



**Public Works and
Government Services Canada**

Requisition No: EZ108-171949

SPECIFICATIONS
For

**Replace West Perimeter Security Fence
Esquimalt Graving Dock, 825 Admirals Rd, Victoria, BC
Project No. R.016116.179**

Tender Issue

APPROVED BY:

[Signature] 28/SEP/16 Nov 29/2016
Regional Manager, _____ Date

[Signature] 2016-11-24
Construction Safety Coordinator _____ Date

TENDER:

[Signature] November 23 2016
Project Manager _____ Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
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Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179

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November 2016

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END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 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 180m of the existing west perimeter chain link security fence at the Esquimalt Graving Dock with a new 3.048m high chain link fence with 'Y' top six strand barbed wire above 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 of the black epoxy coated 37.5mm (non-climb) chain link mesh to be selvedged and wire tie attached to a continuous bottom fence rail.
 - .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 Asphalt repair is required for any existing asphalt damaged during the execution of the Work. Limits of repair to be approved by Departmental Representative prior to asphalt paving.
 - .6 All locations where new fence, and new post holes are to be installed are to be surveyed by ground penetrating radar (GPR) at the contractor's expense. All buried utility conflicts are to be marked out on the ground and a pre-drill report submitted to the Departmental Representative for review and approval prior to any drilling, digging or excavation activities occurring. All GPR pavement markings and depths to be survey recorded and included with the as built survey.
 - .7 As Built site survey of all new work. Refer to Appendix C EGD Standards for Survey.

- .8 All Work to be carried out within PWGSC EGD property limits. The contractor is responsible for locating and/or establishing the property boundary as necessary to carry out the Works.
- .9 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 07:00 to 17:00 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 Graving 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 have not been confirmed and are to be considered as approximate only and should be confirmed prior to construction. Any discrepancies shall be brought to the immediate attention of the Departmental Representative.

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 materials, 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.

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 by the Departmental Representative, 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 Notify Departmental Representative of inspections a minimum of 24 hours in advance of being required.

- .6 The Departmental Representative may require, and pay for additional inspection and testing services.
- .7 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 1 copy 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 (October 2016, Version 05).

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 3 sets of Contract documents for use by the Contractor at no additional cost. Should more than 3 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 1 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 Ili**).
 - .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

PSPC Update on Asbestos Use

Effective April 1, 2016, all Public Service and Procurement Canada (PSPC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials. Further information can be found at <http://www.tpsgc-pwgsc.gc.ca/comm/vedette-features/201604-19-00-eng.html>

PART 1 - GENERAL

1.1 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 Canadian Standards Association (CSA) as amended:
 - .1 CSA Z797-2009 Code of Practice for Access Scaffold
 - .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes
 - .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structure
 - .4 CSA Z1006-10 – Management of Work In Confined Space
- .4 National Fire Code of Canada 2010 (as amended)
 - .1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
- .5 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- .6 Province of British Columbia:
 - .1 Workers Compensation Act Part 3-Occupational Health and Safety.
 - .2 Occupational Health and Safety Regulation
- .7 NMS Section 00 10 10 Specification Index (Appendix A thru Appendix D)

1.2 Related Sections

- .1 Construction Progress Schedules: Section 01 32 18
- .2 Submittals Procedures: Section 01 33 00
- .3 Special Procedures for Contaminated Sites: Section 01 35 15

- .4 Temporary Facilities and Enclosures: Section 01 56 00

1.3 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.

1.4 Compliance with Regulations

- .1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, 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.

1.5 Submittals

- .1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 33 00.
- .2 Work effected by submittal shall not proceed until review is complete.
- .3 Submit the following:
 - .1 Site Specific 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 Copy of Contractors' Construction Safety Manual
- .4 Emergency Procedures
 - .1 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 5 (five) days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.
 - .2 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.
- .3 Submission of the Site Specific 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.

1.6 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, Territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 Health and Safety Coordinator

- .1 The contractor shall appoint a Health and Safety Coordinator who shall:
 - .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.

1.8 General Conditions

- .1 Provide safety barricades and lights around the Contractor's Work Site (as required) and the Contractor Off-Site Offload Facility (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 sites.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

- .2 Secure site at night time or provide security guard as deemed necessary to protect work sites against entry.

1.9 Utility Clearances

- .1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work
- .2 The Contractor will not rely solely upon the Reference Drawings or other information provided for utility locations.

1.10 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 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 Hazard Assessment Form. 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, manlifts 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.

1.11 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.

1.12 Work Permits

- .1 Obtain specialty permits related to project before start of work.

1.13 Filing of Notice

- .1 The Prime 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.

1.14 Health and Safety Plan

- .1 Conduct a site-specific hazard assessment for the Contractor's Work Site and the Contractors' Off-Site Offload Facility (as required), based on a review of Contract documents, required work, and both project work sites. Identify any known and potential health risks and safety hazards.
- .2 Develop, implement, and enforce a Site Specific Project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - .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 communication 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 Site Specific project health and Safety 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 Site Specific Project Health and Safety Plan as required, and re-submit to the Departmental Representative.
- .5 Departmental Representative's review: the review of the contractors' Site Specific Safety Project Health and Safety Plan by Public Services and Procurement Canada (PSPC) shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific Project Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.15 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 other PSPC staff as required.
- .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 PSPC site staff.
- .3 Provide written rescue/evacuation procedures as required for, but not limited to:
 - .1 Work at high angles.
 - .2 Work in confined spaces or where there is a risk of entrapment.
 - .3 Work with hazardous substances.
 - .4 Underground work.
 - .5 Work on, over, under and adjacent to water.
 - .6 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 At least once each year, emergency drills must be held to ensure awareness and effectiveness of emergency exit routes and procedures, and a record of the drills must be kept.
- .6 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.16 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.
 - .2 In conjunction with Departmental Representative, schedule to carry out work during "off hours" when tenants have left the building.
 - .3 Provide adequate means of ventilation in accordance with NMS Sections as indicated in Section 000110 Specification Index.

1.17 Off Site Contingency and Emergency Response Plan

- .1 Prior to commencing Work involving handling of hazardous materials, develop off site Contingency and Emergency Response Plan.

- .2 Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.
- .3 Notification of fire departments [4.17 – Worksafe BC Regulations Part 4 Buildings, Structures, Equipment, and Site Conditions]
 - (1) An employer having at a workplace hazardous products covered by WHMIS, explosives, pesticides, radioactive material, consumer products or hazardous wastes in quantities which may endanger firefighters, must ensure the local fire department is notified of the nature and location of the hazardous materials or substances and methods to be used in their safe handling.
 - (2) Subsection (1) does not apply to a workplace
 - (a) where materials are kept on site for less than 15 days if the employer ensures an alternative effective means for notification of fire departments is in place in the event of fire or other emergency, or
 - (b) which is not within the service area of a fire department.[Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

1.18 Personnel Health, Safety, and Hygiene

- .1 Training
 - .1 Ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
- .2 Levels of Protection
 - .1 Establish levels of protection for each Work area based on planned activity and location of activity.
- .3 Personal Protective Equipment
 - .1 Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
 - .2 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - .3 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within work zones.
 - .4 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
 - .5 Dispose of or decontaminate PPE worn on site at end of each workday.
 - .6 Decontaminate reusable PPE before reissuing.
 - .7 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

- .8 Ensure facial hair does not interfere with proper respirator fit.
- .4 Respiratory Protection
 - .1 Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.
 - .2 Develop, implement, and maintain respirator program.
 - .3 Monitor, evaluate, and provide respiratory protection for site personnel.
 - .4 Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified on site.
 - .5 In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.
 - .6 Immediately notify Departmental Representative when level of respiratory protection required increases.
 - .7 Ensure appropriate respiratory protection during Work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.
- .5 Heat Stress/Cold Stress
 - .1 Implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- .6 Personnel Hygiene and Personnel Decontamination Procedures
 - .1 Provide minimum as follows:
 - .1 Suitable containers for storage and disposal of used disposable PPE.
 - .2 Potable water and suitable sanitation facility.
- .7 Emergency and First-Aid Equipment
 - .1 Locate and maintain emergency and first-aid equipment in appropriate location on site including first-aid kit to accommodate number of site personnel; portable emergency eye wash; 9 kg ABC type dry chemical fire extinguishers as required.

1.19 Asbestos Hazard

- .1 Modifications to spray- or trowel-applied asbestos surfaces can be hazardous to health.

- .2 Removal and handling of asbestos will be performed as per Worksafe B.C. Regulations Part 6 Substance Specific Requirements Asbestos and all applicable regulations.

1.20 Removal of Lead-Containing Paints

- .1 All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.
- .2 Carry out demolition activities involving lead-containing paints in accordance with Worksafe B.C. Regulations Part 6 Substance Specific Requirements Lead and all applicable regulations.

1.21 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.
 - .3 Develop, implement and enforce a communication plan with Departmental representative and EGD maintenance staff for all electrical work and lockout procedures.

1.22 Electrical Lockout

- .1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.
- .2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Departmental Representative.
- .3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

1.23 Overloading

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

1.24 Falsework

- .1 Design and construct falsework in accordance with CSA S269.1- 1975 (R2003).

1.25 Scaffolding

- .1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 and B.C. Occupational Health and Safety Regulations.

1.26 Confined Spaces

- .1 Carry out work in confined spaces in compliance with Worksafe B.C. Part 9 Confined Spaces and CSA Z1006-10 Management of Work in Confined Space.

1.27 Restricted Access

- .1 Contractor shall perform a hazard assessment and develop an appropriate restricted access entry plan in accordance with Worksafe B.C. regulations.

1.28 Confined Space and Restricted Space Outside of Defined Work Site

- .1 Carry out work in confined spaces in compliance with Worksafe B.C. Part 9 Confined Spaces and CSA Z1006-10 Management of Work in Confined Space. Coordinate all confined space entry work with PSPC Departmental Representative through the contractor's confined space entry permit system.
- .2 Contractor shall perform a hazard assessment and develop an appropriate restricted access entry plan in accordance with Worksafe B.C. regulations. Coordinate all restricted access space entry work with the PSPC Departmental Representative prior to entry.
- .3 The Contractor is required to provide a reasonable amount of time to the Departmental Representative for making arrangements for entry and/or access to Confined Space or Restricted Access spaces located outside the designated work site.

1.29 Powder-Actuated Devices

- .1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

1.30 Fire Safety and Hot Work

- .1 Coordinate all hot work with PSPC Departmental Representative through the contractors' hot work permit system.
- .2 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

- .3 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.

1.31 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.

1.32 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.

1.33 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.

1.34 Posted Documents

- .1 Post legible versions of the following documents on site:
 - .1 Site Specific 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 Health and Safety Coordinator, 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.

1.35 Meetings

- .1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.
- .2 All personnel employed by the contractor and its subcontractors shall attend the mandatory EGD Safety Orientation presentation prior to performing Work at the EGD Work Site.

1.36 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 Contractor 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, 2016, Version 05. 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 2 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

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
 - .1 Contractor shall delineate the Contractor's Work Site by means of temporary fencing or continuous barricades.
 - .2 Remove from site all such work after use.

1.4 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.

1.5 ACCESS TO SITE

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

1.6 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.

1.7 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 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 - 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, 2016, Version 05. 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 No washing of concrete trucks onsite will be permitted.
 - .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: 35 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.
- .6 Midden and burial sites as shown on the drawings shall not be disturbed without prior written approval from the Departmental Representative.

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 coarse 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 01 35 15 and 01 35 33 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 Asphalt areas disturbed by the work to be repaired with hot-mix asphalt concrete compacted to a minimum of 95% of 75 blow Marshal density in accordance with ASTM D1559 to a minimum finished thickness of 50mm. Contractor to submit asphalt concrete mix design to Departmental Representative for approval minimum of one week prior to asphalt paving.
- .2 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by the Departmental Representative.
- .3 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .4 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .5 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.
- .6 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.
- .7 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.
- .8 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, 2016 Version 05) 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 100 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 Grub out visible rock fragments and loose boulders to provide a sound, consistent surface to install the replacement security fence.
- .2 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 fence construction or removal activities to be reinstated to match the existing surrounding areas to the satisfaction of the Departmental Representative.

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 A suitable location in Lot 203 area will be designated for use by contractor to stockpile suspected contaminated soils.

1.2 RELATED SECTIONS

- .1 Section 01 35 15 – Special Project Procedures for Contaminated Sites
- .2 Section 31 00 99 – 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 contaminants 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 01 35 15 – 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 by use of ground penetrating radar. 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: 2 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: 35 MPa minimum at 28 days.
 - .2 Exposure Classification F-1
 - .3 Air Entrainment 6%
 - .4 Aggregate Size 38mm maximum, 5mm minimum
 - .5 Concrete mix design to be suitable for exposure to salt water and coastal conditions.
- .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: hot-dip galvanized cold rolled welded steel pipe (ASTM A53, Grade A, (Schedule 40), zinc-coated at minimum 550 g/m2.
- .4 **All posts, rails, caps, hinges and fittings galvanized and powder coated black.**

- .5 Finished fence mesh height to be no more than 50mm above the existing ground.
- .6 Bottom rail to be **42.2mm outside diameter - 3.56mm wall thickness, ASTM A53, Grade A, (Schedule 40) galvanized and powder coated black.**
- .7 Top rail to be **42.2mm outside diameter - 3.56mm wall thickness, ASTM A53, Grade A, (Schedule 40) galvanized and powder coated black.**
- .8 Mid rails, where required, to be **42.2mm outside diameter - 3.56mm wall thickness, ASTM A53, Grade A, (Schedule 40) galvanized and powder coated black.**
- .9 Posts:
 - Line Posts to be 60.3mm outside diameter – 3.91mm wall thickness ASTM A53, Grade A, (Schedule 40) spaced 3.048 m apart maximum.
 - Terminal and Gate posts 88.9mm outside diameter – 5.49mm wall thickness ASTM A53, Grade A, (Schedule 40)
- .10 Tie wire fasteners: aluminum wire (9 Gauge minimum), No. 6 fastened 450 MM on centers.
- .11 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel **powder coated black.**
- .12 Gates: to CAN/CGSB-138.4. All posts, rails, caps, hinges and fittings galvanized **and powder coated black.**
- .13 Gate frames: to ASTM A53/A53M, Grade A, (Schedule 40) galvanized steel pipe:
 - .1 For panels up to 3.0m in length use 42.2mm outside diameter pipe for outside frame and interior bracing.
 - .2 For panels over 3.0m in length use 48.3mm outside diameter pipe for outside frame, 42.2mm outside diameter pipe for interior bracing.
 - .3 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized **and powder coated black after welding.**
 - .4 Fasten fence fabric to gate with twisted selvage at top and bottom.
 - .5 Furnish gates with galvanized steel industrial hinges allowing an opening of at least 90 degrees, frost free latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate **and powder coated black.**

- .6 Double gates complete with 19mm diameter galvanized steel cane bolt.
- .14 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.
- .15 Organic zinc rich coating: to CAN/CGSB-1.181.
- .16 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/m² 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 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 25 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 to a minimum strength of 20 MPa.
- .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 rail between posts and fasten securely to posts and secure waterproof caps and overhang tops. Max clear spacing below the bottom rail and the ground to be 50mm.
- .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 and bottom 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.

3.2 INSTALLATION OF GATES

- .1 Install sliding and swing gates in locations 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 sliding gate gateposts per Detail on drawing C103. Supply V-Track specifications with the Engineer's signed, sealed sliding gate and gate fittings 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.
- .6 All swing type gates to be installed as indicated on the contract drawings with commercial grade lockable frost free gate latches and 19mm diameter solid steel cane bolts. Both the cane bolts and frost free latches to be hot dip galvanized and powder coated black. Cane bolts to insert minimum 150mm vertically into a 25mm diameter Schedule 40 PVC pipe receiver cast into a 250mm diameter x 600mm deep footing. Supply swing gate and swing gate fittings specifications with the Engineer's signed, sealed sliding gate shop drawing submittal to the Departmental Representative for approval.
- .7 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179

32 31 13
CHAIN LINK FENCES AND GATES
(EXTERIOR)
November 2016

3.3 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

**Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179**

APPENDIX A

November 2016

**Appendix A
PWGSC Preliminary Hazard Analysis**



PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	R.016116.179
Location:	Esquimalt Graving Dock
Date:	October 11, 2016
Name of Departmental Representative:	Jon Siska, Project Manager
Name of Client:	EASS-EGD
Name of Client Project Co-ordinator	Stafford Bingham

Site Specific Orientation Provided at Project Location **Yes X** **No**

Notice of Project Required **Yes X** **No**

NOTE:

PWGSC requires "**A Notice of Project**" for all construction work related activities.

NOTE:

OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
	PWGSC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic					Note: When thinking about this pre-construction hazard assessment, remember a hazard is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	Yes	No	Yes	No	

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)	X		X		No natural gas services on site
Slip Hazards or Unsound Footing	X		X		
Working at Heights	X		X		
Working Over or Around Water		X		X	
Heavy overhead lifting operations, mobile cranes etc.	X		X		



Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.)	X		X		
Fire and Explosion Hazards	X		X		
High Noise Levels	X		X		
Excavations	X		X		
Blasting		X		X	
Construction Equipment	X		X		
Pedestrian Traffic (site personnel, tenants, visitors, public)	X		X		
Multiple Employer Worksite	X		X		
Electrical Hazards					
Contact With Overhead Wires	X		X		
Live Electrical Systems or Equipment	X		X		
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions	X		X		
Earthquake	X		X		
Tsunami	X		X		
Avalanche		X		X	
Forest Fires		X		X	
Fire and Explosion Hazards	X		X		
Working in Isolation		X		X	
Working Alone	X		X		
Violence in the Workplace	X		X		
High Noise Levels	X		X		
Inclement weather	X		X		
High Pressure Systems	X		X		
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		X		X	
Suspended / Mobile Work Platforms	X		X		
Other:	X		X		Overhead cranes in operational area
Biological Hazards					
Mould Proliferations		X		X	
Accumulation of Bird or Bat Guano		X		X	
Bacteria / Legionella in Cooling Towers / Process Water		X		X	
Rodent / Insect Infestation		X		X	
Poisonous Plants		X		X	
Sharp or Potentially Infectious Objects in Wastes	X		X		Multiple employer workplace
Wildlife	X		X		Resident deer population



Chemical Hazards					
Asbestos Materials on Site		X		X	
Designated Substance Present		X		X	
Chemicals Used in work	X		X		Active ship repair facility
Lead in paint	X		X		Exterior paint surfaces at Rear Gate Guardhouse contain lead.
Mercury in Thermostats or Switches		X		X	
Application of Chemicals or Pesticides		X		X	
PCB Liquids in Electrical Equipment		X		X	
Radioactive Materials in Equipment		X		X	
Other:					
Contaminated Sites Hazards					
Hazardous Waste	X		X		Suspected contaminated soils
Hydrocarbons	X		X		Suspected contaminated soils
Metals	X		X		Suspected contaminated soils
Other:	X		X		Suspected contaminated soils
Security Hazards					
Risk of Assault	X		X		Multiple employer workplace
Other:	X		X		No unauthorized entry to site.
Other Hazards					

Other Compliance and Permit Requirements ¹	YES	NO	Notes / Comments ²
Is a Building Permit required?		X	
Is an Electrical permit required?	X		Required for any electrical work on site
Is a Plumbing Permit required?			N/A
Is a Sewage Permit required?			N/A
Is a Dumping Permit required?			No dumping allowed on site
Is a Hot Work Permit required?	X		
Is a Permit to Work required?		X	
Is a Confined Space Entry Permit required?			N/A
Is a Confined Space Entry Log required?			N/A
Discharge Approval for treated water required?			N/A

Notes:

- (1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.
- (2) TBD means To Be Determined by Service Provider.



Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.

Service Provider Name	
------------------------------	--

Signatory for Service Provider		Date Signed	
---------------------------------------	--	--------------------	--

RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING

**Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179**

APPENDIX B

November 2016

**Appendix B
EGD Environmental Best Management Practices Manual
(October 2016, Version 05)**



Environmental Best Management Practices



Prepared by:
Public Services and Procurement Canada
Environmental Services

October 2016
Version: 05

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Overview

Risk Management Policy

EGD Site Map

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EBMP #4: Dry Dock Floor Management and Clean Up

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OVERVIEW

The **Esquimalt Graving Dock (EGD)** is a federal government owned and 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 shipyard repair contractors that rent the required sections of the drydock, lease upland work space from the government, and pay a fee for services such as cranes, compressed air, water, sewer and power.

The EGD is committed to managing the actual and potential health and safety, environmental, security, financial and public relations risks, while ensuring quality operations and services. In order to identify and manage these risks, the EGD has implemented an **Environmental Management System (EMS)** and a Risk Management Framework (*in conformance with the internationally recognized standards ISO 14001 and ISO 31000*). The EMS provides the framework for identifying environmental impacts, and ensures adequate controls are in place to effectively manage them.

This manual contains a series of **Environmental Best Management Practices (EBMPs)** developed to reduce impact to the environment related to common activities and operations at the Esquimalt Graving Dock. The manual contains guidance and recommendations 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 EGD to abide by all applicable regulatory requirements and industry standards. All users of the facility are expected to follow the EBMPs.



For additional information contact the EGD Environmental Services Department.



Esquimalt Graving Dock Risk Management 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 acknowledges that risk management is an integral part of attaining this goal. We recognize that risk is the effect of uncertainty on our operations and is inherent within the ship repair industry. Our objective is to identify, monitor and manage risk in order to prevent the harm of our employees, site users, contractors, neighbours, other stakeholders, the environment and our facility, while ensuring and maintaining quality operations and services.

We are committed to managing the actual and potential **health & safety, environmental, security, financial and public relation risks** pertaining to strategies, policies and practices at the Esquimalt Graving Dock.

To meet our commitment we will:

- > *Implement systems and processes to consistently identify, measure, mitigate, minimize and report on risks, while continuing to uphold and adapt the established Environmental Management System and other relevant Management Frameworks.*
- > *Meet or exceed applicable federal, provincial and municipal legislation and regulations, departmental policies, industry standards, practices and other requirements.*
- > *Communicate openly with our employees to ensure they are aware of and understand our Risk Management Framework, the nature of our operations and their roles and responsibilities in managing risk.*
- > *Monitor and review our Risk Management Framework to ensure we are meeting our goals. Ongoing oversight of the effectiveness of our Risk Management Framework is the responsibility of the Esquimalt Graving Dock Risk Management Team.*
- > *Provide the necessary resources to effectively implement our Risk Management Framework, while continuing to improve our programs, procedures and operations.*



Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada



Jim Milne

Director
Esquimalt Graving Dock
Engineering Assets
Strategy Sector



David Latoski

Operations Manager
Esquimalt Graving Dock
Engineering Assets
Strategy Sector

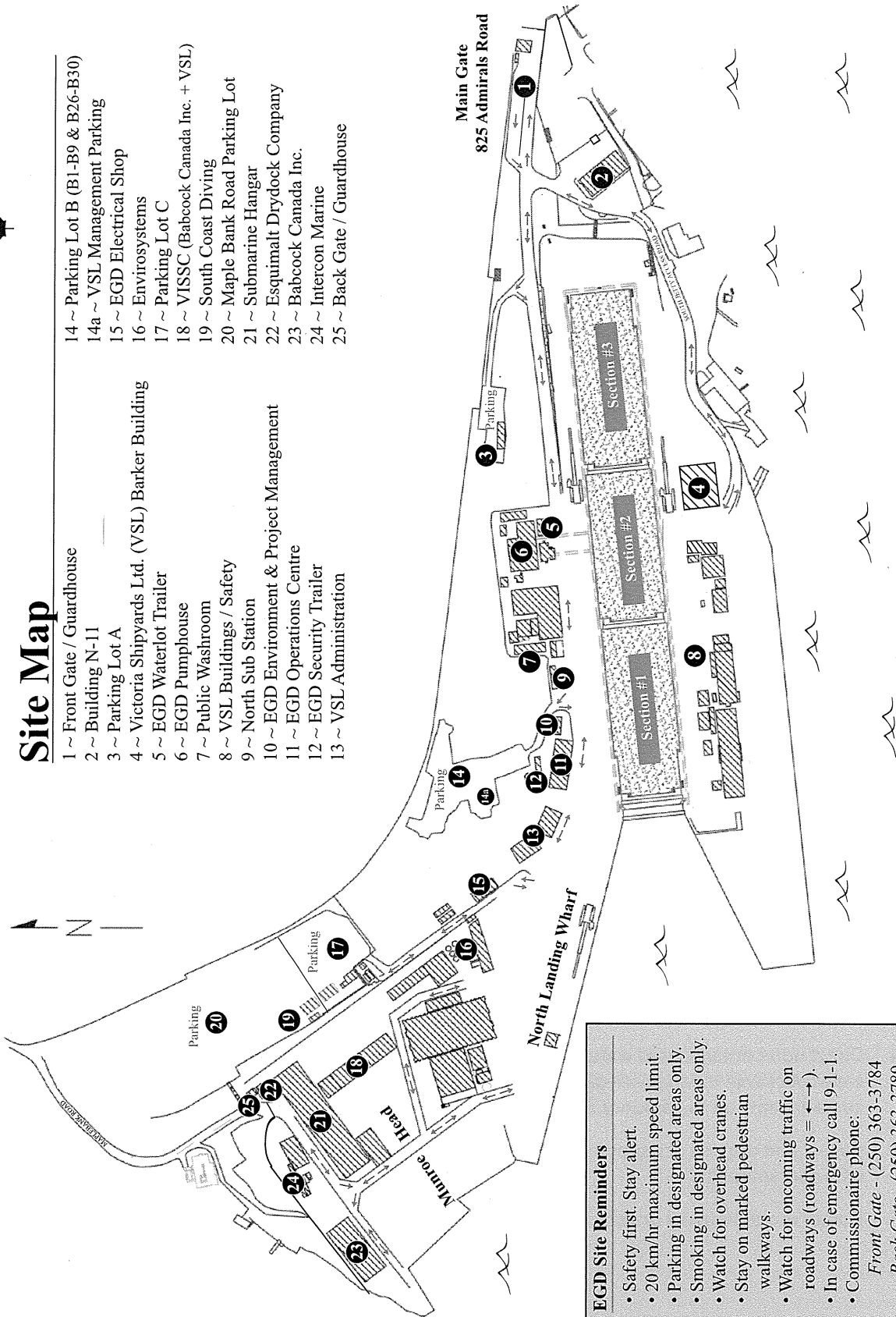
Canada

August 2015



Site Map

- 1 ~ Front Gate / Guardhouse
- 2 ~ Building N-11
- 3 ~ Parking Lot A
- 4 ~ Victoria Shipyards Ltd. (VSL) Barker Building
- 5 ~ EGD Waterlot Trailer
- 6 ~ EGD Pumphouse
- 7 ~ Public Washroom
- 8 ~ VSL Buildings / Safety
- 9 ~ North Sub Station
- 10 ~ EGD Environment & Project Management
- 11 ~ EGD Operations Centre
- 12 ~ EGD Security Trailer
- 13 ~ VSL Administration
- 14 ~ Parking Lot B (B1-B9 & B26-B30)
- 14a ~ VSL Management Parking
- 15 ~ EGD Electrical Shop
- 16 ~ Envirosystems
- 17 ~ Parking Lot C
- 18 ~ VISSC (Babcock Canada Inc. + VSL)
- 19 ~ South Coast Diving
- 20 ~ Maple Bank Road Parking Lot
- 21 ~ Submarine Hangar
- 22 ~ Esquimalt Drydock Company
- 23 ~ Babcock Canada Inc.
- 24 ~ Intercon Marine
- 25 ~ Back Gate / Guardhouse



EGD Site Reminders

- Safety first. Stay alert.
- 20 km/hr maximum speed limit.
- Parking in designated areas only.
- Smoking in designated areas only.
- Watch for overhead cranes.
- Stay on marked pedestrian walkways.
- Watch for oncoming traffic on roadways (roadways = ←→).
- In case of emergency call 9-1-1.
- Commissionaire phone:
Front Gate - (250) 363-3784
Back Gate - (250) 363-3789



Environmental Best Management Practices

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Approved by:	Stafford Bingham
EBMP #1: Pressure Washing	

EBMP #1: Pressure Washing (High and Ultra High)

One of the first activities to occur on a drydocked vessel is pressure washing of the hull to remove salts, marine growth and residual paint, prior to surface preparation or painting. This typically involves pressure washing the underwater hull and/or super structure with water at 2,000 – 3,500 psi. This activity produces large volumes of paint contaminated wastewater (e.g. washwater). Ship repair contractors may also use an Ultra High Pressure (UHP) washing process (from 40,000 – 55,000 psi) to completely remove all paints, often eliminating the need for further surface preparation (e.g. sandblasting) prior to painting. UHP generates even larger volumes of wastewater and slurry solids. All wastewater created from pressure washing and UHP requires management (i.e. assessment, collection, handling, treatment and disposal).

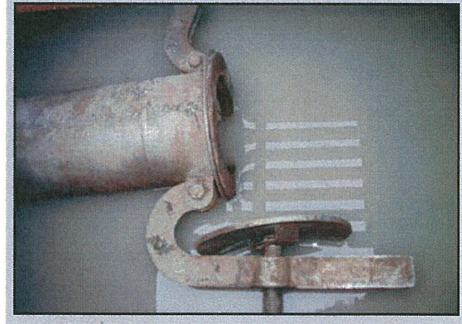
Management of Wastewater on the Graving Dock Floor

- Ensure all wastes and wastewater discharges, resulting from hull and anchor chain washing, as well as dock bottom clean-up activities, are collected and disposed of properly.
- Close all sump well valves in the drydock floor collection system prior to and during pressure washing operations.
- Manage pumps to ensure they are handling the volume of washwater sufficiently.
- Manage washwater storage containers to ensure they are not overfilled.
- Divert contaminated wastewater, that falls outside of the drydock floor collection system, away from the tunnel drains.
- Direct non-contaminated water (e.g. ballast water, cooling water, dock wall/moon pool leakage water) away from contaminants on the drydock floor.
- Collect and dispose of stormwater that comes into contact with contaminants.
- Do not use detergents or additives in washwater.

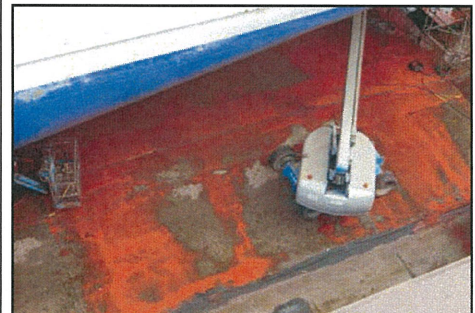
Opening Sump Well Valves

Sump well valves in the drydock floor can be opened to manage rainwater under the following conditions ONLY:

- Dock floor has been pre-cleaned, prior to the completion of the work period.
- A filter cloth has been installed to reduce the migration of debris.



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

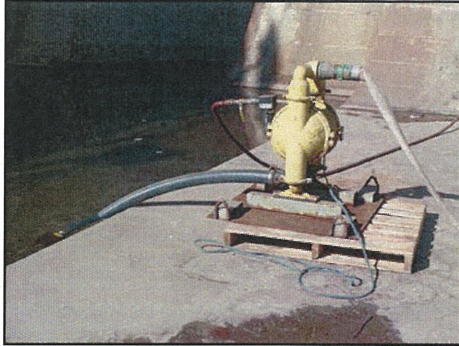


Antifoulant contaminated washwater entering the collection system (trench drains and sump wells) on the drydock floor.



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EBMP #1: Pressure Washing	



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



Sediment from the harbour often settles on dock bottom after dewatering. If this becomes contaminated with paint, etc., it must be disposed of.



The hull of a cruise ship being ultra high pressure washed.

Section 1 Considerations:

Caisson and Dock Wall Leakage & Drydock Floor Sediment

Managing Caisson and Dock Wall Leakage:

- Divert caisson leakage water away from pressure washing areas.
- Water leakage from the caisson can be diverted by using a sump pump connected to the PVC diversion pipe installed on the north wall of the drydock Section 1.
- Divert water leakage from the graving dock walls, during high tide, directly into the drainage tunnel.

Managing Entrained Sediment:

Harbour sediment may accumulate in the corners, trenches, keel blocks and sumps of the drydock Section 1 during normal docking procedure. Users of the section will need to consider management of this sediment and are responsible for removal and proper disposal if it becomes contaminated from their operations and activities on dock floor (e.g. pressure washing wastewater, sandblast grit, paint chips, paint overspray, and other contaminants).

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 UHP waste.
- Remove all water, sludge and debris, generated from UHP washing, from the drydock.
- Ensure the washwater and sludge is disposed of at an appropriately permitted facility.
- Disposal certificates may be requested, by EGD Management, to ensure washwater is being properly managed.



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Management of Pressure Wastewater in Upland Areas/Dockside

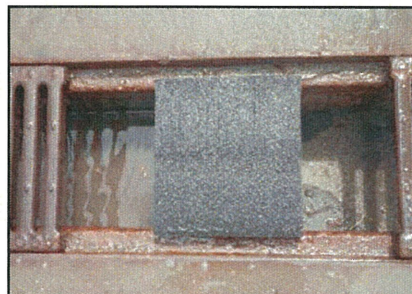
- Perform pressure washing of small vessels and parts, in designated areas only, where wastewater management can be effectively achieved.
- Approval for pressure washing in upland areas (*including the use of a stormwater trench for water collection*) is required from EGD Management
- Wash vessel parts in a suitable contained area (*e.g. enclosed skip*).
- Completely block all drains in the area where pressure washing will occur (*e.g. cover nearby trench drains with filter cloth, place a foam bung in the trench drain to prevent migration of wash water should an incident occur*).
- Ensure sufficient equipment (*e.g. pumps, totes, tanks, foam blocks and sandbags*) is available for the timely collection, control and removal of washwater.
- Contaminated washwater requires proper treatment for disposal. Label containers.



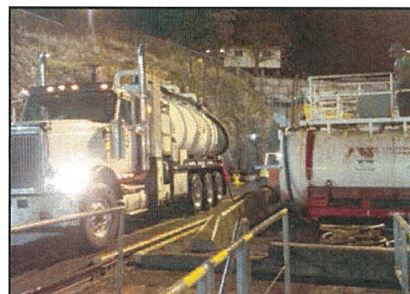
A small vessel is power washed on the North Landing Wharf (NLW).



The trench drain is blocked and a sump pump is installed to collect wash water into a tote.



Example of high density styrofoam blocks used as a drain blocker on the NLW.



Large tank dockside with an attendant.



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EBMP #2: Abrasive Blasting	

EBMP #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.

The dust emissions generated from abrasive blasting operations can contain harmful environmental pollutants and have the potential to negatively effect employees, facility users, neighbours, equipment and infrastructure if it is not properly managed. Fugitive dust may also impact the local marine environment by entering the Esquimalt Harbour directly, or via stormwater runoff, and through direct deposit to uplands soil.

Waste grit may be highly contaminated with antifouling paint and other metals, which also poses a risk to the environment if not handled and disposed of properly.

Dust Control

- Establish dust suppression controls in advance of starting any work.
- Do not abrasive blast during conditions that render containment ineffective (*e.g. during windy conditions*).
- No abrasive blasting of vessels shall be performed while vessels are docked alongside the North Landing Wharf or South Jetty.
- Minimize dust emissions by ensuring blast nozzles are angled perpendicular to the vessel and aimed slightly downward during blasting.
- Properly manage (*contained, covered and secure*) all sandblast product and wastes during transport.

Hoarding (*Physical Containment*)

- 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 and reach the dock floor or walls.
- Ensure containment is properly installed (*connected and overlapped*) so there are no gaps.
- Used tarps with tears and holes should be replaced, repaired or doubled with additional layers.



ADEQUATE containment.



INADEQUATE containment.



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EBMP #2: Abrasive Blasting	

Water Use (Fugitive Dust Suppression)

- Where physical containment techniques are not sufficient to prevent fugitive dust emissions, water may be used to mitigate dust.
- Users may requisition use of Dust Suppression Units (e.g. *Dust Boss*) from the EGD. The units are highly effective at mitigating dust.
- Monitor areas where dust escapes physical containment and adjust dust suppression unit water spray accordingly.
- Do not allow water from the dust suppression units to enter other sections of the dock, especially in the case where another user occupies it.
- Do not allow water from the dust suppression units to come in contact with contaminants on the drydock floor or other work areas. Adjust water spray and relocate contaminants to mitigate impacts.
- Fire nozzle “water curtains” may only be used to control dust emissions when approved by EGD Management in advance. The dust suppression units generates a more effective water mist and uses significantly less fresh water during operation.

Waste Grit Management

- Cover trench drains and tunnel grates in work areas with filter cloth. Replace the cloth as required.
- Manage waste grit by sweeping it into central areas, away from trenches, tunnel grates and dock floor traffic.
- Remove waste grit from work areas as soon as possible.
- Store all waste grit in appropriate containers to prevent leakage.
- Cover all skips, storage bins, tanks, and hoppers to prevent dust emissions and spills.
- Characterize and dispose of waste grit in accordance with applicable provincial regulations.

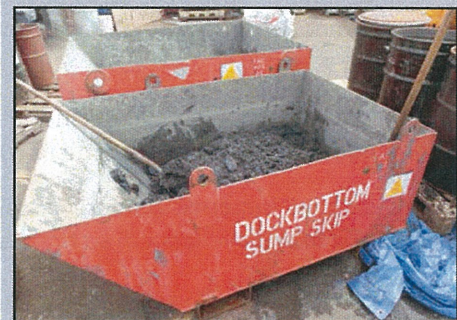


Dust suppression unit in operation.

Store all waste grit away from drains, to prevent contaminants migrating into the marine environment.



INADEQUATE waste grit storage.



ADEQUATE waste grit storage.



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Clean up waste grit to prevent it from being washed into the drainage system by clean water (e.g. cooling water discharge, stormwater, dust suppression unit spray).



Store waste grit in appropriate containers.



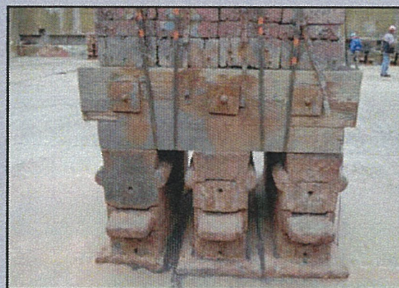
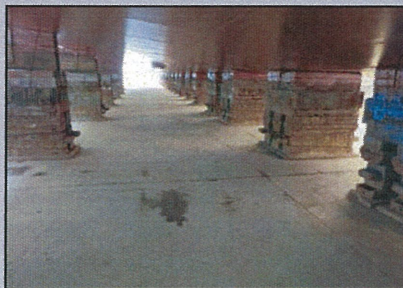
Remove waste grit from work areas as soon as possible to prevent migration of contaminants throughout the drydock floor.

Keel / Bilge Blocks

Keel and bilge blocks on dock bottom present a challenge for the clean up of spent waste grit.

Waste grit must be removed from areas around excess blocks stored in the dock bottom. To prevent grit from collecting between the blocks, they can be relocated or covered prior to sandblasting.

Power washing at the base of the blocks can be effective in removing contaminants.





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EBMP #3: Painting and Coating	

EBMP #3: Painting and Coating

Ship repair and maintenance often requires the painting and coating of vessel surfaces to protect them from corrosion or to inhibit the growth of marine life. The industrial nature of marine paints and solvents, in particular antifouling paints, may result in negative impacts to the environment and surrounding infrastructure, if not properly managed.

Spray Painting

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.
 - Do not use keel blocks, dock floor or dock walls to test paint sprayers.
- Do not spray paint during conditions that render containment ineffective (e.g. 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 (e.g. during painting of anchor chains, or grates).
- Manage overspray on the drydock floor to prevent safety hazards (e.g. slippage).
- When spray painting materials inside the stabilizer pockets, ensure the area is sealed and that the walls and floors are covered.
- For vessels docked in Section 1, ensure that overspray does not reach the caisson sill/moon pool water. Avoid docking vessels so they extend over sill area.

Spray Painting



ADEQUATE containment.



INADEQUATE containment.



INADEQUATE containment.
Ensure tarps are in place to prevent overspray impacting the surrounding work area.



Environmental Best Management Practices

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EBMP #3: Painting and Coating	



ADEQUATE containment on stabilizer pocket doors.



Paint overspray due to INADEQUATE containment stabilizer pocket doors.

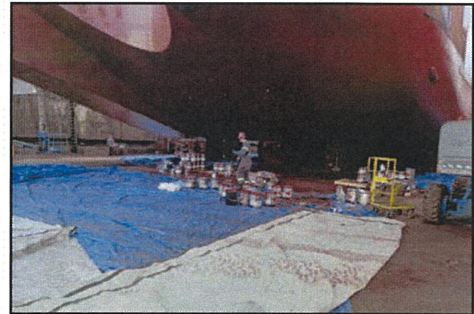
Manual Painting

Painting by hand (*roller, brush*) can be conducted without shrouding the work area; however, the potential remains for product to migrate into the environment. Work spaces and product handling must be managed with care, similar to dockside painting.

- Containment should be large enough to adequately cover the work area and provide a barrier between the work and the environment (*e.g. dock floor, ocean and soil*).
- Ensure containment is secured so there are no gaps.
- Product container lids are to be secured.

Painting Dockside

- Do not spray paint vessels docked alongside the wharves or jetties (*e.g. North Landing Wharf*).
- 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 from going into the marine environment.
- Waste generated from painting and other activities such as grinding, hand tooling and welding, must be prevented from entering the marine environment.



ADEQUATE containment.



While painting vessels docked alongside the wharves or jetties, do not spray paint. Take sufficient measures to prevent paint from entering the marine environment.



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EBMP #3: Painting and Coating	



Empty paint cans must be properly stored on dock bottom and dock side.



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.
- Ensure empty paint containers being dried for disposal are protected from rain.
- Do not dispose of used paint containers that still contain wet paint.

IMPORTANT!

In rare situations (*e.g. 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 EGD Management 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.



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EBMP #4: Dry Dock Floor	

EBMP #4: Dry Dock Floor Management and Clean Up

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 (e.g. ballast water, cooling water, caisson sill water).

Hazardous Materials Management

- Store hazardous materials (e.g. 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.



Collect and properly dispose of all contaminated water.

Sediment Management

- Segregate any marine sediment, that may enter the dock during vessel transfer, from the waste generated during vessel repair. This is 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.





Environmental Best Management Practices

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EBMP #4: Dry Dock Floor	

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 remove 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* (see below), 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.

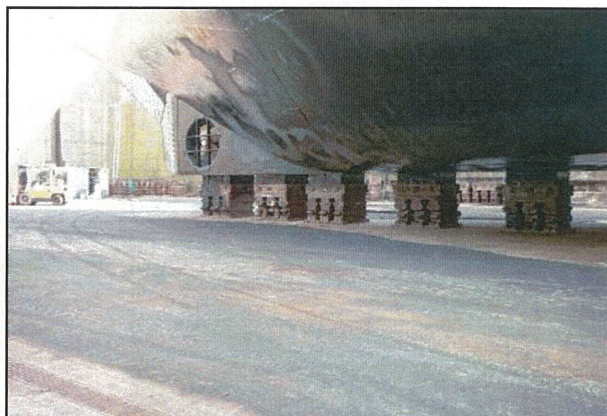


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EBMP #4: Dry Dock Floor	



ADEQUATE:
Example of a dock floor that would pass inspection.



INADEQUATE:
Example of a dock floor that would not pass inspection.

EGD Standards 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:
 - o the removal of abrasive grit,
 - o paint residues or paint chips,
 - o cutting and grinding wastes,
 - o oil and grease,
 - o food and drink containers,
 - o ear plugs,
 - o dust masks,
 - o rope,
 - o cigarette butts, or
 - o 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.



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EBMP #4: Dry Dock Floor	

AREAS IN NEED OF SPECIAL ATTENTION

ACCEPTABLE



RAMPS



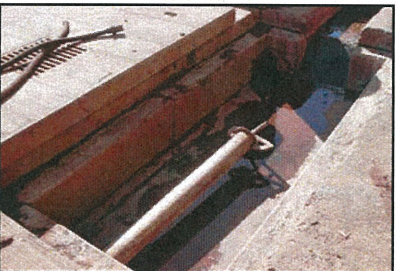
SILLS



KEEL BLOCKS



TRENCH DRAINS



SUMP WELLS

NOT ACCEPTABLE





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EBMP #5: Hazardous Materials	

EBMP #5: Hazardous Materials Handling and Storage

A variety of hazardous materials are used, stored and transported by Users at the Esquimalt Graving Dock (EGD). If not handled appropriately, these materials have the potential to negatively impact worker health and safety, infrastructure and the environment. Hazardous materials commonly used at the EGD include: antifoulant paint, fuels and oils, antifreeze.

Storage

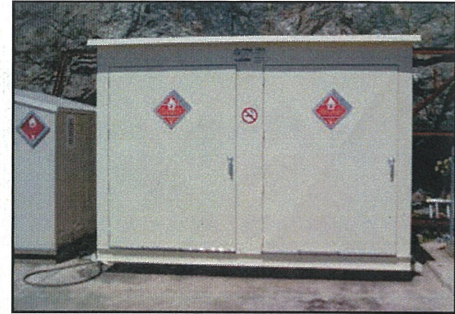
Users must have designated storage areas suitable for the materials they use on site. Where applicable, these areas must:

- 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 (*covered, lids secured, valves closed*).
- Have placards and proper ventilation.
- Have controlled access.
- Be located away from pathways to the marine environment.
- Be located on impervious surfaces (*e.g. concrete*).

Handling

All hazardous materials must be:

- Labelled appropriately with the owner name, product name, first aid information, and PPE requirements.
- Secured appropriately during transport.
- Transported by equipment that can sufficiently handle its weight and size.
- Transported in containers that are stable and not in need of repair (*e.g. totes with broken feet, excessive rust, faulty valves*).



ADEQUATE storage.



ADEQUATE storage.



INADEQUATE storage.



Any container holding hazardous materials must be clearly and properly labelled.



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Areas to Avoid Storing Hazardous Materials



Trench Storm Drains

Any containers placed directly over top or beside a trench drain have the potential to spill to the drain leading directly to the ocean.



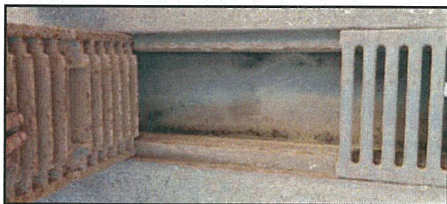
Storm Drains

Any containers placed directly over top or beside a storm drain have the potential to spill to the drain leading directly to the ocean.



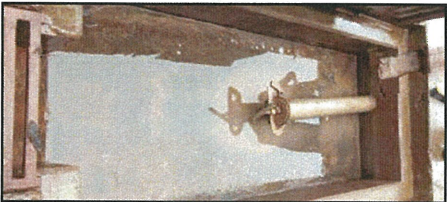
Alongside Wharves and Jetties

Any containers placed alongside the edge of the wharves and jetties at the EGD have the potential to spill directly to the ocean, as there are no berms or secondary containment available.



Dock Floor Trench Drains

If a tote or drum is placed directly over or beside a trench drain, hazardous materials have the potential to flow down the drain and into the marine environment. Although the drains are designed for rapid containment and recovery, there is no guarantee that workers will be present to close drain valves during an incident.



Dock Floor Sump Wells

When the sump well valve is open the sump drains directly into the marine environment. Any containers placed on top of or adjacent to the sump well have the potential to enter the ocean if a spill were to occur.



Dock Floor Tunnel Grate Drains

Tunnel grate drains lead directly to the marine environment. Any containers placed directly over top of or beside a tunnel grate have the potential to impact the marine environment, should a spill occur.

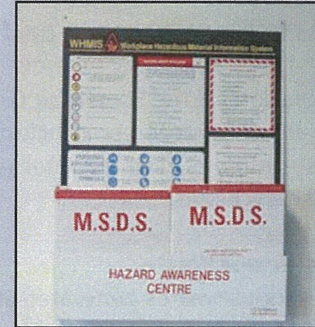


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Safety Data Sheet (formerly Material Data Safety Sheet)

A Safety Data Sheet (SDS) is a document that contains information on the potential hazards (*health, fire, reactivity and environmental*) and how to work safely with the product. SDSs also contains information on the use, storage, handling and emergency procedures all related to the hazards of the material. SDSs must be available (*electronically or hardcopy*) for all products stored on site and be readily available to all employees.



Storage Tanks and Totes

Storage tanks and totes are used for a variety of materials at the EGD, including: washwater, fuel products, bilge water, waste oil/fuel and other waste liquids. Storage tanks and totes may be considered portable/mobile, temporary or permanent. The regulatory requirements for proper use of these tanks vary and is dependent on a variety of factors.

Federal Regulation for Fuel Storage Tanks

The EGD is a Federal facility; therefore, storage tanks onsite need to comply with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations. Users may be required to register their tanks with Environment Canada. **Contact EGD Environmental Services for information.**



National Fire Code

The National Fire Code outlines the requirements for containment, labelling and location of flammable liquid storage.

There are four different fuel tanks at the Esquimalt Graving Dock.



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EBMP #6: Waste Management	

EBMP #6: Waste Management and Recycling

Operations at the Esquimalt Graving Dock (EGD) generate a variety of waste streams including hazardous waste, controlled waste, biological waste, international waste, 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, mercury, PCB containing equipment 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 should 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 (e.g. 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 (e.g. absorbents, rags, etc.).
- Do not dilute or mix hazardous waste, other hazardous or non-hazardous wastes.
- Cover waste containers to prevent exposure to weather (e.g. rain).



All hazardous waste must be carefully stored and disposed of.

Asbestos

All asbestos containers and asbestos-containing materials must be identified by signage and labelling in accordance with applicable legislation.

Companies that engage in asbestos related work at the EGD must be qualified to do so.





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EBMP #6: Waste Management	

Clearly label all hazardous waste containers.

- Labels should include: type of waste, generator/company name, and contact information.

Controlled Waste

Controlled waste such as animal feces, sewage, contaminated grit, stormwater catch basin waste, creosote wood and dead animals can be disposed of at the **Capital Regional District (CRD) Hartland Landfill**.

Controlled waste disposal at requires a permit.

For more information about Controlled Waste disposal contact the CRD Hotline at (250) 360-3030.



Large scale food waste bin.

Food Waste

During normal activity at the EGD, food waste is collected in conveniently located and accessible receptacles onsite and disposed of at the landfill. During larger projects, however, alternative measures are taken to account for the increase in generated wastes.



An example of a Waste Management Area at the EGD.

General Refuse

General refuse should be separated into categories to enable easy disposal. Users are responsible for properly disposing of refuse and recyclable materials. There are many containers throughout the site for disposal of common refuse materials (e.g. steel, wood, glass, cardboard etc.).

Biological Waste

Marine life removed from vessel hulls and sea chests may contain paint contaminants. This waste may be considered a controlled or hazardous waste and would need to be handled and disposed of accordingly.

Biological waste should be stored out of the sun, covered and removed from the facility quickly to prevent any odours from emanating.





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EBMP #6: Waste Management	

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.

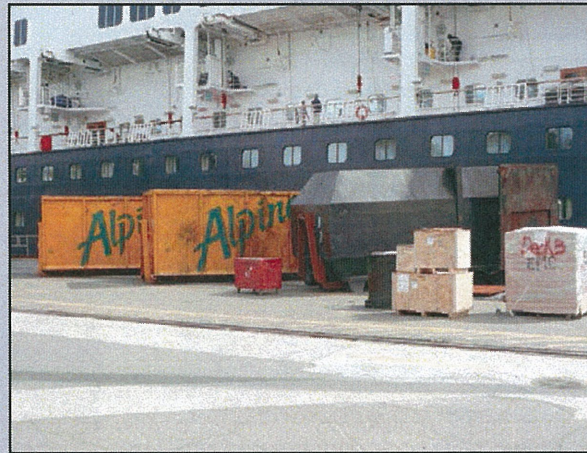
- Recycle solid waste such as plastic, glass, aluminum, mixed paper and cardboard. Recycling areas should be conveniently located and easily identifiable.
- Segregate other solid waste, such as scrap metal, wood, electronics, polystyrene foam and soft plastics for recycling at an approved facility.
- Leaf and yard waste collected on property should be composted or disposed of appropriately.
- 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 species to local areas. Foreign dunnage must be identified, stored, and disposed of at an approved facility without delay.

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.





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EBMP #7: Fuelling & Oil Transfer	

EBMP #7: Fuelling and Oil Transfer

The transfer of fuel and oil is a common activity at the Esquimalt Graving Dock (EGD). Transfer may be from ship to shore (e.g. removal of waste fuel/oil), from shore to ship (e.g. refuelling a vessel from a truck) or land based.

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:
 - o the **EGD Oil Transfer Checklist** must be complete;
 - o an emergency plan must be in place and readily available;
 - o adequate spill response equipment must be available; and
 - o personnel must be aware of spill response procedures.
- 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 (e.g. storm drains, trench drains, edge of the dock) without effective mitigation measures in place.

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, gasoline, lube oil and refined products.

Berthed Vessels

- ALL berthed vessels receiving fuel from a truck or a barge require a containment boom.
- Transfers of fuel and oil to and from ALL berthed vessels 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*.



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Vessels in Drydock

- ALL fuel and oil transfers occurring in the drydock require spill kits to be placed nearby and are not to be completed next to drainage pathways to the marine environment (e.g. trench drains, sump wells, tunnel grate drains).

On Land Transfers

- ALL fuel and oil transfers occurring on land require spill kits to be placed nearby and are not to be completed next to drainage pathways to the marine environment (e.g. storm drains, edge of dock).

Containment Boom Requisition

The Esquimalt Graving Dock has containment boom and deployment equipment available for requisition. To arrange for booking or rental, contact the EGD Operations Manager.



An orange inshore containment boom fully surrounds the vessel while being fuelled.



The hydraulic powered deployment reel with inshore containment boom available for requisition.

EXAMPLE SCENARIO REQUIREMENTS

Scenario 1: FUELLING A BERTHED VESSEL



- Completed and signed **EGD Oil Transfer Checklist** submitted to EGD Pumphouse.
- Containment boom deployed and effectively secured at both ends.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.



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EBMP #7: Fuelling & Oil Transfer	

EXAMPLE SCENARIO REQUIREMENTS (Continued)

Scenario 2: BULK OIL TRANSFER FROM A BERTHED VESSEL



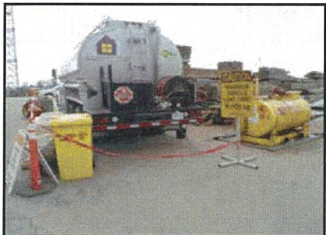
- Completed and signed **EGD Oil Transfer Checklist** submitted to EGD Pumphouse.
- Containment boom deployed and adequately secured at both ends.
- Receiving containers located away from pathways to the harbour (e.g. storm drains, edge of dock).
- Receiving containers in secondary containment and in good condition.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Scenario 3: FUELLING A VESSEL OR BULK OIL TRANSFER IN THE DRYDOCK



- Pumphouse operation on site prepared to shut down auxiliary pumps in case of an emergency.
- Receiving containers located away from pathways to the harbour (e.g. trench drains, sump wells, tunnel grate drains).
- Receiving containers in secondary containment and in good condition.
- 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 (e.g. storm drains, edge of dock).
- Receiving containers in secondary containment and in good condition.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.



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EBMP #8: Invasive Species	

EBMP #8: Invasive Species

Invasive species are a significant threat to the marine ecosystems of British Columbia. The Esquimalt Harbour is known to have 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. Ship repair contractors are encouraged to report unusual species observed during hull cleaning activities.

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, covered and disposed of appropriately.
- Material must be stored away from direct sunlight/heat and disposed of as soon as possible, to avoid nuisance odour pollution.

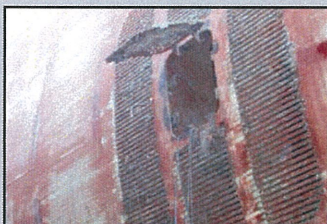
Marine growth removed from vessel hulls must not be allowed to enter the harbour through the drydock drainage system.



INADEQUATE containment:
Biological waste on drydock floor near drains.



INADEQUATE containment:
Biological growth mixed with paint waste on drydock floor.



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.



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EBMP #9: Fish & Wildlife Management	

EBMP #9: Fish and Wildlife Management

The daily operations and activities of the Esquimalt Graving Dock (EGD) have the potential to negatively impact wildlife that frequents the property. The *EGD Wildlife Management Plan* has been developed to assist EGD employees and Users to properly manage interaction with fish and wildlife that are common to the facility.

Fish

Fish and other marine life have the potential to become stranded in the drydock during normal vessel docking/undocking operations. This may include, but is not limited to: salmon and other fish species, seals and octopus.

- The bubble curtain must be employed during vessel transfer into and out of the drydock.
- EGD employees must monitor the drydock for stranded fish and/or other marine life during dewatering and report cases to EGD Environmental Services.
- 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 drydock.

Report all cases of fish and marine life interaction with the drydock to EGD Environmental Services.

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 during migration 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, Canada goose and a variety of other common waterfowl, nesting and songbirds and pollinators (e.g. bats, native bees).



Bubble curtain employed during vessel transfer.



Stranded marine life must be carefully returned back to the Harbour.

Fisheries Act - Destruction of Fish

The EGD has received authorization for the destruction of fish associated with normal operation of the drydock from the Department of Fisheries and Oceans (DFO).

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.

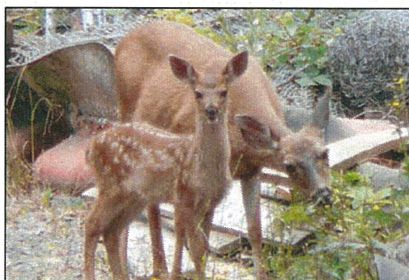
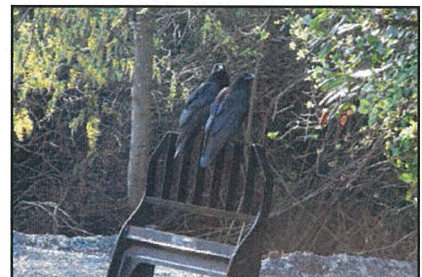


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EBMP #9: Fish & Wildlife Management	

- ALL wildlife must be left alone. Do not approach or handle newborn or juvenile wildlife.
- Injured or orphaned wildlife must not be handled without proper experience and equipment.
- Dispose of dead wildlife appropriately.
- Report observations of injured or deceased animals to EGD Environmental Services.
- Prior approval from EGD Environmental Services is required for the relocation or removal of nesting wildlife; a Migratory Bird Damage or Danger Permit is required to remove nests and retrieve eggs of migratory birds (e.g. seagulls).
- Never mistreat, remove or destroy any areas that could provide habitat for wildlife without prior approval and receipt of appropriate permits from the relevant authority.

**Contact EGD Environmental Services for wildlife related information, incidents and interactions.
Contact the Front Gate Commissionaires for afterhours assistance.**



A variety of wildlife is known to occupy areas of the Esquimalt Graving Dock property.

**Incidents with wildlife are managed on a case by case basis.
Direction and/or assistance must be taken from the appropriate authority when required.**



Environmental Best Management Practices

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EBMP #10: Water Use	

EBMP #10: Water Use

The Esquimalt Graving Dock (EGD) is considered a major consumer of fresh water. Water is provided to the facility by the Capital Regional District (CRD) distribution system, on a fee for use basis. Inefficient use of water may result in a negative economic and environmental impact. Water consumption and the quality of water are both considerations of the environmental management systems at the 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 CRD. Users must be conscious of activities that consume high volumes of water and work to mitigate any water waste.

In order to reduce the amount of water consumed onsite:

- Mitigate dust in problem areas using high efficiency Dust Suppression Units, when physical containment techniques are not sufficient to prevent fugitive dust emissions.
- Use fire nozzle water curtains only when all other attempts to contain particulate emissions from sandblasting have failed. Water curtain use must be approved by EGD Management in advance.
- Avoid use of freshwater to clean work areas, where possible.
- Maintain fittings in buildings and on equipment to prevent leakages.

Water Consuming Activities

Activities associated with vessel surface preparation and dust control use significant amounts of water.



Conventional pressure washing and ultra high pressure (UHP) washing use large amounts of water at high pressure to scour paint and biological material from the hulls of ships.



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EBMP #10: Water Use	

Dust Suppression Units



Dust Suppression Units are used to mitigate the escape of dust from sandblasting operations in the drydock.

Water Quality

The water distribution system at the EGD was originally designed as a fire suppression system; therefore, the water in certain areas of the system may not be considered potable.

- Potable water is not available throughout the facility (*this includes intake to vessels moored alongside or in the drydock*).
- Users of the facility are responsible for ensuring that the water they use meets the guidelines for the purpose intended.
- Users must use backflow prevention when accessing the water distribution system.

The EGD maintains the fresh 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 on an annual basis.



Metered Water Use at the Esquimalt Graving Dock

- Users of the facility must ensure that water is accessed from a metered line when connecting to the water distribution system.
- Portable meters are to be used when required.
- The EGD Pumphouse must be contacted for proper access to the water distribution system.



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EBMP #11: Energy Conservation	

EBMP #11: Energy Conservation

The Esquimalt Graving Dock (EGD), as an industrial facility, is a major consumer of energy. Inefficient energy use may result in negative economic and environmental impacts. Economic impacts are associated with inefficient electrical usage (e.g. cost), while environmental impacts include those associated with the consumption of fuel (e.g. air emissions).

Energy consumption also 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 operating the cranes or printing a report. It is important to minimize energy consumption wherever possible to reduce the release of harmful greenhouse gases and conserve energy.

Electrical Consumption

There are a number of opportunities to increase the efficiency of electrical usage at the EGD:

- Turn off lights and equipment when not in use (e.g. flood lights, office buildings).
- Install energy efficient devices in buildings (e.g. sensor switches, efficient light bulbs).
- Use energy efficient equipment whenever possible and consider energy efficient options when purchasing new equipment.
- Stagger equipment start-up to decrease load on electrical system.





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EBMP #11: Energy Conservation	

Fuel Consumption and Emissions

Opportunities to decrease the amount of fuel consumed by day to day activities include:

- Using energy efficient vehicles.
- Using alternative fuels where possible (e.g. Biofuels).
- Using alternative energy sources where possible (e.g. LED, solar, rechargeable).
- Avoid idling vehicles (e.g. delivery vehicles).
- Use shore power where possible.
- Encourage staff to try alternative means for commuting to work (e.g. carpool, public transit, cycling).

Idling Vehicles

- 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.



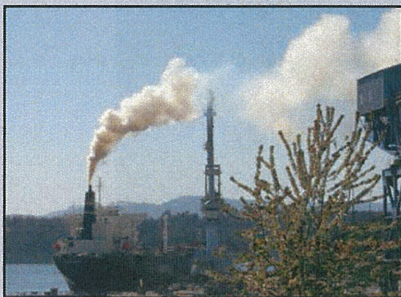
Be aware of the potential impacts of emissions on neighbours near the EGD.



Idling vehicles produce unnecessary air emissions and noise.

Shore Power

For vessels moored alongside at the North Landing Wharf and in the drydock it is important that they utilize shore power when possible. With shore power, the auxiliary generator can be turned off, thereby saving fuel and preventing the release of harmful air pollutants.



Did You Know?

Shore Power may be accessed at the EGD:

- 208V and 480V available on the North Landing Wharf and drydock.



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EBMP #12: Nuisance Pollution	

EBMP #12: Nuisance Pollution (Noise/Odour/Light)

The daily operations of the Esquimalt Graving Dock (EGD) Users have the potential to negatively impact neighbouring residents and businesses, as well as the immediate work area. Nuisance pollution is often created by noise, odour and light.

Noise

- Noise pollution can be generated and recognized in decibel levels, pitch, oscillation and duration.
- 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.
- Sound carries. Operational noise, vehicle noise and loud voices can be heard in nearby areas. Site Users must be aware of the potential impacts of all activities taking place at EGD and be respectful of neighbours.
- Schedule noisy activities for daytime hours 0700 hrs to 2300 hrs on weekdays, weekends and holidays. Through worker education and good practice the generation of high-level intermittent or non-continuous noises can be minimized.
- Personal vehicles, including motorcycles, can disturb neighbouring residents. Your vigilance is appreciated especially during quiet hours. Warning signs are posted at parking areas to remind personnel to be respectful of neighbours when arriving and departing the EGD.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Nuisances Noise Control*.



The EGD is located in close proximity to residential areas.



Personal vehicles with loud engines can disturb neighbouring residents.



Warning signs in parking areas act as a reminder to minimize noise at EGD.

Responses to nuisance pollution complaints will be taken on a concern-by-concern basis.

**To submit a nuisance complaint contact the
Esquimalt Graving Dock Information Line at (250) 363-0227.**



Environmental Best Management Practices

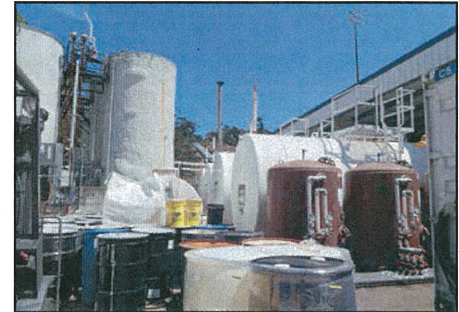
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EBMP #12: Nuisance Pollution	

Odour

- Daily dock operations often create strong and unpleasant odours whether from the release of VOCs, H₂S, organic materials, or chemicals. An offensive smell can reduce the quality of the work environment for neighbouring tenants and residents. Biological material removed from bilges, sea chests and hulls must be contained, covered and disposed of appropriately. Be proactive in planning for timely transport and proper disposal of material; a permit may be required for disposal.
- Material must be stored away from direct sunlight/heat and disposed of in a timely manner, to avoid nuisance odour pollution.
- Odour mitigating measures may be required, if odours are negatively affecting neighbouring properties or onsite personnel.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Odour and Disturbances*.

Light

- Night time dock operations require spotlights to provide a safe work environment. Be aware that strong spotlights can be a significant intrusion for residential neighbours.
- Only utilize spotlights when absolutely necessary. This will help prevent disturbing the neighbours, as well as to ensure a more energy efficient work environment.
- Changing the direction of stationary and portable lights in the workplace may reduce the effect they have on the neighbours.
- Turn off any unnecessary lights.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Odour and Disturbances*.



ADEQUATE containment of odorous waste.



INADEQUATE containment of odorous waste.



Only utilize spotlights when necessary.



Changing the direction of spotlights can reduce light impact on neighbours.



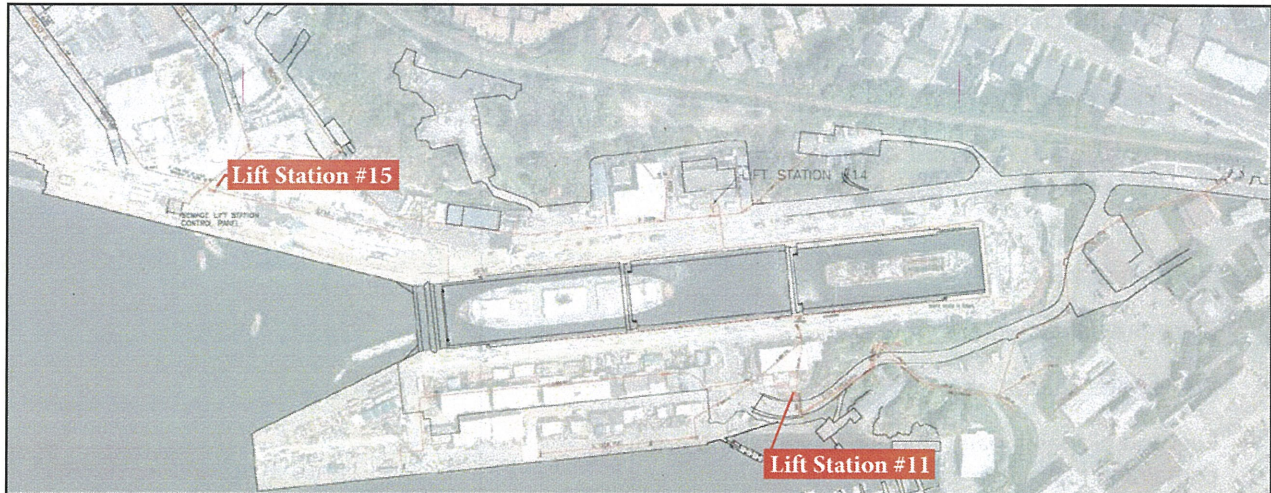
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EBMP #13: Sanitary Waste & Sewer	

EBMP #13: Sanitary Waste Management and Sewer Use

The Esquimalt Graving Dock (EGD) is authorized by the Capital Regional District (CRD) as a ship and boat waste disposal facility. The authorization allows for the proper discharge of sanitary waste, grey water and superchlorinated water at designated locations at the EGD, and stipulates the requirements that must be met prior to discharge.

Discharge to the sanitary sewer at any location other than at LS#15, LS#11 or at vessel connections located in the services tunnels of the drydock is prohibited.



Lift Station #11.



Lift Station Maintenance.



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EBMP #13: Sanitary Waste & Sewer	

The EGD is authorized to discharge to the sanitary sewer at:

- Lift Station #15 (LS#15),
- Lift Station #11 (LS#11), and
- Vessel connections in the drydock.

Permitted wastes include:

- Sanitary waste, *
- Grey water, and
- Treated superchlorinated water.**

***Sanitary Waste:** must contain <50,000 ppm total solids.

****Superchlorinated Water:** must not be discharged to the sanitary sewer unless it has been de-chlorinated to less than 5 ppm chlorine.

Prohibited wastes include:

- Bilge and ballast water,
- Wastewater sludge, and
- Fuel and oil, paint, paint thinner, solvents, and products containing toxic chemicals.

Other Wastes

Other wastes may be considered for discharge to the sanitary sewer on a case-by-case basis; approval *must be* requested from EGD Management prior to discharge.

Discharge to the sanitary sewer at locations other than those authorized may be considered on a case-by-case basis; approval *must be* requested from EGD Management prior to discharge.

Waste Discharge Notification

EnviroSystems Inc. will, as a standard operating procedure, notify the EGD Pumphouse prior to large volume discharges to the sewer system (e.g. any "batch discharge" in excess of 20,000 litres). Coordination of discharge may be required depending on usage of the sanitary sewer system at the time.

EnviroSystems Inc. will contact the Pumphouse on a regular work day if EnviroSystems Inc. is planning to discharge large volumes during times other than Monday to Friday, day shift (0730 hrs to 1600 hrs) or on statutory holidays.

EnviroSystems Inc. must contact EGD Management if there is a change in normal discharge operations (e.g. increase in daily volume).



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EBMP #13: Sanitary Waste & Sewer	

Access to the Sanitary Sewer

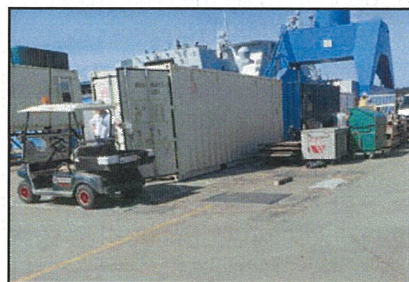
- Users must notify the Pumpouse before conducting any discharges to the sanitary sewer. Typical methods of discharge include: large (*direct connection and discharge from a vessel*), and small (*portable discharges from totes and tanks*).
- Users must complete a **Sanitary Sewage Discharge Form** and provide it to the Pumpouse prior to discharging to the sanitary sewer.
 - o Pumpouse Operators will ensure that sanitary sewer discharges are in accordance with applicable regulations and authorizations.
 - o Pumpouse Operators will provide all completed **Sanitary Sewer Discharge Forms** to EGD Environmental Services.
- Users must ensure a sample collection point is accessible at the point of discharge.
- Users must request approval from EGD Management to connect directly to the sanitary sewer for regular domestic waste (*e.g. washrooms, sinks, toilets*). Any other waste is prohibited from being discharged of through these lines.

Lift Station Maintenance

- Commissionaires will contact the Pumpouse on radio Channel 4 when DND sewer maintenance personnel enter the facility.
- Pumpouse staff will supervise DND personnel work on the lift stations where required.



AUTHORIZED Sanitary Sewer Discharge point, Lift Station #11.



AUTHORIZED Sanitary Sewer Discharge point, Lift Station #15.



UNAUTHORIZED Sanitary Sewer Discharge point (i.e. storm drain).



UNAUTHORIZED Sanitary Sewer Discharge point (i.e. trench drains).



UNAUTHORIZED Sanitary Sewer Discharge point (i.e. sewer manhole).



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EBMP #14: Spill Preparedness	

EBMP #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 still 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 spill response equipment and materials appropriate to the work they are performing.
- 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.
- Containment boom, deployment reels and boat.
- Pneumatic skimmer with drum and brush recovery modules, deployment and retrieval services.
- Staff trained to deal with land and water based spills.

For spills beyond the capability of the facility to manage, contact *Emergency Management (EMBC)*. Additional resources will be coordinated for response to land and water based spills.

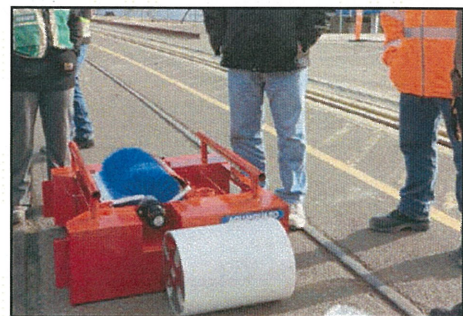
**ALL Spills at the Facility
MUST BE REPORTED to EGD Management.
Details are to be provided in an Incident or Spill Report.**



Spill response training at EGD.



Spill response training at EGD.



Spill response equipment: Skimmer.



Spill response equipment: Spill Kit.

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EBMP #14: Spill Preparedness	



Assess the situation.



Stop product flow.



Secure the area.

Steps to Spill Response

Assess the Situation

- Never rush in. Warn others in the immediate area.
- Stay upwind of the spill and avoid low lying areas.
- Quickly and accurately gather details that may need to be communicated to spill response personnel and the authorities including:
 - What equipment or work activity is involved?
 - What hazards are associated with the spilled product?
 - How large is the spill?
 - Is the situation under control or is it escalating?
 - What areas are or could be affected?
 - Proposed strategy to contain/control the spill.
 - Notify others in the area of the spill.

Stop Product Flow

- Act quickly to stop product flow, **ONLY IF SAFE TO DO SO**.
- Activate emergency shutdowns (*if applicable*).
- Close delivery truck manifold valves, etc. (*if applicable*).

Secure the Area

- Clear the area of public and untrained personnel.
- Ensure those onsite are wearing appropriate PPE.
- If spill is indoors, ensure the building is evacuated.
- Isolate large spills in all directions.
- Limit or prevent access to the site.
- Enforce safety procedures.



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EBMP #14: Spill Preparedness	

Contain the Spill

- Approach the spill from an upwind direction and avoid low lying areas.
- Use appropriate PPE (e.g. gloves, eye protection, respirator).
- Follow safe work procedures.
- Block drains, culverts, and ditches to prevent entry into waterways, sewers or confined areas.
- Contain spill with absorbent materials (from spill kits), earth, sand, or other non-combustible materials.

Notify the Authorities

- Contact your Supervisor immediately.
- Report the spill to EGD Management.
- For spills greater than 100L on land, or any spill of any size that enters the marine environment, contact: Emergency Management (EMBC) Reporting Line: 1-800-663-3456.
- Additional reporting requirements may be required depending on the spilled material.

Recovery and Clean Up

- Use appropriate materials to recover spilled product (e.g. loose absorbent, pads, booms, socks).
- Place waste in labelled 6mm plastic bags or leak proof containers.
- Store waste in secure, dry, well-ventilated location, away from heat and ignition sources.
- Consult with authorities before removing waste from site.
- Arrange for waste disposal at an approved facility by a qualified contractor.

Investigation & Reporting

- Investigate the spill or incident and complete and submit required reports to the authority having jurisdiction.



Contain the spill.

Environmental Emergency Contacts (24 Hours):

EGD Commissionaires

250-363-3784

Emergency Management (BC) Reporting Line

1-800-663-3456

DND QHM

250-363-2160

or
VHF Channel 10



Recovery and clean up.



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EBMP #15: In-Water Hull Cleaning	

EBMP #15: In-Water Hull Cleaning and Maintenance

The cleaning, maintenance and repair of the underwater hull and associated appendages 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.
- In-water hull cleaning of 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 work. This applies to in-water hull cleaning to remove organic growth only, NOT to coating removal.

In-water Maintenance

- In-water maintenance may be considered on a case by case basis and must be approved by EGD Management prior to the commencement of work. In-water maintenance may include but is not limited to:
 - o Cleaning of anodes, inlets, props, and transducers for operational and inspection purposes only.



All vessels approved for in-water hull cleaning or maintenance must have a containment boom in place prior to work starting.

Additional requirements may be required on a case by case basis depending on the scope of work involved.

NOTE: Cleaning of the above water hull while berthed alongside the dock is PROHIBITED.

Did You Know?

Antifouling paints and their residues contain heavy metals, such as copper, which 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.



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EBMP #16: Housekeeping	

EBMP #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. Good housekeeping programs will identify and assign responsibilities for shift clean up, day-to-day cleanup, proper waste disposal, removal of unused material, and regular inspection.

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 potentially contaminated water could enter the stormwater system.
- Ensure trench and storm drains within designated leased areas are kept clean and free of debris.
- Sweep and/or clean active working areas on a regular basis.

Storage

- Do not store materials or equipment outside of leased areas.
- Regularly inspect lease areas for unidentified or improperly stored materials.
- Ensure all stored products and wastes are clearly labelled and identifiable.
- Place a drip pan underneath vehicles and equipment when performing maintenance. Promptly transfer used fluids to the proper waste or recycling drums.
- Ensure all containers (e.g. drums, totes, pails) are in good condition and have a clean exterior at all times. Ensure containers are not left open; secure lids or cover containers when not in use.



INADEQUATE: Keep work areas neat & orderly.



*INADEQUATE:
Keep trench and storm drains free of debris.*



*INADEQUATE:
Ensure storage containers are not left open.*



ADEQUATE: Keep work spaces organized and clear of debris to prevent accidents.



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EBMP #17: Stormwater Management	

EBMP #17: Stormwater Management

Stormwater has been identified as one of the primary pathways of contaminant loading to the local harbour associated with Esquimalt Graving Dock (EGD) operations. Common contaminants found in stormwater samples include metals, extractable petroleum hydrocarbons (LEPH/HEPH), and total suspended solids (TSS). Five upland stormwater catchment areas terminate into the Esquimalt Harbour from the EGD property. The drydock floor tunnel drainage system leads directly to the Esquimalt Harbour. Any material entering the tunnel drainage system, either through tunnel grate drains or open sump well valves, will end up in the harbour. Deleterious materials must not be allowed to enter the storm or tunnel drain system.

Uplands Stormwater Management

- Store hazardous materials away from storm drains and trenches on the dock floor and in upland areas.
- Ensure totes, drums, pails and skips containing hazardous materials are protected from the weather (e.g. lids secure, tarps in place).
- Place filter cloth over storm and trench drains when working with deleterious substances that are in close proximity to, and that could pose a hazard to the marine environment.
- Divert and contain stormwater runoff containing contaminants and sediment with proper materials and filtration, prior to entering the drains (e.g. use filter cloth, hay bales, sand bags).
- During heavy stormwater events, ensure storm drains and trenches are kept clear of debris to prevent flooding.
- Conduct regular inspections of storm and trench drains in lease areas to ensure they are kept clear of debris.
- 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.



Prevent deleterious substances entering marine environment by placing filter cloth in the trench drains.



Sand bags used on dock bottom to divert and filter excess water.



Do not allow trench drains to build up with debris. This helps to prevent flooding during heavy stormwater events.



Environmental Best Management Practices

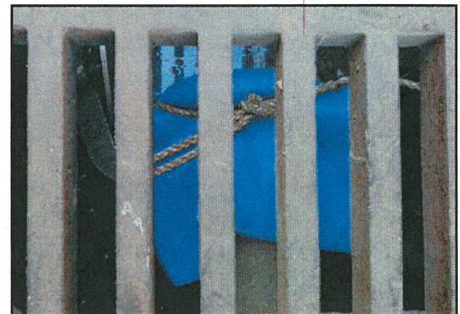
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EBMP #17: Stormwater Management	

Drydock Floor Stormwater Management

- Stormwater has the potential to mix with washwater and other contaminants on the drydock floor during normal operations. Users of the drydock must plan in advance for stormwater management during their work period.
- To reduce the amount of washwater requiring treatment, stop power washing operations until stormwater can be controlled.
- To prevent contamination of stormwater with washwater, waste sandblast grit and other hazardous materials and wastes, cleanup work areas as soon as possible.
- Sump well valves may be opened to allow stormwater to drain into the tunnel drains when the trench drains, sump wells and dock floor area is clear of contaminants and debris. In the case where washwater collection is completed, but the trench drains, sump wells and dock floor have not been cleaned, a filter cloth may be secured over an open sump well valve to allow stormwater flow. This procedure prevents contaminants and debris from entering the drainage system. This method requires dedicated personnel management of the process and regular filter cloth replacement. Do not poke holes in the filter cloth.
- Tunnel grate drains on the drydock floor in Section 2 and 3 may be uncovered enough to allow stormwater to flow into the drains. Ensure the area is clear of contaminants and debris.
- Sump well valves must be closed in sumps containing visibly contaminated material. Sump wells must be pumped out and cleaned prior to opening the valves.
- Ensure there is capacity in the trench drain/sump well collection system to manage expected stormwater volume. This will allow for continued collection and will prevent flooding of the dock floor.
- Prior to flooding and dewatering of the drydock, ensure all sump well valves are open.



Uplands storm drain with filter cloth. Avoid storing hazardous materials near storm drains, which are directly linked to the marine environment.



Filter cloth secured over sump well valve to allow stormwater flow.



Environmental Best Management Practices

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EBMP #18: Property & Infrastructure	

EBMP #18:

Property and Infrastructure Maintenance, Modifications and Construction

Significant environmental issues and potential impacts are known to be related to the management of Esquimalt Graving Dock (EGD) property and infrastructure. Any new property and infrastructure construction or modification projects at the EGD must consider environmental issues in project planning and implementation. Common environmental aspects that require consideration and management when planning and implementing projects include: dust emissions, hazardous materials and wastes, storm water runoff, noise, and prevention and response to accidental spills and releases. Requirements for the operational aspects are identified in specific sections of the EGD EBMPs.

Infrastructure Maintenance & Repair

Maintenance and repair of existing facility property and infrastructure often results in waste generation and other environmental aspect considerations to be addressed.

Minor Concrete Work

- Contain dust emissions from cutting and drilling.
- Prevent concrete slurry runoff from entering storm drains.
- Prevent debris from mixing concrete from entering storm drains or the marine environment.
- Prevent concrete slurry runoff from entering the trench and tunnel drains and the "moonpool" on the drydock floor.

Use of Preserved Wood

- Avoid use of creosote preserved wood products where possible.
- Follow applicable guideline for use of preserved wood products.
- Creosote wood waste may be considered a hazardous, restricted or controlled waste, and must be handled and disposed of accordingly.

Demolition/Renovation

- Ensure structures are assessed for the presence of hazardous materials prior to demolition or renovation (*e.g. asbestos, lead based paint, PCB and mercury containing ballasts, mould*).
- Hazardous materials and waste must be handled and disposed of according to applicable regulatory requirements.
- Halocarbon containing equipment must be managed in accordance with the Federal Halocarbon Regulations.



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Land Use Application

The EGD Land Use Application (EGD LUA) contains sections specific to potential environmental aspects related to the project. These sections must be completed with all relevant information.

EGD Management will respond with additional environmental protection and mitigation measures if required.



Infrastructure Modification & Construction

All modification and construction projects at the EGD must be assessed for environmental impacts, and plans put in place to mitigate the identified impacts. Projects managed by the EGD will be completed in accordance with the national project management system and site specific requirements.

For projects managed by Users:

- Any 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 a property or infrastructure project, the EGD Land Use Application must be completed in full and submitted to EGD Management for review.

Green Space and Vegetation

The EGD property includes areas of vegetation that provides many benefits, including important habitat for wildlife and sensitive native plant species, and act as a buffer between the industrial operations of the facility and the neighbouring residential area.

All projects which have the potential to impact green space, vegetation and wildlife habitat must be reviewed and approved by EGD Management.

Tree and Vegetation Compensation Policy

To facilitate the EGD wildlife management plan and reduce the likelihood of habitat loss at the facility, property and infrastructure projects that require the removal of vegetation must provide compensation in the form of appropriate vegetation replacement. Additional supplies are also required when compensation vegetation is purchased to ensure that new plantings will be successful (e.g. soil, mulch, tree protection, and water bags). Consult with EGD Management prior to work to determine what compensation is required.



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Soil Management

The EGD has undergone significant capital and operation and maintenance projects in recent years. Extensive investigations into the soil conditions (*e.g. contamination and structure*), utility mapping and identification of archaeological conditions have taken place. The industrial history of the facility has resulted in known 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 Excavation

Planning Excavation

1. Consult with EGD Management prior to excavation to identify:

- Project area and excavation boundaries.
- Known utilities, structures, and historical information regarding the proposed excavation area.
- Known contaminated soil locations and the nature and level of contaminants potentially in the soils to be excavated.
- Archaeologically significant areas, requirements for mitigation of archaeological impacts, and dealing with unanticipated archaeological finds.

2. Prepare a plan for soil management: stockpiling and sampling of soils to be excavated. Key issues to be considered include:

- Turnaround times for sample results may take up to 2 weeks.
- Parameters to be sampled may vary depending on the area of excavation. Common parameters include total metals, leachable metals, PAHs, and hydrocarbons (*LEPH, HEPH*).
- EGD Management must approve stockpile areas.
- Soils which exceed the CCME Industrial Levels or BC CSR Industrial Levels: must be disposed of off site at an approved disposal facility.
- Soils which are below industrial standards: may remain on site if geotechnically suitable, if there is an identified use for the soil, and when approved by EGD Management.

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 the risks. This includes adequate Personal Protective Equipment (*PPE*) and hygiene practices (*e.g. no smoking, wear gloves*).



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*ADEQUATE soil stockpile management.
Soils placed on poly and covered.*



*INADEQUATE stockpile of contaminated soil.
Soil should be covered to prevent exposure to
elements, runoff and people.*

Conducting Excavation

- Ensure appropriate PPE and hygienic precautions are in place to prevent exposure to contaminants in the soils.
- Monitor all excavations for visible soil contamination or archaeologically significant material.
- Ensure soil is stockpiled, sampled and analyzed in accordance with the Environmental Management Act and Contaminated Sites Regulation, and BC Ministry of Environment Technical Guidance Document 1, Site Characterization BC Government Technical Guidance on Contaminated Sites (January 2009).
- Ensure soils suspected of contamination are stockpiled on an impervious surface (e.g. 6 mil PVC or plastic poly liner) and adequately covered to prevent exposure to wind, storm water runoff or people. Stockpiles must not exceed 50m³ in size.
- Imported fill material used for surfacing, backfilling or any other use must meet CCME Residential/Parkland (RL/PL) Land Usage Soil Quality Guidelines. Fill material information must be provided to and approved by EGD Management before being used on site.

After Excavation

- Ensure all soil is disposed of at a facility that is permitted to accept that material.
- Obtain all disposal records, including: waste manifests, weigh bills and disposal certificates from the receiver.
- Report the volume, analysis results, excavation details and dimensions and disposal records to EGD Management.
- Provide all as-builts and project drawings to EGD Management in the format compatible with the EGD drawing standards.



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Archaeological Considerations

The EGD property and surrounding area has a rich First Nations history. There are 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 scope of the project a detailed Archaeological Impact Assessment may be required.
- All Users, including contractors and employees working on excavation projects, must be made aware of the potential for archaeological chance finds. In the case where suspect archaeological material is discovered during excavation, work must stop in that area and EGD Management must be notified immediately.

Archaeological Overview Assessment

An Archaeological Overview Assessment was conducted for the EGD which outlines the archaeologically sensitive areas on the property and identifies areas of high archaeological potential.

Archaeological significant materials found during excavation projects at the facility include shell midden, artifacts, faunal and human remains.



Many archaeologically sensitive areas exist on the EGD Property.



First Nations archaeologists examine materials unearthed during excavations at EGD.

**Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179**

APPENDIX C

November 2016

**Appendix C
EGD Standards for Surveys**



Esquimalt Graving Dock (EGD) STANDARDS FOR SURVEYS

Revised 2012-02-28

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) STANDARDS FOR SURVEYS

Revised 2012-02-28

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.

Esquimalt Graving Dock (EGD) STANDARDS FOR SURVEYS

Revised 2012-02-28

- 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 A**.

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.

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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 A - ITEMS TO BE INCLUDED IN SURVEY

Revised 2012-02-28

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 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 A - ITEMS TO BE INCLUDED IN SURVEY

Revised 2012-02-28

- (X) Electric utilities – the location of:
 - (X) power poles – 1 point at ground elevation
 - () power poles – 1 point at top of pole elevation
 - () guy wires – 1 points
 - (X) anchors – 1 points
 - (X) Rectangular junction/pull boxes – 4 corners
 - () Round junction/pull boxes – cover center
 - () Underground conduits – all tie-ins (existing or new) and change of directions
 - (X) vaults – 4 corners

- (X) Storm, sanitary or combined sewers – the location of:
 - (X) manholes – cover center
 - (X) culverts – 2 centreline measurements to show direction of flow
 - () headwalls – 4 corners
 - (X) catch basins – 4 corners + 1 centre measurement at gutter line
 - (X) 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.

- (X) Water – the location of:
 - (X) all water valves – center point
 - (X) standpipes – center point
 - () regulators – center point
 - (X) 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 A - ITEMS TO BE INCLUDED IN SURVEY

Revised 2012-02-28

- 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 – 4 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 A - ITEMS TO BE INCLUDED IN SURVEY

Revised 2012-02-28

- Existing buildings – the location of:
 - 4 corners of Rear Gate Guard House
 - 4 corners of Jenkins Building at Munroe Head
 - NE and NW corners of VISSC Building
 - _____
 - _____
 - _____

- Location and description of any building or major structure on adjoining land that is not more than ____ feet outside the parcel being surveyed.

- Other – the location of:
 - 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.

 - Property line location adjacent to new chain link security fence installed under this project

 - PBM Benchmark: Department of Public Works (DPW) 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

 - Location and extent of new or remaining gates and turnstiles within chain link security fencing.
 - _____
 - _____
 - _____
 - _____
 - _____
 - _____
 - _____

**Replace West Perimeter Security Fence
Esquimalt Graving Dock
825 Admirals Road, Esquimalt BC
Project No. R.016116.179**

APPENDIX D

November 2016

**Appendix D
Schedule of EGD Dock Charges**

Public Works and Government Services Canada

Home > PWGSC Services > Property and Buildings > Real Property > Esquimalt Graving Dock > New rates effective April 1st, 2016
 > Annex 1 – tariff of dock charges

Annex 1 – tariff of dock charges

(Sections 2, 4, 5, 8, 17, 20, 33, 34, and 38)

▶ Table summary

Article	Services and facilities	April 1, 2016	
1	Booking	\$5,307.46	
2	Draining, per section	\$5,307.46	
3	Berthage, per metre, per day	\$6.20	
4	Rail mounted crane, per hour	(a) with light hook	\$487.30
		(b) with main hook, up to 50 tonne lift	\$703.87
		(c) with main hook, over 50 tonne lift	\$1,082.90
5	Mobile crane, per hour	(a) 9-tonne crane	\$135.36
		(b) 20-tonne crane	\$173.26
		(c) 30-tonne crane	\$211.17
		(d) Forklift	\$102.88
		(e) Tower crane	\$173.26
6	Air compressor (first), per manifold hour	\$119.12	
7	Air compressor (second), per manifold hour	\$113.70	
8	Air compressor (wheeled), per manifold hour	\$59.56	
9	Motorized vessel, per hour	\$196.88	
10	Fresh water, per cubic metre	\$1.36	
11	Electric power, per kilowatt hour	\$0.16	
12	Tie-up or letting go	\$861.39	
13	Overtime labour services, dry-dock employee, per hour	\$106.32	
14	Security services, per vessel, per day	\$487.30	
15	Dockage, 1 section, per day	\$3,184.47	
16	Dockage, 2 sections, per day	\$10,614.91	
17	Dockage, 3 sections, per day	\$14,860.87	
18	Dockage per ton, per day: under 5,000 gross tonnage	\$0.00	
19	Dockage per ton, per day: 5,000-34,999 gross tonnage	\$0.12	
20	Dockage per ton, per day: 35,000-69,999 gross tonnage	\$0.11	
21	Dockage per ton, per day: 70,000-89,999 gross tonnage	\$0.10	
22	Dockage per ton, per day: over 89,999 gross tonnage	\$0.09	
23	Sewer Discharge, per litre	\$0.01	
24	Vacuum loader	\$70.38	

Date modified: 2015-09-29

