Public Works and Government Services Canada

Requisition No: 9R306-02

DRAWINGS & SPECIFICATIONS
for MARINE CIVIL WORK

Institute Of Ocean Sciences (IOS) Timber and Concrete Floats
A, B1, B2 C & D Installation

APPROVED BY:

Regional Manager, AES — Date

Construction Safety Coordinator — Date

TENDER:

Project Manager — Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
Room 219 - 800 Burrard Street, Vancouver, B.C., V6Z 0B9

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DISCIPLINE	SEAL
PRIME CONSULTANT MARINE ENGINEER	
Seals immediately below limited to specifications related to work contained in Section 01 11 05	
STRUCTURAL ENGINEER	n/a
ELECTRICAL ENGINEER	n/a
MECHANICAL ENGINEER	n/a
Seals immediately below limited to specifications related to work contained in Section 01 11 05	

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes	.1	Location of site.
	.2	Site conditions.
	.3	Work covered by contract documents.
	.4	Time of completion.
	.5	Use of site.
1.2 Precedence	.1	Division 1 Sections take precedence over technical specification sections in other Divisions of these Project Specifications.
1.3 Related Sections	.1	Section 35 05 51 - Marine General Site Work.
1.4 Site Conditions	.1	Visit site before submitting tender. Make inquiries or investigations necessary to become thoroughly acquainted with site, soil, climatic and tidal conditions along with the nature and extent of the work.
	.2	Submission of a tender will be deemed confirmation that the Contractor if familiar the site and is conversant with all relevant conditions.
	.3	All known discrepancies are to be brought to the attention of the Departmental Representative and are to be accounted for in the Contractor's Bid Price.
1.5 Location of Site	.1	The work is located at the Institute of Ocean Sciences located at 9860 West Saanich Road, Sidney, BC.
	.2	The work site includes the timber and concrete floats A, B1, B2, C and D.
1.6 Work covered by Contract Documents	.1	The principal works to be executed and for which all materials, plant and labour are to be supplied by the Contractor as shown on in the plans and in the specifications: .1 Demolishing and removal of existing floats, piles,

gangways and other marine works as required for the construction.

.2 Taking over Owner supplied materials, transportation and storage on the site.

.3 Supplying of additional and balance of materials required for completion of works.

.4 Fabrication and installation of steel pipe piles for floats and ramps.

.5 Fabrication and installation of steel platforms, access span and foundations

.6 Receiving, transportation and installation of concrete float and vehicular ramp.

.7 Fabrication and installation of timber floats

.8 Fabrication and installation of gangways

1.7 References

.1 National Research Council of Canada (NRC):
- .1 National Building Code of Canada (NBC) 2010.

.2 See Section 01 35 33 for additional references.

1.8 Codes and Standards

.1 Perform work in accordance with the National Building Code, the Workers' Compensation Board of B.C., and any other code of provincial or local application provided that, in any case of conflict or discrepancy, the most stringent requirements shall apply.

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

.3 Use latest edition of standards and codes.

1.9 Documents Required

.1 Maintain at job site one copy of the following:
- .1 Contract Drawings
- .2 Contract Specifications
- .3 Addenda
- .4 Reviewed Shop Drawings, product data and samples;
- .5 Change orders
- .6 Other modifications to contract
- .7 Field Test Reports
- .8 Copy of all permits from Authorities Having Jurisdiction

.9 Permit Drawings (where applicable)
.10 Industrial Health and Safety Regulations of WorkSafe BC
.11 Copy of approved work schedule
.12 Manufacturer's installation and application instructions
.13 Health and Safety Plan and Fire Safety plan
.14 Environmental Emergency Response Plan (including Spill Response Plan)
.15 Record Drawings (working marked print)
.16 Site Instructions
.17 Site Reports
.18 WHMIS Documentation

.2 Departmental Representative may furnish additional drawings to assist proper execution of work. These documents will be issued for clarification only. Such documents will have the same meaning and intent as if they were included in the plans referred to in the Contract documents.

1.10 Record Drawings

.1 As work proceeds, maintain accurate records to show all deviations from the contract drawings. Note on as-built drawings as changes occur. At completion of work supply one set of all drawings and specifications clearly marked. Supply one set in CAD and pdf format.

1.11 Geotechnical Report

.1 A geotechnical information is contained in Appendix E.

1.12 Datum

.1 All elevations or soundings used in the drawings and specifications refer to chart datum. Refer to Appendix L.

1.13 Layout of Work

.1 Departmental Representative may set stakes and establish bench marks to indicate the location, alignment and reference elevations for the work.

.2 Lay out work on the ground and execute the work to the Departmental Representative's satisfaction.

1.14 Assistance by the Contractor

.1 Place work vessels at the Departmental Representative's disposal as required for the Departmental Representative to perform his duties.

1.15 Time of Completion .1 Complete works as stipulated in Invitation to Tender. Total Completion no later than March 31st, 2017.

1.16 Work Schedule .1 Within 10 days of Contract award, provide a schedule of work. Observe the following requirements:

.1 Whenever a variation from the schedule in excess of 5 working days occurs or is expected to occur, notify Departmental Representative of the change.

.2 Provide information as indicated below:

Materials Assembly Phase:

Materials	Supplier	Date of Delivery
Steel Piling		
Timber		
Hardware		
Gangways		
Miscellaneous steel		
Fenders		

Construction Phase:

Activity on site	Start	Complete
Start of Work at Site		
Demolishing		
Taking over Owner supplied materials		
Supplying of Materials		
Pile Fabrication and Driving		
Floats Fabrication and Installation		
Gangways Fabrication and Installation		
End of Work at Site		

.3 Notify Canadian Coast Guard, Regional Operation Centre no less than 5 days before start and completion of proposed activities at the site in order that they may issue Notices to Shipping.
Contact information is:
CCG
Regional Operational Centre Alerting Desk
Email: Notship.western@innav.gc.ca
Tel. 1-800-889-8852

1.17 Use of Site

.1 Keep facility closure to a minimum. The Contractor will not have exclusive site access. The Contractor's activity must be coordinated with other users for a minimum operation disruption. The Contractor must coordinate and maintain access to site.

.2 Float C must not be out of service for longer than 2 weeks. Either floats B or C must be available for service. No more than 2 floats to be taken out of service at any time.

.3 Use of site: limited to immediate area of the work and areas assigned by the Engineer for office storage, equipment, stock piles, sanitary facilities, etc.

.4 As there will be NO ACCESS to any of the buildings, the Contractor will provide sanitary facilities for the work force in accordance with governing regulations and ordinances.

.5 Vehicles entering and left in the designated work area must have the Contractor's logo/name clearly marked on the vehicle.

.6 Arrange parking in areas directed by Department Representative. Maintain construction parking area clean and free of construction related debris. Make good damage resulting from the Contractor use of parking areas, at no cost to the Contract.

.7 Confine work and operations of employee to areas defined by the Contract Documents unless directed otherwise in writing by the Department Representative. Do not unreasonably encumber premise with products.

.8 Hours of work.

.1 Perform work between normal hours of 07:00 to 18:00, Monday to Friday, except holidays and in accordance with local noise bylaws.

.2 Work may be performed after working hours, on weekends and holidays as approved by Departmental Representative.

.9 Temporary power and light.
- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, and any other power requirements necessary for completion of the Work.
- .2 Provide and maintain temporary lighting necessary for the performance of the Work under this contract. Illumination levels shall be in accordance with WorkSafe BC requirements.

1.18 Project Meetings

.1 Meet with Departmental Representative within 5 days of Award of Contract date, to establish scope of Work and approach to project construction operations

.2 The Departmental Representative will arrange project meetings and assume responsibility for setting times. The Contractor will be responsible for recording and distributing minutes.

1.19 Location of Equipment and Fixtures

.1 Location of existing equipment and fixtures indicated or specified is to be considered as approximate.

1.20 Material and Equipment

.1 Metric-Sized Products:
- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
- .2 The Contractor is required to provide metric products where specified in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.
- .3 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric-sized products which are available on the Canadian market will not be considered sufficient reasons claiming that they cannot be provided.
- .4 Claims for additional costs due to provision of specified modular metric-sized products will not be considered.

.2 Material and Equipment:
- .1 Use new material and equipment unless otherwise specified.
- .2 Within seven (10) days of written request by Departmental Representative, submit following

information for any or all materials and products proposed for supply:

.1 Name and address of manufacturer.
.2 Trade name, model and catalogue number.
.3 Performance, descriptive and test data.
.4 Manufacturer's installation or application instructions.
.5 Evidence of arrangements to procure.

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

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

.5 Specifications for materials supplied by Owner are shown in Appendices F, G, H and I. All additional and balance of materials supplied by the Contractor should match or exceeds materials supplied by Owner or to comply with technical specifications if provided.

.3 Manufacturer's Instructions:

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

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

.4 Fastenings, General:

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

.2 Obtain Departmental Representative's approval before using explosive-actuated fastening devices.

.3 Comply with CAN3-Z166-M85 Series when using explosive-actuated fastening devices.

.5 Fastenings, Equipment:

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

.6 Delivery and Storage:

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

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

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

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

.5 Owner supplied materials for timber floats will be delivered to IOS, 9860 West Saanich Road, Sidney, BC, V8L 4B2.

.6 Owner supplied steel pipes, concrete float B1 and vehicular ramp will be delivered for transportation by the Contractor at Steveston, 12740 Trites Road, Richmond, BC V7E 3R8.

.7 The Contractor will take over Owner supplied equipment and materials, will inspect all supplies and will report any damages and shortages within 5 working days. The Contractor will be responsible for all loading, handling, transportation and storing on the site.

.8 The Contractor to have representative present on site to accept all deliveries to site and is responsible for unloading.

.7 Construction Equipment and Plant:

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

.2 Maintain construction equipment and plant in good operating order.

1.21 Shop Drawing Review

.1 The review of shop drawings by Departmental Representative is for the sole purpose of ascertaining

conformance with the general concept.

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

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

1.22 Testing and Inspection Services

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

.2 Contractor will appoint and pay for services of testing laboratory including the following:

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

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

.3 Mill tests and certificates of compliance.

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

.5 Additional tests specified in paragraph following.

.3 Where tests or inspections performed by the testing service reveal work is not in accordance with the contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.

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

.5 Provide Departmental Representative with a copy of testing laboratory reports as soon as they are available.

1.23 Sleeves, Hangers and Inserts

.1 Provide and set sleeves where conduits pass through masonry or concrete. Pack sleeves with glass or mineral wool. Obtain Departmental Representative's approval before cutting for sleeves. Provide and install hangers and inserts where required.

1.24 Interpretation

.1 In interpreting the Contract, in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions govern.

.2 In interpreting the Plans and Specifications, in the event of discrepancies or conflicts between:

.1 the Plans and Specifications, the Specifications govern;

.2 the Plans, the Plans drawn with the largest scale govern; and

.3 figured dimensions and scaled dimensions, the figured dimensions govern.

.4 the Plans and Specifications govern over the appendices.

1.25 Measurement for payment

.1 Payment for work will be made at the Prices Per Unit as tendered for the various classifications of the work appearing in the 'Unit Price Table" of the Form of Tender .

.2 Any work called for in the specifications or shown on the plans, or which is necessary for the completion of the work called for in the specifications and is not specifically listed as a separate item in the "Unit Price Table", shall be deemed incidental to the general purpose of the Contract and no separate payment will be made on account of any such work, but the cost of any such incidental work shall be included in the Price Per Unit values as tendered for the various items appearing in the "Unit Price Table".

.3 “Mobilization and Demobilization” a single lump sum will include all work required to supply the material, plant, and labour (including temporary sanitary facilities) to the

site of the work at the start of the project and to remove all materials, plant and labour from the site at the end of the project. The supply and maintenance of the temporary sanitary facilities for the work force will be included in this pay item. This item will also include all costs associated the General Conditions requirements, instructions of the Contract.

.4 "Demolishing" a single lump sum will include all work required to supply the material, plant, and labour for removal and disposal of existing timber floats, gangways, piles, boat lift trestle, demolishing of all existing works as required to complete the project. The removed steel pipe camels to remain the Owner's property and will be stored by the Contractor on the site as instructed by Departmental Representative. The re-profiling of the seabed at Float A is also included in this item. For As-Built records refer to Appendix D and J.

.5 "Piles" steel pipes for pipe piles will be supplied free of charge by the Owner. Additional steel piles will be required to complete fabrication of all piles; This additional steel pipe quantity will be supplied by the Contractor and measured for payment by linear meters (lin.m) of piles delivered to the fabrication yard and incorporated into piles. Transportation of piles to the site, fabrication, driving and installation will be measured for payment by unit for each pile completed in place. Price shall also include all pile fabrication and handling, pile appurtenances, cutting shoes, concrete and reinforcement infill, grout as specified, rock sockets, rock penetration and cutoffs. For pipes supplied by the Owner refer to Appendix F.

.6 "Float A" timber, hardware, billets and fasteners will be supplied by the Owner to storage at IOS. Additional timber, hardware and fasteners will be required to complete gangway landing platform landing custom float. This additional quantity supplied by the Contractor will be measured for payment in as a lump sum. Hardware, fasteners and appurtenances will not be measured for payment. Those are considered incidental to payment for additional timber. Additional buoyancy billets will be supplied by the Contractor and measured for payment for

each billet delivered to storage at IOS. Supply and fabrication of the steel pile frames will be measured for payment for each frame. Fabrication and installation of Float A using all Owner and Contractor supplied materials will be paid for as a lump sum inclusive of all labour and incidentals. Measurement for payment for support platform, access span and access span foundation will be as a lump sum for each inclusive of all materials, labour and equipment. Measurement for payment for gangway will be as a lump sum inclusive of detailed design, materials, labour and equipment for installed and commissioned gangway. For Owner supplied materials refer to Appendices.

.7 "Float B1". Measurement for payment for the float B1 be as a single lump sum that will include acceptance of a complete float supplied by the Owner at Steveston, towing and installation at IOS. For details refer to Appendix I and K. ~~Measurement for payment for fendering system will be as a lump sum for all materials, labour and equipment for a complete fendering in place. Measurement for payment for steel pile well lining will be as a lump sum for all materials, labour and equipment for a complete system in place.~~ Vehicular ramp measurement for payment will be a single lump sum that will include acceptance of a complete ramp supplied free of charge by the Owner at Steveston, transportation and installation at IOS. For details refer to Appendix H. Measurement for payment for the ramp abutment will be as a lump sum for all materials, labour and equipment. Measurement of payment for supply and construction of the access roadway will be a lump sum inclusive of all materials, labour and equipment. For Owner supplied materials refer to Appendices.

.8 "Float B2" timber, hardware and fasteners will be supplied by the Owner to storage at IOS. Additional buoyancy billets will be supplied by the Contractor and measured for payment for each billet delivered to storage at IOS. Supply and fabrication of the steel pile frames will be measured for payment for each frame. Fabrication and installation of Float B2 using all Owner and Contractor supplied materials will be paid for as a lump sum inclusive of all labour and incidentals. Measurement for payment for support platform will be as a lump sum for all materials,

labour and equipment. Measurement for payment for gangway will be as a lump sum inclusive of detailed design, materials, labour and equipment for installed and commissioned gangway. For Owner supplied materials refer to Appendices.

.9 "Float C" timber, hardware and fasteners will be supplied by the Owner to storage at IOS. Additional buoyancy billets will be supplied by the Contractor and measured for payment for each billet delivered to storage at IOS. Supply and fabrication of the steel pile frames will be measured for payment for each frame. Fabrication and installation of Float C using all Owner and Contractor supplied materials will be paid for as a lump sum inclusive of all labour and incidentals. Measurement for payment for support platform will be as a lump sum for all materials, labour and equipment. Measurement for payment for gangway will be as a lump sum inclusive of detailed design, materials, labour and equipment for installed and commissioned gangway. For Owner supplied materials refer to Appendices.

.10 "Float D" timber, hardware and fasteners will be supplied by the Owner to storage at IOS. Additional timber, hardware and fasteners will be required to complete custom corner float unit. This additional quantity supplied by the Contractor will be measured for payment in as a lump sum. Hardware, fasteners and appurtenances will not be measured for payment. Those are considered incidental to payment for additional timber. Additional buoyancy billets will be supplied by the Contractor and measured for payment for each billet delivered to storage at IOS. Supply and fabrication of the steel pile frames will be measured for payment for each frame. Supply and fabrication of the steel reinforcing frames will be measured for payment as a lump sum. Fabrication and installation of Float D using all Owner and Contractor supplied materials will be paid for as a lump sum inclusive of all labour and incidentals. Measurement for payment for support platform will be as a lump sum for all materials, labour and equipment. Measurement for payment for fendering system will be as a lump sum for all materials, labour and equipment for a complete fendering in place. Measurement for payment for gangway will be as a lump sum inclusive of detailed

design, materials, labour and equipment for installed and commissioned gangway. For Owner supplied materials refer to Appendices.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Shop drawings and product data.

.2 Certificates and transcripts.

.4 All other submissions including Schedules, Health and Safety plans, and Spill plans as required in the plans and specifications.

1.2 Related Sections

.1 Section 01 11 05 - Marine General Instructions.

.2 Section 35 05 51 - Marine General Site Work.

1.3 Administrative

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

.2 Work affected by submittals shall not proceed 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 Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittals has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

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

.7 Verify field measurements and coordinate affected adjacent Work .

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

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

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

1.4 Shop Drawings
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 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 5 working days for Departmental Representative's review of each submission.

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

.5 Make changes in shop drawings as may be required, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.6 Accompany submissions with transmittal letter

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.

.7 Submissions shall 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.

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

.9 Submit 1 electronic copy of shop drawings for each requirement requested in specification Sections. Electronic copy to be in PDF format. For large files provide data on CD, 2 copies required. As-Built drawings to be submitted in paper format, 2 copies.

.10 Submit 2 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop

drawings will not be prepared due to standardized manufacture of product.

.11 Delete information not applicable to project.

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

.13 If upon review by 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 re-submission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept. 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 all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

Not applicable

END OF SECTION

1. References

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

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

.3 Canadian Standards Association (CSA):
- .1 CSA S269, Falsework for Construction Purposes.
- .2 CSA Z797, Code of Practice for Access Scaffold.
- .3 CSA-S350, Code of Practice for Safety in Demolition of Structures.

.4 Fire Protection Engineering Services, HRSDC:
- .1 FCC No. 301, Standard for Construction Operations.
- .2 FCC No. 302, Standard for Welding and Cutting.
- .3 HRSDC website: http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/index.shtml

.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.

2. Related Sections

.1 Refer to the following as required:

- .1 Marine General Instructions: Section 01 11 05.
- .2 Marine General Site Work: Section 35 05 51.

3. Workers' Compensation Board Coverage

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

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

4. Compliance with

1 PWGSC may terminate the Contract without liability to

Regulations

PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

5. Submittals

.1 Make submittals in accordance with Section 01 11 05 and 01 33 00.

.2 Submit the following:

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

.3 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 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review upon request.

.4 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.

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

.1 Be construed to imply approval by the Departmental Representative.
.2 Be interpreted as a warranty of being complete,

accurate and legislatively compliant.

.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6. Responsibility

.1 Assume responsibility as the Prime Contractor 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.

7. General Conditions

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

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

.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 site against entry.

8. Project/Site Conditions

.1 Work at site will involve:

.1 Construction on floats during high and low tides.

.2 Slippery and unstable surfaces.

.3 Preservative treated wood.

.4 Pile removal and pile driving

9. 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.

10. Filing of Notice

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

.2 Provide the Departmental Representative with a copy of all notices.

11. Health and Safety Plan

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with 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 communications and recordkeeping procedures.
- .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
- .3 List hazardous materials to be brought on site as required by work.
- .4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- .5 Identify personal protective equipment (PPE) to be used by workers.
- .6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation for new workers.

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

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

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

12. 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.

.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.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:
- .1 Work with hazardous substances.

.2 Work on, over, under and adjacent to water.

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

13. Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (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.

14. 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.

15. 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.
16.	Overloading	.1	Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.
17.	Falsework	.1	Design and construct falsework in accordance with CSA S269.1.
18.	Scaffolding	.1	Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CAN/CSA-S269.2.
19.	Powder-Actuated Devices	.1	Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.
20.	Fire Safety and Hot Work	.1	Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
		.2	Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.
21.	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.
22.	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.
23.	Posted Documents	.1	Post legible versions of the following documents on site: .1 Health and Safety Plan. .2 Emergency procedures. .3 Notice of Project.

.4 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.

.5 Workplace Hazardous Materials Information System (WHMIS) documents.

.6 Material Safety Data Sheets (MSDS).

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

24. Meetings

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

25. Correction of Non-Compliance

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

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

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

END OF SECTION

PART 1 - GENERAL

1.1 Environmental Factors

.1 Ensure that operations meet all applicable environmental regulations and standards.

.2 Comply with mitigation requirements as noted in the plans and specification and, in Appendix A and B.

.3 The contractor is responsible for the completion of the Notice of Project Application, and must submit a copy to the Departmental Representative within two days of submission.

1.4 Submittals

.1 Submittals: in accordance with Section 01 33 00 – Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

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

.1 Environmental protection plan: include:

.1 Name(s) of person(s) responsible for ensuring adherence to Environmental Protection Plan.

.2 Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from site.

.3 Name(s) and qualifications of person(s) responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

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

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

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

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies 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, dewatering of ground water, disinfection water, hydrostatic

test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

1.2 Vessels	.1	Vessels and floating equipment must not come to rest on the intertidal or sub-tidal zones unless specified otherwise.
1.3 Fires	.1	Fires and burning of rubbish on site not permitted.
1.4 Disposal of Wastes	.1	For specific waste disposal requirements see Section 35 05 51
	.2	Do not bury rubbish and waste materials on site.
	.3	Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
1.5 Drainage	.1	Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
	.2	Do not pump water containing suspended materials into waterways, sewer or drainage systems.
	.3	Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
1.6 Work Adjacent to Waterways	.1	Do not operate land based construction equipment within waterways.
	.2	Do not use waterway beds for borrow material.
	.3	Do not dump excavated fill, waste material or debris in waterways.
	.4	Design and construct temporary crossings to minimize erosion to waterways.
	.5	Do not skid logs or construction materials across

waterways.

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

.7 Do not blast under water or within 100 m of indicated spawning beds.

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 beyond application area, by providing temporary enclosures.

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

.5 Spill kits and containment are to be maintained on site and ready for deployment in case of spills.

.1 Spill kits are to contain sufficient quantities of absorbent material on site in close proximity to working machinery.

.2 During the work there are to be trained and qualified personnel on site that are ready to deploy spill kits when necessary.

1.8 Protection of Wildlife

.1 Make every effort to minimize disturbance to the benthic and upland wildlife communities.

.2 Any large invertebrates adhering to the portion of the wharf or jetty under construction must be removed and replaced in the nearby marine environment.

.3 Do not disturb eel grass or kelp beds.

1.9 Pile Driving

.1 Install protective barrier curtains.

.2 Barrier curtains shall comply with DFO requirements.

PART 2 – PRODUCTS

Not applicable

PART 3 - EXECUTION

Not applicable

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-94, Stipulated Price Contract.

1.3 INSPECTION

.1 Refer to CCDC 2, GC 2.3.

.2 Allow Departmental Representative and Engineer unrestricted 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.

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

.4 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.

.5 The Engineer may 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. If such Work is found in accordance with Contract Documents, the Owner shall pay cost of examination and replacement.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Department of Fisheries and Oceans for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Department.

.2 Contractor to provide equipment and access required for executing inspection and testing by appointed agencies.

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

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect.

Correct defect and irregularities as advised by Engineer at no cost to The Department. Contractor to pay costs for retesting and re-inspection.

1.5 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.

1.6 PROCEDURES

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

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

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

1.7 REJECTED WORK

.1 Refer to CCDC, GC 2.4.

.2 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 the Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

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

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

1.8 REPORTS

.1 Submit inspection and test reports to Engineer.

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

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.10 MILL TESTS

.1 Submit mill test certificates as required in specification sections.

1.11 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems if applicable.

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 REQUIREMENTS

.1 Section 02 81 01 Hazardous Materials

.2 Section 01 35 33 Marine Health and Safety Requirements

.3 Section 01 35 43 Environmental Procedures

1.2 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

.2 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.

.3 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill.

.4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

.2 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-[2008], Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).

.2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

.3 CSA International

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning of this Section with Departmental Representative to:

.1 Verify project requirements.

.2 Verify existing site conditions adjacent to demolition work.

.3 Co-ordination with other construction subtrades.

.2 Hold project meetings every week.

.3 Ensure key personnel to attend.

.4 WMC must provide written report on status of waste diversion activity at each meeting.

.5 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

.2 Scheduling:

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 In event of unforeseen delay notify Departmental Representative in writing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures - Construction/Demolition Waste Management Disposal.

.2 WMC is responsible for fulfilment of reporting requirements.

.3 Prior to beginning of Work on site submit detailed Waste Reduction Workplan and indicate:

.1 Descriptions of and anticipated quantities [in percentages] of materials to be salvaged reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters. Provide dumpsters to deposit re-usable and/or recyclable materials of the following:

.1 Metals

.2 Wood

.3 Cardboard

.4 Plastics

.5 Other materials as indicated in technical sections.

.4 Anticipated frequency of tippage.

.5 Name and address of haulers and waste facilities.

.4 Submit copies of certified bills of lading receipts from authorized disposal sites and reuse and recycling facilities for material removed from site upon request of Departmental Representative.

.1 Written authorization from Departmental Representative is required to deviate from haulers and receiving organizations listed in Waste Reduction Workplan.

.5 Shop Drawings:

.1 Submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.

.2 Submit demolition drawings stamped and signed by professional engineer registered or licensed in Province of BC, Canada.

.6 Sustainable Design Submittals:

.1 LEED Canada-NC Version 1.0 Submittals: in accordance with Section 01 35 00.

.2 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with EPA 832/R-92-005 authorities having jurisdiction.

.3 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, applicable Provincial and Municipal regulations.

1.6 SITE CONDITIONS

.1 Environmental protection:

- .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .3 Fires and burning of waste or materials is not permitted on site.
- .4 Do not bury rubbish waste materials.
- .5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
  - .1 Ensure proper disposal procedures are maintained throughout project.
- .6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction as directed by Departmental Representative.
- .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .9 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

.1 If material resembling spray or trowel applied asbestos or other substance listed as hazardous to be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Proceed only after receipt of written instructions have been received from Departmental Representative.

.2 Structures to be demolished are based on their condition at time of examination prior to tendering.

- .1 Remove, protect and store salvaged items as directed by Departmental Representative. Salvage items as identified by Departmental Representative.

Part 2 Products

2.1 EQUIPMENT

.1 Equipment and heavy machinery:

.1 On-road vehicles to:CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

.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 jurisdictions.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Prevent movement, settlement or damage of adjacent structures,

.1 Provide bracing, shoring [and underpinning] as required.

.2 Repair damage caused by demolition as directed by Departmental Representative.

.3 Support affected structures and, if safety of structure being demolished adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

.4 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.

.3 Surface Preparation:

.1 Disconnect electrical and telephone service lines entering buildings to be demolished.

.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap [designated] mechanical services.

.1 Natural gas supply lines: remove in accordance with gas company requirements.

.2 Sewer and water lines: remove to property line in accordance with authority having jurisdiction as directed by Departmental Representative

.3 Other underground services: remove and dispose of as directed by Departmental Representative.

3.2 DEMOLITION

.1 Blasting operations not permitted during demolition.

.2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

.3 Prior to start of Work remove contaminated or hazardous materials from site and dispose of in safe manner and in accordance with Section 02 81 01 - Hazardous Materials.

.4 Demolish structure as indicated on drawings.

.5 Piles to be removed fully extracted from the ground.

.6 At end of each day's work, leave Work in safe and stable condition.

.1 Protect interiors of parts not to be demolished from exterior elements at all times.

.7 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative

.8 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.9 Use natural lighting to do Work where possible.

.1 Shut off lighting except those required for security purposes at end of each day.

3.3 CLEANING

.1 Develop Construction Waste Management Plan related to Work of this Section.

.2 Divert excess materials from landfill to site approved Departmental Representative.

.3 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.4 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.

.5 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

.1 Label stockpiles, indicating material type and quantity.

.6 Separate from general waste stream each of following materials. Stockpile materials in neat and orderly fashion in location and as directed by Departmental Representative for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.

.1 Timber piles.

.2 Lumber.

.3 Miscellaneous metals.

.7 Supply separate, clearly marked disposal bins for categories of waste material. Do not remove bins from site until inspected and approved by Departmental Representative.

.8 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

.1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.

.2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

N/A

1.2 REFERENCES

.1 Canadian Environmental Protection Act,1999 (CEPA 1999).

.1 Export and Import of Hazardous Waste Regulations (SOR/2002-300).

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 National Fire Code of Canada [2005].

.4 Transportation of Dangerous Goods Act (TDG Act).

.5 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

1.3 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

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

.3 Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.4 SUBMITTALS

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

.2 Product Data:

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

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

.2 Submit to Departmental Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Do not transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.

.7 Do not use flammable liquids having flash point below 38 degrees C, such as naptha or gasoline as solvents or cleaning agents.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are not mixed.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.4 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.5 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

1.6 TRANSPORTATION

.1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.

.3 If hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Ensure compliance with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label container(s) with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

Part 2 Products

2.1 MATERIALS

.1 Only bring on site quantity of hazardous materials required to perform work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 DISPOSAL

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

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

1.2 REFERENCES

.1 American Concrete Institute (ACI)

.1 SP-66-04, ACI Detailing Manual 2004.

.1 ACI 315-99, Details and Detailing of Concrete Reinforcement.

.2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.

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

.1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A143/A143M-03, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A185/A185M-05a, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.4 ASTM A1064/A1064M-16, Standard Specification for Carbon Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

.3 Canadian Standards Association (CSA International)

.1 CSA-A23.1-[04]/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-A23.3-04, Design of Concrete Structures.

.3 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.

.4 CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.

.4 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 SUBMITTALS

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

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315.

.3 Submit shop drawings including placing of reinforcement and indicate:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Engineer, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.4 Detail lap lengths and bar development lengths to CSA-A23.3, unless otherwise indicated.

1.4 QUALITY ASSURANCE

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

.1 Mill Test Report: provide Engineer with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request submit in writing to Engineer proposed source of reinforcement material to be supplied.

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

.3 Waste Management and Disposal:

.1 Separate waste materials for recycling and handle in accordance with local regulations.

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

Part 2 Products

2.1 MATERIALS

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

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

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

.4 Cold-drawn annealed steel wire ties: to ASTM A1064/A1064M-16.

.5 Welded steel wire fabric: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.6 All reinforcement for this project is 'black' (no galvanizing, no epoxy-coated bar).

.7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.8 Mechanical splices: subject to approval of Engineer.

.9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23, ACI 315 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain Engineer approval for locations of reinforcement splices other than those shown on placing drawings.

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

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

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

Part 3 Execution

3.1 FIELD BENDING

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

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

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Engineer approval of reinforcing material and placement.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 20 00 - Concrete Reinforcing.

1.2 REFERENCES

.1 American Concrete Institute (ACI)

- .1 ACI 121R, Guide for Concrete Construction Quality Systems in Conformance with ISO 9001.
- .2 ACI 305R. Guide to Hot weather Concreting.
- .3 ACI 306R. Guide to Cold Weather Concreting.

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

- .1 ASTM A185-05, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.3 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.

.4 Canadian Standards Association (CSA International)

- .1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .3 CSA A283, Qualification Code for Concrete Testing Laboratories
- .4 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

1.3 SUBMITTALS

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

.2 Shop Drawings:

- .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing and embedded parts.
- .2 Submit drawings showing formwork and falsework design to: CSA-A23.1/A23.2.

.1 At least 4 weeks prior to beginning Work, submit concrete mix design to Engineer for review and approval.

.2 Provide testing results for review by Engineer and do not proceed without written approval when deviations from mix design or parameters are found.

.3 Concrete hauling time: submit for review by Engineer deviations exceeding maximum allowable time of 90 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

.1 Submit to Engineer, minimum 4 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.2 Quality Control Plan: cylinders, slump, and air tests will be arranged onsite by the Engineer, paid for by the Department.

.3 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: maximum allowable time limit for concrete to be delivered to site of Work and discharged not to exceed 90 minutes after batching.

.1 Modifications to maximum time limit must be agreed to by the Engineer and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by the Engineer.

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

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Ensure that concrete waste is disposed of in accordance with local regulations.

.2 Concrete washout to be done offsite, in an approved facility (ie: back at suppliers' yard).

.3 Unused concrete products 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.

Part 2 Products

2.1 MATERIALS

.1 Portland cement: to CAN/CSA-A3001, Type GU.

.2 Supplementary cementing materials:

.1 Fly ash shall conform to CSA A3000, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and shall have an on ignition loss not exceeding 3%. Class N pozzolan for use in mitigating Alkali-Silica Reactivity shall have a Calcium Oxide content of less than 13% and total equivalent alkali content less than 3%.

.2 Maximum 20% natural pozzolan to CSA A3000 by mass of total cementitious materials.

.3 Maximum 10% silica fume to CSA A3000 by mass of total cementitious materials

.3 Water: to CSA-A23.1/A23.2.

.4 Aggregates in accordance to CSA A23.1/A23.2.

.1 Normal density, clean, hard uncoated inert particles from naturally formed sand and gravel formations or from crushed quarried rock, boulders or cobbles.

.2 Maintain uniformity of quality and colour throughout the Work.

Unless authorized in writing by the SFC Engineer do not use aggregates deemed reactive when tested for Alkali-Aggregate Reactivity in accordance with CSA A23.1/A23.2.

.5 Admixtures and additions:

.1 Air entraining in accordance to ASTM C260/C260M.

.2 Chemical admixture in accordance to ASTM C494/C494M. The SFC Engineer shall approve accelerating or set retarding admixtures during cold and hot weather placing.

.1 Retarding according to ASTM C494/C494M, Type B, D, or G.

.2 Accelerating admixtures in accordance with ASTM C494/C494M, Type C.

.3 Water reducing agents in accordance to ASTM C494/C494M, Type A, E, or F. High Range Water Reducer shall be ASTM C494/C494M, Type F and ASTM C1107/C1107M.

.4 Curing compound in accordance to CSA A23.1/A23.2.

.5 Shrinkage-reducing admixture (SRA) in accordance to ASTM C494/C494M.

.6 Other concrete materials: to CSA-A23.1/A23.2.

2.2 MIXES

.1 Performance Method for specifying concrete: to meet Engineer performance criteria in accordance with CAN/CSA-A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in quality management plan.

.2 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1 and S-3

.2 Minimum compressive strength 35 MPa at 28 days.

.3 Maximum aggregate size: 20 mm

.4 Maximum slump at point of discharge: 80 $\pm$ 30mm

.5 Air content at point of discharge: 4% to 7%

.6 Density of air-dry concrete: 2300 $\pm$ 150kg/m^3.

.3 Surface texture: broom non-skid finish on top deck, as-formed or steel trowel finish on all other surfaces.

.4 Concrete supplier's certification for both batch plant and materials to meet CSA A23.1/A23.2 requirements.

.5 Provide quality management plan to ensure verification of concrete quality to specified performance.

Part 3 Execution

3.1 PREPARATION

.1 Provide Engineer with 24 hours notice before each concrete pour.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

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

.4 Protect previous Work from staining.

.5 Clean and remove stains prior to application of concrete finishes.

3.2 CONSTRUCTION

.1 Perform cast-in-place concrete work in accordance with CSA-A23.1/A23.2.

3.3 CURING

.1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and in accordance with CSA-A23.1/A23.2.

3.4 SEALING

.1 Following curing, apply sealing compound in accordance with manufacturers instructions (or alternate sealer as reviewed and approved by the Engineer).

3.5 SITE TOLERANCES

.1 Concrete floor slab finishing tolerance in accordance with CSA-A23.1/A23.2.

.2 Embedded Elements and Anchor bolts:

.1 Embedded elements shall be accurately located, both in plan and elevation, and so held in place that they will remain in location during placing and curing of concrete. Embedded metal shall be positioned within ± 3 mm unless otherwise indicated on the Drawings.

.2 Tolerances from the dimensions shown on the drawings for bolt settings, after the concrete has set, shall be as follows unless noted otherwise on the Drawings:

.1 Bolts within a group: ±3 mm

.2 Bolt group to adjacent bolt group: ±6 mm

.3 Maximum accumulation between two bolt groups: ±6 mm per 30 m, not to exceed ±25 mm

.4 Projection from designated surfaces: ±6 mm

.3 Anchor bolt threads shall be protected and inserts shall be kept free of any deleterious materials. After placing concrete, ensure nuts and bolts run freely.

3.6 FIELD QUALITY CONTROL

.1 Concrete testing: to CSA-A23.1/A23.2 by testing laboratory arranged by Engineer and designated by PWGSC.

.2 Each load of ready mixed concrete shall be accompanied by a delivery ticket on which is printed, stamped, or written with the following information:

.1 Name and location of ready-mix company and batch plant.

.2 Date and serial number of the ticket.

.3 Name of the contractor.

.4 Specific designation of the job (name and location).

.5 Specific class and mix identification of the concrete in conformance with that employed in these Specifications, e.g. code number, order number.

.6 Amount of concrete in cubic meters.

.7 Truck number, cumulative total, and/or load number.

.8 Time that the load arrived on the project.

.9 Time that the discharge of load was started.

.10 Time that the discharge of load was completed.

.11 Amount of water added by contractor after batching, units used and his initials.

.12 Amount of admixture added after batching.

.13 Time stamped when loaded or time of first mixing of the cement and aggregate.

.14 Ordered slump and air content.

3.7 CLEANING

.1 Use trigger operated spray nozzles for water hoses.

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

.3 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

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

1.2 REFERENCES

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

- .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .3 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 414 MPa Tensile Strength.

.2 Canadian General Standards Board (CGSB)

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

.3 Canadian Standards Association (CSA International)

- .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
- .4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .5 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

1.3 SUBMITTALS

.1 Product Data:

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

.2 Shop Drawings

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

1.4 QUALITY ASSURANCE

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

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

.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with local regulations.

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

.3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.

.4 Wherever possible, divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

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

.2 Steel pipe: to ASTM A53/A53M.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48, electrode to match steel grade and metallurgy.

.5 Bolts and anchor bolts: to ASTM A307 unless noted otherwise.

.6 Aluminum plate: Alloy 5052 H32 temper (or approved equal).

.7 Aluminum Tube: Alloy 6061 T6 temper, rounded corners (or approved equal).

2.2 FABRICATION

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

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

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

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

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

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

.4 Aluminum fabrications to self colour (no painting of aluminum).

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint (or other alternate method reviewed and approved by Engineer):

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.5 SHOP PAINTING

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

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

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

Part 3 Execution

3.1 ERECTION

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

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

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

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

.5 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

.6 Touch-up galvanized surfaces and welds with zinc rich primer or marine-grade epoxy where burned by field welding.

3.2 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 The Contractor is responsible for design, supply, delivery to site and installation of gangways as per specifications detailed herein.

.2 Section Includes:

.1 Materials, design requirements and application for three aluminum marine gangways.

.3 Related Requirements

.1 Section 01 11 05 – General Instructions.

.2 Drawing 9R306-2-102

.3 Drawing 9R306-2-301

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CAN/CSA-S157/S157.1-[05], Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.

.3 CSA W47.2-[M1987(R2003)], Certification of Companies for Fusion Welding of Aluminum.

.4 CAN/CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59.2-[M1991(R2008)], Welded Aluminum Construction.

.6 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).

.7 CAN/CSA W117.2-[01], Safety in Welding, Cutting and Allied Processes (Developed in co-operation with the Canadian Welding Bureau).

.8 CAN/CSA- S6

.2 Aluminum Association (AA)

.1 AA DAF 45-[03(R2009)], Designation System for Aluminum Finishes.

.3 ASTM International

.1 ASTM A307-[07b], Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 ASTM A325-[09], Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.3 ASTM A325M-[09], Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength [Metric].

.4 ASTM A490-[09], Standard Specification for Structural Bolts Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.

.5 ASTM A490M-[09a], Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints [Metric].

.6 ASTM B209M-[07], Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric].

.7 ASTM B210M-[05], Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes [Metric].

.8 ASTM B211M-[03], Standard Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire [Metric].

.9 ASTM F593-[02(2008)], Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

.4 American Welding Society (AWS)

.1 AWS - A5.10/A5.10M[1999(R2007)], Specification for Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods.

1.3 SYSTEM DESCRIPTION

.1 These specifications cover the design and supply of aluminum gangways with appurtenances.

.2 Design and supply includes, but is not limited to, the following:

.1 The primary gangway structure consisting of hollow aluminium structural sections,

.2 Non-slip grating,

.3 Aluminum tube handrail, both sides, continuous for the full length of gangway,

.4 Timber kick plate/rub board, both sides, continuous for the full length of gangway,

.5 Gangway hinges and bearings complete with hanger bars, pins, cover plate, lower end apron, hinge, transition plate,

UHMWPE rollers, runners fixed down to the float deck, and all connection bolts, pins and screws to the timber planks on top of the floats.

1.4 DESIGN REQUIREMENTS

.1 Design gangways in accordance with drawing 9R306-2-102 and drawing 9R306-2-301.

.2 Design gangways to withstand the following loadings and combinations:

.1 Uniformly Distributed Live Load 4.8 kPa (2.4 kPa for Float B2)

.2 Concentrated Point Load 3 kN on 200*200m area from John Deere Gator wheel (does not apply for gangway at Float B2),

.3 John Deere Gator TS 4X2 at max speed of 10 km/hr and applicable handrail and breaking forces (does not apply for gangway at Float B2).

.3 All miscellaneous fasteners and non aluminium components are to be Grade 316 stainless steel.

.4 The structure must include elements to allowing safe lifting for transport to site and for maintenance while in operation.

1.5 SUBMITTALS

.1 Product Data:

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

.2 Shop Drawings: Submit shop drawings to the Departmental Representative for review and approval prior to fabrication.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.

.2 Submit shop drawings to include fabrication and erection documents consisting of full connection and design details, shop details, erection diagrams, erection procedures and material lists.

.3 Indicate cuts, copes, connections, holes, threaded fasteners, rivets, welds and other items. Indicate welds using welding symbols as shown in Appendix A of CSA W59.2.

.4 Provide samples of materials, finishes and colors at the request of the Departmental Representative.

.5 Submit certification from fabricator that gangways conform to design requirements specified herein.

.3 Closeout Submittals: provide maintenance data for gangways.

1.6 QUALITY ASSURANCE

.1 Retain qualified professional engineer, registered or licensed in Province of British Columbia, Canada with experience in Work of comparable complexity and scope, to perform following services.

.1 Design gangways in accordance with the design requirements, and

.2 Review, stamp, and sign shop drawings.

.2 Execute welding by firms certified in accordance with CSA W47.2.

.3 Ensure welding operators are licensed per CSA W47.2 for types of welding required by Work.

Part 2 Products

2.1 MATERIALS

.1 Aluminum bar, rod, wire: to ASTM B211M.

.2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B221M.

.3 Aluminum sheet or plate: to ASTM B209M.

.4 Aluminum drawn tubes: to ASTM B210M.

.5 Aluminum bolts and rivets: to ASTM B316M.

.6 Aluminum welding wire: to AWS - A5.10/A5.10M.

.7 Stainless steel bolts: to ASTM F593.

.8 Steel bolts: to ASTM A325M.

.9 Galvanizing: hot dip galvanized steel bolts to CAN/CSA-G164.

.10 Include materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.

.11 Incorporate only new materials free from defects which impair strength, durability.

.12 Welding materials: to CSA W47.1 and W59.

Part 3 Execution

3.1 EXAMINATION

.1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary.

3.2 FABRICATION

.1 Verify dimensions of existing Work before beginning fabrications and report discrepancies to Departmental Representative.

.2 Fabricate gangways to CAN/CSA-S157 and in accordance with reviewed shop drawings.

.3 Fit and assemble Work in shop where possible.

- .1 Shop fabricate gangways in sections as large and complete as practicable.
- .2 Where shop fabrication is not possible, make trial assembly in shop.

.4 Accurately cut, machine and fit joints, corners, copes and miters so that junctions between components fit together tightly and in true planes.

.5 Weld connections where possible and cut off bolts flush with nuts.

- .1 Countersink bolt heads, and provide method to prevent loosening of nuts.
- .2 Ream holes drilled for fastenings.

.6 Weld joints tight, flush, and in true planes with base metals.

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

.7 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication.

- .1 Show holes on shop drawings where possible.
- .2 Place holes in manner to avoid reducing strength in member.

3.3 WELDING

.1 Execute welding to avoid damage or distortion to Work: execute welding in accordance with following:

- .1 CAN/CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.

.2 CSA W59.2 -M1991 for design of connections and workmanship.

.3 CAN/CSA W117.2 - for safety.

.2 Thoroughly clean welded joints and expose steel for sufficient distance to perform welding operations.

.3 Test welds for conformance and remove Work not meeting specified standards and replace to be reviewed by Departmental Representative.

3.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 11 05 General Marine Instructions.

.2 Deliver complete gangways to the site.

.3 Storage and Protection:

.1 Store and handle gangways to prevent permanent deflection, distortion or damage

.2 Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

3.5 INSTALLATION

.1 Provide all necessary manpower and equipment for unloading and installation of the gangway according to the location specified in the plans. Make the required adjustments to position the gangway in the space provided on the floating dock.

.2 Ensure the proper functioning of the gangway on a complete tidal cycle and make the required adjustments and provide assistance when in operation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 00.01 - Rough Carpentry.

1.2 REFERENCES

.1 American Wood-Preservers' Association (AWPA)

- .1 AWPA M2-[01], Standard for Inspection of Treated Wood Products.
- .2 AWPA M4-[06], Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA International)

- .1 CSA O80 Series-97(R2002) - O80S2-05, Wood Preservation.
- .2 CSA O80.201-M89, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.
- .3 CSA O322-02, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

1.3 SUBMITTALS

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

.2 Quality assurance submittals:

- .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
- .2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
  - .1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
  - .2 Moisture content after drying following treatment with water-borne preservative.
  - .3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 QUALITY ASSURANCE

.1 Plant inspection of products treated with preservative by pressure impregnation will be carried out by designated testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA O322 certified stamp.

.3 Inspection and testing of timber float materials (bullrails, blocking, stringers, crossties, flanges, splice timbers) will be carried out by a Testing Laboratory acceptable to the Engineer.

.4 Costs for testing to be included in the bid price for the timber float.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling or disposal in accordance with local regulations.

.2 Contractor to make an effort to recycle or reuse as much 'waste' material as possible.

Part 2 Products

2.1 MATERIALS

.1 All timber materials to be Coast Douglas Fir, #1 Structural Grade or better unless specified otherwise. For supplemental and additional materials match materials already supplied.

.2 All timber materials for this project will be incised and preservative treated as follows: a) Bullrails and risers - ACZA treated; b) All other materials - Creosote treated.

.3 ACZA treated timber to have minimum 6.4 kg/m3 retention, with a minimum depth of penetration of 10mm as specified in CSA 080.14

.4 Creosote treated timber to have minimum 224 kg/m3 net retention, with a minimum depth of penetration of 19mm. Treatment in accordance with CSA 080.2.

Part 3 Execution

3.1 APPLICATION: FIELD TREATMENT

.1 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Remove chemical deposits on treated wood to receive applied finish.

.3 It is the intention that ALL HOLES and ALL TIMBERS will be pre-framed for this project in order to eliminate field touchup and modification. Shop drawings

for the pre-framed float components will be submitted to the engineer for approval before placing the order for these materials.

.4 Where absolutely necessary, field cut ends and drilled holes to receive 2 coats of copper napthenate (chemical soaked rag pulled through holes twice, once in each direction).

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 06 05 73 - Wood Treatment

1.2 REFERENCES

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

.1 ASTM A123/A123M-[02], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 Canadian Standards Association (CSA International)

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA O141-05, Softwood Lumber.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2005.

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal: Separate waste materials for disposal in accordance with Clause 1.19 “Material Disposal” of Section “011 11 15 – General Instructions”.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, Coast Douglas Fir softwood, #1 Structural Grade or better, dressed to dimensions shown on drawings, moisture content 19% or less in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Lumber supplied by the Contractor to supplement PWGSC supplied materials to match the PWGSC lumber.

2.2 ACCESSORIES

.1 Nails, spikes and staples: to CSA B111.

.2 Bolts: 15.9 mm diameter A307 (galvanized) unless indicated otherwise, complete with nuts and washers.

.3 Use stainless steel screw for securing mini-mesh decking to stringers.

2.3 FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for pressure-preservative treated lumber.

2.4 WOOD PRESERVATIVE

.1 Wood preservative to Section 06 05 73

Part 3 Execution

3.1 PREPARATION

.1 All timbers are to be accurately framed and drilled, counterbored in accordance with the shop drawings, prior to preservative treatment. The intention is to keep field drilling and framing to a minimum.

.2 All components to be identified with a clearly visible tag and identifying mark number. These tags may need to be installed after the treating process.

3.2 INSTALLATION

.1 Comply with requirements of DFO Best Management Practices for Piledriving and Marine Construction.

.2 Install components in accordance with the shop drawings, then square up and tighten all bolts, install floatation billets and decking as per the drawings.

.3 Use appropriate safety procedures and personal protection when working with treated wood, in accordance with WCB safe-work procedures.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 05 50 00 - Metal Fabrications.

1.2 SUBMITTALS

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

.2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.

.3 Sub-surface investigation report: when site conditions differ from those indicated, submit written notification to Engineer and await further instructions.

.4 Submit schedule of planned sequence of driving to Engineer for review, as specified.

.5 Equipment:

.1 Submit prior to pile installation, for review and approval by Engineer: list and details of equipment for use in installation of piles.

.2 Impact hammers: submit manufacturer's written data as specified.

.3 Non-impact methods; submit characteristics to evaluate performance.

.4 Drilling equipment: Descriptions, manufacturers’ specs, details of installation sufficient for Engineer to evaluate the suitability of the method.

1.3 EXISTING CONDITIONS

.1 A Geotechnical subsurface investigation report is included with the specification (Cook Pickering & Doyle, February 1974, Appendix E). It is important to note that this report was not done for this project, it was done for the original Pat Bay Ocean Sciences Pier Project. The information contained in this report is believed to be representative and accurate, and the information on the drawings is based to a large part, on the information contained herein. Pipe piles driven on D-dock (north side of the approach pier) in 2010 were advanced using a vibratory hammer, to approximately 4.0m penetration, with typically 1 to 2m in firm material (possible till) then refusal on bedrock.

.2 The specific type of bedrock is unknown, but presumed to be: mudstone, siltstone, sandstone, or conglomerate typical for the Southern Gulf Islands area.

.3 Notify Engineer immediately in writing if subsurface conditions at site differ materially from those indicated on the drawings or in the geotechnical report, and await further instructions. No claim for a change in subsurface conditions will be entertained if the Contractor has not notified the Engineer within 48 hours of discovering the variance.

1.4 SCHEDULING

.1 Provide schedule of planned sequence and timeline for pile installation to Engineer for review, not less than two weeks prior to commencement of pile driving.

Part 2 Products

2.1 MATERIALS

.1 Pile material supplied by DFO is specified in Appendix F.

.2 Piles may be fabricated and installed full length, or they may be installed in sections with field splices as required at Contractors' option. All splices to be full strength joints.

.3 It is assumed that these piles will be spliced, although it may be possible to supply and install full-length piles to meet the advancement and cutoff criteria specified on the drawings. Contractor to make suitable allowances for splicing (if required) or for handling full length piles (if required).

2.2 PILE INSTALLATION EQUIPMENT

.1 Hammers to be selected by Contractor with details for impact and non-impact methods, as well as overburden-style drilling methods submitted to the Engineer for review.

.2 The Contractor is fully responsible for ensuring that the equipment he chooses is capable of advancing the piles to the specified tip elevations.

Part 3 Execution

3.1 PREPARATION

.1 Protection:

.1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.

.2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.

.3 When damages occur, remedy damaged items to restore to original or better condition at own expense.

.2 Ensure that ground conditions at pile locations are adequate to support pile driving operation and that piles are not left in an unstable condition. Temporary staying of piles (if necessary) is a Contractor responsibility.

.3 At Contractors' option, pre-boring of holes may be acceptable to facilitate pile alignment control.

.4 Contractor will remove and replace rip-rap material as required to facilitate pile driving.

3.2 INSTALLATION

.1 The selection of equipment and method is up to the Contractor, but in all cases the Contractor is wholly responsible for advancing the piles to the minimum tip elevations and penetrations into bedrock as indicated on the drawings, and to the tolerances as identified in section 3.4 below.

.2 Installation of each pile will be subject to the approval of the Engineer. The Engineer will be sole judge as to acceptability of each pile with respect to final driving resistance, depth of penetration, specified tolerances.

.3 Piles installed to specified bedrock penetration - Seat each pile to the specified penetration into bedrock.

.1 Do not overdrive to cause damage to piles in bedrock.

.2 The Engineer will determine refusal criteria for piles seated in rock sockets based on type of pile and driving equipment as proposed by the Contractor.

.4 Piles driven to refusal on bedrock - Seat each pile to practical refusal on bedrock (ie: no rock sockets required).

.1 Do not overdrive to cause damage to piles on bedrock contact.

.2 The Engineer will determine refusal criteria for piles driven to rock based on type of pile and driving equipment as proposed by the Contractor.

3.3 APPLICATION / DRIVING / DRILLING

.1 Use driving caps and cushions to protect piles, appropriate to the method and equipment chosen by the Contractor.

.1 Piles with damaged heads will have the damaged section removed and (if necessary) a new piece of pipe spliced on top as determined by the Engineer. No claims for additional costs for this work will be entertained unless the completed pile length is more than the lengths specified on the Contract Drawings.

.2 Hold piles securely and accurately in position while driving.

.3 Deliver hammer blows along axis of pile.

.4 Use of water jet: Jetting of piles is not permitted, except as required to facilitate the drilling operation and equipment.

.5 Cut off piles neatly and squarely at elevations as indicated to tolerance of plus or minus 5 mm.

.6 Remove cut-off lengths from site on completion of work.

3.4 INSTALLATION TOLERANCES

.1 Pile heads to be within 75 mm of locations as indicated.

.2 Piles not to be more than 2% of length out of vertical alignment.

.3 Piles installed outside of these tolerances may be accepted at Engineers discretion, but if so directed the Contractor shall remove and re-install the pile to meet the Contract tolerances at no cost to the Department.

3.5 OBSTRUCTIONS

.1 Because the piles are specified to be advanced by drilling methods, any visible surface obstructions are assumed to be the responsibility of the Contractor.

.2 Contractor to allow for a pre-pile dive survey at all pile locations in order to remove any visible obstructions before pile installation begins. The Engineer is to be advised as to timing for the dive survey so he may attend.

.3 Sub-surface obstructions may be present in the overburden. These sub-surface obstructions fall into two categories: a) rocks and buried wood debris; and b) buried metal debris or buried reinforced concrete debris.

.1 Rocks and wood debris are Contractor responsibility and no claims for such obstructions will be entertained.

.2 Buried metal debris including reinforced concrete will be claimable as an extra to the Contract, as long as the Engineer agrees as to the nature of the debris encountered. All instruction in this matter will be through the Engineer and will require clear direction and written communication on both sides. As part of a claim under this section the Contractor will be required to prove that he has actually incurred additional costs as a result of said obstruction.

3.6 FIELD QUALITY CONTROL

.1 Contractor to maintain accurate records of driving for each pile, including:

.1 Type and make of hammer, stroke or related energy.

.2 Other driving equipment including drill details, air/water details, leads.

.3 Pile size and length, location of pile in pile group, location or designation of pile group.

.4 Start time and finish time for each stage of pile advancement, with pertinent notes describing sequence and steps taken.

.5 Seating criteria and result.

.6 Final tip and cut-off elevations.

.7 Other pertinent information such as interruption of continuous driving, pile damage, obstructions encountered.

.2 Submit pile driving records to the Engineer for review and signoff at the completion of each week.

3.7 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 American Society for Testing and Materials (ASTM):
- .1 ASTM A123/A123M-13, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A252-10, Specification for Welded and Seamless Steel Pipe Piles.
- .3 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.2 Canadian Coast Guard (CCG):
- .1 MA 2080, General Specifications for Moorings for Aids to Navigation, Issue C (September 1999).

.3 Canadian Institute of Treated Wood/Western Wood Preservers Institute (CITW/WWPI):
- .1 Best Management Practices for the Use of Treated Wood in Aquatic and Westland Environments (BMP), November 2011.

.4 Canadian Standards Association (CSA):
- .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .2 CSA G40.21-13, Structural Quality Steels.
- .3 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CSA-O56-10, Round Wood Piles.
- .5 CSA-O80 Series-08, Wood Preservation.
- .6 CSA O121-08, Douglas Fir Plywood.
- .7 CAN/CSA-S16-14, Limit States Design of Steel Structures.
- .8 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
- .9 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

.5 National Lumber Grades Authority (NLGA):
- .1 Standard Grading Rules for Canadian Lumber, 2014 edition.

1.2 Inspection and Acceptance

.1 At his discretion, the Departmental Representative may inspect materials and products at any stage of manufacture,

transportation and assembly. Satisfactory inspection at any stage does not preclude future rejection if the materials or products are subsequently found to lack uniformity or fail to conform to the specified requirements.

.2 The Contract work will not be accepted until the materials or products are satisfactorily installed in the completed structure as specified.

.3 Additional costs incurred by PWGSC that result from unsatisfactory materials or workmanship will be charged to the Contractor.

1.3 Mobilization and Demobilization

.1 Mobilization and demobilization will include all work required to supply the material, plant and labour to the site of the work, unless specified otherwise.

PART 2 - PRODUCTS

2.1 General

.1 Use only new materials except where specified otherwise.

.2 Use products of one manufacturer for material and quipment 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 as base metal in which they occur.

.1 Prevent electrolytic action between dissimilar metals.

.2 Use non-corrosive fasteners, anchors and spacers for securing exterior work.

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

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

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

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

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

.11 Store products in accordance with suppliers' instructions.

2.2 Timber

.1 Timber to NLGA, No. 1 Structural Grade Coast Douglas Fir conforming to NLGA Standard Grading Rules for Canadian Lumber unless otherwise specified or supplied by PWGSC.

.2 Decking is to be full sized rough sawn timber and wane free.

.3 Timber shall be graded in the following classes:
- .1 Boards, sheathing and form lumber.
- .2 Light framing.
- .3 Joists and planks.
- .4 Beams and stringers.
- .5 Posts and timbers.

.4 Frame and bore timber before treating unless specified otherwise.

.5 Any required timber shims shall be creosote treated plywood, treated to meet the requirements of use category UC5A as described in wood treatment.

2.3 Treatment of Wood Materials

.1 Refer to Section 06 05 73 Wood Treatment.

2.4 Steel

.1 Small fastenings: to CSA B111.

.2 Drift bolts, machine bolts, washers and miscellaneous iron: to CSA G40.21.

.3 Items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties are not acceptable.

.4 Bolts: all bolts are to be machine bolts unless specified otherwise.
- .1 Machine bolts:
  - .1 Conform to ASTM A307.
  - .2 Provide with steel plate washers under head and nut, unless specified otherwise.
- .2 Drift bolts: un pointed, with ragged edges beaten off.

.5 Steel plate washers:
- .1 Shape: round, unless specified to be square.
- .2 Size: select from table below, unless specified otherwise:

WASHER DIMENSIONS

Bolt Size	Thickness	Round Plate Outside Diameter	Square Plate Side Size
12.7 mm	5 mm	62 mm	62 mm
15.9 mm	6 mm	69 mm	69 mm
19.1 mm	6 mm	75 mm	75 mm
22.2 mm	8 mm	81 mm	81 mm
25.4 mm	9 mm	87 mm	87 mm
31.8 mm	11 mm	100 mm	100 mm
38.1 mm	11 mm	112 mm	112 mm

.6 Bolt holes:
- .1 Machine bolts: bore holes to provide a driving fit.
- .2 Drift bolts: bore holes 1.5 mm less than bolt diameter.

.7 Welding:
- .1 Unless specified otherwise, welding is to be in

accordance with CSA W59.

.2 Provide evidence that welding companies are certified to CSA W47.1.

.8 Steel Grades:

.1 Channels and Angles: 350W

.2 Miscellaneous Plate: 300W

.9 Finish:

.1 All fabricated steel profiles, angles and plates are to be hot dip galvanized unless otherwise noted.

2.5 Hardware

.1 Bolts (drift, machine, carriage, lag, etc.), nuts and washers: hot dip galvanized to CAN/CSA-G164.

.2 Spikes and nails: hot dip galvanized to CAN/CSA-G164 unless otherwise specified.

.3 All other hardware specified to be galvanized: hot dip galvanized to CAN/CSA-G164 unless specified otherwise.

.4 Stainless steel screws to ASTM F593-02

2.6 Chains and Shackles

.1 Mooring/Float Connection Chain:

.1 To CCG MA 2080 C.

.2 Black carbon steel, 19.1mm, long-link mooring chains, galvanized.

.2 Shackles:

.1 Crosby load-rated shackles galvanized or alternate approved by addendum during tendering.

.2 Secure pin against rotation after fastening with No. 12 gauge (2.052 mm) insulated copper wire.

PART 3 - EXECUTION

3.1 Handling of Treated Materials

.1 Treated materials will be rejected if damaged in any manner during handling, including damage from strapping and slings.

3.2 Field Preservative Treatment

.1 Treated materials:

.1 Do not make field cuts in treated material unless permitted by the Departmental Representative. When specified or approved, field treat cuts with field treatment preservative.

.2 Pile tops, pile bolt holes, pile bracing bolt holes, and cap-to-pile bolt holes may be field cut. Treat as specified.

.3 Before treatment all braces are to be bored on one end for the bolt to pile connection. This bored end is to be installed in the structure at the lowest end of the brace.

.4 Where field treatment is required, treat with 3 coats of preservative (for specific preservatives refer to CSA-O80 Series-08, Wood Preservation).

END OF SECTION