airborne particles from entering the atmosphere and surface waters.
    - Containment should be large enough to adequately enclose or segregate the working area.
    - Ensure containment is secured so there are no gaps.
    - Ensure that containment reaches the dock floor or walls.

Adequate Containment

Inadequate Containment



- Do not spray paint during conditions that render containment ineffective (i.e. windy).
- Place containment beneath and around structures being painted on dock floor and in work areas to ensure overspray does not reach the surrounding area (i.e. during painting of anchor chains, grates, etc.).
- Manage overspray on the graving dock floor to prevent safety hazards (e.g. slippage).

For vessels docked in **Section 1** ensure that overspray does not reach the sill water. Avoid docking vessels so they extend over sill area.

Painting Dockside

- Do not spray paint vessels docked at the North Landing Wharf or South Jetty.
- Use rollers and brushes to paint vessels dockside
- Ensure tarps are in place below work areas, as well as in between the vessel and the dock to prevent spills and drips from entering the water.
- Ensure paint cans are stored securely when working alongside vessel edges.
- Ensure floor grates of manlifts are covered to prevent spills to the marine environment
- Waste generated from grinding and hand tooling must be prevented from entering the marine environment.

Ensure tarps are in place to prevent overspray impacting the surrounding work area.

While painting vessels berthed at the North Landing Wharf and the South Jetty do not spray paint, and take measures to prevent paint from entering the marine environment.

Temporary Paint Storage/Mixing Areas

- Must be under cover to protect from inclement weather
- Only in designated areas
- Must be on secondary containment (a tarp at minimum)
- Ensure empty paint cans and other associated wastes from painting are stored properly, protected from the weather, and removed from dock bottom as soon as possible.

In **rare** situations (i.e. shape of the vessel combined with ideal weather conditions) containment may not be necessary to prevent overspray from escaping the area.

In this situation, the User must notify PWGSC **prior** to beginning the work, and obtain approval, **in writing**, to paint without completely enclosing the vessel. Restrictions and monitoring requirements will be applied.

To this date this has only been allowed in three situations:

- painting underneath a flat bottom barge
- painting the underwater hull portion of the midsection of a cruise ship
- painting of a C-class ferry underwater hull area during calm wind conditions

BMP #4

Dry Dock Floor Management and Cleanup

Drain Management

- All sump well valves must be closed prior to and during power washing operations.
- Cover all tunnel drains and net cages during sandblasting, painting and power washing to prevent contaminants from entering the marine environment.
- In the case of a spill or release on dock bottom all sump well valves must be closed and all contaminated material contained and removed from dock bottom.
- Direct all contaminated water to the trench drain system, to avoid entering the tunnel drains.
- Collect and properly dispose of all contaminated water. Ensure sufficient equipment is available for contaminated water collection.
- Ensure all non-contaminated water is directed away from work areas and into the tunnel drain system. (i.e. ballast water, cooling water, caisson sill water).

Sediment Management

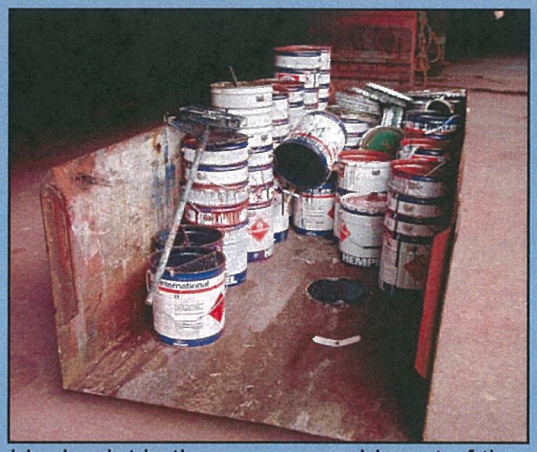
- Segregate any marine sediment which may enter the dock during vessel transfer from pollutants generated from vessel repair in order to reduce the amount of wastes requiring disposal.
- Collect and properly dispose of marine sediment that becomes contaminated with waste generated from vessel repair.
- Remove all contaminants and residues from the trench drains and sump wells prior to flooding at the end of work period.

Hazardous Materials Management

- Store hazardous materials (i.e. fuel, paint, waste oils) away from the drains on dock bottom.
- Store hazardous materials to the inside of the trench drains so that any spills or releases can be captured.
- Store hazardous materials in areas protected from the weather, water curtains and other water sources.
- Ensure adequate spill response equipment is in close proximity to hazardous material transfer operations. At a minimum one spill kit is required per section of the graving dock.

Housekeeping

- Remove waste sandblast grit from the work area as soon as possible to prevent migration of grit contaminants into tunnel drain system.
- Store wastes collected from the dock floor in appropriate secondary containment and removed from dock bottom as soon as possible.



Residual paint in the cans, may drip out of the skip and enter the marine environment through the drain systems.

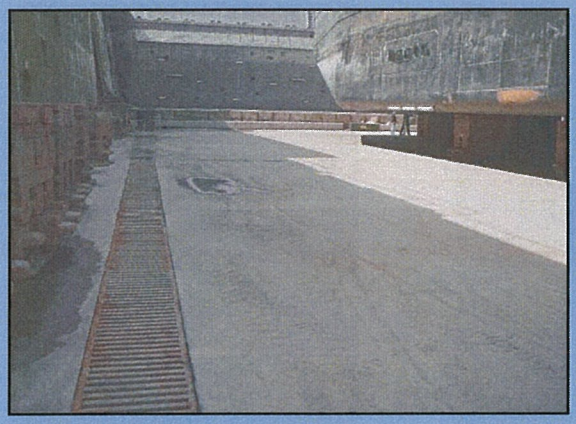
Leaving garbage around the work site attracts wildlife such as seagulls, racoons, and rats.

When cleaning dock bottom, skips of waste sandblast grit may leak contaminated water and should be removed as soon as possible.

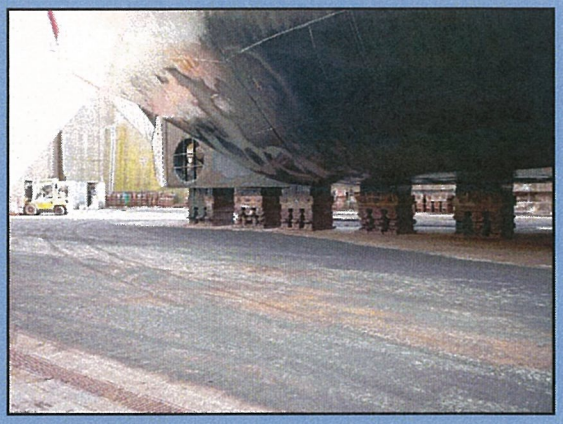
All hazardous materials must be stored in appropriate containment and away from tunnel drain system.

Inspection and Cleanliness

- Prior to flooding, the drydock must be cleaned to meet the Esquimalt Graving Dock (EGD) Standard of Cleanliness, as determined by the EGD undocking supervisor.
- Users must ensure that the dock floor is free of deleterious substances prior to flooding.
- Water may be used to clean the dock floor; however, any wastewater generated must be collected and disposed of properly.
- If a vessel occupies a shared portion of a dock section each User must clean the trench drains up to and including the section sump well.



Example of a dock floor that would pass inspection.



Example of a dock floor that would not pass inspection.

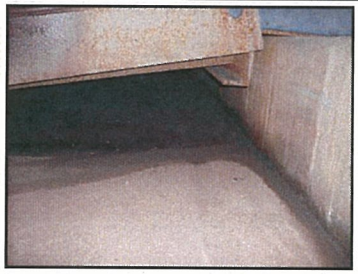
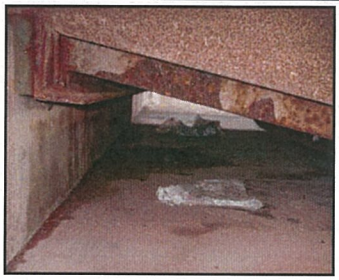
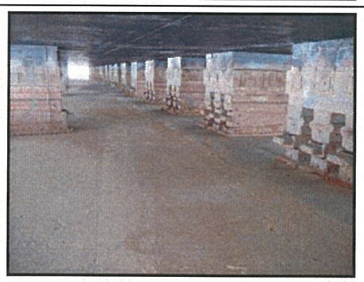
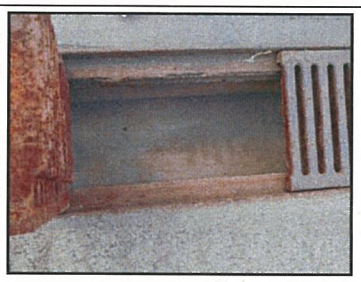
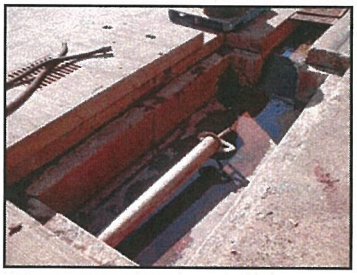
EGD Standard of Cleanliness

Due to the importance of drydock cleanliness prior to flooding, and since quantitative testing is impractical due to time and cost restrictions, the following guidelines will be used to assess cleanliness of drydock surfaces.

- All drydock surfaces, including stairwells and sills must meet the standard for "**residue free**" prior to flooding of the drydock. **"Residue free"** is considered met when a person of normal visual acuity, while standing, is unable to detect visible accumulations of potential pollutants.

- This includes, but is not restricted to, the removal of abrasive grit, paint residues, cutting and grinding wastes, oil and grease, food and drink containers, ear plugs, dust masks, rope, cigarette packs, or any other refuse that may have been deposited during the work period.

- Debris of natural origin that may have been deposited during the previous flooding of the drydock, such as wood, sand, silt, seaweed, or marine life may be exempt from these requirements, as long as it will not contaminate the environment upon reintroduction.

Important Locations	Acceptable	Not Acceptable
Ramps		
Sills		
Keel Blocks		
Trench Drains		
Sump Wells		

BMP #5

Hazardous Materials Handling and Storage

A variety of materials are used, stored and transported by the Users at the Esquimalt Graving Dock (EGD). If not handled appropriately, these materials have the potential to negatively impact worker health and safety, infrastructure or the environment.

Long Term Storage

Users must have designated storage areas suitable for the materials they use on site. These areas must:

- Have appropriate secondary containment suitable to the quantity and nature of the material in that area
- Ensure materials are stored in accordance with compatibility requirements
- Be protected from the weather
- Have placards and ventilation (where applicable)
- Have controlled access

Short Term Storage and Working Areas

These areas must be:

- Clearly identified and labelled
- Located away from pathways to the marine environment
- Located on impervious surfaces (i.e. concrete, asphalt)
- Protected from the weather

Materials must be:

- Stored in containers appropriate for the nature of the material
- Labelled appropriately with product name, first aid information, and PPE requirements.
- Secured appropriately during transport

MSDS for all products stored on site must be available to all employees.

Empty containers must be labelled "Empty".

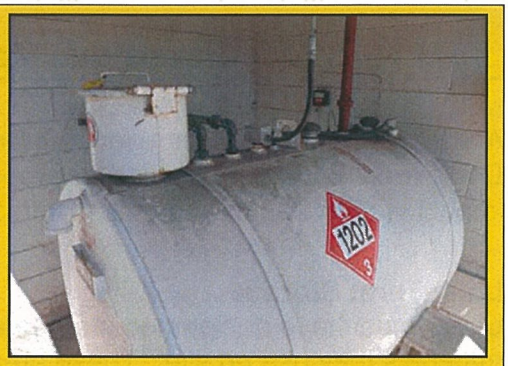
Inspect all valves and storage containers for rust or damage before use.

Federal Regulation for Fuel Storage Tanks

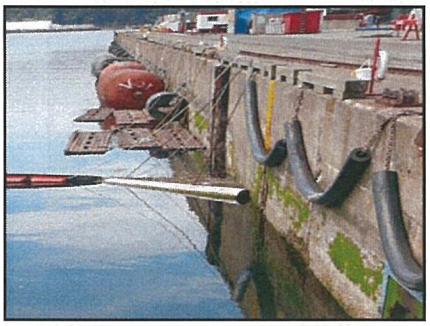
As the EGD is a Federal facility, any storage tanks onsite may fall under the Petroleum and Allied Petroleum Products *Storage Tanks Regulations* (2008). Tenants may be required to register their tanks with Environment Canada.

National Fire Code

This code outlines the containment, labelling and location requirements for flammable liquid storage.



Areas to Avoid Storing Containers of Hazardous Materials

Drains: Although the trench drains provide the opportunity to collect accidentally released materials, if a tote or drum is placed directly over top or beside a drain the material will flow directly into it and the spill may not be noticed until it is too late.	
Fire Holes: On the South Jetty the fire holes flow directly into the harbour. If any containers fail near the fire holes, the material will not be able to be recovered once it is in the harbour..	
South Jetty and North Landing Wharf Edges: Any containers placed near the edge of the jetties have the potential to spill directly into the harbour as there are no berms or secondary containment available.	

BMP #6
Waste Management and Recycling

Operations at the Esquimalt Graving Dock (EGD) generate a variety of waste streams including hazardous waste, international wastes, and general refuse and recyclables.

Hazardous Waste
Hazardous wastes generated at the EGD may include waste oil and oil filters, antifreeze, batteries, paint and solvents, oily rags and absorbent materials, spent grit, solids generated during power washing, and asbestos. Appropriate management of hazardous waste will reduce environmental liability associated with inappropriate disposal and storage as well as reduce the risk of human injury and environmental impact.

Hazardous waste storage shall be segregated from new product storage.

- Ensure designated storage areas are away from active work areas.
- Ensure areas are covered to reduce exposure to environment and wildlife.
- Ensure that waste accumulation areas are organized.

Hazardous waste should be segregated into separate containers.

- Ensure containers used are appropriate for the type of waste (i.e. separate drums for waste oil, oil filters, antifreeze, batteries, paint and solvents, oily rags and absorbent material, spent grit)
- Store batteries in a manner that prevents leakage of acid to the environment.
- Properly dispose of contaminated clean-up materials (i.e. absorbents, rags, etc.)
- Do not dilute or mix hazardous waste other hazardous or non-hazardous wastes.
- Cover waste containers to prevent exposure to weather (i.e. rain)

Clearly label all hazardous waste containers.

- Labels should Include: type of waste, generator/company name, and contact information

Asbestos

All asbestos containers and asbestos-containing materials must be identified by signage and labelling in accordance with applicable legislation.

Companies which engage in asbestos related work at the EGD must be qualified to do so.

Biological Waste

Marine life removed from vessel hulls may contain paint contaminants. This waste may be considered a controlled or hazardous waste and would need to be handled and disposed of accordingly.

Recycling

All Users of the EGD are responsible for collecting and disposing of the solid waste they generate from their activities, properties and vessels they are responsible for.

- Recycle solid waste such as plastic, glass, aluminum, mixed paper and cardboard. Recycling areas should be conveniently located and easily identifiable.
- Segregate other solid waste, such as scrap metal, wood, electronics, polystyrene foam and soft plastics for recycling at an approved facility.
- Leaf and yard waste collected on property should be composted at designated sites located on dock property.
- Construction and demolition waste should be reused or recycled wherever cost effective and technically feasible.
- Encourage the use of recyclable products to reduce the solid waste impact on the environment.

International Waste

Like hazardous waste, International Wastes may pose a threat to human health and the environment.

Dunnage from vessels has been known to carry invasive insects to local areas. Foreign dunnage must be identified, stored, and disposed of at an approved facility.

Food wastes may carry pathogenic organisms that could cause illness to those handling it. Food wastes shall be kept in separate, closed containers. The Canadian Food Inspection Agency (CFIA) will inspect foreign vessels and issue directions on disposal.

BMP #7
Fuelling and Oil Transfer

At the Esquimalt Graving Dock (EGD) the transfer of oil and fuel is a common activity. An accidental release during these operations has the potential to negatively impact the environment, and health and safety of those at the facility.

- Prior to any fuelling or oil transfer operations an emergency plan must be in place, adequate spill response equipment must be available, and employees aware of spill response procedures must be on hand.
- All transfer and storage equipment must be in good condition, tested, and properly connected.
- Do not place storage and transfer equipment near pathways to the marine environment (i.e. storm drains, edge of the dock).
- Berthed vessel fuelling operations involving trucks and barges as well as bulk oil transfers exceeding 10 tonnes (10,000 L) per day must comply with the **EGD Fuelling and Oil Transfer Policy and Checklist**.

Vessel Fuelling and Bulk Oil Transfer

Definition of Oil: as described in the Canada Shipping Act oil is considered petroleum in any form, including: crude oil, fuel oil, sludge, oil refuse, and refined products.

- All berthed vessels receiving fuel from a truck or a barge require a containment boom.
- Transfers of greater than 10 tonnes of oil per day to/from a berthed vessel require a containment boom.
- An **EGD Oil Transfer Checklist** must be filled out and signed by representatives from the truck and the vessel and submitted to EGD representatives in the pumphouse prior to fuelling or oil transfer operations.
- Transfer operations must comply with the *Canada Shipping Act*, *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals Subdivision 5*.

Containment Boom Rental

The Esquimalt Graving Dock has a boom and deployment equipment available for rent. To arrange for booking or rental contact the EGD Operations Manager.

An orange containment boom surrounds the vessel while being fuelled

The EGD boom reel and containment boom

Example Scenario Requirements

Scenario 1: Fuelling a berthed vessel

- Completed and signed EGD Oil Transfer Checklist submitted to EGD Pumphouse
- Containment boom adequately secured at both ends.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Scenario 2: Fuelling a vessel or bulk oil transfer (greater than 10 tonnes a day) in the drydock

- Completed and signed EGD Oil Transfer Checklist submitted to EGD Pumphouse.
- Pumphouse operator on site prepared to shut down auxiliary pumps in case of an emergency.
- Receiving containers located away from pathways to the harbour (i.e. tunnel drains).
- Adequate spill response equipment and qualified personnel available.
- Emergency response plan in place.

Scenario 3: Bulk oil transfer from berthed vessel (greater than 10 tonnes a day)

- Completed and signed EGD Oil Transfer Checklist submitted to EGD Pumphouse.
- Containment boom adequately secured at both ends.
- Receiving containers located away from pathways to the harbour (i.e. storm drains, edge of dock).
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Scenario 4: Onshore oil transfer between containers

- All containers located away from pathways to the harbour (i.e. storm drains, edge of dock).
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

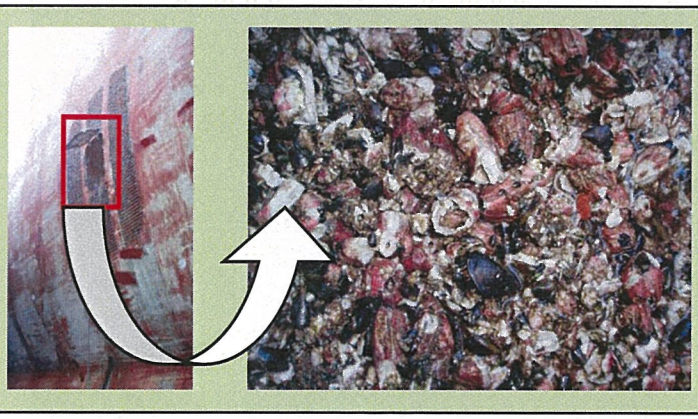
BMP #8

Invasive Species (Ballast Tanks and Hulls)

Invasive species are a significant threat to the marine ecosystems of British Columbia and Esquimalt Harbour. In 2000 a Fisheries and Oceans sponsored study of invasive species found that Esquimalt Harbour had a disproportionately high number of non-indigenous species. It has been widely recognized that the primary source of non-indigenous marine species in local waters are the ballast tanks and hull surfaces of transoceanic vessels.

Marine growth removed from vessel hulls must not be allowed to enter the harbour through the graving dock drainage system.

- Ballast Water
  - Vessels must follow Transport Canada Ballast Water Control and Management Regulations
- Ballast Tank Sediment
  - Shipyards must follow Transport Canada Ballast Water Control and Management Regulations
  - Sediments removed from the ballast tanks at the EGD must be contained, collected and disposed of at an authorized facility.
  - **Sediments must not be allowed to enter the harbour.**
- Anchor chain-growth
  - All biological material removed from anchor chains must be contained, collected and disposed of appropriately.
- Sea chests
  - All biological material removed from sea chests must be contained, collected and disposed of appropriately.



Sea chests such as this one from a cruise ship docked at the EGD often contain a significant amount of marine life. If not managed appropriately this marine life has the potential to negatively impact the local ecosystem of the harbour

BMP #9
Fish and Wildlife Management

The daily operations and activities of the Esquimalt Graving Dock (EGD) have the potential to negatively impact wildlife which frequents the property.

Fish

Fish and other marine life have the potential to become stranded in the graving dock during normal vessel docking/undocking operations. This may include, but is not limited to: salmon, octopus, other fish species, and seals.

- The bubble curtain must be employed during vessel transfer into and out of the graving dock.
- EGD employees must monitor the graving dock for stranded fish and/or other marine life during dewatering.
- Whenever possible, EGD employees must retrieve fish and marine life and safely return them to the Esquimalt Harbour.
- Users are prohibited from removing fish and marine life from the graving dock.

Report all instances of fish and marine life interaction with the Graving Dock to EGD Environmental Services

Authorization for the Destruction of Fish (Section 32)

The EGD has received authorization for the destruction of fish associated with normal operation of the graving dock from the Department of Fisheries and Oceans.

Conditions of the Authorization:

- Take all reasonable precautions to prevent the trapping and mortality of fish
- Monitor the success of preventative measures and retrieval success
- Report to the DFO annually

Wildlife

A variety of wildlife is known to occupy areas of the EGD property. In some cases wildlife may use the facility as a nesting/breeding ground, while others are present for short periods of time to pass to another location or to feed. Activities and operations at the EGD have the potential to impact the well being of wildlife at the facility.

Such wildlife includes: deer, raccoon, mink, river otter, great blue heron, osprey, raven, cormorants and a variety of other common nesting and song birds.

- All wildlife must be left alone
- Injured or orphaned wildlife must not be handled without proper experience and equipment.
- Dispose of dead wildlife appropriately.
- Prior approval from EGD Environmental Services is required for the relocation or removal of nesting wildlife.

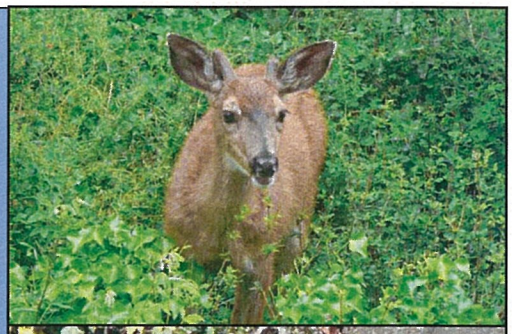
In all cases, call EGD Environmental Services for wildlife related incidents

EGD Wildlife Management Plan Contact Information

Conservation Officer
T: (250) 391-2225 (daytime)
1-800-663-9453 (after hours call centre-will take messages and pass along to the Conservation Officer)

BC SPCA Wild ARC
(Animal Rehabilitation Centre)
T: (250) 478-9453

Vancouver Aquarium Rehabilitation/Rescue
T: (604) 258-7325

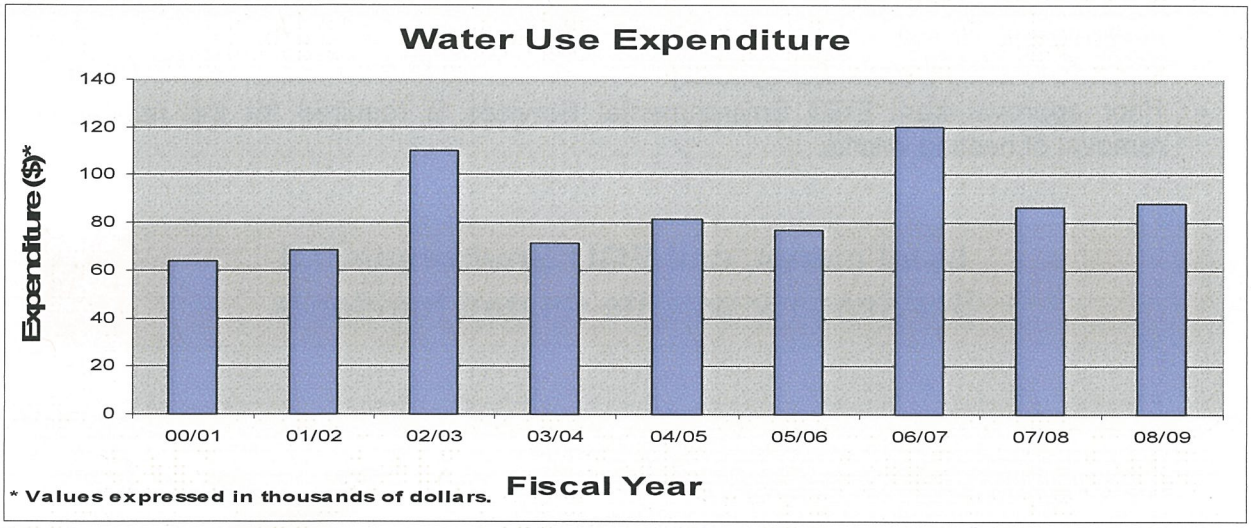


BMP #10
Water Use

Water consumption and the quality of water are considerations of the environmental management system at the Esquimalt Graving Dock (EGD).

Water Consumption

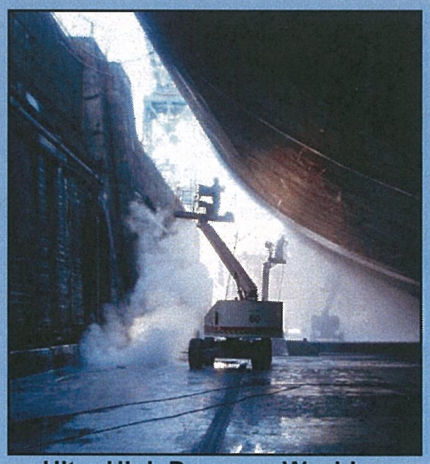
Large volumes of water are used during normal operations at the facility; because of this the EGD is considered a high volume user of fresh water in the Capital Region.



Significant Water Consuming Activities

Water Curtains

Water curtains are used to mitigate the escape of dust from sandblasting operations in dock bottom



Ultra High Pressure Washing

Ultra high pressure washing uses large amounts of water at high pressure to scour paint and biological material from the hulls of ships

In order to reduce the amount of water consumed onsite:

- Only use water curtains when all other attempts to contain particulate emissions from sandblasting have failed.
- Avoid use of freshwater to clean work areas (e.g. graving dock bottom, wharves, jetties).
- Maintain fittings in buildings and on equipment to prevent leakages.

Metered Water Use at the Esquimalt Graving Dock

- Users must ensure that water is accessed from a metered line when connecting to the water distribution system
- Portable meters are to be used where necessary.
- Pumphouse must be contacted for proper access to the water distribution system.

The EGD maintains the water distribution system.

- Flushing of the entire system is conducted on an annual basis.
- Collection and analysis of water in comparison to drinking water quality guidelines is conducted regularly.

The water distribution system at the EGD was originally designed as a firefighting system; therefore, the water in certain areas of the system may not be considered potable.

- Users are responsible for ensuring that the water they use meets guidelines for the purpose intended.

BMP #11
Energy Conservation

The Esquimalt Graving Dock (EGD), as a facility, is a major energy consumer. Inefficient energy use may result in a negative economical and environmental impact. Economical impacts are associated with inefficient electrical usage (i.e. cost). Environmental impacts include those associated with the consumption of fuel (i.e. air emissions).

Electrical Consumption

There are a number of opportunities to increase the efficiency of electrical usage at the EGD:

- Turn off lights when not in use (flood lights, office buildings)
- Turn off equipment when not in use
- Use energy efficient equipment whenever possible
- Stagger equipment start-up to decrease load on electrical system

Fuel Consumption and Emissions

The second largest source of greenhouse gas emissions from the dock is employee commuting and fuel consumption. Some opportunities to decrease the amount of fuel consumed by day to day activities are:

- Use energy efficient vehicles
- Use alternative fuels/energy sources if possible
- Avoid idling vehicles
- Use shore power whenever possible
- Encourage staff to find alternative means for commuting to work (i.e. carpool, public transit, cycling)

Idling Vehicles

Idling Vehicles produce unnecessary air emissions and noise.

- Do not idle vehicles near building doorways or air intakes
- Vehicles must be turned off if idling for more than 3 minutes in a 60 minute period

Greenhouse Gas Emissions:

Energy consumption results in the production and release of greenhouse gas emissions through the combustion of fossil fuels. Every aspect of work at the EGD results in the release of greenhouse gases whether it is running the cranes or printing a report. It is important to minimize energy consumption wherever possible to mitigate the release of harmful greenhouse gases.

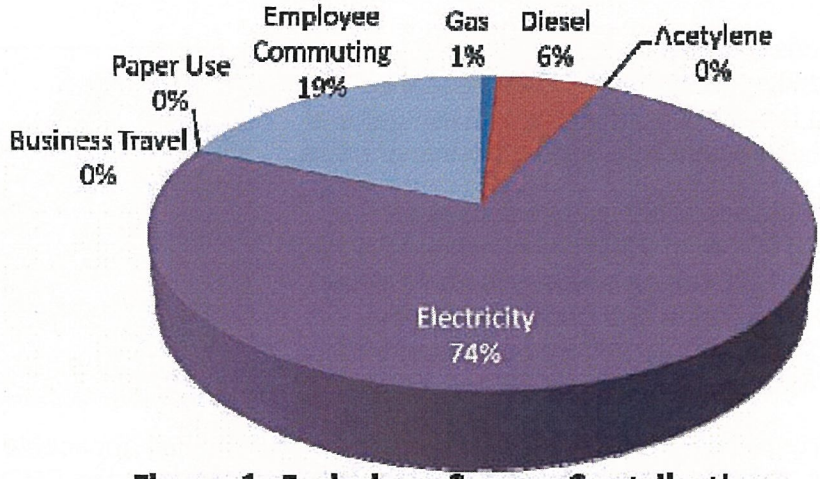
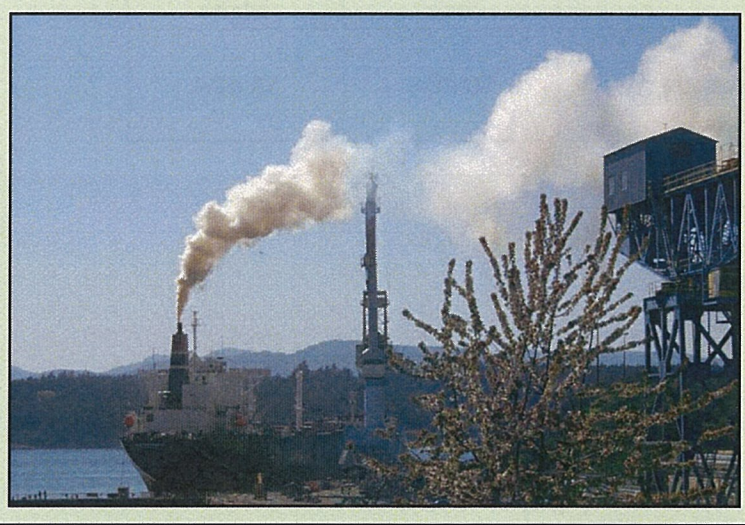


Figure 1: Emissions Source Contributions 2006/2007

The Royal Roads University (RRU) Greenhouse Gas Audit determined that the largest source of carbon emissions at the EGD was electricity use. Employee commuting was the second largest greenhouse gas producer.



Shore Power

When vessels are moored at the North Landing Wharf or the South Jetty it is important that they utilize shore power. With shore power the generator can be turned off thereby saving fuel and preventing the release of harmful air pollutants.

BMP #12

Nusiance Pollution (Noise/Odour/Light)

The daily operations of the Esquimalt Graving Dock (EGD) tenants have the potential to negatively impact the work and living environment of neighbouring businesses and homes. Nuisance pollution is often created by noise, odour and light.

Noise

- The main sources of noise at the EGD include sandblasting, drilling, hammering, compressors, generators and the crane warning bell. Even general shop repair activities generate large amounts of noise.
- Whenever possible schedule noisy activities for daytime hours 0700 hrs to 2300 hrs on weekdays, and from 0700 hrs to 1900 hrs on weekends and holidays. Through worker education and good practice the generation of high-level intermittent or non-continuous noises can be minimized.
- The EGD Environmental Policy makes a commitment to follow all applicable municipal laws and regulations, therefore it is expected that the daily operations at the EGD will meet the Esquimalt Noise Control Bylaw (2677).

The EGD is considered an "Activity Zone" and the neighbouring area is considered a "Quiet Zone". Building and infrastructure related projects at the EGD may fall under the definition of a "Construction Zone" as per the Esquimalt Noise Control Bylaw.

Esquimalt Noise Control Bylaw		Noise Receiver Zone	
		Quiet	
		Day	Night
Noise Source Zone	Activity	60 dBA	55 dBA

Construction Zone

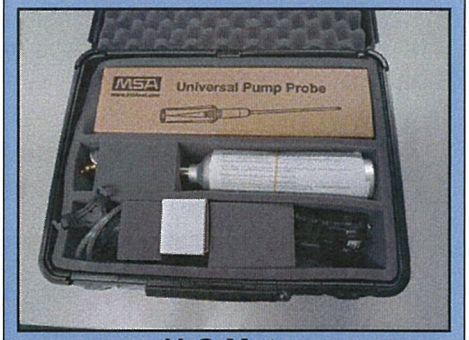
Building and infrastructure related projects at the EGD may fall under the definition of a "Construction Zone" as per the Esquimalt Noise Control Bylaw. The definition of a construction zone according to the Esquimalt Noise Control Bylaw is:

a) the erection, alteration, repair, relocation, dismantling, demolition and removal of a building;
b) structural maintenance, power-washing, painting, land clearing, earth moving, grading excavating, the laying of pipe and conduit, concrete placement, and the installation, or removal of construction equipment, components and materials in any form or for any purpose;
c) any work being done in connection with any of the work listed in paragraphs (a) or (b);

The noise level limit for a "Construction Zone" is **85 dBA** day and night.

Odour

- Daily dock operations often create strong and unpleasant odours whether from the release of VOCs, H_2S, organic materials, or chemicals an offensive smell can reduce the quality of the work environment for neighbouring tenants and home owners.
- In the event that odours are negatively affecting other tenants or stakeholders odour mitigating measures may be required.
- Contact EGD Environmental Services in the event of a nuisance odour from an unknown source.

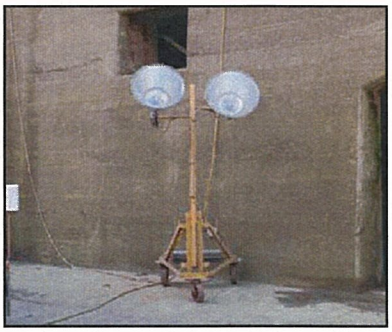


H_2S Meter

The EGD utilizes an H_2S meter to ensure that any emissions released from the sanitary sewer system that create nuisance odours are not hazardous to adjacent work areas.

Light

- Night time dock operations require spotlights to provide a safe work environment. However for residential neighbours strong spotlights can be a significant intrusion.
- Utilizing spotlights only when absolutely necessary will help prevent disturbing the neighbours as well as provide a more energy efficient work environment.
- Changing the direction of the lights may reduce the effect they have on the neighbours.
- Turn off or report to your supervisor any unnecessary lights left on.

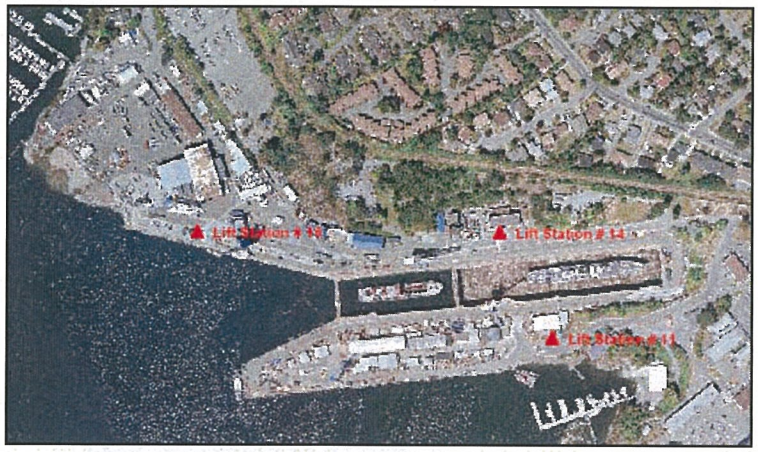


BMP #13

Sanitary Waste Management and Sewer Use

The Esquimalt Graving Dock is authorized by the Capital Regional District (CRD) as a ship and boat waste disposal facility.

Discharge to the sanitary sewer at any location other than at the LS#15, LS#11 or the four vessel connections at the Graving Dock is prohibited.



The EGD is authorized to discharge to the sanitary sewer at the:

- Lift Station #15 (LS#15),
- Lift Station #11 (LS#11) and
- And the four vessel connections in the graving dock.

Permitted wastes include:

- sanitary waste
- grey water
- treated superchlorinated water*

Prohibited wastes include:

- bilge and ballast water
- wastewater sludge
- fuel and oil, paint, paint thinner, solvents, and products containing toxic chemicals

***Superchlorinated Water:** must not be discharged to the sanitary sewer unless it has been dechlorinated to less than 5 ppm chlorine.

- Users must notify the Pumphouse before conducting any discharges to the sanitary sewer. Typical methods of discharge are: large (connection to a vessel), and small (portable discharges from totes).
- Users must complete a Sanitary Sewage Discharge Form and provide it to the Pumphouse prior to discharging to the sanitary sewer.
- Pumphouse Operators will ensure that sanitary sewer discharges are in accordance with applicable regulations and authorizations.
- Pumphouse Operators will provide all completed Sanitary Sewer Discharge Forms to EGD Environmental Services, who will submit quarterly reports to the CRD.
- Users must ensure a sample collection point is accessible at the point of discharge.

BMP #14

Spill Preparedness and Response

The Esquimalt Graving Dock (EGD) is committed to the protection of human health and the environment. Safety and environmental management programs have been implemented at the EGD to reduce the potential for accidents and spills. Emphasis is placed on the prevention of spills, and although the potential for spills can be reduced through these programs, spills do happen.

All Users operating at the EGD must have the capability to effectively manage spills resulting from their activities and operations.

- User employees must have adequate training in spill response
- User employees must have access to appropriate spill response equipment and materials
- Users must have plans and procedures in place to respond to spills

For spills which are beyond the capability of the User or are not being effectively responded to by the User, the EGD will provide assistance. The EGD has additional resources available, including:

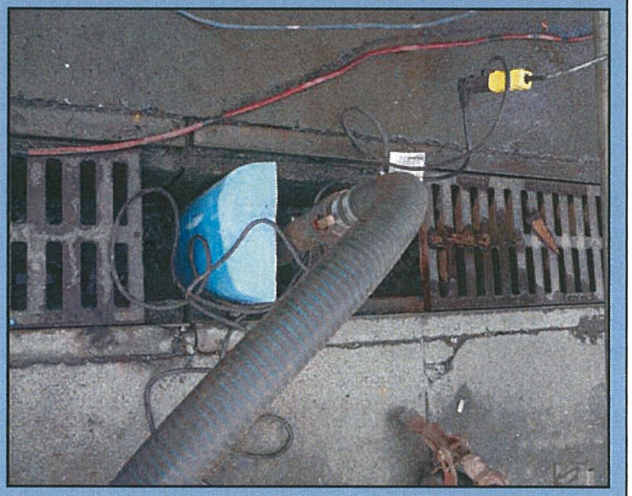
- Spill kits and response materials for land and water based spills
- Spill response boom, deployment reels and boat
- Staff trained to deal with land and water based spills

For access to the EGD spill response resources, contact EGD Management or Commissionaires.

For spills beyond the capability of the facility to manage, the DND, Port Operations and Emergency Services Branch (DND POESB) will provide support for response to land and water based spills.

ALL Spills Must Be Reported to EGD Management

Trench Drains: The EGD has installed trench drains throughout the site. These drains are easily accessible and allow for rapid containment and recovery of materials spilled on the property or in the drydock.



Environmental Emergency Contacts (24 Hours):	
EGD Commissionaires	250-363-3784
Provincial Emergency Program (PEP)	1-800-663-3456
DND POESB/QHM	250-363-2160 or VHF Channel 10
Canadian Coast Guard	1- 800-889-8852 or VHF Channel 12
Environment Canada	604-666-6100

BMP #15

In-water Hull Cleaning and Maintenance

The cleaning of the underwater hull in water has the potential to release harmful contaminants into the marine environment.

In-water Hull Cleaning

- In-water hull cleaning of vessel hulls that are coated with antifouling paint is prohibited at the Esquimalt Graving Dock.
- Vessels coated in non-biocide containing paints (such as silicone based), may be considered on a case by case basis and must be approved by EGD Management prior to the commencement of hull cleaning activities.

Vessel berthed at the North Landing Wharf for in-water hull washing. In-water hull washing must not release antifouling paint. Discoloured water is an indication that you may be harming the environment.

Did you know?

Antifouling paints and their residues contain heavy metals, such as copper, that are toxic to aquatic organisms, including salmon and shellfish. Wash water and solid residues from the washing, scraping, sanding, and blasting of antifouling paints from boat hulls are considered "deleterious substances" under the *Fisheries Act*. Releasing these wastes to fish bearing waters is a violation of the Act.

In-water Hull Maintenance

- Users must receive approval from EGD Management prior to commencement of hull maintenance.
- Cleaning of the anodes, inlets, props, transducers, etc.
- Underwater maintenance required for operational and inspection purposes is permitted at the Esquimalt Graving Dock.

For inquiries regarding in-water hull washing please contact the Esquimalt Graving Dock Management at (250) 363-8056

BMP #16
Housekeeping

An organized, clean facility provides an environment that reduces the potential for pollutants to enter surface and ground water through spills and accidents. General cleanliness will lead to more organized and consistent handling of hazardous materials and waste products.

Clean-Up

- Clean debris from work areas immediately after any maintenance activity. Dispose of collected material appropriately.
- Ensure garbage and recycling containers are available in all leased areas and are emptied regularly.
- Do not use running water to clean the work areas where the contaminated water could enter the storm drainage system.

- Ensure trench and storm drains within designated leased areas are kept clean and free of debris.
- Sweep and/or clean the active working area of the yard on a regular basis.

Storage

- Do not store material/equipment outside of identified boundaries of leased areas.

- Regularly inspect the lease areas for unidentified or improperly stored materials.
- Place a drip pan underneath vehicles and equipment when performing maintenance. Promptly transfer the used fluids to the proper waste or recycling drums.
- Ensure all containers (i.e. drums, totes, etc.) are in good condition and have a clean exterior at all times.

BMP #17

Stormwater Management

Stormwater has been identified as one of the primary pathways of contaminant loading to the harbour from daily Esquimalt Graving Dock (EGD) operations. Common contaminants found in stormwater samples include cadmium, copper, chromium, arsenic, tributyltin (TBT), extractable petroleum hydrocarbons (LEPH/HEPH), and total suspended solids (TSS). Five stormwater catchment areas terminate into the harbour from the EGD property.

A stormwater monitoring program has been implemented at the EGD. The stormwater outfalls will be sampled semi-annually in the spring and fall. Waste grit separators have been installed upstream of the five stormwater outfalls. These help to remove contaminants or debris that enter the storm drain system from daily operations at the EGD, in particular they remove: fuel or oil, paint, sandblast grit, general debris.

Materials Storage:

- Store hazardous materials away from storm drains and trenches.
- Store hazardous materials away from the South Jetty fire holes. These holes lead directly to the marine environment.
- Ensure totes, drums and pails containing hazardous materials are protected from the weather.

Storm Drains:

- Ensure storm drains are kept clear of debris to prevent flooding during heavy stormwater events.
- When using trench drains for secondary containment, ensure the containment system is monitored and removed in a stormwater event. A blocked trench drain may cause flooding of the area.
- Conduct regular inspections of trench drains in lease areas to ensure they are kept clear of debris.

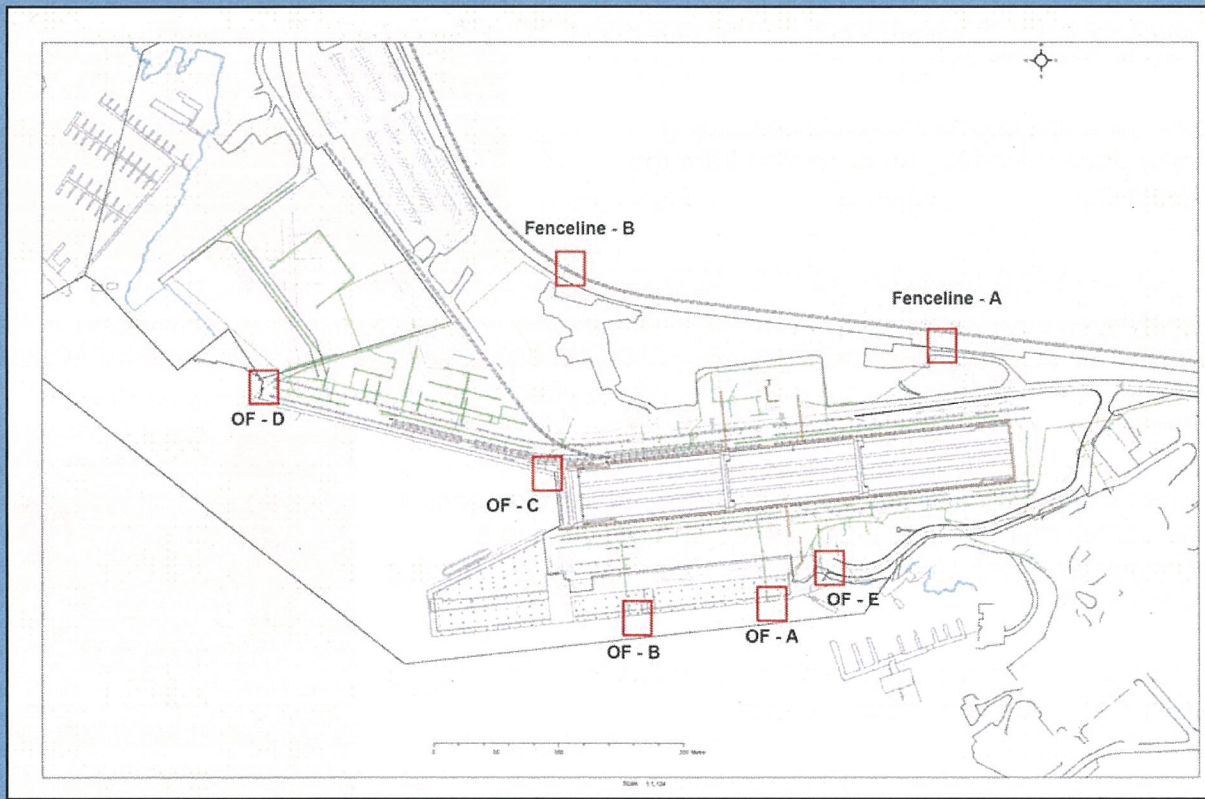
During heavy rain events in dock bottom:
Stormwater has the potential to mix with wash water during power washing operations in dock bottom. To reduce the amount of wash water requiring treatment it is good practice to stop power washing operations until storm water can be controlled.

- Sump well valves may be opened to allow storm water to drain in to the tunnel drains if the area is clear of contaminants and debris.
- Sump wells containing visibly contaminated material must be pumped out and cleaned prior to opening the valves.
- Ensure there is capacity in the trench drain/sump well system to manage the expected stormwater volume to prevent flooding of the dock floor.

Stormwater Monitoring Program

- Stormwater sampling is conducted semi-annually in the spring and fall by EGD Environmental Services.
- Stormwater samples are tested for: total metals, total suspended solids, tributytin, LEPH/HEPH and microbiological parameters.

EGD Stormwater Monitoring Program Sample Sites



BMP #18

Property and Infrastructure Maintenance, Modifications and Construction

There are significant environmental issues and potential impacts related to the management of Esquimalt Graving Dock properties and infrastructure. Any new construction or modifications to the infrastructure at the EGD must consider environmental issues in the project planning.

Infrastructure Maintenance

Maintenance and repair of the aging EGD infrastructure often results in waste generation and other environmental issues which need to be addressed.

Minor Concrete Work

- Contain dust from cutting and drilling.
- Prevent runoff to the storm drains.

Use of Preserved Wood

- Avoid use of creosote preserved timbers where possible.
- Follow applicable guideline for use of preserved wood products.
- Creosote wood waste may be considered a hazardous, restricted or controlled waste.

Demolition/Renovation

- Ensure structures are assessed for the presence of hazardous materials (i.e. lead paint, asbestos) prior demolition or renovation.

Infrastructure Modification and Construction

All construction projects taking place at the EGD need to be assessed for environmental impacts, and plans put in place to mitigate these impacts.

Environmental Impact Assessment

- Any significant changes to infrastructure, changes to an existing lease or application for a new lease, must be approved by EGD Management.
- Prior to the approval of an infrastructure project, a CEAA Environmental Impact Assessment may be required.
- An Environmental Approval Form must be filled out for new lease applications and changes to existing leases.

*****The Environmental Impact Assessment and Environmental Approval Form outlines specific environmental protection and mitigation measures required*****

Common project related aspects that require management include: noise, dust, hazardous materials, storm water runoff, and prevention and management of accidental releases and spills. Requirements for the operational aspects are identified in previous sections of these EBMPs.

Significant non-operational aspects related to construction projects may include:

- Loss of Green Space and Vegetation
- Management of Archaeological Impacts
- Soil Management

Loss of Green Space and Vegetation

The EGD property includes an area of vegetation that provides many benefits. It is home to a number of sensitive native plant species, provides habitat for wildlife, and acts as a buffer between the industrial operations of the drydock and ship repair operations and the neighbouring residential area.

All projects which have the potential to impact vegetation must be reviewed and approved by EGD Management.




Archaeological Considerations

The EGD property and surrounding area has a rich First Nations history. There are four Provincially Registered Archaeological Sites listed within the property boundaries of the EGD.

- All excavation projects must be reviewed and approved by EGD management prior to work beginning
- Depending on the scale of the project a detailed Archaeological Impact Assessment may be required.

Esquimalt Graving Dock Archaeological Overview Assessment

An Archaeological Overview Assessment was carried out in 2010 which outlines the archaeologically sensitive areas on the EGD property and identifies areas of high archaeological potential. Archaeological significant materials found during excavation projects at the facility include artefacts, shell midden, faunal and human remains.

Soil Management

The EGD has undergone significant capital and operation and maintenance projects in recent years. Extensive investigations into the soil conditions (chemical contamination and structure), utility mapping and identification of archaeological conditions have taken place. The industrial history of the facility has resulted in the contamination of the soil and in-fill material used on site. The primary contaminants commonly found at levels exceeding industrial soil standards include: arsenic, cadmium, copper, lead, mercury, zinc, and polycyclic aromatic hydrocarbons (PAH).

Requirements for Excavations at the EGD

Planning Excavation

1. Consult with EGD Facility Management to identify:
   - Project area and excavation boundaries.
   - Known utilities, structures, and historical information regarding the proposed excavation area.
   - Known contaminated soil locations, the nature and level of contaminants potentially in the soils to be excavated.
   - Archaeologically significant areas, requirements for mitigation archaeological impacts, and dealing with unanticipated archaeological finds.

2. Prepare a plan for management, stockpiling, and sampling of soils to be excavated. Key issues to be identified include:
   - Turnaround times for samples may be up to 2 weeks.
   - Parameters to be sampled may vary depending area of excavation. Common parameters include total metals, leachable metals, PAHS, and hydrocarbons (LEPH, HEPH).
   - Stockpile areas must be approved by EGD Management.
   - Soils which exceed the CCME Industrial Levels or BC CSR Industrial levels must be disposed of off site at an approved location.
   - Soils which are below industrial standards may remain on site if geotechnically suitable, approved by EGD Management, and there is an identified use for the soil.

3. Ensure contractors and employees are aware of the health and environmental risks associated with the suspected contaminated soils and have procedures in place to mitigate these risks. This includes adequate Personal Protective Equipment (PPE) and hygiene practices (i.e. no smoking, wear gloves)

Conducting Excavation

1. Ensure appropriate PPE and hygienic precautions are in place to prevent exposure to contaminants in the soils.
2. Monitor all excavations for visible soil contamination or archaeologically significant material.
3. Ensure soil is stockpiled, sampled and analysed in accordance with the BC MOE Technical Guidance on Contaminated Sites (January 2009).
4. Ensure soils suspected of contamination are stockpiled on an impervious surface and covered with a minimum 6 mil PVC or plastic liner to prevent exposure to wind, storm water runoff or people.
5. Imported fill material must be certified clean by the supplier.

After Excavation

1. Ensure all soil is disposed of at approved facilities.
2. Obtain disposal certificates from the receivers of contaminated soils.
3. Report to EGD Management on the volume, analysis of results, excavation details and dimensions.
4. Provide all as-builts and project drawings to EGD management in the format compatible with the EGD drawing standards.

Requirements for Small Excavations (less than $10m^3$)

In areas of suspect contamination: soil must be removed, stockpiled and sampled. Soil cannot go back into the excavation or used elsewhere on site until it is determined through analysis to contain contaminants less than industrial soil standards. The EGD management must give approval for any reuse of excavated soil on site.

In areas of non-suspect contamination: soil may go back into the excavation if geotechnical suitable. The EGD management must give approval for any reuse of excavated soil on site.

Appendix D
EGD Standards for Surveys

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Revised 2014-11-26

1. INTRODUCTION

This standard is written to provide the British Columbia Land Surveyor (BCLS) a guideline for producing acceptable topographic survey for all EGD projects.

2. APPLICATION OF THE STANDARD

This standard applies to surveys that are intended to show new installation of structures, utilities and underground conduits including the existing structures, utilities and underground conduits in the vicinity of the project and as requested by EGD Representative.

The Surveyor in making topographic surveys uses accepted terrestrial and/or GPS surveying methods. Topographic surveys that additionally depict the location of property lines must also be in compliance with the current standard for property surveys and show all legal boundary evidence found.

3. DEFINITIONS

1) Benchmark (control point) is a relatively permanent material object, natural or artificial, bearing a marked point whose elevation above or below an adopted datum is known and whose horizontal coordinates are known in an accepted coordinate system (UTM NAD 83 CSRS Zone 10).
2) A Contour is an imaginary line on the ground, all points of which are of the same elevation above or below a specified datum.
3) The Parcel is the area designated by an EGD Representative and is usually, but not necessarily, given by a legal description of the property.
4) Utilities are services provided by governmental and private entities that provide the following: electric power, telephone, water, sanitary and storm sewer, gas, etc.
5) Acronyms and Definitions:
    - BCLS: British Columbia Land Surveyor
    - EGD: Esquimalt Graving Dock
    - NEZ: Northing, Easting, Elevation – Coordinates
    - PBM: Permanent Benchmark (Control point)
    - TBM: Temporary Benchmark (Control point)
    - Headwall: concrete wall structure on top of or on each side of culvert.

Esquimalt Graving Dock (EGD)
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4. RESEARCH AND INVESTIGATION

1) The Surveyor shall acquire the elevation and datum of all benchmarks to be used in the survey. The elevation used shall be based on a nationally accepted datum whenever practical or unless otherwise instructed by an EGD Representative. The EGD Representative shall specifically describe the parcel to be surveyed.
2) At least four (4) benchmarks shall be established using Global Positioning System and electronic survey total stations, in which the position of all survey works and detected objects shall relate.
3) The benchmarks shall be established on stable ground within 6 m (20 ft) adjacent to the project site or as directed by EGD Representative. The benchmarks shall have reference numbers, coordinates and heights above the established datum (geodetic and/or chart datum).

5. THE SURVEY

The survey shall be performed on the ground to obtain the information required in this standard and any additional information requested by EGD. The Surveyor shall select the equipment and procedures necessary to obtain the horizontal and vertical positional accuracy required by these standards.

6. DATA

The surveyor shall locate and show on the survey map the following information:

1) The location of permanent structures including retaining walls and culverts.
2) The location of street or road paving, entrances, driveway openings and sidewalks.
3) Elevations on the top of curbs, gutters and sidewalks.
4) EGD building numbers assigned to the parcel.
5) North arrow and scale of drawing.
6) Legend depicting the symbols and abbreviations used on the drawing.
7) Provide buildings footing corners, exterior corners, roof line corners and main floor elevations of all required building listed in Appendix A.
8) Location and elevation of existing structures, utilities, underground conduits or drainage courses on or near the surveyed parcel.

9) Schedule of all benchmarks with the reference numbers coordinates (UTM NAD83 CSRS Zone 10) and heights above the established datum (geodetic and/or chart). Description and location of the benchmarks shall also be submitted.

10) Original copy of the survey field logbooks or electronic logbook printouts data duly endorsed by the British Columbia Land Surveyor. All survey data from field logbooks or electronic notebooks shall include and clearly indicate corrections or errors done during surveying work.

11) Certificates showing that the surveying equipment used have been calibrated in the last twelve (12) months shall also be attached. These certificates shall also be submitted prior to start of work.

12) The surveyor map grid coordinate system shall be based on NAD 83 (North American Datum) UTM Zone 10.

13) Levels related to established datum (geodetic and/or chart).

14) All other items listed in **Appendix D**.

7. POSITIONAL ACCURACY

The following relative positional accuracies are provided as a guide for surveys.

	Vertical Positional Accuracy Feet	**Horizontal Positional Accuracy Feet**
Contour line 300 mm (1′) interval	± 200 mm (0.65 ft)	± 300 mm (1 ft)
Contour line 600 mm (2′) interval	± 400 mm (1.30 ft)	± 600 mm (2 ft)
Contour line 1.2 m (4′) interval	± 800 mm (2.60 ft)	± 1.200 m (4 ft)
Contour line 1.5 m (5′) interval	± 1.000 m (3.20 ft)	± 1.200 m (4 ft)
Contour line 3.0 m (10′) interval	± 2.000 m (6.50 ft)	± 2.400 m (8 ft)
Floor elevations	± 10 mm (0.05 ft)	± 300 mm (1 ft)
Spot paving elevations	± 10 mm (0.05 ft)	± 300 mm (1 ft)
Spot ground elevations	± 50 mm (0.20 ft)	± 600 mm (2 ft)
Sewer invert elevations	± 10 mm (0.05ft)	± 300 mm (1 ft)
Underground utilities/conduits	± 10 mm (0.05ft)	± 300 mm (1 ft)
All underground services/structure	± 10 mm (0.05ft)	± 300 mm (1 ft)

Positional Accuracy is given at the 95 percent confidence level.

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

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8. ELECTRONIC DATA DISTRIBUTION

Surveyor to provide the survey data in an AutoCAD 2012 or 2010 .dwg drawing file. The surveyor shall also provide a signed and sealed hard copy drawing. This drawing shall be the official map and shall be deemed to be correct and superior to the electronic data.

The electronic data file shall also contain a statement that the file is not a certified document and that the official document was issued and sealed by (*name and commission number of the BCLS*) on (*date*). Surveyor to also provide a table of the survey points data (NEZ) in electronic format (MS Excel, MS Word or PDF).

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Appendix D - ITEMS TO BE INCLUDED IN SURVEY

Revised 2014-11-26

The following items marked with an **(X)** are to be included in the survey:

( ) Boundary survey of the parcel.

( ) Plot the location of easements and rights-of-way as shown on the recorded subdivision subdivision plan and all easements evidenced by a recorded document provided by EGD. The plan or document number of each shall be shown.

( ) Vicinity map with subject property highlighted.

( ) Observable evidence of recent earth moving work, borrow or fill.

( ) Cross-section of offsite drainage courses for engineering studies.

( ) Spot elevations covering the entire survey limits showing high points, low points, grade changes, and at sufficient intervals to represent the general character of the terrain. Existing contours shall be drawn with major contour lines at 10m (25') intervals and minor contour lines at 2m (5') intervals unless otherwise noted.

( ) Elevations at the inside of walk, top of curb, and gutter at approximately one inch 3cm (1") intervals at the final map scale.

( ) Dimensions of curb, sidewalk, and gutter lines or ditch lines and centerline of all streets, alleys or roads adjoining the parcel. Indicate type of paving surface and condition.

( ) Location, width and elevation at both ends of all existing sidewalks. Include a description of the kind and general condition of the sidewalk.

( ) Location, diameter, and species of all trees over 10 cm diameter.

( ) Perimeter outline only of thickly wooded areas unless otherwise directed.

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Appendix D - ITEMS TO BE INCLUDED IN SURVEY

Revised 2014-11-26

( ) Electric utilities – the location of:

- ( ) power poles – 1 point at ground elevation
- ( ) power poles – 1 point at top of pole elevation
- ( ) guy wires – 1 points
- ( ) anchors – 1 points
- ( ) Rectangular junction/pull boxes – 4 corners
- ( ) Round junction/pull boxes – cover center
- ( ) Underground conduits – all tie-ins (existing or new) and change of directions
- ( ) vaults – 4 corners

( ) Storm, sanitary or combined sewers – the location of:

- ( ) manholes – cover center
- ( ) culverts – 2 centreline measurements to show direction of flow
- ( ) headwalls – 4 corners
- ( ) catch basins – 4 corners + 1 centre measurement at gutter line
- ( ) clean-outs – center point
- ( ) Include elevations of the top and bottom of manholes, culverts, headwall and catch basins.
- ( ) Show type, size, and direction of flow and invert elevation of all pipes or culverts.

( ) Water – the location of:

- ( ) all water valves – center point
- ( ) standpipes – center point
- ( ) regulators – center point
- ( ) fire hydrants – 1 point at ground elevation
- ( ) fire hydrants – 1 point at top of hydrant elevation

( ) Gas – the location of:

- ( ) all valves – center point
- ( ) meters – center point
- ( ) gas line markers – center point
- ( ) Show elevation on top of any valves.

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Appendix D - ITEMS TO BE INCLUDED IN SURVEY

Revised 2014-11-26

( ) Telephone – the location of:

- ( ) all poles – 1 point at ground elevation
- ( ) all poles – 1 point at top of pole elevation
- ( ) manholes – center point
- ( ) Rectangular junction/pull boxes – 2 opposite corners
- ( ) Round junction/pull boxes – cover center

( ) Street/Roads – the location of:

- ( ) all lamp poles – 1 point at ground elevation
- ( ) all lamp poles – 1 point at top of pole elevation
- ( ) Rectangular junction/pull boxes – 4 corners
- ( ) Round junction/pull boxes – cover center
- ( ) road cross-section: Survey spot levels along cross-sections at maximum 5m (15') intervals up to 30m (100') beyond the edges of the road shoulder. The interval of the spot levels shall be varied based on the condition at site. If required, closer spacing shall be surveyed where the terrain is not uniform such as deep gullies and creek areas.

( ) Heating – the location of:

- ( ) steam manholes – center point
- ( ) vaults – 4 corners

( ) Location and dimensions of:

- ( ) tanks – 2 opposite corners minimum
- ( ) fences – corners/gates + changes of direction
- ( ) fences cross-section: Survey spot levels along cross-sections at maximum 5m (15') intervals up to 30m (100') beyond the edges of the fences lines. The interval of the spot levels shall be varied based on the condition at site. If required, closer spacing shall be surveyed where the terrain is not uniform such as deep gullies and creek areas.
- ( ) obstructions – 2 opposite corners minimum

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Appendix D - ITEMS TO BE INCLUDED IN SURVEY

Revised 2014-11-26

(X) Existing buildings – the location of:

(X) NW and SW corner of demarcation bldg

(X) NE Corner of defunct Guardhouse in parking lot C

( ) _____

( ) _____

( ) _____

( ) _____

( ) Location and description of any building or major structure on adjoining land that is not more than _____ feet outside the parcel being surveyed.

(X) Other – the location of:

(X) As built location of new chain link security fence, both top and bottom, at 5.0m stations matching the design to confirm alignment and minimum height requirements have been achieved.

(X) Property line location adjacent to new chain link security fence replaced for this project R.016116.105.

(X) PBM Benchmark: Public Works Department Bolt located in bedrock on N side of the EGD, 8.7m E of SE corner of the Pumphouse with 2.5cm head projecting 3.0cm above the sloping surface of rock. Elev =4.722m

(X) Existing drain manholes 2.0m+/- S of design drawing stations 1+076, and 1+097.

(X) Location and extents of new sliding evacuation gate.

(X) Four corners of the electrical vaults, at the stairway landing adjacent to design drawing station 1+358, and approximately 20m south of design drawing station 1+524.

(X) North side of the high mast pole lights S of design drawing stations 1+250, 1+311, and 1+435.

( ) _____

Esquimalt Graving Dock (EGD)
STANDARDS FOR SURVEYS

Appendix D - ITEMS TO BE INCLUDED IN SURVEY

Revised 2014-11-26

( ) _____

( ) _____

Appendix E
Schedule of EGD Dock Charges

SCHEDULE
(section 2, paragraphs 4(2)(e) and 5(1)(c) and sections 34 and 36.1)

DOCK CHARGES ($)

Item	Column 1 Services and Facilities	Column 2 April 1, 2010 – March 31, 2011	Column 3 April 1, 2011– March 31, 2012	Column 4 April 1, 2012– March 31, 2013	Column 5 April 1, 2013– March 31, 2014	Column 6 April 1, 2014– March 31, 2015
1.	Booking	4,200.00	4,400.00	4,600.00	4,800.00	5,000.00
2.	Draining, per section	3,800.00	4,100.00	4,400.00	4,700.00	5,000.00
3.	Berthage, per metre, per day	5.19	5.35	5.51	5.67	5.84
4.	Rail-mounted crane, per hour					
	(*a*) with light hook	407.88	420.12	432.72	445.70	459.07
	(*b*) with main hook, up to 50 tonne lift	589.16	606.83	625.04	643.79	663.10
	(*c*) with main hook, over 50 tonne lift	906.40	933.59	961.60	990.45	1 020.16
5.	Mobile crane, per hour					
	(*a*) 9-tonne crane	113.30	116.70	120.20	123.81	127.52
	(*b*) 20-tonne crane	145.02	149.37	153.86	158.47	163.23
	(*c*) 30-tonne crane	176.74	182.04	187.52	193.13	198.94
	(*d*) Forklift	86.11	88.69	91.35	94.09	96.92
	(*e*) Tower crane	145.02	149.37	153.86	158.47	163.23
6.	Air compressor (first), per manifold hour	99.70	102.70	105.78	108.95	112.22
7.	Air compressor (second), per manifold hour	95.17	98.03	100.97	104.00	107.12
8.	Air compressor (wheeled), per manifold hour	49.85	51.35	52.89	54.47	56.11
9.	Motorized vessel, per hour	164.80	169.74	174.84	180.08	185.48
10.	Fresh water, per cubic metre	1.13	1.17	1.20	1.24	1.28
11.	Electric power, per kilowatt hour	0.13	0.14	0.14	0.15	0.15
12.	Tie-up or letting go	721.00	742.63	764.91	787.86	811.49
13.	Overtime labour services, drydock employee, per hour	88.99	91.66	94.41	97.24	100.16
14.	Security services, per vessel, per day	407.88	420.12	432.72	445.70	459.07
15.	Dockage, 1 section, per day	2,200.00	2,400.00	2,600.00	2,800.00	3,000.00
16.	Dockage, 2 sections, per day	8,400.00	8,800.00	9,200.00	9,600.00	10,000.00
17.	Dockage, 3 sections, per day	11,600.00	12,200.00	12,800.00	13,400.00	14,000.00
18.	Dockage per tonne, per day: under 5,000 gross tonnage	0.00	0.00	0.00	0.00	0.00
19.	Dockage per tonne, per day: 5,000-34,999 gross tonnage	0.12	0.12	0.12	0.12	0.12
20.	Dockage per tonne, per day: 35,000-69,999 gross tonnage	0.11	0.11	0.11	0.11	0.11
21.	Dockage per tonne, per day, 70,000-89,999 gross tonnage	0.10	0.10	0.10	0.10	0.10
22.	Dockage per tonne, per day: over 89,999 gross tonnage	0.09	0.09	0.09	0.09	0.09
23.	Sewer discharge, per litre	0.01	0.01	0.01	0.01	0.01
24.	Vacuum loader	58.92	60.88	62.50	64.38	66.31

SOR/2009-324, s. 16.